

JANUARY 31, 1979

#45

T-18 NEWSLETTER:

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The last T-18 newsletter was published 13 April '76. At that time it was felt that almost all the necessary material for T-18 construction had been covered, so it was decided that the most pressing need was to use the time to condense and update all the previous newsletters.

This had become a necessity, as the original master stencils were getting pretty well worn out after they had served nearly 1300 plan holders so well.

When Lu and I published the first newsletters in 1963 a considerable amount of our efforts were directed towards locating materials and suppliers, tools, etc. A lot of this material has been obsolete for some time, so has been eliminated in the new condensed version.

This gives a small measure of relief to the Sunderland family after 15 years of faithful, unselfish service to fellow T-18 builders. At Oshkosh this year Lu told me he still gets an average of 5 or 6 letters each day from T-18 builders!

To introduce myself to some of you, I'm Dick Cavin (#16). I reluctantly said goodbye to 35 years as a pilot for Braniff International when I reached the Federally mandated retirement age of 60 two years ago. Since then most of my time and effort has been occupied building and flying T-18s and writing the newsletter for EAA Chapter 168.

This has given me time to consider some of the newer aspects of T-18 building that have been used the past few years, so I've volunteered to give Lu a hand on the newsletter for several issues.

Our EAA chapter recently purchased an offset printing press, complete with plate maker, and as we print about 300 newsletters each month (of about 20 pages per issue), we also buy our paper in bulk. We also take advantage of bulk mailing rates, which are only around .08¢ per issue, third class. As editor, I have been given chapter approval to make full use of all these facilities at a very nominal cost, which will cover future maintenance, etc.

All of this translates to the ability to turn out very sharp, readable copy, fully illustrated with pictures, at a very low

cost per issue. The T-18 printing and mailing fund is close to depletion, so we are asking for donations from all of you, as subscribers, to get it off the ground. We are asking for a minimum of \$3.00 per man and hopefully this will take us through around 10 issues if we watch our costs closely.

As in the past, we need your input if we are to maintain the high quality of the newsletter. Remember, an editor has to have "reporters". He can't do it all, so we earnestly solicit your story, as long or short as you care to write. If you type, fine, but if not just sit down and scratch out your description of the subject matter, just like you were talking to a buddy over a cup of coffee. Don't worry about the spelling or punctuation, etc. We'll re-write it if it needs it. Don't consider any item (about the way you solved a problem) as too trivial to mention and don't assume that "everybody knows how to do that"!

There have been a lot of changes take place since the T-18 design left the runway in 1962. In the intervening 16 years the airplane has gradually evolved into a rugged, reliable, high speed vehicle, with a capability that equals or exceeds the finest, most sophisticated factory builds, costing many times more. About 250 have been built to date, with at least that many more somewhere in the construction process. Mandatory changes and "ADs" are remarkably few, certainly a tribute to the design expertise of JOHN THORP. Many of these airplanes are approaching the 2000 hour mark and several are well past that figure. Some of these "high timers" have done most of their flying from rough, unimproved landing areas, which is even more evidence of design excellence. Surely an aggregate total of 100,000 flight hours would be on the conservative side. Even the accidents have shown the T-18 to be very "survivable", as long as it isn't a stall/spin situation.

The rugged "A" frame landing gear and heavy members and attach beams from the seat back forward are mainly responsible for protecting the occupants from serious, or fatal injury. The outward curving shape of the fuselage in that area is also a potent safety factor, as crash researchers have discovered in Ag aircraft accidents.

With the gear acting as a "pylon", with the engine hanging from one side and the rest of the structure from the other, very high G forces on the airframe are greatly softened and slowed up, thus allowing gradual deformation of the structure, the key to survival



of high G impact. The A frame gear's ability to soak up huge amounts of energy before failure also validates its unique role as an effective barrier to prevent the engine from smashing thru the firewall and crushing the cockpit occupants. I know of no other single engine design that has this very valuable safety feature.

The T-18 basic design has given rise to a whole series of modifications, greatly widening its appeal to potential builders. From its starkly simple "plain Jane" beginning we have seen horsepower go from the almost extinct 125 hp. GPU to over 200, with constant speed props added, along with gear fairings, flaps, pressure cowling, canopies, and fuel in the wings. Fixed and retractable tricycle gear versions have appeared and also a couple of retractable conventional gear examples have been built, one of which was a single place. Several 3 place copies have surfaced, too, with jump seat capability to carry a child. Two inches more width at the cockpit is provided in the so-called "wide body" modification, that LU SUNDERLAND initiated. Cockpit comfort has been greatly enhanced with the addition of electric trim and electrically driven flaps, along with moving rudder cables to the outer walls of the fuselages. This allows both forward and rear tunnels to be eliminated, thus eliminating a universal complaint about the very cramped and restrictive leg room area. The 3" dia. aluminum tube between the seats, that encloses the push-pull tube, makes a big difference in comfort at the hip level, too. All these things add up to increased enjoyment of long cross-countries.

The astronomical cost and unavailability of hangar space has been the motivation for LU SUNDERLAND's folding wing design mod and no doubt those factors will mean that more and more builders will be forced to go this route if they are able to justify the increasing fixed costs of airplane ownership. Average hangar rent in metropolitan areas is around \$100/month and that \$1200 per year will buy a good radio, or lots of gasoline, plus pay for insurance each year! If the take-home idea repels you, a very practical alternative presents itself in the sharing of hangar space. In many T hangars just folding one wing of a T-18 would make it fit under any high wing Cessna easily. Four T-18s with both wings folded could share a single T hangar, with room to spare. Maybe 5.

Let's stop and take note of an important fact: All these modifications have added weight, so each of those 86 square feet of

wing has to work harder. Not only does the stall speed increase, but the former aerobatic capability is drastically compromised (or been wiped out)! Fifteen pounds of weight are added by the wing folding.

The light, early day T-18s are known to have good spin recovery characteristics, but be aware that a large "gray" area exists when we depart from the proven norm, so extreme caution should be observed in attempting maneuvers. If you have an overpowering urge to stretch your neck and break a few blood vessels in your eyes and brain, why not be sensible and do it in an airplane that's truly built for it?

As most of you know, new airfoils that are capable of higher lift and less drag are not only on the horizon but are here. MR. THORP is in agreement that we should pursue the testing of these new airfoils with the very worthwhile goal of lowering the stall speed.

### AIRFOILS

BILL JOHNSON is an engineer for Boeing (Seattle) and he has done a lot of testing on computer-generated airfoils. He applies a mixture of polyester resin and microballoons to the wing of his T-18 and sculptures the various airfoils to shape. He then goes out and flies the airplane to prove or disprove predicted performance. Not only has he been able to apparently reduce stall speed to slightly over 50 mph I.A.S., but also to fly the airplane at angles of attack as high as 25 degrees. Such an angle for landing wouldn't be of any advantage with the present gear, of course, but it certainly points the way for safer, slower approach speeds. Think what that would mean if you were forced to land in a heavily forested area.

NASA has also been doing their homework on such airfoils and results to date show great promise. The pace of such research is quickening, so the coming year may yield some very tangible benefits. In our next issue we'll publish the coordinates of one of the most promising of these airfoils.

In our little review of T-18 evolution let's look at an important area, that strangely enough hasn't received but a very minimum of publicity: This is the maximum use of Matched Hole Tooling through purchased parts made from master tooling. Practically every part on a T-18 can now be purchased and with the assurance that it will mate with adjacent ones.

I personally believe a lot of people are choosing the Varieze to build for the reason that it not only goes fast, but they believe it can be built by them in a short time. The years have shown that a large number of projects are never finished for the simple reason that they take too much time to build. Family tolerance and enthusiasm reaches the vanishing point when too much time elapses. I think this has been the case with many of the early day T-18 plans purchasers, or else many, many more T-18s would have flown by now. I'm also sure that a considerable number realized (or thought) they were in over their head when they tried to make heads or tails of their plans for the first time.

We now have several "storekeepers" that can supply 99% of the parts you need to build a T-18, either complete or partially fabricated, so a truly giant step forward has been taken. Surprisingly, very little publicity has been given to this phase of homebuilding. Let me give an example of what this really means in time saved.

#### MATCHED HOLE TOOLING - OUTER WING ASSEMBLY

Last summer I made up an outer wing for the T-18 in a little less than 16 man/hours! Two days work, if you please. A weekend's work as another way of looking at it. Laying out the skin, drilling it, bending it, and dimpling took 3 hrs. 15 min., building the spars and attaching the fittings took 6:45, assembling the ribs, spars, and skin (by drilling skins and spars together) took another 2 hrs. 15 min., and riveting took up another 3 hrs., for a total of 15:15. A very relaxed pace was maintained, too, not a hammer and tongs effort.

The pre-formed ribs, with holes punched, were purchased from KEN KNOWLES. I had previously laid out a wing skin template, so I used it, but the scribed and center punched skin can also be purchased from Ken, so I did not include the time spent making the template. (One of Ken's skin layouts could actually have been done in a little less time).

#### BENDING WING SKINS

Bending the wing skin is done by clecoing the "false" line of rivet holes on the bottom skin to the line of rivet holes on top of the rear spar. A 2 x 6 was then laid spanwise on the top skin and pressure applied (gradually moving towards the leading edge) until the leading edge radius exactly fits the contour of the ribs at that point. I got lucky and hit it the first time, but it conceivably could take a half hour or so to bend, un-cleco, check for fit, re-cleco, etc. You need to be careful not to over-bend, so "sneaking up" on it is a wise procedure.

Some people have used 2" x 6" longer than the 4' skin width and laid certain thickness wood blocks on the floor underneath the projecting ends of the 2 x 6s, so they act as "stops" to prevent over-bending. It's also good practice to mark the forward edge location of the 2 x 6 each time it's used. This keeps it parallel with the L.E. and locates the pressure point, too. You may possibly need to "shim up" your 2 x 6 in the center, since more bending takes place at the outer two ribs than in the middle two.

When checking the bending of the skin the best procedure is to have the two center nose ribs cleco'd to the front spar, so that the unit can quickly be re-cleco'd to the skin and checked. If skin fit looks okay on the center two then slip the outer two in, cleco, and check them, too.

Again, be cautious. A too sharp leading edge can mean the airplane can be pretty nasty at stall. It can mean you'll have a wicked wing dropper at stall (maybe starting a spin) if you also get a little twist in the panel. I never cease to be amazed at how little "massaging" of the trailing edge of the aileron is required to correct a considerable wing heavy condition. (It's so little that you actually can't see it.)

When FRANCIS RICHARDSON and I joined forces last year to build two sets of folding wings we checked and re-checked our leading edge skin bends about 4 times each panel, being careful to get all 6 skins with matching bends.

MODIFIED MATCHED HOLE TOOLING, WINGS  
Francis and I used a jigless method of wing assembly, that I believe is best described as Modified Matched Hole Tooling. All skin holes are pre-drilled and all rivet holes in the ribs are pre punched, too, but no holes are pre-drilled in either the front or rear spars. When all the ribs, skin, and spars are cleco'd together we lay a large level on top of the front spar, carefully leveling it. The level is then placed on the rear spar to compare. When the two readings are identical the wing is square, with no twist. Be aware that you should take care to exactly align the level parallel to the spars to get an accurate reading. At this point clamps are attached to the ends of the spars, holding the skin tightly in position. Now thru the row of spanwise holes in the skin the spars are now drilled and cleco'd.

Prior to drilling the skin, while it is still in the flat condition and has been scribed and center punched, take time to check your hole layout for accuracy. First measure from the lower left corner punch mark to the upper right corner punch mark. Now compare this distance with the measurement from the lower right

corner to the upper left corner. This is sometimes called "X" checking and is a very accurate way to check for squareness. You are actually measuring the hypotenuse of two triangles. They should be equal.

This might be a good time to remind you to check your sheet aluminum in the same manner, if squareness is essential to the part. You cannot safely assume that the edges of the sheet are parallel to each other! Francis and I found at least half of our sheets out of square when we were laying out our folding wing skin templates.

### RIVETING WINGS

We found that riveting and bucking on the outer wing panels (standard wing) is easier to do with the panel standing vertical, with one end resting on the floor. The outer folding wing is something else. It takes a really long arm to reach far enough in to buck the #4 rib from the end. You might want to use blind rivets here or get a bucking bar with a long handle. Personally, I'm very reluctant to use Pop rivets anyplace except where the space for a bucking bar is very limited. Without going into greater detail on Pops here, just consider one point: Pops are known to loosen after awhile. Also well known is the fact that a loose rivet will pop paint loose all around it. Ask yourself if it is worth it to spoil a paint job.

### SKIN SPICE

On the folding wing we wrapped the skin chordwise, which requires a skin joint, unless you can find a 6 ft. wide sheet of aluminum. We chose to make a butt joint over one of the ribs, which in turn required a double width flange on that rib. A simple lap joint would have been much quicker - and better, too, but we didn't know that then.

Our double width flange was a separate piece, of .040, riveted to the "web" part of the rib, with rivets spaced about every 1/2". Bend relief cut-outs were made at about the same interval, so obviously it was a time consuming job. The .040 flange did not give the degree of lateral rigidity desired, allowing a slight amount of spanwise "rocking". As a result Francis' out-board skin wound up with a little "oil can" in between the spars adjacent to the splice joint. I lucked out on my wings, but as a result of this experience I would strongly recommend using a lap joint, even tho' it theoretically might not have the eye appeal of the butt joint.

I would further recommend you purchase the big steel attach fittings from KEN KNOWLES, unless you have access to a big metal

cutting bandsaw and have a buddy at a steel company that will cut you off the 6 blanks of the thick 4130 steel plate needed. You'll also need a buddy at the heat treat plant, so that you won't have to pay the minimum heat treat poundage fee.

I further would recommend you buy the entire folding wing package from Ken; skins, ribs, spar stock, push rods, bellcranks, ailerons, flaps and fittings. The total cost really shouldn't rattle your cage. Look at it this way - the folding wing will completely pay for itself in about 2 years! Further, you'll get all of your money back again when you (or your heirs) sell the airplane some-day down the line! Maybe more.

Now if that isn't a truly handsome return on your money, I'd sure like someone to show me another investment (in these days of galloping inflation) that will even begin to approach the handsome dividends of a folding wing. Furthermore, what other investment will let you have that much fun in the meantime, too?

Had you ever really stopped to consider your T-18 in the light of being a good investment? Have you noticed that when T-18s and T-18 projects are advertised in Sport Aviation or Trade-a-plane that they are only advertised one time? I think that pretty well establishes the T-18 as pretty saleable. It's an open secret that all makes of airplanes are appreciating in value at a pretty handsome rate - from 10% to 15% per year the last 2 or 3 years. That rate pretty well parallels the annual increase on new aircraft. Would it shock you to learn that Cessna's 152 trainer carries a price tag of almost \$20,000? And a new Bonanza around \$100,000? Does all that change your viewpoint towards what you are investing in your project? It did mine. When I took note that my savings were shrinking by at least 10% per year, due to inflation, and I was losing 3% in the exchange between the 7% interest received, plus having to pay tax on that 7%, I decided to put my money into T-18 parts, engines, etc. At least I can have a little fun out of things and maybe break even down the line.

Quite a few of the T-18 builders, including Lu and I, were pretty upset with the members of the working aviation press at our last two national conventions, actually the last three. The past three years the aviation press has studiously ignored the fact that there were 45 T-18s there in 1976, 36 of them there in 1977, and 43 were present in 1977. There was much made of the fact that 24 Variezes were on deck and that does speak well for Burt Rutan's design, but why the T-18 wasn't accorded the honor due it I don't know. I do know that several T-18 builders left their T-18s at home because they resented the situation the years before.

I will have to say that the press was fair in their coverage of the '77 accident at OSH. It was properly described as a stall type situation that could have happened to any design and that even it would have probably been survivable if the gas cap had not popped out. Anyway that's all negative now and of very little benefit to dwell on our alleged scurvy treatment. On a positive note an annual T-18 (only) Fly-in was brought up frequently at OSH and great enthusiasm was noted. We'd like to have Your opinion on the subject. Please specify if you are an owner, builder, or plans holder, but above all please write us on the subject.

This brings up the subjects of where and when, as well as if. I heard one suggestion that it be held in a different city each year. This sounds like a good idea. The Bonanza and Cessna 172 owners clubs do this I know. Very successfully, too.

Just imagine what a wonderful sight it would be to have say 100 T-18s lined up. Visualize, if you will, a half day of engine installation inspection, where all cowlings would be removed and the entire entourage could inspect oil cooler installations, fuel systems, engine controls, mufflers, heat muffs, air boxes, oil filters, voltage regulators, exhaust ramps, baffling, engine instrument probes, air filters, etc.

Also, wouldn't it be great to list and compare the dozens of different props in such a gathering? The same for instrument panels? Or upholstery? Or radio installations? The variety of paint schemes would be an inspiration to those with projects in the nest, wouldn't it?

A nice touch would be the preparation of a T-18 "scrapbook" or yearbook, complete with pictures of the individual airplanes and the builders, and a detail box that would list equipment, engine, prop, empty weight, performance. Such a book and a memorial plaque for all pilots present would really make a nice souvenir, wouldn't it?

The friendships formed would be one of the greatest benefits. It would be like the "old" days at Rockford, when it was big enough to be interesting and exciting and small enough so that we got to know and socialize with a considerable number of fellow enthusiasts. Lifelong friendships are inevitable by-products of such gatherings.

Events like efficiency flights to nearby towns and other semi-competitive flights could be scheduled. We could have scales on hand to do up-to-date weight and balances, etc. Various workshops could be set up, demonstrating several building operations.

As to where we'd have the T-18 fly-in we obviously wouldn't want to pick a busy airline terminal, but tower controlled airports, with limited airline service isn't a major problem, as I doubt if there is a single no-radio T-18 flying. There are several deactivated Air Force Bases in the midwest that might be selected and the long runways and large ramps and hangars (for protection against thunderstorms) would make them attractive. Adequate motel space would be a must, since camping out probably wouldn't be too popular without facilities prepared in advance.

It would seem that the logical way to select sites would be on a state by state basis, listing the airports and cities that meet a certain determined set of standards.

We could speculate on sites for hours and not get anywhere, so how about you people that live in Iowa, Illinois, Missouri, Kansas, Oklahoma and North Texas - (or any of the states close to the Mississippi river) taking a sharp look at airports and towns in your area and checking them out and sending in the results of your survey? It might be a good excuse to fly or drive somewhere and take the wife on a little trip, hey?

Let's try to choose places that have a minimum of 4000 ft. of runway, with preferably a good crosswind runway, too, and adequate paved parking. Check with the Jr. C of C, a good motel manager, the airport manager, etc. Make note of any local sightseeing points that might be of interest, too.

Weather certainly should be carefully considered. The whole Mississippi Valley is well known as "Tornado Alley" and with good reason. From April thru mid June there are violent squall lines that go as far south as southern Texas. After mid-June the weather moves north and in late July frequently stagnates into static weather fronts of low ceilings and fog in the morning and large areas of thunderstorms in the afternoon, from northern Missouri to the Dakotas on the west and to mid-Illinois and Michigan on the east. (This is usually a problem going to OSU). We can't outguess the weather months in advance, but we might try to give ourselves a break.

Now if you, and you, and you don't at least write in your views on such a fly-in there won't be one! We'll have to assume no one is interested if only 10 or 15 respond, so it certainly wouldn't justify the effort involved.



As an after thought, do you think you would rather fly into OSH to see the airplanes the first day or so and then fly out to say Rockford or somewhere else to the south of OSH for 2, 3 or 4 days? That might be the simple way to get the whole thing off the ground the first year and then we can all get together and shake it all out. Anyway, please write!!

Let's remember that such a fly-in would not only be for the owners of flying T-18's, but also for those that are building and have to come in by car, rented plane, or airline. How about hearing from you builders? What, specifically, would you like to see and do at such a fly-in? What kind of forums or workshops?

Like I said before, tho', if you don't write there won't be a fly-in. We'll just have to assume that enough people aren't interested.

### BAGGAGE COMPARTMENT

The subject of the baggage area is a little hard to make a decision on in advance and because the important question of aft C.G. is involved it might be a good idea to defer it until the airplane is given a preliminary weight and balance check.

Battery weight and location come into the picture. If your T-18 is powered with a 180 hp. engine and constant speed prop you can be pretty sure of needing weight aft, so your battery will probably go in the bay just aft of the baggage compartment. If this proves to be so, the entire depth of the baggage compartment bay can be used, as long as a tunnel surrounds the push-pull tube and the rudder cables are protected.

I have a wood prop on my airplane and my battery is located in the baggage compartment bay. My remote compass unit and inverter are also in this bay, so a baggage floor is a must.

In order to have access to the units under the floor a folding baggage floor was used. A fore and aft piano hinge forms the dividing line of the fold of unequal size segments. The size of the quick fold-up door is determined by the space above, forward, and behind. The smaller door segment will easily flop up and over the other for quick access to the battery, or if access is desired in the entire compartment the entire floor can be easily removed by loosening the dzus flush fasteners. (See sketch.) Take note of an additional angle ~~mounted back to back with the rear carry thru spar.~~ A baggage floor support "ledge" must be provided on all four sides. The ones on the side are joggled, so that the floor is flush with all "ledges".



Don't forget to insulate your floor and skins in the baggage area and to close off Bulkhead #571 with a removable rear wall for the baggage compartment. If you have some .016 or .020 sheet laying around, bend up some angles for stiffeners and pop rivet them on the back side of the light weight sheet closure. This will prevent the baggage area from being an effective sounding board for magnified noises in the tail cone area.

### COCKPIT CLUTTER

I don't have a radio speaker in my airplane and my microphone and earphone jacks are on the far left side of the dash panel. I normally use a Telex Mark II feather weight microphone/headset combo, with a push-to-talk switch attached to the switch with a wrap around velcro fastener. This leaves both hands free at all times. I despise the big, heavy "pillow" type of headsets. I like to leave my right ear uncovered to hear the passenger's conversation, along with engine sounds. I've been used to this for years and I can hear the radio loud and clear via the little piece of hollow plastic spaghetti and ball shaped "nipple" that sticks in my left ear. I recommend this set up, but in case you prefer the heavier, bulky headphones, Telex also makes a double headset type with a fixed dynamic mike. My unit has an "elecret" mike with claimed superior noise canceling qualities.

I was recently giving PAUL KIRIK some left side time and to free him from distraction I used the radio. This cross-cockpit mess of cords made me wish for a mike/headphone jack on the right side, too. Like so many things, it would be pretty easy to do before installing in the airplane. I've seen a couple of T-18s with the headphone jack behind the seat on the deck and this looks like a good way to reduce cockpit clutter.

You might also look into wiring an intercom set up into your comm system. Easy, clear communication with your passenger without yelling is a definite plus.

On the subject of clutter, had you thought about one of the newer Alcor dual cyl. head and EGT gauges? In these days of low lead 100 gas, it has been proven to be very essential to lean the engine in a proper and precise manner to avoid the plug and valve problems, that are a definite problem with the fuel used now. The cost of the dual instrument is about the same as two separate instruments, but you save some instrument panel space and weight.

PANEL PLANNING

While you are building your T-18 are you doing some definite planning on your instrument panel? First of all you should really do some serious soul searching to determine whether you will ever make a practice of flying on "wet" IFR, making VOR and ILS approaches, or if your flying will primarily be VFR.

If you are going to go the full IFR route you are looking at probably 25-30 lbs. of extra weight (utilizing 2 to 3 sq. ft. of your 86 sq. foot wing and raising the stalling speed) and adding a considerable amount of cost and complexity. You should (must?) have fail-safe, back up or dualization for all systems and radios. A separate battery should back up alternator failure, etc. In case of power loss, would you have a sufficient electrical back up for the vacuum instruments lost or vice versa? Are you prepared for the required maintenance cost of periodically validating instrument accuracy?

Perhaps you simply want to have your own "airliner", with a well equipped cockpit to enjoy and maybe practice with now and then. Well fun and pleasure is the name of the game and so if you are aware of the weight and dollar cost, have at it.

If IFR is your cup of tea, take a look at the basic airline "T" panel adapted as a standard instrument arrangement long ago. I'll publish a typical layout and plumbing and electrical diagram if there is sufficient interest.

I can promise you that you'll like the way your airplane flies much better if you don't heavy it up. My T-18 weighs 927# empty and the empty CG falls at 20% M.A.C. It's a minimum equipped airplane but I can safely approach at 80-90 mph, it stalls at 60-62 IAS, it will true out 200 mph, it gets off in about 800 ft. loaded, has a 1500 ft./min. climb with a Cassidy 68-66 (71) wood prop and is powered with an O-320 B2B 160 boss engine. My radio is a Genave Alpha 200B and I have a remote compass with peanut inverter, no gyro instruments, except electric turn and bank, which runs off the same inverter that powers the compass and cyl. head temp. I do have an Alcor EGT and feel that joint use of the EGT and CHT are pretty worth while to properly lean as per AVCO bulletins.

TCP

I regularly add TCP to the 100 LL fuel as a bulwark against valve and plug troubles that plague so many nowadays.

I'm pretty interested in preventing troubles in that area, as last year after my return from OSH my GPU swallowed a valve (on

the left rear cyl.) on my 1st takeoff after returning. Luckily I had another airport 2 miles straight ahead and had just enough power left to stagger in. The fuel was 100 LL and I had run out of TCP.

You may have heard that the Embry-Riddle flight school in Florida put TCP in half of their trainers and that half had no problems, but the other half had valve and plug troubles galore on the 100 LL. Results were definitely conclusive.

Because our printing set up is different from previous newsletters we won't be doing drawings that are adjacent to the printed copy. Sheets of photos and descriptive drawings will be added at the end of the newsletter, so if you need to refer to "Fig. 1" etc., just turn to the photo or drawing pages.

I've already prepared an outline for the next newsletter, which will be published and mailed just after the holidays, so that there will hopefully be fewer mail foul-ups than during the holiday rush.

#### FUTURE NEWSLETTER SUBJECTS

Here are some of the subjects to be covered: Gas tank installation on the Wide Body; Filler cap door and flush filler neck; Scupper drain provisions; Access plate for fuel quantity sender unit; Heat muff and muffler design and installation; Placement and design of newer instrument panels, that allow room for radio installation in the panel ahead of the tank; Suggested IFR instrument groupings; Designee observations on running of battery cables, size and type, location and types of solenoids to be used; Location and design of cabin heat valve; New developments in baffling and air flow control inside the cowl; Location of accessories on the firewall and proper attachment procedures; Additional methods of fitting spinners; Comments on dash frame modification and stiffeners; Alternate seat design and attachment; Some pointers on upholstery installation; Comments and sketches on removable access plates and doors for the battery area, above the tank, tail area, bottom skin, forward floor, outer wing fittings, and tool access to the #522 fittings; Additional comments on N.L. #34 re the alignment of stick, stabilator, and trim tab; Designee cautions on seat belts and shoulder harness; Comments on airspeed calibration necessity for flutter prevention and related material; Reprints of Sport Aviation articles on flutter; Info on new brake line material, and comments on routing of brake lines; Complete commentary on improving cockpit room by removal of forward and rear tunnels (covering the installation of electric trim, electric flap actuation, rudder cable relocation); Ultra light weight electric aileron and rudder trim; and some observations on fitting of canopies.



In addition, we'll try to cover some of the unique problems relating to building the folding wing.

I solicit your comments on any of the articles we publish, including any criticisms (constructive or otherwise). I especially ask you to contribute any construction tips, submit even rough, freehand sketches, accounts of problems you encountered and how solved (or not solved), flight test reports, weight and balance reports, wiring diagrams, good sources of equipment or materials, etc.

We would also like as many good, sharp black and white pictures of your cockpit, cowling, engine installation, etc., as you can manage. Polaroid black and white are usually not sharp enough for good reprint and color pictures lose detail when converted to black and white. Don't write on the back of pix, as this will often show thru on reprint.

We would like to begin a complete "rogues gallery" of all completed T-18s and their builders. It would be a nice way to record your accomplishment and an excellent way for builders to become better acquainted with others. It would also enable new builders to get ideas on paint schemes and many other items. Please include pertinent details on the ship (i.e. date flown, hours to date, engine hp., prop pitch, empty weight, performance figures, etc.)

This wraps it for now, amigos. Please send comments and other material to me at P. O. Box 168, Addison, TX, 75001.

For the present, send your donation checks (\$3.00 min.) to Lu or me, but make them payable only to "T-18 Mutual Aid Society".

Best wishes,

Dick Cavin

It's your newsletter. Be a part of it.

Our newsletter was written just before Xmas, but it was decided to delay printing and mailing until January, so that our 3rd class mailing wouldn't get fouled up with heavy holiday mailings. We got a further delay in early January when our offset press developed the hiccups. As it stands now, we hope that this issue will be in your hands in mid-February.

We have also run a circ. notice in Sport Aviation to ask you to note the resumption of the newsletter in their Chapter Notice section.

### WING RIVETING SEQUENCE

In the meantime I had an occasion to build up another outer wing panel (std) and I again timed the various operations with nearly identical times I reported earlier in the newsletter, so it seems that a weekend per outer panel might be at least a bench mark to use in estimating time needed. I did record our riveting sequence, which follows below.

1. Cleco #2 and #3 nose ribs to front spar and then cleco the ribs and spar to the skin.
2. Rivet #2 and #3 nose ribs to skin.
3. Rivet front spar to skin, top and bottom.
4. Rivet #2 and #3 rear ribs to the #2 and #3 nose ribs (thru spar web).
5. Rivet BOTTOM flanges of #2 and #3 rear ribs to skin.
6. Cleco in rear spar and rivet entire bottom flange to skin.
7. Rivet #2 and #3 rear ribs to rear spar.
8. Rivet spar doublers to rear spar and aileron hinges.
9. Rivet top flange of #2 and #3 rear ribs to skin.
10. Insert #1 and #4 nose ribs and rivet to skin.
11. Insert #1 and #4 rear ribs and rivet to skin.
12. Rivet #1 and #4 front and rear ribs together thru spar web & fitting.
13. Final closure: Rivet entire top flange of rear spar to skin.
14. Stand back and admire your work while trying to remember if you might have left a couple of clecos inside.

In the above example, #1 rib is the most inboard rib and #4 is the most outboard one.

Our sincere thanks to Mrs. Peggy Cutler for typing our copy this month. I write about 30 pages of legal size longhand copy each month for our chapter 168 newsletter and Peggy diligently wades thru all that verbiage and turns it into impeccably typed copy (not like this page, which I plead guilty to).

I would appreciate it if you guys would feed the kitty promptly, as I'm footing the bill for this first issue and with over 1300 plans holders of record the printing and mailing costs for this issue will be in excess of \$330 to \$370. When you send your check would be a good time to send me a little story about your T-18 and some black and white pictures, too.

P.S. The baggage compartment drawing wasn't suitable for reproduction and will be re-drawn and included in the next newsletter. In the meantime if there is some subject you'd like to see developed please let me know.

DICK

DICK CAVIN, 10529 SOMERTON, DALLAS, TEXAS, 75229 214/351-4604

Just in case this is the first Newsletter you've received in the new series, this is the 2nd of the new series. The original series stopped with #4. A couple of years back it was re-written in a condensed form, that eliminated obsolete material and duplication.

**TO NEW BUILDERS:** If you are a new builder and do not have the older N.L.s, they are still available (only) from Lu Sunderland, 5 Griffin Drive, Apalachin, N. Y., 13732 for \$10. If you are missing some of the older series, write Lu and enclose a S/SA envelop and allow about 12¢ per page to cover cost of Xeroxing. Many builders say they couldn't have built the airplane without them and that they are truly essential. I agree. There's invaluable info in them.

That's a tough act to follow, but we hope our efforts in the new series will be equally appreciated. So far all comments have been complimentary except one and he took me to task for my cautious approach to bending wing skins. He had stood on a 2" x 10"-6 ft. long and it had taken him 5 times to bend the required radius on his wing leading edge.

**MORE ON WING SKIN BENDING:** First of all, I outweighed him 2 to 1, and I used a 2" x 6", which gave me a big advantage in p.s.i. I'll have to repeat, tho', that it is EXTREMELY important to take care not to bend too sharp a leading edge. Thorp strongly recommends that one should use a female template taken from the airfoil layout to check the contour, using a light on the other side of the template. Several builders that have had the occasion to re-skin wings have been amazed at how much slower they could fly with a bit "softer" L. E. radius (John Thorp was one of those). Anyway I don't think there was any real disagreement with my critic, as we both want the same thing--- a well behaved airplane, that won't roll over on its back and bite when it stalls. Right?

**NEWSLETTER NEWS:** We've found that the success of a N. L. is directly proportional to the degree of participation of all the members. If it falls on the shoulders of one person to generate information it will founder sooner or later. The T-18 M.A.S. newsletter was not only the very first of the newsletters, but has been widely acclaimed as the very best, too--- because of the volume of information that came from the builders. Let's keep it that way. The "M" stands for Mutual, meaning all of us.

I've already received a good number of builder tips, project progress reports, flight performance figures, opinions, etc. in response to our request in N.L. #45. T-18 builders are a unique bunch, in that there is an almost family relationship among us. Our N. L. is the cement that binds the M. A. S. together and many close friendships have been the resulting benefit of our helping the next guy realize his dream a little easier.

Response to our ad in Sport Aviation hasn't really been overwhelming, but we've been getting contributions coming in at the rate of two or three per day. We also sent out quite a few complimentary copies, so human nature being what it is I'm sure a lot more of them will gradually get around to signing up, so we'll be hanging in there. Due to the fact that some of you very generously sent in \$5, \$10, \$20, and \$25, instead of the suggested minimum of \$3, we are barely over the minimum we needed to hack the lower cost minimum mailing rate (3rd Class).

**OUR BUDGET:** We're trying to keep our costs to 30¢ per issue and to do this we have to mail 3rd class. Our 2 oz. N. L. costs about 8¢ to mail this way.

3rd class can only be sent within the U.S.; a minimum of 22¢ pieces per mailing; and it is necessary to mail all at one time. This will preclude individual mailings in between newsletters, so if you didn't get N.L. #45 drop me a note and I'll pitch one in for you when #46 goes out.

**FOREIGN MEMBERS:** If you will go to your Post Office and purchase Universal Postal Union coupons I can exchange them for U.S. stamps. For Canada, you will need to allow 30¢ for each mailing (2 oz), as all foreign mail must go first class. Airmail to other countries will require even more postage, of course. Perhaps some one of you in Australia should start a T-18 N. L. there and include pertinent info from this N. L.? It would be cheaper that way.

**ADDRESS CHANGES:** If you change address and miss out on a N. L. let me know and I'll try to get you caught up at the next mailing. If possible, advise in advance.

**REQUEST TO MEMBERS:** As much as I'd like to respond individually to your questions, etc. I'm sure you realize that this isn't practical. If you do write, please leave space for an answer after your questions and of course include a stamped/self-addressed envelop. If you're really in a hurry for an answer plz write me your phone number and I'll call you collect during the time period you specify.

**SERIAL NUMBERS:** We need to know your plan serial number if you have one. If you bought from someone else please send their serial number, name, etc. We'll re-register it with John Thorp for you. If you have not bought plans and have joined the M.A.S. for the info, that's okay, but we'd like to know so we can classify you. Sometime soon we'll publish a sheet that lists the numbers of all current drawings and points out which drawings are obsolete or are the latest mod'n drawings, etc.

**MODIFICATIONS:** If you've bought plans (or a T-18) from someone else, here's some of the recommended changes, especially if you are using a 180 hp engine:

.032 center wing skins and closer rivet spacing on nose ribs (service dictated); .032 side skins (at least back to sta. 170 & all the way on); .040 for bulkhead #601 (rough ground taxiing) and double row of rivets each side flange. .063 external gusset above; .032 skin over tank (optional); and of course the complete stabilator mod. This is a mandatory mod as far as Mr. Thorp is concerned!

**TAIL MOD THOUGHTS:** It shouldn't be necessary to repeat this, but there are still some T-18s flying without the tail mods called out. The builders are likely telling themselves that, "I'm safe, as long as I don't go over 180 mph." NOT TRUE! Thorp says you are riding a bomb with a lighted fuse if you do. Altho' he had previously pushed #2997 up much faster, he once got a "bump" out of it at 165 mph! (Before the mods were done. He now feels the stab is good up to 'sonic' speed, but has redlined it at 230, because other components of the airplane (rudder, ailerons, etc) could enter destructive resonance regimes at speeds above those tested. Why gamble your life or your passenger's life-or those on the ground? An accident would give the T-18, BAA, Thorp, and yourself an undeserved black eye. Last year I heard that one T-18 builder was cited by the FAA for "Operating his aircraft in a reckless manner", a careless act under F.A.R.'s, because he refused to make the mod when the inspector brought it to his attention. As you may know the FAA recently boosted the minimum dollar penalty for violations, as an aftermath of the San Diego fiasco, so give it a serious think, huh? You can well imagine what a field day a lawyer would have in such a situation. I have been told that liability does not end if one sold the airplane.

**WARNING: DO NOT USE SENSENICH M-74 PROPS. EVEN ON GPUs!** Just at press time I got note from J. Thorp about this. More on it next N.L. (This is a last minute "paste on", due to no extra N.L. space elsewhere).

# ACCIDENT REPORT:

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Space this month doesn't permit full coverage, but I'll go into greater detail in a later N.L. The other day I got a letter from an old friend, John Fox (3801 127th N. E., Bellevue, WA, 98005), one of the original T-18 builders. He told how the T-18 he had built (and donated to the museum) years ago was destroyed in an accident, caused by still another in-flight failure of a cut-down and re-pitched metal prop! This one was a Sensenich from a Cherokee, reportedly. The engine was a 150 hp O-320 Lyc. and there was about 100 hours on the prop since installation. This could have easily resulted in a double fatality, but pure luck and the rugged T-18 airframe enabled the pilot and his wife to survive.

Your choice of a prop is one of the most important decisions you'll make in building your T-18. Previous newsletters have spelled out what you should and should not do about selecting a prop and John and Lu's article on prop failures in Sport Aviation is worth re-reading. Perhaps we ought to reproduce it in its entirety. Above all, don't blindly buy a prop. If you don't really know, don't be afraid to ask. THE M-76 IS OK APPARENTLY

If you lose part of a prop in flight you might shake the engine out before you could get it shut down. If that happens about your only hope of keeping it from stalling would be to quickly roll it into a steep turn. I lost a prop on an old biplane in 1937 and I can promise you that you'll never have a more exciting time in your life. THE M-74 IS NOT!

NEW ENGINE PROBLEMS: A word of caution about the Lycoming O-320 H2AD 160 horse engine, about 3800 of which were recalled by Cessna.

Lee Skillman, 7 Worthington Lane, Parkersburg, W. Va., 26101, has been working on his T-18 for 14 years (that he describes as a "love affair") and he's now close to test flight day. Trouble started, tho', when he bought a factory overhauled engine. The top cross-over tube on the T-18 motor mt. won't clear the engine and one of the lower ones wouldn't clear the sump of this very different engine. Major surgery on the mount was required to make it fit.

It didn't end there either. He then had to butcher his cowl and add 3" tear drops to make room for the fuel pump and prop governor pads (just aft of the ring gear), which he says stick out like rabbit ears. Also the carb is mounted 2.5" right of center, affecting air scoop location.

This wasn't all, tho'. He ordered a cross-over exhaust from Dix Mackey, which was guaranteed to fit all 160 hp Lycs. It wouldn't fit the H series and he sent it back. A replacement was supposed to be there in two weeks, but he's been waiting 5 weeks now, so Dix must be having problems with it.

Lee's not a tail dragger pilot and he'd be very grateful if some East Coast T-18er would come in and test fly his bird for him this July or August. I think that a guy that's hung in there for 14 years and had that much trouble deserves a little help, don't you?

He's also high in his praise for Ken and Geri Knowles for their help, which included some pre-fab parts, too. (I, too, can't say enough about the promptness with which he fills orders and the quality of his work, even tho' he's been swamped with orders from overseas since OSH last year).

SEPPERS: Our only sources for "per plans" T-18 spinners at the moment are the Ken Knowles Co., 5398 Trail St., Norco, CA, 91760 and the Ken Brock Co., 11828 Western Ave., Stanton, CA, 90680. If you're going the constant speed route they have a spinner that's ready to bolt on and go for \$150. If you are using a fixed pitch prop you'll have to check with them for special instructions pertaining to your prop thickness.

I got quite irritated with the Rattray Co. last year. I had just installed one of Bill Cassidy's "Pacesetter" wood props on the 160 Lyc. and I called

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(cont'd) them to inquire if they had a T-18 spinner and how was the front bulkhead set up for the Cassidy prop. Oh, yes, they had a T-18 spinner and were very familiar with that prop thickness, etc., so I said to send me one. 6 weeks went by and no spinner, so I called again. They had no record of my order, but we went thru the complete song and dance again. 3 weeks later it finally arrived. C. O. D. \$128, but the only resemblance to the Thorp spinner was the dia. of the shell base. Shape and contour were very different from the drawing. Not only that, but it was poorly made, with huge burrs left on the holes in the bulkhead. I was suspicious that it was not heat treated. I sent it back for a refund and was charged a 20% re-stocking fee. The refund came fairly quickly. I guess homebuilders have to be a hardy lot to persevere in spite of the frustrations along the way and the time involved, too.

In a future N. L. I'll give a report on how to install a spinner and how to modify the front bulkhead of a spinner when you switch to a different thickness prop. In the meantime you might review Bob Kaergaard's article on spinner assembly in an early N. L. and Tony Ringell's article in his monthly Sport Aviation column. Incidentally, Tony's new book is out, and it's great.

COWLINGS: Here's some good news from Marc Bourget, 351 Quincy #5, Stockton, CA, 95207. Marc is a law student, who lives close enough to John to visit him often, and he tells me that if there is sufficient demand that another production run is possible on the Thorp metal cowl. John has given him permission to assess the demand, as well as authority to coordinate and make any such production runs. If you are interested, please contact Marc (not John).

In case you didn't know, Thorp's cowl design is a functionally superior cowl design, aerodynamically integrated with the rest of the T-18 design, is light, quickly removable for routine inspection and maintenance (A most important feature on a homebuilt). His proven design is the quality standard. Movable internal cowl doors can be added (as on Paul White's "Kong") to reduce drag at cruise to a minimum. Combined with internal flow smoothers mounted on firewall firewall sides, they give the ultimate in efficient cooling.

Fiberglass copies of Thorp's metal cowl have been available from Ken Knowles and Merrill W. Jenkins for some time and are of good quality. I've also heard that someone in South Texas has made a fiberglass cowl, that apparently was molded over the metal cowl.

MORE ON MODIFICATIONS: Marc also pointed out that when one starts out to modify John's design that they are tampering with pressure distribution values that have been carefully integrated into a complete design, via coordinates of many equations. It was not generally known until the past year or so that the fuselage shape was defined by equations that dictated the curvature of the side skins. I well remember that John once told me that the angle of the side skins (to B.L. O) could be borderline for stabilator pitch authority under certain combinations of 40° flap extension and full forward C.G.

All of the above is not saying necessarily to not build a wide body, Marc says, but he well aware that there may well be a performance penalty to pay for that extra room.

LETTER FROM JOHN THORP TO BUILDERS: Quote. "The center wing beam WBS, #537-1, of the heavier T-18s has taken a permanent set from aerobatics.

During the building phase a web of 7075 T-6 can easily be substituted for the .040 2024 T-3 called out now. It is stronger and I would recommend it for



new construction and also for Lu's convertible wings. If an older wing is being re-skinned the web can be beefed up by installing 3/4 x 3/4 x .063 angles in EACH of the two inboard bays on Each side. Use 2 angles between the ribs, making 3 equal spaces between ribs and using existing holes in the web. Use 4 evenly spaced rivets per stiffener.

Chuck Borden's T-18 is the only one that I have seen with a bent center wing main beam. He fell out of a slow roll and ended up in a very high speed pull out. There was over 6G's on the clock. I have heard of at least one other incident. Chuck repaired his airplane with the vertical angles and re-skinning of the wing with .032 and then sold it. He didn't need to worry about the airplane. It is stronger than it was when new".

7075 is a bit more susceptible to cracking than 2024-T3, so be sure to get rid of nicks and scratches.

AEROBATICS IN A T-18: Before you go out and do aerobatics in your T-18 consider this point: A 6G capability is ordinarily considered as the MINIMUM in strength capability for doing aerobatics..safely.Had you ever wondered why truly aerobatic airplanes can take up to 12Gs? If your T-18 weighs over 850# empty, do you know how much fuel and pilot weight can be added before your G tolerance becomes LESS than the 6G Minimum? Do you KNOW how many Gs your engine mount can take safely? And how about your prop blades? Are you a smooth, competent aerobatic pilot/ Are you REALLY competent to do aerobatics in a very clean and responsive airplane? Or has your experience been in slow, high drag airplanes, like a Citabria? Are you aware of the possible consequences if you exceed V<sub>re</sub> if you fell out of a 'busted' maneuver? Have you considered the effect of Gs on your gyro instruments? Do you think you could open the canopy at 200+ MPH? Inverted? After you've considered all these points what do you think about the logic of flying your beautiful T-18 into a nearby airport where there is an FBO with a 2 place Pitts for rent to those wishing to stretch their neck a little?

A smoothly done barrel roll normally isn't considered an acrobatic maneuver (from a practical standpoint only), but letting the nose down while inverted could result (and already has) in excessive airspeed on pull out and Gs sufficient to bend the main wing beam. Let's not clutter up the landscape with pieces of smashed tin and bloody hunks of meat. It makes the environmentalists furious.

BEGINNERS CORNER: Those of you in the 'beginner' stage that have to <sup>MAKE</sup> as many things themselves as possible to stay in the airplane buildin' budget, your very first decision is WHERE TO START. Obviously it should be a simple part, not too demanding in skill, and one that will prepare you for the more demanding tasks ahead. The ailerons pretty well fill that bill.

BUILDING THE AILERONS: (See previous write-ups, too). The plans call for .016 skin for the ailerons, rudder, and stabilator tabs. They will take up about 25 sq. ft. of the 36 sq. ft. in a 3' x 12' sheet (The standard size for .016 and .020). The extra 10 sq. ft. won't be wasted, as the chances are that you probably will want to make one or more parts over (if you're human like the rest of us). Never order the exact amount of material on the plans. Even the pro's don't make a perfect part every time. Allow a little extra for practice and 'goofs'.

If there is a metal salvage co. in your area the smartest thing you can do is buy 2 or 3 sheets of metal for making layouts and templates. Aluminum is preferred, but galvanized will do in a pinch. Temp extremes will give trouble via different expansion rates of alum and other metals. .032 or .040 is desirable for templates. Avoid battered or badly bent metal. Lay out the top and bottom skins on this metal and your parts will come out well.

SOME TOOLS YOU'LL NEED: You'll need a good straight edge (about 4" x 60" or more), a pair of dividers, a prick punch, hammer, sharp metal scribe, and a good scale that's graduated in 10ths, 100ths, & 1000ths. Do NOT attempt to build the airplane with a rule in 16ths, 32nds, etc. A rule 1 to 2 ft. in length is ideal, but you can make do with one 6" long if you mark your straight edge with your scribe to identify various multiples of 6", etc. Your local sheet metal shop or A/C contractor can chop you off a long hunk of galvanized or alum for the st. edge.

You can lay out the skin directly, without a template, if you are super-careful, but when making form blocks for ribs, etc, ALWAYS make a template first (for necessary accuracy). You can then locate index tooling holes in the template, the form block, and the part blank, so that the template and form block can be keyed together or the blank keyed to the form block. Don't forget to reduce form block size by the metal thickness on all sides. Sizes of formed parts (ribs, bulkheads) are outside to outside dimensions. Think of it as the smallest "door frame" you could push the part thru with zero tolerance (after forming).

TIP: Mark the edges of your template with a "Marks-A-Lot" felt pen, key it to your slightly over-size form block and start disk sanding. When the disk sander starts nicking the coated edge it's easy to see that you are making the form block the exact size of your template.

Once your layout is complete on one skin you can lay it on top of another blank and drill both identical parts simultaneously, saving one operation. First drill a hole or two on opposite corners and slip a rivet in each hole, with head on the down side. Secure the other end with a little 'C' clamp, or an alligator clamp, and you've got a perfect dowel pin to index parts together. Don't use cleco's, as they have a bit of "slop".

Use the same template to lay out the hole pattern for the stiffeners and their location on your skin template. The little skin stiffeners are best laid out and drilled in the flat, prior to bending. Take note that the flanges on the top don't face the same way as the ones on the lower skin.

When riveting stiffeners on the thin sheets I prefer to drive them from the back side. I put all rivets in their hole and lay a strip of masking tape over them to hold them there. The sheet is then turned over and a hammer and flat-end punch (or steel rod) are used to head the rivet up from this side. Hold the rod squarely on the rivet and smack it with the hammer. A large flat piece of steel is laid under the skin as a fixed bucking bar. This method avoids skin stretching around the rivet and results in a very smooth skin. It's even superior to using a rivet squeezer.

PILOT DRILLING: It's considered better shop practice to first drill 3/32 holes, and then as parts are mated, to drill out the holes with a 3/16 bit. This takes care of any slight mismatch of holes. Take care to use a sharp drill bit and be sure and hold the drill absolutely vertical or you'll 'wallow' out the hole and make it egg shaped. Check the reflection of the drill bit in the sheet to be drilled and you can readily see if it's vertical.

FORM BLOCK MATERIAL: Almost any 3/4" thick wood will do for form blocks-chip board, plywood, etc., so don't knock yourself out trying to find Benelex or hardwoods. Most of the wear is on the radiuses, where the flange is bent over, and you can make many, many parts before there is appreciable compression of the wood. One of the best deals is found at a cabinet shop where they'll have "drop off" pieces of the wood and plastic laminate.

FORMING RIBS, UPDATED: I've received several letters from new builders complaining that 6061-T4 is hard to find and that it's time-consuming and that forming is difficult. It's very educational to learn to make 'em that way,

but we've learned to make them an easier way the last few years, using 2024-T3. With the exception of the flap ribs, every rib on the airplane can be made this way...EASILY... and no relief cut-outs are necessary either. This method is now widely used. It's the easiest by far.

In the process of bending metal over a form block (or in a brake) a certain amount of the metal is thinned out where it is bent. This "stretching" causes the outer flange edge to "grow" in length, as this is the only place the metal can move, resulting in a wavy or curved edge. We take care of this excess metal by crimping (between rivet hole locations). Crimping pliers are available from Aircraft Spruce & Specialty for about \$13, or you can tap them into the form block with a cone shaped rotary file in a drill. Tap the crimps in over the notches by hammering them lightly with a wood or metal mallet used as the male part of the "die".

Take care the bow out of the rib (caused by forming). Crimps should be as deep as is necessary for the part to be restored to original straight line condition. Check it by laying it on the bench top. If you've over-crimped just slightly flatten the crimps until it's straight.

Use a rubber mallet to evenly bend the flange down around the form block until the excess metal resists further bending. You will probably have 10" to 20" of springback and a pretty wavy edge at this point. Pull the rib off the form block and start crimping as necessary. You can use the slotted spring-brake here now to complete the flange bending to the required shape. We write-up on it later in this N.L.)

Pre-crimps: Be sure the inner flange edge has been 'set' to the form block so the rib may not have the exact form block shape and size. Also, pre-mark rivet hole locations prior to crimping, making a dot with marks-a-lot.

If you form bulkheads over a form block you'll probably need to straighten them via crimping, too. Brake forming doesn't stretch the metal quite as much as hammering over a form block, so will require less crimping. A longer flange will require more crimping, too. You will note that a crimped flange is much stiffer than an uncrimped one. Every place you crimp makes the metal "stronger" it's as thick as the depth of the crimp! Obviously the crimps should all be away from mating surfaces.

Give the above method a try. You'll catch on to it quickly and swear by it, too. It's a lot easier to do than explaining it in 25 words or more.

If you've 6061 on hand go ahead and use it, of course. The compressive strength of 6061-T4 is nearly as good as 2024-T3, even tho' the tensile strength is much less. To get equal tensile strength with 2024-T3 you'd have to use much thicker material. That's why you don't see 6061 called out for any of the spar or fuselage extrusions. It wouldn't be safe to substitute.

Ribs are loaded in compression primarily, as are bulkheads. Mr. Thorp chose 6061 for ribs, due to its comparative ease of forming by beginners. At that time the common practice was to make ribs and other compound curve parts out of 2024-O (dead soft) and then heat treat to the T3 condition. This method was not satisfactory for builders that lived away from heat treat facilities and in addition there were problems with warpage from improper quenching and corrosion resistance if the pure aluminum coating (Alclad) went into solution with the alloy matrix from improper heat application. Mr. Thorp even made it easier for beginners by showing an optional method of pre-forming, using relief cut-outs on the nose rib flanges.

6061-T4: It might be noted that (6061) T-4 is an unstable condition and skin age hardens to 6061-T6 within 60-90 days, so usually has to be

special ordered because of limited shelf life. If you get T6 just sock it a little harder, but the EASY way for most applications is 2024-T3. Flap nose ribs and dash frames are two of the parts that require severe forming and are difficult to make with 6061 and nearly impossible with 2024-T3. If you don't buy these parts ready made, you'll either have to go the heat treat route or use relief cut-outs. Crimping can be used, but they'll have to be deep and close together. They probably would interfere with rivet holes, too. If you use relief cut-outs anywhere be sure that they don't deadend in the area being bent, as they are likely to crack under forming stress. Get them on out into the flat area before you stop drill the end of the relief cut.

BENDING EXTRUSION: Several new builders have asked for an explanation on how to bend the angle extrusions used in the fuselage. It's really no big deal. Simply put the extrusions in a vise and give them a tap with a rubber mallet on each side of the vise, then slide it along an inch or so and repeat. Don't slug it and try to get the desired curve on the very first pass. If you get a little buckling going on the compressed side take a ball peen hammer (or your rivet gun) and a bucking bar and work it out flat. With the skins and bulkheads clecoed together you can lay the extrusion against the outside of the skin to establish the bend contour.

If you want to "open up" the angle of the extrusion a few degrees wider than the normal 90° lay it down on the vise anvil, so that it looks like an inverted V, and tap it on top, moving it along as you do. If the sharp corner (apex) of the inverted V is sanded off, so that it is parallel to the inner fillet radius it's even easier to do.

JOGGLE EXTRUSION: There are several places where the extrusions must be joggled or double joggled in the fuselage. It's quite easy to do this with a "joggle fork" in a vise...providing the sharp corner is sanded off (as in the paragraph above). Always use a joggle fork that's thicker than the joggle depth desired, allowing for some spring back. This is a simple method that works well. Another method is to make a male/female die set-up to use in a vise, but this takes a lot of pressure applied slowly.

JOGGLE FORKS: You'll need a variety of joggle forks for the various material thicknesses. (See sketch of a typical one). Dimensions aren't critical, but all edges in contact with the part to be joggled should be rounded off and polished, so that sharp edges don't dig in and mark the part. Basically a joggle fork is nothing more than a small rectangle of metal, with a slot near the center. The slot is of sufficient height to allow flanges and extrusions to be inserted. The slot should be several times wider than the thickness of the part to be joggled.

In use the fork straddles the area to be joggled and is put in a vise and the jaws squeezed closed until the joggle fork legs are almost parallel to the flange being joggled.

ATTACHING EXTRUSIONS TO SKIN: Over the years there has been some controversy as to whether extrusions should be pre-bent before riveting them to the skin. It was said that riveting the extrusions to the skin in the flat, without pre-bending stretched the skin tightly between the frames and was a superior method. It's been done both ways and I'm not sure what the consensus of opinion is, but it does seem certain that flat attachment will indeed give flat spots between frames, as verified by laying a straight edge between frames and eyeballing it.

There is a middle ground that several builders have used in the past. It entails pre-bending the large 1x1 extr'n, but the others are first match drilled with the skin and then clecoed to the skin. In the next phase the

tailheads are attached to the skins, one by one, in order, from one end to the other. This bends the extrusions gradually and also stretches the skin a bit, too. I did this on the last fuselage I made and I believe it's the better way. I think the best riveting procedure to follow after this is to start at the middle and work both ways away from the middle.

**RIVETING:** Be aware that when you drive a rivet that the skin around it is pushed out some and the skin will grow a bit in length. The more rivets in one long line there are the more you are likely to notice the accumulated stretching. Over-driving rivets accentuates this, of course, but don't under-drive rivets just to have a more pleasing side skin, either.

After driving the rivet, leave the bucking bar in place and smack the factory head with a rubber mallet. This bumps out the depression left in the skin from riveting. If you'll experiment on scrap to find the best combination of air pressure to the gun and bucking bar weight you'll minimize the problem. At any rate please don't plaster up rivet heads with body filler in an attempt to impress the troops. All you are going to do is add a LOT of weight - probably as much as 25-30 lbs. if you did the whole airplane that way! One experienced builder weighed his airplane before and after painting with Dupont Inren and it came out 30# heavier...with NO body filler.

Extra filler wt. will only raise your landing speed, lengthen your take off run, cut your rate of climb, etc. The sad part is that sooner or later it will come off in chunks. Body fillers are simply resins with inert fillers added to enhance their sanding qualities. Polyester resin is known to be a poor adhesive under ideal conditions and epoxy is known to de-bond in the presence of moisture. Resins will continue to cure and shrink as much as 6% when subjected to prolonged exposure to sunlight and heat, popping the paint film loose. The more filler in one area the worse this becomes. Vibration and temp changes do the rest.

**WING PLATE:** We'll cover more items for beginners. In the meantime why not drop me a note, indicating what building areas that you'd like more info on. First of all, tho', go back thru the older N. L.s and chances are you'll find the answer there. By the way, have any of you had a chance to work up a subject index for the condensed version of N. L.s #1 thru #44? If so, plz send it a copy and we'll run it as a separate page. If you run across a good way to solve a problem, send it in. It would make my work easier if I could type it up in the format we use and all I'd have to do would be to paste it on another sheet to make the plate. If you can't type, don't let that stop you, tho'. Write it up the best you can and I'll re-write if it's necessary as I type it up.

**DEAN DENMAN FLIES AFTER 16 LONG YEARS!** Dean (255 Hemlock St., Greenfield, Mass. 01302), has plan serial #31 and in Jan. '79 his bird was airborne for the first time, to his unrestrained delight. He has a 160 hoss Lyc. in it and one of Bill Cassidy's "Pacesetter 200" wood props on it. Empty wt. is 55# with oil and wheel pants. He says, "It climbs like crazy and seems to be going about 170". As soon as he gets everything settled down he'll send some accurate perf data. He said that Bill Cassidy commented that it was the first one flown in the age-hardened condition!

Dean is an old, old friend from back in the early T-18 days and we used to visit a lot on my Denver layovers when I was flying domestic 707s. He sold a great stainless steel cross-over exhaust kit last year (are they still available, Dean?). I was very pleased with the one I got from him.

Dean Thorp has said over and over that if you don't have a cross-over exhaust on a 1-cyl. Lyc. that you are cheating yourself out of as much as 10% of your horsepower! Another way of saying it is "A cross-over exhaust will pay for itself in fuel in short order and give you better performance in the

in the meantime".

**CHINO FLY-IN:** I went out to Chino last month annual Fly In and got to look at a bunch of fine T-18s and visit with a great bunch of guys. Don Taylor set a new record on a round trip flite to Las Vegas. The T-18s were the most numerous type there, but "California sunshine" really fouled up the works and kept many airplanes away. The ceiling and viz didn't break both days until noon. Then at 1:30 they closed the field for a much too long aerobatic program.

The highlight of my trip was flying Ken Knowles wide-body, folding wing T-18 on its return trip to Corona. I flew it in the air for awhile and I simply could not detect any significant difference between his T-18 and any of the other 21 I've flown or flown in. Even with the shortened ailerons the roll rate and control authority was "pure T-18", which is saying that it is a delight to fly. Possibly the extra 5" of fuselage length increases an already good pitch and yaw stability a small amount, but I honestly could not detect it if it did. I've never flown any T-18 that had anything other than beautiful control and stability, but it would be meaningless to rate one airplane against another in this area, as control friction, c. g. position, etc. would vary somewhat from one airplane to another.

**WIDE BODY:** The wide body T-18 is noticeably more comfortable at shoulder height, even tho' Ken has 1" thick upholstery above the W. L. 42 extrusion. I'm a hefty 235 lbs, so I don't really sprawl out in full comfort unless I'm in a Cherokee, etc, but the W.B. seems pretty great to one my size. I've flown a couple of T-18s that had thick upholstery up as far as the W.L. 42 extr'n and just cloth glued to the skin above that point and two of us my size were most comfortable with that arrangement. Offset (bent) sticks are most helpful for that little bit of precious leg room, too. I'd recommend them. Even if you personally are trim and slim you might want to consider that some day when you sell the airplane that the buyer will probably be 6'3" and weigh 250 lbs.

**FOLDING WING:** The folding wing has extra flap area and I was most curious to see what this would do to approach speed and glide path angle. Chris Fast, who built the wing from parts Ken made, had written me that the folding wing weighed 20 lbs. more than the standard wing and I wondered if the extra flap would make up for that extra weight. That extra 20 lbs. "uses up" about 1 sq. ft. of wing area, so there is an increase in the CLEAN stall, but I'm guessing the flapped stall comes out about even, all else equal. Airspeed indicators are notoriously inaccurate at high angles of attack, so unless we calibrate it and do tests under exactly identical conditions we are only comparing apples to oranges. To summarize my observations, Ken had the air speed down to 80 mph IAS on final to Corona, with no visible increase in sink rate and it felt good and solid and there was even a little bit of float in ground effect left when he flared. He feels it flies as least as slowly as the other airplane, but no conclusions should really be drawn from a one time observation.

**NEWS OF THE LDS-2 AIRFOIL:** From the mail I've received so far the majority of builders are opting to build the folding (pardon me, convertible) wing. At least 3 have already flown; Ken's, Chris Fast's, and Bill Cox's, and several more are on the verge of flying that I know of. I just talked to Ken after my return from Chino and he said Chris Fast had just delivered the new wing to him that was built with the new LDS-2 airfoil and that he was hoping to have it fitted to the airplane the next day. This was the 4th set of wings that Chris has built, incidentally. (More on him next month). Any way we'll soon have some answers on what the new airfoil will do at low and high speeds. Some people doubt that we will be able to tell any measureable difference, while others are most optimistic.

JUNE 25th, 1979, THE T-18 WE/C WITH THE LDS-2 AIRFOIL FLIES: I just returned from California last night, still aglow with the pleasure of a really great weekend. What made it so great was 19 T-18s, 3 Sky Scooters, 1 Derringer and several other homebuilts and factory built showing up at Lodi CA at the Linde Airpark at 11am in a surprise birthday fly-in and cover-dish luncheon in honor of John Thorp's 67th birthday. Around 60 persons showed up to show their respect and admiration for their good friend and to again express their gratitude for his designing the world's Best sport airplane,

I flew out to LAX on Braniff on Friday afternoon and Geri Knowles met me and drove us out to Corona, where Ken was all set to go part way in the remaining daylight. We were loaded up to gross, with all our bags, cameras, gas, etc., but I got a pleasant surprise as to how quickly the 160 hp and c/s prop combination got us up and out of there. I was also pleased with our rate of climb to 8500 ft, averaging a little over 1000 ft./min. @ 120 mph TAS. Ken doesn't have an outside air temp gauge in the new one, so I can only guess at the temp. It was cool, tho', as the inward opening cockpit vent in the canopy almost made it too cool. At cruise Ken pulled square power of 23" and 2300 rpm and we were indicating better than 162 mph at the time. I don't know what crz hp we were pulling or what our TAS was, but we made the 215 miles we flew to Vicalia in 1 hr. 15" from takeoff to touchdown and that comes out to mighty close to 180 mph, including climb to 8500' and that was against a forecast headwind component of 10 kts! That's mighty good perf in anyone's book, I'd say.

During crz I was experimenting with pitch stability by raising and lowering the nose a few degrees and releasing the controls and seeing how many long period oscillations it took for it to return to trim speed. Our c. g. at the time was probably fairly close to the aft limit, with about 15 gals. of fuel remaining, and I don't think you'd want any better pitch stability. Kicking the rudder to deflect the nose 10° would zero it back out after a decreasing series of 3 oscillations after release, also just about perfect. Our really pleasant surprise came at the end of the return trip, where Ken stalled the airplane, carrying about 1500 rpm. Without flap it was indicating about 60 when it broke very GENTLY, with LOTS of pre-stall buffet and very good aileron control remaining at the stall. The pitch down was about 15°.

Now all these figures are only the very first sampling of numbers and you shouldn't consider them cast in stone until more data can be acquired and instrumentation verified, but it appears that the new airfoil doesn't hurt crz speed and it stalls perhaps 5 mph slower than the regular airfoil and it does have better stall warning and desirable pitch qualities it seems. Remember that the new airfoil is on the outer wings only and the flow at the dihedral break might be a big factor in stall characteristics. Tuft tests should tell us several things, so again, until we have hard facts and figures let's not jump at too many conclusions. Ken and I were both very pleased with its over all perf, but both of us are so crazy about how T-18s fly that I'm sure that we could be accused of just a little prejudice.

Our return consistently showed a ground speed of 180 mph or better when I did time checks between check points. We were at 7500 ft. and Ken was using 22" and 2200 and indicating 160 average.

I was again taking a look at aileron effectiveness at crz. I could squeeze a tiny bit of aileron pressure on, with no detectable movement of the aileron (referenced against the T.E. of the wing tip) and get a roll rate of at least 5°/sec. I had time to observe several things enroute and one of the things that is worthwhile is the "joggled" stick, where one curves one way and the other the opposite. That way no one's leg gets pinned landing in a strong crosswind operation.

It's a real pleasure to be around the T-18 gang on one of those get togethers. Each and every one of them are something special to me. I've heard others say the same thing. Perhaps we all operate on the same wavelength is why we chose the T-18 design in the first place. It seems that all of them are always willing --even eager-- to share information to help the next guy. I've noticed other groups are close-mouthed or even a little bit surly in that respect. It seems they let their pride of accomplishment inflate their hat size, but I've yet to meet a T-18er with that attitude.

I would go into greater detail about John's surprise party, but Don Downie and his wife were there (both writers and photos) and Shirley Clarke, too, so you'll be reading all about it Homebuilt Aircraft, Private Pilot, Plane and Pilot, and possibly other mags, so I'll just say we all had a marvelous time and that is was a thrill to see that many T-18s lined up for pix.

I was sick when I got home and discovered the color film in my camera had jammed in the factory carton and I didn't get a single picture in color. I had another camera with B&W film in it, so I didn't get skunked, but I was looking forward to some color shots to look back on some day.

OSHKOSH '79: You've probably already seen the announcement in Sport Aviation about the 2nd Annual T-18 Builder's Dinner, again organized by John Walton, formerly of Keenah, WI, but now a resident of Houston, Tx. This year it will be held on Tuesday, July 31st, at 7:00 pm at Hatch's Anchor Inn. That's on Arizona St., just off W. 20th Ave., on the N.E. side of Wittman Field. The first meeting brought over 100 T-18ers together and we had a ball. You can make reservation on the T-18 Flight Line at OSH or in advance by contacting either

Sandy Cordoza		Barbara Walton
3 Juniper	or	temporary-P.O. Box 40307
Woodland, CA. 95695		Houston, Tx. 77040
(916) 666-9106		call info for ph. #

Prospective T-18 builders are welcome, too. It's a great way to get acquainted with people you'll enjoy knowing over the years.

Bob Dial: Those of you that know Bob will be happy to know that he's on the way back from the heart attack he suffered earlier this year. He says he will be at OSH again with his T-18-with a legal P.I.C. of course.

Chris Fast: He, also is making excellent progress on recovery from his heart problem and he, too, carries a legal pilot.

Oats Tokle: I saw Oats at John's party and he has hopes of getting a 3rd class ticket before too long. Oats didn't have an attack, but they caught him trouble on a treadmill EKG luckily, for his piping was practically choked off. Oats flew DC-10s for UAL.

We were all delighted to see John and Kay looking in good health and spirits. I don't think I've ever seen John smile so much in one day and Kay was positively radiant. I'm sure that John has averaged getting 5 or 6 long distance calls a nite since the design came out and perhaps some people might think she would get bitter at the constant intrusion, but if she does she really doesn't show it. She's always been most gracious to all of us weirdo airplane nuts.

Perhaps about now you're saying, "I thought this newsletter was supposed to be all how-to-do-it-stuff". Well, there's a very pleasant social side to it, too, and it's a big part of the fun of it all. As you know, I'm pretty much a nut on my admiration for how the T-18 flies, but I also equally enjoy getting to know all the T-18ers well and I think most of you feel that way.

This makes me think of something Ken Knowles told me about when he built his first airplane that's worth passing along.

He said that he worked on his airplane only on Mon., Tues, Wed., & Thurs. and saved Fri., Sat., and Sun. for activities with the family. Looking back, I can see that such an arrangement would keep down problems with the wives and children. Some women get to viewing the airplane project as a rival for the husband's affection with predictable results.

PAUL KREIK, (2221 23th Ave. A, Moline, Ill. 61265) is very close to flying his T-18 and I can promise you that it will be excellent. I stopped in and looked at his project on the way to OSH in '77 and the workmanship was very professional looking....as it should be. Paul's the chief honcho in maintenance for the John Deere Co.'s jet fleet. Here's his thoughts on the building of wings and fuselage: "After reading the earlier N.L.s thoroughly, I decided to drill the W.L. 42 fuselage stringers in the flat position with the side skins as templates, as recommended. This worked beautifully for assembly, but upon installation and riveting of the side skins they were drawn slightly, so that the full curvature of the skins was not obtained. I would recommend to anyone making side skins to drill angles upon installation of the skins to prevent the flattening of the side curvatures between the bulkheads. It was most pronounced in the cockpit area between the dash frame and the roll bar upright. I doubt very much if this will affect performance, but I'm sure that it will be noticeable with a shiny coat of paint on it. The skins are drum tight."

WINGS: Paul has this comment on wing installation: "After reading so much about wing twist and resultant vicious stall characteristics, I decided to go one step beyond in building my wings. A simple vertical jig was made to support the center wing at the inner and outer attach points. An incidence board was cut out of clear redwood, traced from the airfoil template.

This board, along with a propeller protractor, borrowed from our shop, was used to check the wing for twist during fabrication and the extensively during riveting. This procedure was also used for the outer wing panels. There was no measurable twist in any panel.

When installing the wing to the fuselage, the incidence boards again came into play. 1/8" pilot holes were drilled in the rear spar attach fittings at bulkhead sta. 91. No holes were drilled in the rear spars themselves. The fuselage was leveled, the wing main bolts installed and tightened. A chalk line was struck on the floor and make shift plumb bobs taped to the Leading Edge of the wings to insure a straight L. E. The protractor was zeroed out on the level fuselage, using the W. L. 20 stringer, and then the incidence was set per plans and the rear spars were clamped to the attach fittings. The existing pilot holes in the fittings were then extended into the spars. They were then drilled nearly to size, reamed and bolts installed before clamps were removed. Incidence is exact on both wings. This same procedure was also used to rig the outer panels.

Now that the wings are leveled and set, one final job remains: The installation of the flaps.

INSTALLING THE FLAPS: In my years of admiring the T-18s before I took the plunge, one major discrepancy stood out: The flaps never seem to align with the ailerons, etc. I realize that the left flap is used for trimming in roll, of course.

When attaching the flap hinges, a template was used, however there seemed a lot more margin for error, so again I drilled a pilot hole in the wing for half of the fitting and didn't drill any holes in the flap hinges themselves. The incidence board was again clamped to the wing, the flaps clamped in place, and the pilot holes drilled into the flap hinges. This allowed the correct incidence angle to also be set into the flaps. They were then removed, reamed

to size and then re-installed. A 1/16" spacer was put on the leading edge of the left flap when the rigging was being done, to allow the left flap to be raised higher than the right one if required later for roll trim.

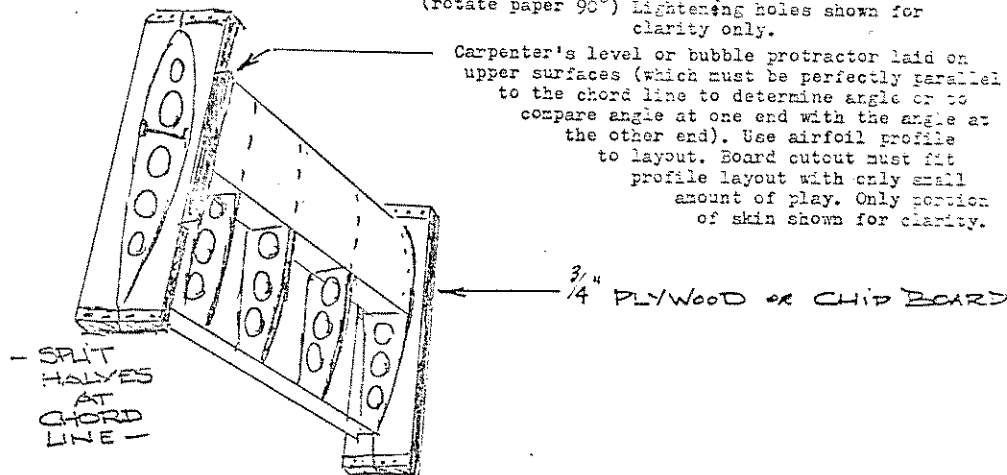
I firmly believe that the wing installation is the most critical procedure for a good flying airplane and should not be left to the possibly less precise procedures and measurements, error accumulations, that are possible when matched hole tooling alone is used. I'll be one very unhappy fellow if I end up with bad stall characteristics or a wing heavy condition. The same incidence board procedure was used to fabricate the horizontal tail.

While speaking of flaps, I had the pleasure of being invited to go flying with Bob Dial in his T-18 when in Detroit for my brother's wedding. His cockpit seemed to be much larger than any T-18 I'd been in and for good reason. He had installed an electric flap motor, removed the forward tunnel, and lowered the aft tunnel. The flap motor was a very simple installation of a 400 power window motor and sector gear (See pictures we ran last issue in #45 N.L.) Bob has lowered his flaps at 120 mph with no problems while testing this installation. (John recommends 110 max for flap extension).

COMMENT ON ABOVE: Well now, gents, THAT'S the kind of report we need from you out there. I ask that you send in anything on the building or operation of the airplane, or your thoughts or questions, doings of T-18s and T-13 people, etc. Just because someone else has told how to do something in the past N. L.s, don't let that stop you. Tell us how you did it. Paul's method above is very good and you certainly won't go wrong if you take that route. Before someone else rises to the defense of matched hole tooling and points out that quite a few of the estimated 300 T-18s that have flown have been built completely with matched hole tooling and without jiggling of any kind and most of them fly superbly. In all fairness, tho', the incidence board method has been widely used for many years and is the simplest way to know if a structure is properly aligned. The wing riveting sequence we described in N.L. #45 used a modified matched hole tooling procedure. Basically that means that it's a way to check on the effect of accumulated hole "slap". A 1/8" rivet won't fit in a 1/8" hole, so a slightly larger hole, (#30) is used. The tolerance around the rivet can twist structures during riveting, if care isn't taken during the riveting.

INCIDENCE BOARD: I know some of you don't know what we are talking about when we say incidence board, so to save a thousand words I'll make a little sketch of it below.

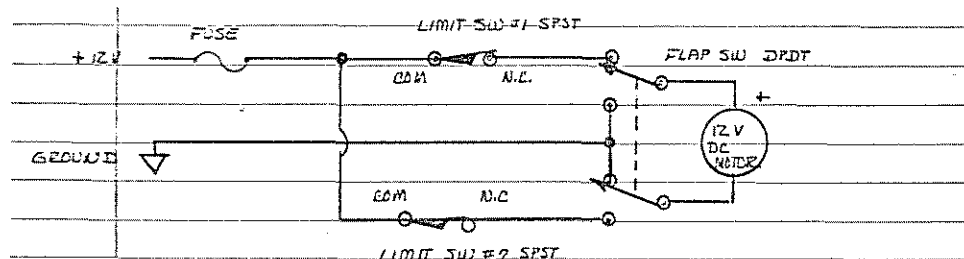
(rotate paper 90°) Lightening holes shown for clarity only.



**ELECTRIC TRIM:** A good many builders are going to electric trim on the stabilizer. I have flown two airplanes now with electric trim and I was very pleased with it. As most of you already know it's no sweat to fly the airplane without a trim tab, so failure is no problem. One of the airplanes we ran the tab full travel and pulled the c/b, so that it was trimmed full tail heavy. I just reduced airspeed to 120 and could have flown all day with it, so I don't think a runaway motor to full tab travel would present any big problem. A simple "in transit" light would warn the pilot if it continued to run when the switch was released, so the c/b could be pulled long before full travel was reached. Limit switches would be desirable, of course. The pickle switch could be installed on top of the stick or in the vicinity of the prop/throttle control.

Originally it was found that the headlight "eyelid" motor from a '67 Camaro was just about perfect for weight and rpm. They've become super hard to find at Chev dealers and cost is \$25-\$40. Ken Morgan, 439 Louella, Hurst, TX, 76053, found a little motor that may be even better and it's readily available for \$12. It turns about 1 1/2/sec. with no load and if that was a bit too fast a voltage dropping resistor can easily be put in the circuit. It's small and light, too. Write Herbach and Rademan, 401 E Erie Ave, Philadelphia, PA, 19134 and tell 'em you want a gear head motor, #TM21K038, 12 V. reversible.

Next issue I'll have at least one circuit drawing for the installation. Disregard: Here's one from Al Bosonetto, 32625 Benson Dr., Westland, MI, 48145.



Al also says he is designing a microprocessor controlpanel that will monitor fuel, fuel flow, eng. hrs., CHT, EGT, Time, speed, distance figures, and a warning signal when fuel, oil, elect., or vacuum fall out of specs. It should be small & light, 2 lbs, and would not replace any gauges until it's been proved out. Sounds great, Al. Keep us up-dated on it.

**AUTOPILOTS:** Howard Henderson and Sylvan Keebler, both of St. Louis, have installed fluidic autopilots (wing levelers) that they built. They are having fun with them, but say they are "cranky" at this stage of development, but will use the later improved circuits. More on these after OSH. Sylvan also has electric trim and electric flaps and I'm hoping he'll come thru with a good article on both. Howard is using the new airfoil on his new wing, but is having a problem converting wing tips. He's been making new molds, etc. to adapt. Ken Knowles solved the problem very simply. He slit the trailing edge of the wing tip forward about 6 or 8 inches, and inserted a pre-cured slab of fiberglass in the slot and stuck it all back together with resin. I looked at it closely and it fits beautifully. ....Back to autopilots. Bryant Foxler, 1007 Shell, Midland, Tx, 79701, has an autopilot in his T-18 and has promised an article and sketches on its installation. We've got a lot of new developments to yak about in coming issues if we just get the input from members.

**AILERON AND RUDDER TRIM TABS:** I saw one movable aileron trim tab at Lodi and hope to have an article on it by next issue. There was some discussion there of using the same principle of an ultra-light model airplane servo operating via a tiny 1.5 oz. electric motor inside the control surface itself, to operate both rudder and aileron trim tabs. The motors would mount on the forward spars of the control surfaces in order to not deteriorate static balance. There's no denying that such trim tabs contribute a great deal to the enjoyment of an airplane's best flight characteristics. To me, it's a pain to fly instruments with an out of trim airplane, i.e. to have to continuously hold right rudder during climb, etc. Perhaps the fluidic autopilots and wing levelers will fill the bill if we can make them fulfill a dual purpose. If we could use them to trim all three axis, then turn them off and hand fly the airplane until we wanted to relax and look at a map or re-trim for some other condition of flight, I'd really like to have one. Also, to be realistic, such a unit might be a life saver if the untrained pilot blunders into IFR conditions. Let's also be aware that pilot seizures in flight aren't unknown and an autopilot would enable the probably non-flying passenger to get on the radio and get some help. It would probably enable them to fly to an airport and possibly even fly an approach. It would give such a passenger pretty good odds if they had had a few trailing landings, but were not current. What's your opinion on the subject?

**INSTALLING CANOPIES:** This is one area that we need a LOT of input, so that we can explore more than one method of doing things. John F. Kenton, 16611 126th Pl. S.E., Renton, WA, 98055, has sent in this very excellent method of fitting the canopy frame to the airplane. Here it is, word for word:

#### PREPARATION & INSTALLATION OF THE A650 CANOPY

Prior to installing canopy onto aircraft deck, position frame on work bench as per sketch.

Using 2 straight edges (use extrusion, square tubing, etc.), place to inboard sides of rear pins & aft rollers parallel to each other and full length of canopy and secure with clamps (4 places).

Note: Remove screws retaining rollers & cut dowels instead, to provide flush butting of straight edges to rollers. Also cut 2 pcs. of 3/4 x 3.0" wide by 36.00 scrap lumber and position between frame sides for retaining forward tracking dims (dimensions). Secure with belt, rope, or equiv't.

Now measure dims to outside of both parallel straight edges at pins & roller location. Should be identical.

**EXAMPLE:** My aft pins to outside straight edges was 15", but my aft rollers were 14.75", ... Replacing .090 spacers with .215 lgth spacers brought the rollers to same dims as the pins.

Now measure dims from inboard side of canopy frame at fwd end cockpit area L/R sides to straight edges. Should be equal. Otherwise it still won't track freely.

You may have to spring the frame to agree, but at the same time hold the 3rd inside dim.

Prior to installing tracks, drill #40 pilot holes in the aft deck tracks ONLY (in detail part only).

To install tracks, position canopy frame onto deck in closed position and insert fwd cockpit track onto rollers and clamp to skin, also insert deck tracks onto rollers temporarily.

Note: Use .200 shims to hold clearance between deck and canopy (locate at

(locate at top of seat frame).

Move fwd tracks as high as possible, but holding 1/4" dim edge distance for 1/8" skin rivets and drill #40 pilot holes and cleco.

Position aft tracks with 3rd rivet hole location from fwd end over rivet center line of #571 frame, top flange, sta. 119. Using masking tape secure fwd ends only to deck skin.

Move canopy to open position and secure track aft end with masking tape.

Move canopy a number of times to closed and open position, rearranging the track as necessary, until no binding is evident.

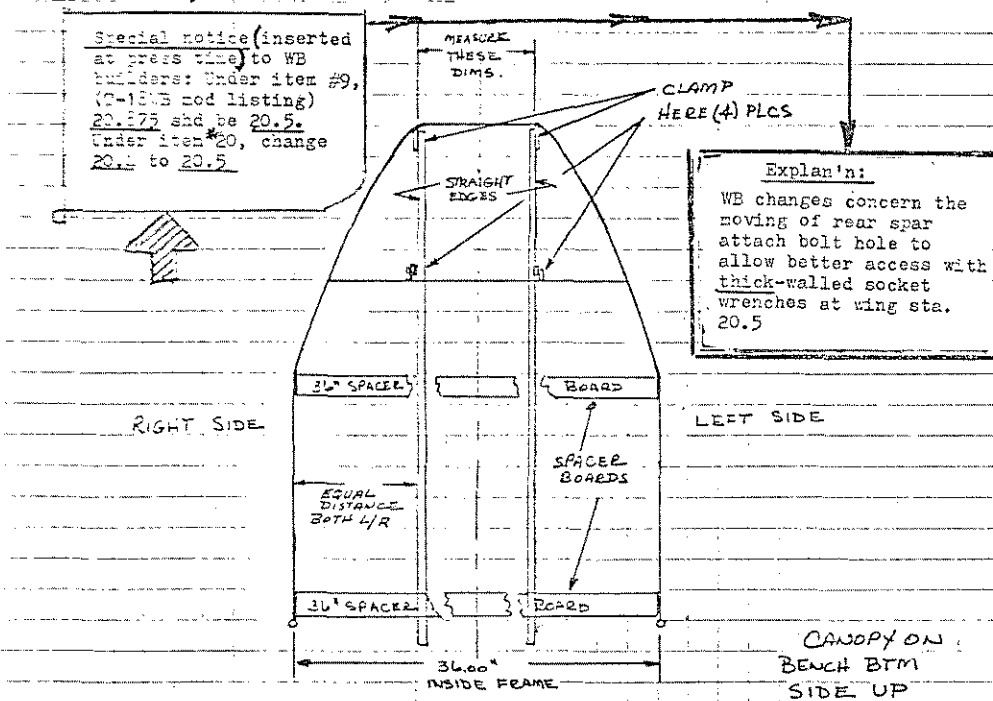
Recheck that 3rd rivet hole from fwd end of track with center of #571 top frame flange, sta. 119. If still in line, pilot drill #40 hole and cleco

Now drill #40 pilots aftmost & 3rd from aft end from each track thru deck skin & cleco from underneath to allow canopy movement for checking & tracking.

Prior to full size drilling make brackets A580-16-2 with 2 pilot drill holes in flange common to #572 frame only and draw rivet center line common to deck skin (use masking tape and pencil).

Locate detail A580-16-2 in position spotting center line with track from 2 each pre-drilled pilots, mark with pencil, remove, check on bench and drill 2 holes each bracket.

Reposition A580-16-2 brackets & cleco from underneath. If still tracking satisfactorily finish drill remaining holes from aft flange of bracket thru frame & track thru deck skin.



Thanks for a really thorough write-up on installing the canopy, John. That was very well done. I'm sure it will be thoroughly appreciated. The canopy has been one area we've neglected to cover in detail in the past. How about more of you writing your method of canopy installation or any other tips concerning the canopy? There are literally dozens of ways to do every job and it would be of benefit if we could take a look at different ways of doing things.

Richard Keller, (5446 Connecticut Ave., La Mesa, CA, 92041) sent me an article for the N. L. about touring the high Rockies country in his T-18, including landing at a wilderness airstrip, which would have been ok except for the fatigue failure of all 4 axle attach bolts occurring simultaneously. The loss of a wheel put him over on his back. It's too good to hoard for our N.L., so I've sent it on to Sport Aviation. If Jack Cox doesn't run it I'll print it in the N.L. It has some points worth meditating over in it. Rick has his bird about ready to fly again and now has a 180 hess Lyc. hanging in it. He has an "extra" engine that he was going to put in it to replace the O-290-C when the 180 came available. He'll sell the extra 160 hp O-320 B2B engine, with the engine mount, horseshoe ring, and Lord mount biscuits, for \$2600, I believe. He may also have a prop. That series engine will also take a c/s prop. It's identical to the one I have on my T-18. There's a thin knockout sheet metal plug in the end that has to be removed and a disk inserted in the shaft a couple of inches back to divert oil to the governor.

Today is July 4th and I'm trying to get this N.L. finished and in the mail so that everyone will get their copy by Oshkosh time, but it's going to be nip and tuck. I have to do it all by myself, printing, collating, stapling, making address labels, etc., so I'll run off some extra copies to take to OSH for some of the last minute joiners. I'll also bring a stack of the baggage compartment drawings, as getting the new plate made will delay this N. L. and I'll just run it the next time. I'm beginning to get some good info and tips in for future N.L.s, so please do your part and write up what you have done on your project...even your mistakes. We'll have an anonymous column of "Don't do what I did".

**FOR SALE CORNER:** We'll carry for sale notices for T-18 M.A.S. members' projects and T-18 related items if it doesn't get to be too big an item. It will be on the honor system. If you sell an item because of the N.L. we request you make a small donation to our fund. We can't assume any responsibility for quality, but if you have items that might not come up to accepted standards please use Trade-A-Plane, etc.

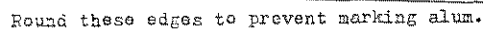
Here's a wide body, folding wing project built by an AI, now in hospital. Price \$4500. Wings, ailerons, flaps, controls, complete. Tail group complete. Fuselage skins, formers, longerons, on hand, no work done. Also cowling, wheel pants, gas tank, spinner, prop ext'n, on hand. Call Wes Silverman, 1-502-245-9479, 410 Bermuda Way, Louisville, KY, 40243, for further details.

If you have plans for sale we must have the serial number or we cannot carry the ad. If you have an airplane for sale you should furnish the plans with it. If you have parts, please specify who made them. Please keep all such notices as brief as possible.

That's it for this time, gents. Plz excuse my taking so long to get it out and plz xcz my terrible typing. You can recognize me at OSH as the one whose index fingers are worn down to the first knuckle.

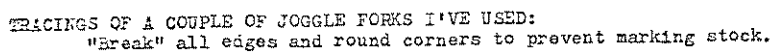
You guys just sitting and looking at your plans, I'd like to know why you're not building yet. Maybe the M.A.S. can help you get under way. Let us know.



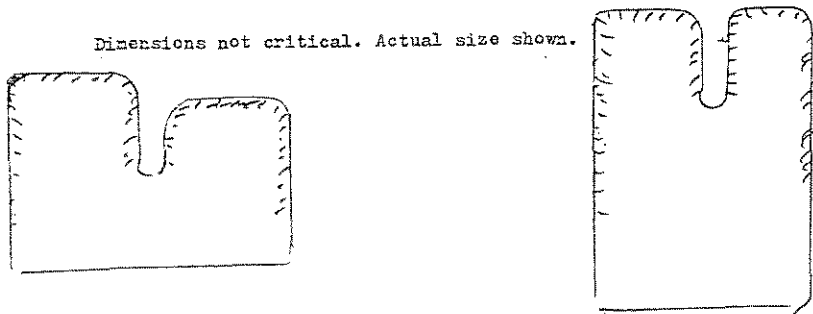


USING THE MINI-BRAKE TO ADJUST FLANGE ANGLES OF RIBS, ETC. CAN ALSO BE USED TO BEND SKIN OVER THE TANK.

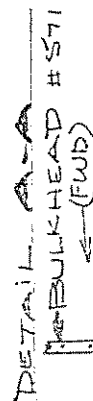
Use your free hand to maintain considerable pressure to hold rib tightly against bench as you bend flange with other hand, much like a big brake hold down wing clamps stock down tightly.



Dimensions not critical. Actual size shown.



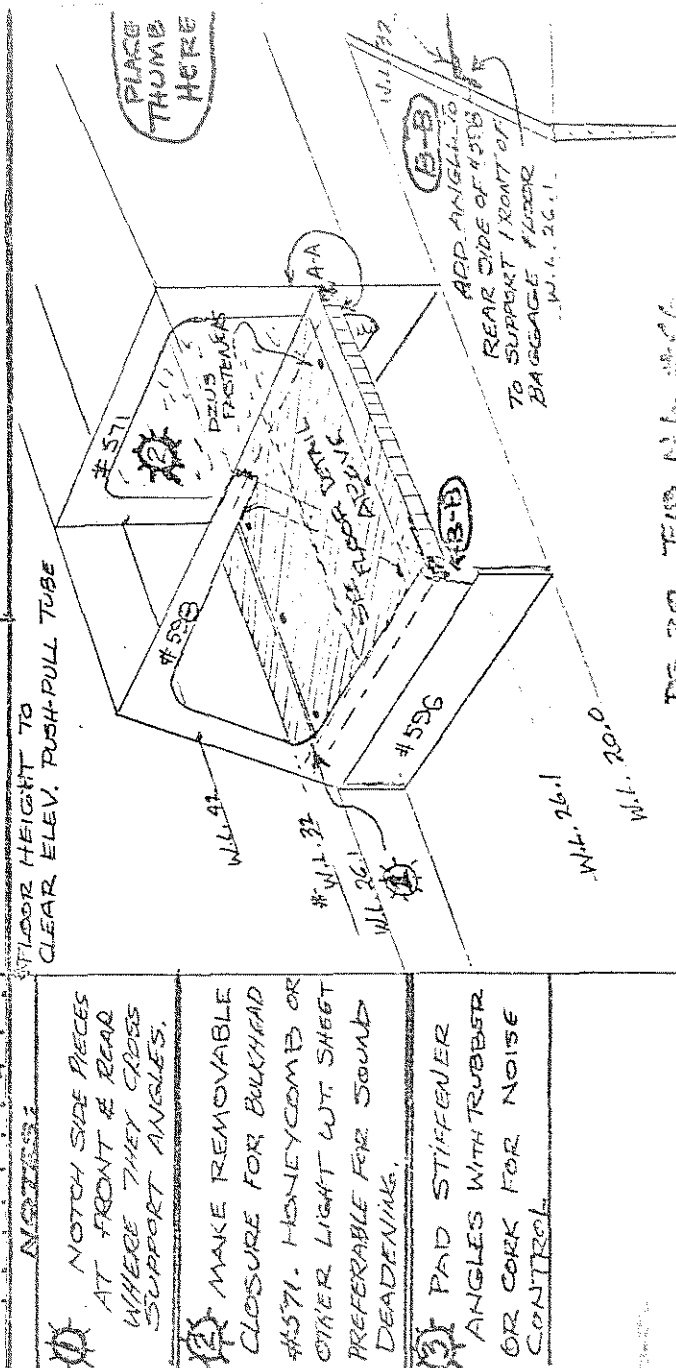
P. S. I just found out that Ken Knowles is selling his first T-18, now that he's flying the wide body with the convertible wing and new airfoil. The #1 airplane has the folding wing and standard fuselage. John Thorp did one of his superb conversions on the engine, making it a D engine of 135-140 hp by using D-2 pistons and using the big crankshaft and valves. Don't know TP on it, but I think about 400 hrs. I believe Ken is asking \$14,000 for it.



ADD ANGLE TO FRONT  
SIDE OF #571 TO  
SUPPORT BRAGGAGE  
FLOOR AT REAR.

W. L. 26.1 EXT'N.

BAGGAGE FLOOR DETAIL (LOOKING AFT)



1907



DICK CAVIN, 10529 SOMERTON, DALLAS, TEXAS, 75229

214/351-4604

OSHEEN 1979 is now history and I'm hoping to get this issue out by around the 1st of Sept. and hopefully you will have it in your hands by around the 10th. I mailed #46 out on 16 JULY '79 and most of you had rec'd it prior to OSH, but if you didn't please let me know. I printed up quite a few extra copies of #46 for late joiners, etc. I'm sorry I can't get these things cranked out a little faster, but I'm having to be a one man gang for writing, typing, printing, collating, folding, stapling, addressing, mailing, zip code sorting, and a couple of other things (that Lu & Marilyn did for several years), so you'll have to be a little patient with me until I get up to speed. On issue #46 I ran into a week's delay in using the chapter printing press and the delay came at a time when it was already close as to whether 3rd class mailing would get them delivered to you before OSH.

OSHEEN HAPPENINGS: Our T-18 turnout for this year was well below '73 and '77, in numbers, but it was a banner year for the T-18s in the award area. I had to leave on Wed. morning, so didn't have time to gather in the official results, but B. C. Posner and BOB Dial teamed up to clock 203 mph on the high speed leg of the 500 mile contest course of the Lowers-Palck-Baker Efficiency Race! The contestants were allotted 22 gallons for the race and if they exceeded that amount they were disqualified. With Bob flying B. C.'s airplane they only used 20 gallons! (at low altitude, too). That's 25 miles to the gallon! After the high speed dash was over they flew the rest of the course at a lazy 130 mph for max fuel economy. I don't know how the other contestants came out, but Bob said they were far ahead of Bent Paser's fast Mustang II-by about 20 mph. Perhaps others in the race had a different game plan, but 203 mph and 25 MPG isn't too shabby in anyone's book, is it? You'll read all details in Sport Aviation, so I won't dwell on it at further length except to say congratulations to Bob and B.C. Very well done!

Just prior to leaving I learned that two other T-18s there were top awards winners, but my informant wasn't quite certain what for. Richard M. Schaefer, 5842 West 95th, Los Angeles, CA, 90045 (S/N 82) fielded his magnificently appointed M41RS to deservedly win top honors for the best T-18 there. It would be hard for anyone to come up with a finer custom built airplane than Richard's. I had seen it earlier at the Chino Fly-in and had admired it then. Its conservative, classic elegance gave it the look of a distinguished thoroughbred, which it truly is.

The other winner was really a surprise! It was officially listed as an AT-19 and was built by Gale Abels, 3100 6th St., Boulder, Colo. 80302 (S/N 766). Strictly speaking, it is not a T-18. It was based on the T-18 design, but it has a Vee tail and had extended, tapered outer wing panels. Each outer panel appeared to be nearly 2 ft. longer than std and in addition had an extra flap segment about a foot long. The extra segment was actuated by the inboard wing flap, like the T-18C wing. The fuselage appeared to be stretched a few inches also. It was a beautifully built airplane, with excellent workmanship.

I lost my notes on it, as well as the details on Schaefer's airplane, but I do remember Mr. Abels telling me he was a high country sailplaner and considerations of high altitude and sailplane design practices strongly influenced his changes. I was admittedly a little dubious of the crosswind capability in a strong wind, but Mr. Abels said he was quite pleased with its response in a 25 mph X-wind. He said it indicates 214 mph top, but that his airspeed system hadn't been calibrated as yet. You'll see details on both these airplanes in Sport Aviation and probably in a future newsletter, too, so I won't elaborate on specs at this time.

JUDGING T-18s: Perhaps a word of explanation on T-18 judging at OSH is in order. This year 3 experienced T-18 builders were chosen to act as Judges. None had an airplane at OSH. Lloyd Toll, Bill Cox, and Paul Kirik served this year and each scored each airplane independently, so that they couldn't influence each other's

scoring. 19 items were examined and given a score of 1 to 10. Spinner, cowling, air scoop, exhaust, gear fairing, cabin fresh air intake, windshield fit, canopy, etc.- in fact, every independent item on the airplane was judged for fit, appearance, workmanship, originality, and harmony with the complete airplane. Items like wing tanks or mufflers scored extra points. Previous year winners were ineligible for judging, so Paul White's great "Kong" and Bill Cordoba's beauty couldn't repeat this year, according to the ground rules.

An award for the T-18 there with the most hours was given to "Doc" Cottinsham, a Nebraska radiologist, who has flown his T-18 for 2475 punishing hours into the most primitive and roughest strips, in all kinds of weather, for about 80% of those hours. N299V looked a little worse for wear in chipped paint and grime, but structurally it didn't appear to have suffered. Rough fields are hard on airplanes. Probably more than any other factor, but Doc's bird didn't have any loose rivets easily detectable. (Don't get the idea that I'm saying for you to not do thorough pre-flight, just because the airplane is rugged!)

Our 2nd Annual T-18 Dinner was arranged by Sandy Cordoba again this year, with pre-convention work by John Walton, too. It was a great success. About 150 very enthusiastic T-18ers and wives were in attendance. After dinner we were treated to an account of the day's race by Bob Dial and B. C. Posner. Don Gaylor gave a short account of highlights of his two round the world flights and Clive Ganning also gave an abbreviated commentary of his flights around the perimeter of the Australian continent and also his round trip flight from Sydney to London.

I'd like to recommend Clive's book ("Charlie Mike Charlie") as one of the most interesting and exciting books you'll ever read. He's a tremendous author. His book literally puts one inside his head, with YOU inside his T-18 cockpit for an incredible series of high adventures. Perhaps you've heard a bit about his set-to with 4 Syrian Migs, bent on shooting him down. You'll fly thru monsoons, desert sandstorms, fog, over oceans, jungles, deserts, thru thunderstorms so bad he could just hang on. I think you'll agree that not only is he a fine pilot, but that he also has the rare gift of painting a word picture that is so completely absorbing that you won't be able to put it down, once you start. You'll have an even greater appreciation of what a fantastically fine airplane the T-18 is. Clive's book was published in Australia and he had a booth at OSH, but I don't know whether there will be further distribution of the book in the U. S., but I certainly hope so. If it's not advertised in Sport Aviation I'll get details on it from Clive. His address is 3 Leon's Court, Blackburn, Victoria, Australia. By the way, Clive was also a multi-Ace in WWII, one of three at OSH this year. He's also a fine gentleman, a man you'll instantly like.

My old friend, Peter Hodgson, was there again and he says the T-18 is being built in considerable numbers in Australia and New Zealand- about 60 projects added to the 30 now flying there, I think. Pete's on his 2nd T-18. Ben Miller, of Middlesex, England, was also present at the dinner and he said that at present he is the only active T-18 builder in Great Britain, altho' there are other plans holders. When his T-18 flies there'll probably be a rash of new starters, as the sight of a real live T-18, on the ground or in flight, seems to always start a prairie fire of sorts.

AUTOPILOTS AND WING LEVELERS: Autopilots and wing levelers will be more and more important for builders in the future. Last year Byrant Rowland, (1307 Shell St., Midland, Tex., 79701) fielded his T-18 with a Century autopilot installation at OSH. It was very simply hooked to the walking beam by using a longer bolt thru the rod end bearing, thus tying the actuator arm of the AP to the AC control system.

This year Howard Henderson, displayed a different approach to the problem in the fluidic wing leveler he had built up from scratch. A true "Fly-by-wire" system,

it bypasses the aileron control system and actually "flies" the aileron by the means of an electronically actuated servo-tab, that is added to the trailing edge of the aileron. The 1.5" x 9.5" servo tab is positioned by a tiny, featherweight model airplane servo (reversible DC motor), that is mounted on the backside of the aileron spar. A tiny bellcrank and push-pull tube apply the muscle to move the tab. The tab itself is balsa, with .016 alum epoxy-boded on both sides for a more durable unit in its exposed position (to ground-pounding type gawkers). He and Sylvan Keehler have both installed these units on their T-18s and both found the present tab size is the minimum size needed for control authority. Howard promised to write a full report on the installation for the N.L. "soon".

Howard's master control panel for the W/L was a tiny 1" x 2" piece of laminated plastic mounted at the bottom edge of his ins't panel in add-on fashion. It had two miniature toggle switches: one was power on & off, and the other was a selector switch to command either automatic wing leveling or simply to use it as an aileron trim tab to pick up a heavy wing. The latter mode is called "manual". He also had a couple of little rheostat knobs. When in the manual trim mode a wing can be raised or lowered by making the desired motion with the knob. (i.e. to lower the right wing, turn the knob to the right). This knob is labeled "trim" and the other labeled "gain". The gain knob increases or lowers the rapidity of response to either manual or automatic signals. The beautiful part of the whole system is its weight and cost. The whole thing probably doesn't weigh much over a pound, and I believe Howard said the whole thing could be built from a kit supplied by (?) for well under \$100! (At present I don't know the name of the supplier or any other details, so if you can't wait until the next N. L. to get going on one, you might call Howard for details). He lives at 444 Bryan Ave., Kirkwood, Mo., 63122. Howard is doing some further testing, tho', so I'd recommend you curb your curiosity for a little while longer.

Howard let me pick up the sensor (which he mounts under his seat) and rotate it to the left and right, simulating the yaw to the left and right of the nose. I watched the tab as I did this and the servo reacted immediately in proportion to the movement of the sensor box. The box itself is about the size of a cigar box.

I am most enthusiastic about the little wing leveler and its potentialities in the T-18. It will be invaluable for normal VFR XC flight to permit the pilot to study his maps more often, etc. Altho' Howard says it is not adequate for true IFR flight (i. e. tracking radials, flying an ILS, and other very precise turning) it would be a valuable "co-pilot" to permit the pilot to use both hands in routine radio work, chart study, etc. Its manual aileron trim function makes it worth its weight in gold, particularly for those with electric flaps. The same trim system could be applied to the rudder for centering the ball and fatigue on longer flights would be practically eliminated. By eliminating the front tunnel and using the electric trim for the stabilator, one can move their feet and legs around for comfort. You can well imagine how automobile passengers or drivers would howl if they had to keep their feet and legs in one position for hours on end. The T-18 is a really super XC machine, but that doesn't mean we should sacrifice all the creature comforts in the process, does it?

Still another benefit of a wing leveler that most people don't want to think about is the possibility of in-flight incapacitation of the pilot. Obviously our passengers should be qualified to land the airplane for maximum safety, but we all know that very few are. Think for a moment about how a non-pilot would attempt to fly the airplane while simultaneously trying to tune the radio and call for help. There would then be the problem of navigating to an airport, etc., but at least it would buy them some valuable time and enhance their chances of survival. Frequently an incapacitated pilot will revive after awhile and take over for landing. We recently lost a local T-18 when the pilot lost consciousness just after breaking ground on a takeoff(solo). He might have survived if

he had had a wing leveler and had time to recover consciousness, altho' this is pure speculation. He might have even survived the impact if he had worn a shoulder harness. The airplane made a 180° turn after takeoff, impacting in soft ground. The turn and pitch angle (down) gradually increased in the classic spiral mode and the airplane hit on the right wing tip, gear, then spinner. Mr. Clardy's head struck the dash frame well to the right of center, strongly indicating he was slumped to the right at impact.

Survivability: Such lessons as above highlight the importance of wearing shoulder harness. Admittedly, it's somewhat restrictive, but it's something you'll get used to. We used to complain about them in airline work when they were first made mandatory, but we soon got used to them.

As we pointed out in #45, the A-frame gear is a tremendous plus in an impact, in that it not only prevents penetration of the engine into the tank and cockpit, it also absorbs a huge amount of energy in the deceleration process.

More on seats: In the area of survivability, don't overlook the importance of the seat. Several years ago a T-18 pilot suffered a broken back when his seat collapsed on impact. A dust devil got him a few moments after t/o. His daughter was uninjured, except for bruises made by shoulder straps, but his seat failed downward. His additional body weight failed bulkhead #592 in compression. His fix on his next T-18 was to add short pieces of vertical angle on #592 just below the 2 hinge points (that allow his seat to be tilted forward for baggage compartment access). You might want to take a long hard look at this item.

Several years ago I wrote an article in the July '67 Sport Aviation, entitled "A Discourse on Seats", in which I described a super-comfortable seat design and also described certain features that make seats modern torture racks. The very worst type of seat is a slab of foam with sheet metal or plywood supporting it. We had this type of seat on the Electra and it caused a rash of spinal and rectal injuries when turbulence was encountered. The foam scarcely slowed up the pilot's body before it hit the sheet metal "pan" virtually unchecked. The ideal seat I described was basically a canvas sling, attached to a special tube frame via nylon laces thru eyelets in the canvas. The back tilted forward about 15° at the mid-shoulder blade area, thus supporting the entire body from the knees to the head. Such a seat eliminated local pressure points under the thighs, etc. that cause discomfort and cut off circulation on long flights. The frame and sling used a sculptured foam and material slip-on "sack" for maximum comfort and eye appeal. The springing effect of the foam and nylon lacing made it pure luxury. The dimensions and angles shown in the article got mixed up somehow, so if you refer to that article just use your protractor to get the right number, as the drawing was correct in scale and angles shown.

To that seat I would add a woven barrier below the seat for crash-worthiness. The seat sling would normally never touch the 1" wide woven strips of aluminum pop riveted to a tube or extrusion frame. Its only function would be to stop the vertical movement of the body if impact forces were high enough to fail the sling and laces. I, too, would add vertical support legs for the barrier frame.

An outstanding feature of that seat design was the tubes at the juncture of the bottom and back were not a single, common tube, as is normally used. The bottom tube of the back was well below the level of the bottom tube frame and also the rear tube of the bottom was well off of the back frame plane. Thus one's sensitive tail bone area never came into contact with a hard point and the effect was like being suspended in a hammock.

MORE COMMENTS ON OSH T-18s: While at OSH I got a chance to talk with several builders and go over their airplane in great detail. I wanted to do so with each one of them, but unfortunately I couldn't always locate a lot of them when I

How do you make your seats? What would you do differently now?

was in their area. I guess they were tramping up and down the lines when I was around.

While T-18 airframes conform quite closely to plans in most cases, I was surprised to see how widely other details varied from plane to plane. Several builders graciously opened up and no-two of them were alike forward of the firewall. There were actually 2 different types of cowlings. I expected to find a wide spread in make of props and differences in diameter and pitch, which I did. I also did anticipate that there would be a wide mix in wood, metal, and constant speed props and there were, but I was really surprised at the variety of spinners there. Nearly every airscoop was different, ditto airboxes and air filters. Oil cooler location and installation varied widely. Some had oil filters, some didn't. The exhaust systems were all different, too. The exhaust exit tubes came out of the cowl in a variety of places at very different angles to the airstream, too. The carburetor and cabin heat systems were all as different as the N numbers on the individual airplanes. Internal exhaust support brackets and clamps were no exception to the rest of the items.

When I got to the electrical systems it was again the same story. There was an almost even division between generators and alternators. Battery and starter solenoids were all over the place. Most all seemed to agree that the voltage regulator should be at the upper right corner of the firewall. I was surprised to find that not too many had "blast-tubed" their mags or generators and very few had taken the trouble to baffle efficiently around alternators or generators. Everyone was a little different on their fuel filter. Also all throttle, mixture, and heat controls were secured at the mid-point in a different way.

There was one immediate benefit of all this eagle-eye routine: An inch long crack quite close to the flange was found in one exhaust system. That points out the value of a good pre-flight inspection of the engine compartment. That's one big reason I particularly favor John Thorp's cowl design. Removing or replacing the "cheeks" is quick and easy and the entire engine and accessory area can be inspected easily and there is plenty of light to see little things before they get to be big things. If you re-read the previous 4 or 5 paragraphs you can't help but come to the conclusion that as far as engine installations are concerned...each T-18 has a different design engineer and comes out of a "factory" that does things differently to the next one. It's most unlikely that all of these installations will be 100% trouble free. Therefore it follows that frequent, thorough inspections are called for. The Thorp cowl also allows a considerable amount of work to be done without removing the top and bottom parts. Incidentally I haven't heard from Marc Bourget re: response to the feeler for a possible new production run of the metal cowls- or even an estimated price.

When we looked at brake systems and gear fairings it was the same story. Windshields and canopies (in particular) showed the individual touch. Antennae and pitot/static systems likewise. Treatment of floorboards and forward area sound-proofing also ran the gamut.

Most all of these items have been covered in the newsletters, but usually only one way of doing things has been described. There are literally dozens of ways to do all of the above mentioned items and obviously most all of them are at least moderately successful and satisfying to their builders. If YOU and YOU will sit down and describe in detail how YOU solved the engine installation items it would give us enough material to keep the N.L.S. going for years and it would really help the new builder. All of YOU know why it takes 6 to 9 months to make an engine installation, don't you? How about it, amigos? Will you do your bit to repay some of that free info you received thru some generous EAAer? Here's what I'd like: "Here's how I fitted my cowling and attached it....." and "Here's the airscoop design I chose and here's the way I fitted an air filter in it".. or "Here's my airbox design"....or "Here's the way I set up my carb heat muffs and cabin heat muffs and how I routed the heated air where it was going".

Anyway, you get the idea. Black and white pictures are great, too. If you talk about controls, mention what hardware you used, how long a flex control was, where you bought it, cost, etc. One of the most widely needed items is patterns for baffling. Most builders would gladly pay a reasonable fee to save all that time and trouble. If you have such patterns, make note specifically what model of engine it's for, as there is considerable variance between models.

1980 T-18 Fly-In: After talking to most of the builders present at OSH this year and tabulating the response to the trial balloon in N. L. #45, it was decided to forego discussion of a T-18 Fly-In at our annual dinner affair. It was felt that perhaps the number of people there probably wouldn't represent a true cross section of T-18ers and also any discussion and voting would be excessively time consuming. It was suggested to me that we send out an opinion survey sheet with the N. L. this fall and if a sufficient response resulted we would make plans from that standpoint. If the survey fell flat, we'd just have to forget the idea for that year at least. I'll try to add the questionnaire to our next N. L. (#46), so please be thinking of it in the meantime.

As we mentioned in #45, it would be a great thing to have all builders remove their cowlings at the same time and the new builders could go down the line and see how every item that we mentioned on page 5 had been done and have the T-18 owner answer questions on each subject, etc. If an organized effort was put forth, I feel that we could easily have 50 T-18s on hand the 1st year, and we could likely have as many as 300 to 400 builders and potential builders. We could have forums and seminars on most every subject, as well as several workshops. We could have interview circles where the builder and his airplane could be introduced in detail and photographed and a scrapbook type of thing made up from this data. In short, we could have every feature of OSH, but all of it revolving around just one type of airplane! There is a big difference between pipe dreams about such a project and the actual planning and organizing that it will take. First of all it requires a definite commitment from the rank and file that they are in favor of such a Fly-In and that they will be there and support it. A place and a date must be selected, motels surveyed, campsites and other physical facilities checked out, etc., so let's start with Step #1 and see what the majority would prefer, via the questionnaire.

Don Taylor (44455 Benton Rd., Hemet, Calif., 92343, phone 714/ 925-7404) is the first person to fly around the world (twice) in an airplane he built himself, is looking for new worlds to conquer. During Chino Fly-in time he set a new record in class for Los Angeles to Las Vegas and return. He has now planned another long, long flight, but before he can make definite plans he has need of a new sponsor. There are a lot of expenses other than fuel to consider on such a venture and are beyond his personal budget as an Air Force retiree. Perhaps you might know of a company or even an individual that might sponsor such a flight? It never hurts to ask, you know. If you have some ideas along this line and need more details give Don a whistle.

As you probably know, Don's T-18 has integral fuel tankage in the wings (the so-called wet wings) to get the range that he does. Quite a few builders look wistfully at the idea of longer range for their T-18, but the specifics of the project are elusive to them. Don went to John Thorp for advice when he first built his wet wing and followed his recommendations with obvious success. Don has promised to describe in detail what's involved in an article for our N. L. in the very near future. Any other builders that have gone this route are also requested to write an article about it. Not only the specific steps in construction, but also their evaluation of it in service experience. .

Thoughts on fuel in the wings: One of the problems that can arise with fuel in the wings is that of lateral unbalance. If little or no fuel is in one wing and

the outer wing is full, or nearly so. Obviously this could become critical on landing roll and could be compounded if a strong crosswind existed.

Airplane aircraft have circumvented this problem with tank to tank transfer lines and dump valves, but their primary defense is fuel management. When a tank on one side feeds and the one on the other doesn't you've got a problem in your lap immediately. Proper fuel management on a single might involve switching from one wing tank to the other every 15 minutes, if you don't have the capability to feed from both tanks simultaneously, as Cessna does. The 15 minute bit would only produce an average 12-14 lb. unbalance, allowing a controllable and fairly symmetrical loading for landing. It probably would mean a landing earlier than that originally planned, too.

Fuel in the wings is "self relieving" in flight, as far as positive G's goes. In other words it doesn't increase the bending load on the spar in flight, like adding that much weight inside of the fuselage would do. However landing with a lot of fuel in the wings (negative G's) could cause structural damage if the landing was hard. The above statement is a generalization and isn't intended to be a specific guide. Some of those things are unknown "gray areas", in view of limited service experience and it would be wise to consult with the aircraft designer on the subject. At least until there is a larger reservoir of service experience to draw upon.

Slipper Tank: One of the simplest and most trouble free extra tankage system could be "Slipper" tank, inserted spanwise in suitably shaped lightening holes in the nose ribs of the outer wing. The simplest form of this would be an irrigation pipe of some diameter less than the spar height. A 5" dia. pipe will yield 1 gal./running foot of length. I don't have any numbers on it, but my feeling is that you should have about 1/4" of rib web above and below the pipe, along with a 30" flange around the lightening holes to properly support the tank. Such a tank wouldn't use but a portion of the available space in the nose rib and would be wasteful in added weight- especially so if the irrigation pipe is over .032. Additional nose ribs might be desirable. An abbreviated length of slipper tank could also be used in a portion of the outer wing on the rear side of the spar.

If you find the irrigation pipe idea wasteful of space and weight, perhaps a tank shaped like the leading edge area of the wing and made of .040 6061, with a single welded seam running spanwise would be a better alternate. How would you form such a tank? Easy. Use a brake. Bend the lower rear corner, leaving about 6" standing vertically (to be trimmed to size later). Then form the bend of the nose of the rib by a series of small bends of just a few degrees of bend and then wrap the top back until it contacts the vertical rear "tank wall". Trim and weld the seam. Prior to welding this seam insert a pre-fabricated "track" of baffles. It's not considered good practice to weld baffles to a tank envelope, as the attach points are "hard points" and have been found to be a source of leaks. A better set up would be a series of under-size "nose ribs" joined together as a unit, via pop riveting to light weight stringers, which maintain spacing between the baffles. Tank ends are also under-size "nose ribs" welded to the ends of the tank. The filler neck should weld to one end, coming out flush with the wing tip upper surface. Don't forget to add an external tank drain at the lowest point of the tank.

be aware that any airplane with fuel in the outer wings have a possible addition- record in the area of spin recovery. A recent NASA spin tunnel report states that the amount of mass and the distance from the CG was a more important factor in spin recovery than anything else--even CG location.

25. SEE N.L. #48 FOR CALLENE WOOD'S COMMENTS ON "THE SLIPPER TANKS IN HIS 'FORERUNNER'"

FOLDING OF THE WINGS: A question has been posed about the possibility of folding a wet wing (in the T-16C version). Q. "Is there room for a flexible fuel line in the wing cap area and could it be folded and unfolded without disconnecting or re-connecting the fuel lines?" A. Yes, there is room and yes, it probably would have to disconnect the line to fold the wing. It would not be practical to fold the wing with any fuel in it and definitely not to transport it.

Folding VS. Removable Wings: A few of the convertible wing builders have said that they plan to install the wing folding mechanism strictly for future use, when and if hangar space and costs get out of line in their area. They also said it would be an excellent item for future sale. Some others I know of will use the wing folding feature as a means of moving the wing easily and perhaps towing the airplane on its own wheels or a trailer (since it is of legal highway width with the center wing attached). If one wasn't able to fly often, the extra time and trouble of removing and attaching the wing probably wouldn't be too objectionable.

Folding The Standard Wing: One of the standard wing builders called me the other night and said he was contemplating making the standard wing bolted at the center-outer wing joint. It seems that it would be relatively easy to find a hanger to share if he could fold the outer panels and reduce the span to 18'. His solution was to pull the bottom pin (bolt) of the fitting and fold the outer wing up over the center one, like a Navy fighter. He said he had drawn out a quick removable gap cover and a quick disconnect for the filler neck's, but was in doubt about the fittings, whether to use the present ones or go to a steel fitting (for better wear resistance).

I'm not qualified to answer that question, but if I had an opinion I'd be inclined to NOT add around 15 extra pounds of weight in fittings for that type of wing folding. I'd be more inclined to consider a steel backing at the rotational point, but I'd certainly have a professional opinion before I made any such decision.

MC51 FLIES: I got a letter from Clayton "Doc" Swenson, 11510 Parkway Lane, E. Baker, Corners, Wis. 53150 a few days before CGA, telling me that his T-16 was signed off and ready for test hop, but that he was a tri-gear pilot only and he was taking tail dragger dual in a Cessna. It alerted me to think of a barely tail wheel qualified pilot doing a test hop on a brand new bird that might possibly turn out to be a real squirrel on the initial go, so I wrote him back and asked him to defer the 1st flight until CGA time and that I'd do so for him if conditions were all favorable. He agreed.

He drove me down to Burlington, Wis., where the airplane was. On the way I filled him with lots of questions on how he built nearly every inch of the airplane and I learned a lot about him and the airplane from his answers. On arrival at his airplane we gave it an item by item going over, with more questions until I was thoroughly satisfied that he had built an exceptionally good airplane. His obvious sincerity and conservatism made lots of points with me. There was only one little item I was dubious about: At the suggestion of someone else, he had given the gear a wee bit of "high cut" and when I did an eyeball evaluation of the airplane, standing about 100 ft. out in front of it, I was pretty sure that I could see it. This made me expect the airplane to be direction.

While waiting for the ceiling to lift I did a couple of taxi runs with it and sure enough it got pretty sloppy on roll out when power was cut, but it was controllable if you kept it in it every second. I've flown several T-16's that would "dart" with you at around 40 mph or roll out and later found out that gear was bad too out in at least a 60 mph.

After about a 3 hr. wait on the weather we finally got a little improvement, but still not enough ceiling to do the stall antics, etc. I decided to go ahead and

This print is a reprint of your TEST FLITE - IN Detail?

make a short flight with it around the field to check it for trim and engine cooling. I made still another taxi run with it and it felt so good I went back and got my canopy breaker (hammer) in place and lit the fuse. I took off west with a NW wind of 10 to 12 knots, swinging around to the north. This put me out over good, open country. By making a 30° turn to the right soon after I broke ground I began a teardrop pattern, of 180° change of direction, that could have allowed me to return to the field for an east landing (after 300-400 ft.) if engine or other problems arose. It also put me into the wind a little better if something turned sour under 300 ft. No such maneuver was necessary, as the bird flew very well and everything was solid. No temperature indication was out of the box, so I bent it around and came back to the field for an east landing.

On a purposely high final I very gradually pulled full flaps a few degrees at a time, ready to dump them if it started to roll. It was a little lady, so I left 'em down and went ahead and put it on the numbers. I always seem to luck out better landings with a little bit of crosswind to contend with. Perhaps I work at it a little harder to put it on the upwind wheel out of the forward slip approach. Anyway, Bud was one happy guy to find out that he had a good airplane.

His airplane is powered with the 160 hoss Lyc. and it swings a Sensenich wood prop of 66 dia. and 78 pitch, which is too much pitch and lugs the engine. I only got 2000 rpm on static run-up and in flight it was still far below the 2700 rpm where the engine is rated at 160 Clydesdales. That pitch would appear to be closer to right for 180 hp. I would guess that a 66-76 would be a better prop. Time will tell how well it works out.

I just got a letter from Bud and he said on checking wheel alignment that he had to add a 1/16" tapered shim to his right wheel and now it is a real pussycat for him to control on the ground, even up to 55 mph, so now he's even more pleased with his plane.

Bud was supposed to get some dual on a local Mustang II, but his friend bent one of the gear legs on the first demo landing and wound up creaming it completely, but he and Bud didn't get hurt.

Kenny and Chris Fast: Excerpted from a letter Chris wrote me several weeks ago: "I have just completed a pair of outer wing panels (folding) for Kenny Knowles and Lu, built to the new airfoil coordinates. Will deliver them tomorrow so Ken should be able to fly them to OSH this year.

This is the 4th set of T-18 wings I have built and will say that the riveting sequence you described in N.L. #45 is accurate. Let the spars float until any twist is removed (usually by shimming between the main spar and ribs as necessary) then drill the spar holes last. And, yes-the lap joint on the outer wing skin (T-18C) is no problem when overlapped.

One more thing you might discuss that may be bothering some of the boys is the preparation of the outer wing spar caps on the "C" wing. These have to be skill-sawed to size from the oversize angle, as furnished by Ken. The sawing relieves internal stresses and you wind up with a sizeable curve--both directions. I have found that the best way to bring them back straight is to "massage" them with a file or in my rivet gun against a steel angle along the edge of my work bench--being careful not to overdo it and cause a curve in the opposite direction. You may also find that the spar is slightly curved after riveting the caps to the web--so straighten it again by the above method before skinning the wing. This is important if you want good wing alignment (Amen-Ed).

About my ship, N4354A

Weight--2400 with C wings

Engine O-290 GPU, converted by John Thorp with D-2 pistons, 7:1 Comp. ratio, 135-140 hp.

Prop- Sensenich X76RWS-8-71, 68" dia. & 71" pitch.

The prop was vibration tested to determine critical RPMs (test sheet encl'd). My O-290 turns this prop 2200 static at S. L., 2400 on climb out, which gives 1200 fpm with full load. Turning 2400 at 5000' and Man. Pr. of 19-20 the ship cruises out at 150 mph TAS (70% power) which is the power I usually use when in a hurry to get somewhere and it burns 6-7 Gal/Hr at this power. Top speed at S.L. was 180 IAS turning 2875 rpm with the standard wing. Haven't tried it with the new wing yet.

Instrument panel includes: Electric T & B, vac. gyro horizon, and D.G., Genave Alpha 200A nav/com radio, wing tip strobes, etc.

About Chris: 66 yrs. old and still thinking and feeling young. Retired 3 yrs. ago after 40 yrs. with Douglas as Quality Control Administrator, transport aircraft. Now I'm enjoying my home workshop, building T-18 assemblies for my friends, mostly for Ken, and my A&P license and my private pilot license were issued in 1935.

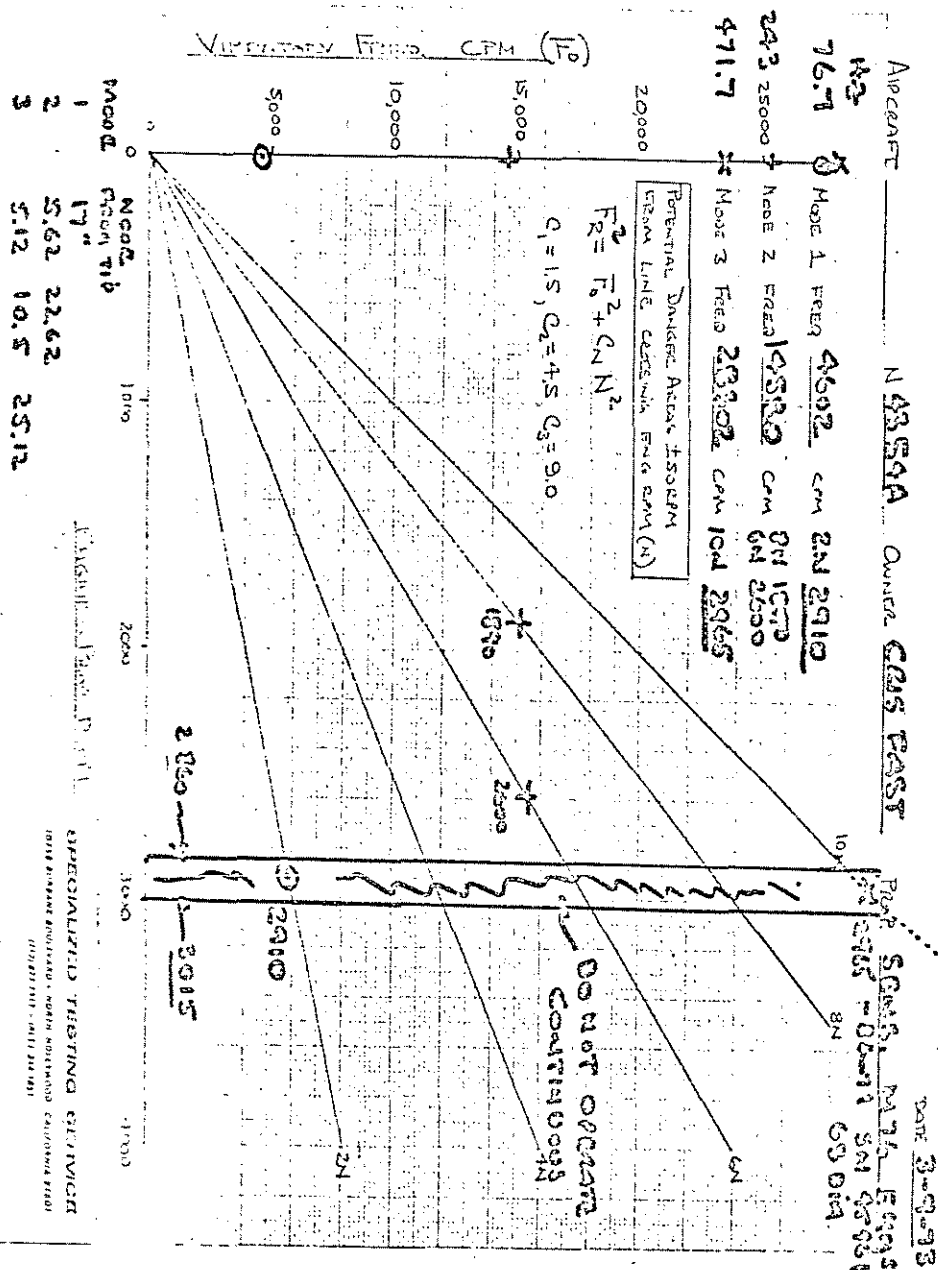
I had a preventative maintenance triple by-pass done on my heart arteries 2 yrs. ago, so my med certificate is still under "negotiation" with the Feds. I hope to get it back this yr., as 2 yrs. seems to be the magic no. Also, I just passed all of the tests, including a treadmill test given me by the FAA cardiologist that sits on the review board in Wash. DC. I've lost track of Cats Tokle and I'd like to give him some of the info on this. In the meantime I take a pilot with me when flying, so as to not break the law. Hoped to make OSH this year, but a conflict came up and will miss it.

About the T-18 Fly-in you mentioned, but have no suggestions for the location of it at present." Best regards, CHRIS.

Thanks for a fine letter, Chris, and especially thanks for that tip about the straightening extrusions by massaging them with the rivet gun. Several years ago I used my rivet gun in a like manner to get the curve in the fuselage ext'n, with good results. I also had used it to straighten outer wing spars (C), but it didn't occur to me to do it on the caps. I made up a little gizmo to straddle the rivet heads on the spars, so as not to overdrive them. I used a scrap piece of 3/4" thick alum, about 4" long and 1.5" wide and sawed a slot in it wide and deep enough to clear the rivets. Driving a long line of rivets stretches the metal a little bit around each rivet hole and the accumulated stretching will cause a part to "grow" noticeably, hence the curve. On a long line of rivets you should never start driving at one end and go down the line. Skip around in some sort of order, or else you'll find that pre-drilled holes won't match with the line.

That stretching of the metal around a driven rivet isn't a real problem if you are aware of it. Next time you're around a T-18 get well out in front of it where you can eyeball it for alignment and you'll see a tiny bit of dihedral in the horizontal tail. If you can't see it, measure it. It's there. It's due to one less rivet on the bottom of the fitting than on the top, so one side stretches more than the other. That's nit-picking, but it's a pretty good way to be aware of the results of stretching.

We're including Chris Fast's prop test sheet in this newsletter and I think you will find it educational. I would suggest you drag out a copy of the article about propeller fatigue, written by Lu Sunderland in the Nov. issue of SPORTS Aviation, pg. 23, and carefully review the subject if you are using, or thinking of using a cut-down metal prop. Your choice of a prop is one of the most important decisions you'll make in your life! Your very life can depend on it! Don't blindly buy a metal prop.



Note that page 11 is the chart on Chris East's prop vibration survey, as done by Specialized Testing Service, 10758 Burbank Blvd., North Hollywood, CA. 91601 phones: Office 213/877-7317, res. 344-1851

Note that the chart is a plot of Cycles per minute vs. RPM (or F vs. N, as they denote it. Modes 1, 2, & 3 refer to where the modes (non-vibrating points) are located with relation to the tip. Again referring to Lu's article, you can decipher the chart quite easily when you learn the meaning of the various symbols in the equations. If any of you do not have the Nov. 1972 Sport Aviation send me a dollar to cover costs of postage and Xeroxing and I'll send you a copy---or if enough of you request it I'll reproduce all 4 pages of Sport Aviation and run it in a future N.H. On second thought I'll do that, as that article should be a vital part of your reference file on the T-18, so scratch the Xerox offer.

You may note that due to less damping at higher altitudes, where the air is thinner, stresses on a prop can be as much as 75% higher above 10,000 ft. than those below 5000 ft. Be aware that on the "bad" N74 prop, cut down to 68" that the allowable stress of 4800 lbs. per sq. inch was exceeded by another 2000#/#sq. when the prop was turning 2630 rpm.

These danger area rpms spread out to 50 rpms each side of the critical rpm, so it is absolutely essential that you have an accurate tach! To verify tach accuracy easily, run the engine at night with a fluorescent light near the prop. At multiples of 600 rpm the strobe effect from the 60 cycle current will cause the prop to appear to be stopped.

It's too bad the owners of the T-18 that crashed in Washington a few months ago weren't aware that this information was available. John Foy originally built the airplane, powered with a GPU, and he donated it to the EAA Museum several years ago. The museum sold it to Wag-Aero, who in turn sold it to a Mr. Christian in Calif. It had been re-engined with a 150 Lys and a cut-down and re-pitched prop from a Cherokee was installed.

When the prop failed over Yakima with a loud explosion the vibration shattered the left side of the windshield and unlatched the canopy, sliding it back. Mr. Hallstrom, the pilot, was practically unable to see because of air blast and vibration and most of his vision was only a blur until he touched down. He cut the throttle and mixture and stalled the aircraft in an effort to stop the prop, and this almost succeeded after two attempts, that also resulted in short spines. He spotted a plowed field and attempted to land there over a grove of cherry trees. He went thru a couple of small cherry trees and then over on his back. They later found he had hooked a steel cable on short final (a 3/8" thick braided power cable).

He and his wife had some difficulty getting out of the inverted ship, but he got out and tried to lift the wing to free his wife. By this time a fire had started and passerbys helped him get her out, altho' she suffered burns on her legs in the process.

John visited the accident site and inspected the wreckage in detail and he and the Hallstroms are convinced that only the rugged construction of the T-18 kept this from becoming a real tragedy and they all thanked John Foy for such an excellent design.

I think this story should make one and all realize the seriousness of selecting a prop for an airplane. As we pitch props more and more to reach higher cruising speeds we are indeed tickling the tail of a roaring dragon, as Thorp says. To repeat, "Selecting a prop for your T-18 is probably the most important single decision you've ever made"!!!!

Is a metal prop safe? Obviously it is or you'd see wood props on factory built

TELL US ABOUT YOUR PROP OR ENGINE INSTALLATION, PLZ

airplanes, but a metal prop is NOT safe if you haven't had a static vibration survey run on it. Don't let anyone tell you otherwise. Since most of the newer T-18s will probably have engines of 150 hp and up it's even more important. The formula that tells when a metal prop will fatigue and break is very simple: It's  $F \times T$ , or Force times Time.

Many of the experts will say that a wooden prop is only about 90% as efficient as a metal one, but Bill Cassidy's wood Pacesetter prop pulled a Mustang II thru the traps at 225 mph on 150 or 160 hp. That same prop on my 160 hp. T-18 gives me a top of 196 mph TAS, as verified by timed runs. Show me a factory built airplane that will match that kind of performance, gear up or down. Gravel and rain are problems with any prop and more so with wood, but you can buy two wood props for what you'd pay for one GOOD metal one, and you can repair gravel damage on a wood prop. You file metal away on damaged metal ones. If you feel compelled to fly in rain, perhaps you'd better be thinking about a constant speed metal one.

UPDATE FROM HOWARD HENDERSON: Just rec'd a note from Howard after OSH and he said the wing leveler worked fine in smooth and rough air on way home from OSH. He only used it for short periods to map read, he said, as he thinks the servo has a somewhat limited life.

Howard and I had discussed the possibility of the servo tab becoming unhooked and fluttering and in turn exciting the aileron to flutter. He said he had talked at length with an experienced aerodynamicist with McDonnell/Douglas and that he agreed that by making the tab extremely light it would probably buzz at such a high frequency that the aileron would not respond. He said 1.75" x 9" would be a good tab size. 3 to 4 lbs. of stick force will easily overpower full tab.

Also, "Most of the troubles on my installation and Keebler's can be traced to variations in airflow. I use a small motor blower and Keeb uses a needle valve attached to his vacuum source. My original cheap motor was not stable and Keeb's needle valve needs to be changed to a model engine type valve."

This is one gadget I highly recommend! (Sure sounds good). He says he now uses a high quality motor and stability is now very good. He enclosed a sketch of the tab cross section, shown below.

(NOT TO SCALE)

A few pages back we talked about a long row of rivets distorting a structure. The trailing edges of T-18 control surfaces are a good example. Bud Iverson scrapped a couple of ailerons because of the curve he had on the T.E. He came up with a solution that worked pretty well for him: He bent up a piece of .040 into an angle, with one leg about  $\frac{1}{4}$ " and the other about 1" and used it as the filler strip between the skins, instead of the flat piece of .040 normally used. After riveting up the T. E. he cut the standing 1" leg off and dressed it down. The stiffness of the standing leg kept it from bowing.

A detail that may escape you is the skins and filler strip don't lay flat together, unless the top and bottom skin are given a slight "kick" in a brake before bending. Some builders have also epoxied the three pieces together before riveting and gone back after the epoxy has cured and riveted it up. This also minimizes curvature, especially when the "scatter" sequence is used. Be careful and don't overdrive rivets, too.

More construction tips from Bud Iverson: Bending Flap Skins: Bud got some skin buckling in the mid area of the leading edge when he bent up his flap skins. The center part of any skin will tend to bend less than the outer edges because of uneven stretching. Buckling may occur if one attempts to wrap a skin around the ribs. Bud's solution to this was to add three more nose ribs equally spaced. He does have a pair of super-straight flaps now, I can testify. The pre-punched flap skins that Ken Knowles supplies have nearly an extra foot of skin added to the trailing edge of top and bottom skins to facilitate bending and for exactly locating the center of the bend. The two rear lines of rivet holes are clecoed together and the skins bent just like the wing skins, by laying a 2 x4 across and shoving down on it. It is VERY difficult to get an exact hole match, because of the difficulty of bending an exact L. E. radius. I'm sure it wouldn't be as much of a problem if .020 skin was used instead of .025. Someone asked Thorp about using .020 and he said it should be okay and that he called out .025 so that the builder wouldn't have to buy a sheet of alum for that one purpose only.

Still another method of bending the leading edge is to put a 5-10 degree "kick" with a brake right at the very center of the L. E. prior to actually wrapping the skin around the ribs. Again, you should have extra metal at the T. E., to be cut off after assembly. The little bit of stretching at the L.E. done by brake bending takes most of the fight out of the skin. (You can't see or feel such a bend).

Rudder Assembly (Iverson): Bud had difficulty getting at the A-586 rudder rib to buck it. Someone told him to turn it upside down and he said that worked fine. I made a note on the top rib that I can't decipher. I wrote, "On top rib, one flange up, one down, riveted together", so I'll get Bud to clarify for use in a future N. L.

Rigging the stick to the stabilator (Iverson): Bud said he built an inverted "U" shaped jig out of wood that clamped to #601 and #592 bulkheads to clamp the stick to. The airplane was put in level flite position and the 7 degree angle was drawn on the jig to align the stick with. Another builder put masking tape on the fuselage sides just ahead of the L. E. of the stabilator to measure deflection.

Steve Riffe, 5208 Astoria, Amarillo, Tx, 79109, came up with this one: In an area that was too small to use a hammer to tap the nibbed Whitney punch and leave a punch mark, he put masking tape on the other part and simply hand pushed the nib into the tape. It left an indent in the tape and accurately located the hole center. Very good, Steve. That's a handy one.

Pete Gonzalez, 1318 Server Dr., Colorado Springs, Colo. 80910: Pete has an O-290 in his T-18 (N308, s/n 180) and now has a Posa carb on it and has picked up about 50 rpms with it. He is in the process of changing props now and is installing a Cassidy Pacesetter wood prop. His home field is around 7000 above S. L., so it will be interesting to see how it works out. He was at OSH and promised to send me a full history on the ship....soon. Several years ago I had the RV-3 prototype, which had an O-290 GPU in it. It had a modified MA-4 carb on it, (which was a little too much carb) and I bought a Lake carb and flew it for awhile just before I sold the airplane. It performed better than the MA-4, but it had no in-flite mixture adjustment. Later, a mixture control for in-flite use was devised and worked quite well I'm told. MA-3 and MA-4 carbs are getting very scarce and quite expensive. I'm told that a used MA-4 will sell for \$250 to \$350. That makes the Lake and Posa a pretty good buy for the O-290 boys. I have a friend here that had a brand new Lake (for a GPU) that I think he still has, as he sold his airplane before he could install it. If anyone is interested I'll find out about it. It's new cost was \$150, but if he still has it and you need one make him an offer.

HOW DID YOU DO THESE THINGS WHEN YOU BUILT YOUR T-18



RECEIVED FROM MOTORS: In N. L. #46 I made note of a low cost, light weight, 50 motor that was just about ideal for electric trim. I just got notes from two builders that had ordered motors from the co. listed and they are out of stock and don't expect to have them later. Drat it!

At OSH Wallace Hunt handed me a Xerox of an almost identical spec motor made by Varo, Inc. It is available (I think) from their Electrokinetics Div., 402 E. Gutierrez St., Santa Barbara, CA., but I have no other info on it at present. Wallace also included a Xerox from Airborne Sales Co., 8501 Stellar St., Culver City, CA. (P.O. Box 2722, 90230) and they have new, surplus Varo motors for \$10.50 ea. Their catalogue # is 3175.

How about one of you Calif. boys that live near Culver City going by there and checking it out as to the number they have on hand, how fast the shaft turns on 12V, etc. and let me know? Also if anyone else comes on a source for a cheap, light wt. 12V reversible motor with a gear box that turns very slowly let me know, plz.

ED BYRNE, 250 Franklin, Pittsburg, Pa., 15241. is an old friend of mine from back in the early days of the T-18 in 1962. He bought plans #7 s/n, but because of his heavy schedule as an airline pilot for Allegheny and some 15 years as a member of ALPA's All-Weather Landing Systems Evaluation Team, he never found quite enough spare time or energy to finish up his project. Persistence pays off, tho', as he now has a T-18 to fly (and pet) until he gets his finished. Ed bought the T-18 that you saw advertised at OSH for 10K and he jumped in it and flew it home. He got a real bargain, too, as it very well built.

It turned out that it was the 2nd T-18 built by Bob Kaergaard, who lost his 1st one in a hangar fire. Anyway, I'm delighted that Ed now has a T-18 after all these years. He called me the other nite to tell me how much he and his son are enjoying flying it and to thank me again for telling him about it.

\*\*\*\*\*TRADING POST\*\*\*\*\*

Project For Sale: Bob Lanoue, 13 Mattabassett Dr., Meriden, CT, 06450 has gotten some bad news about the amount of his upcoming retirement income, so he has to put his project on the block. He has the two outer wings (std) finished and signed off by the FAA in Oct. '78, entire fin, rudder, and stabilator from parts supplied by Ken Knowles, a wide body canopy frame from K.K., #522, #537-5, and #632 fittings (4 sets) from Dewberry, plus aileron weights and #499 bushings and pivots. He also has a new set of plans, in which only 2 sheets have been used, all back newsletters, and reference file for material. Wings are flush riveted with Morel pops that were press fit after original drilling of 3/32 and dimple and drilled out to #30 (good). Wing fittings were also press fit. He has \$1300 worth of 1st class parts and assemblies that he'll sell for \$1000. That's a darn good buy for someone.

Fuselage for sale, Milton Hershey, 12107 Drujon, Dallas, Tex., 75001, 214/387-0445 has an unriveted fuselage for sale (std width) and also a fin, a set of Ken K. wing ribs, wing skins, wing beams (unassembled), clecos, etc. He was informed of backlogged "Honey Do" projects that came before airplane building and so he gave up and bought into a factory type ship. Milt is very busy and hard to catch and I know he wants \$650 for the fuselage and fin, but I don't know about the rest of the items. If you are interested give me a call some nite and I'll get the dope on them in the meantime.

List your left-overs: If you have decided to sell your project, an engine, a prop, instruments, radios, plans, newsletters, major or minor airframe components ...in fact anything that a T-18 builder might use...yes, even tools. If you have finished your airplane and want to sell your clecos, compressor, rivet gun, etc., just list it here. If the N.L. sells it make a little contribution to the fund. No junk, please...and please, fellows, let's take pride in the fact that the T-18 M.A.S. is an outstanding example of the Golden Rule in action.

Q and A: "Why are actual dimensions shown on some parts, while on most of them you'll have to subtract one water line or one station line from another? A:... The parts that are NOT in a purely vertical plane, such as the fire wall, the dash frame or seat back frame require actual dimensioning, as all water lines, station lines, and butt lines are in planes perpendicular to each other. Anything not in these planes of reference would correspond to the hypotenuse of a triangle.

Computers as a shop tool: The hand held computer is as common now as pockets on a shirt and just as handy, too. For those of you doing your own layout work, it is an essential. I was helping someone lay out a part a while back and after subtracting one water line value from another on the computer, we left the answer in the computer, which was right in front of us, as we laid the part out. I had to think back to the "old days" when we'd do all of this computation right on the drawing or a vacant spot. Repeating the number to ourselves we'd start to layout the part. Somehow ever once in awhile we'd measure a wrong dimension and the waste basket would get a new part. To put the computer right in front of your scale and the work it'd be a lot harder to make a goof. Another thing that almost guaranteed that you'd make a mistake was to have a visitor talk to you as you worked. Anything that breaks your concentration causes mistakes. 95% of the ruined parts are caused by measuring something wrong.

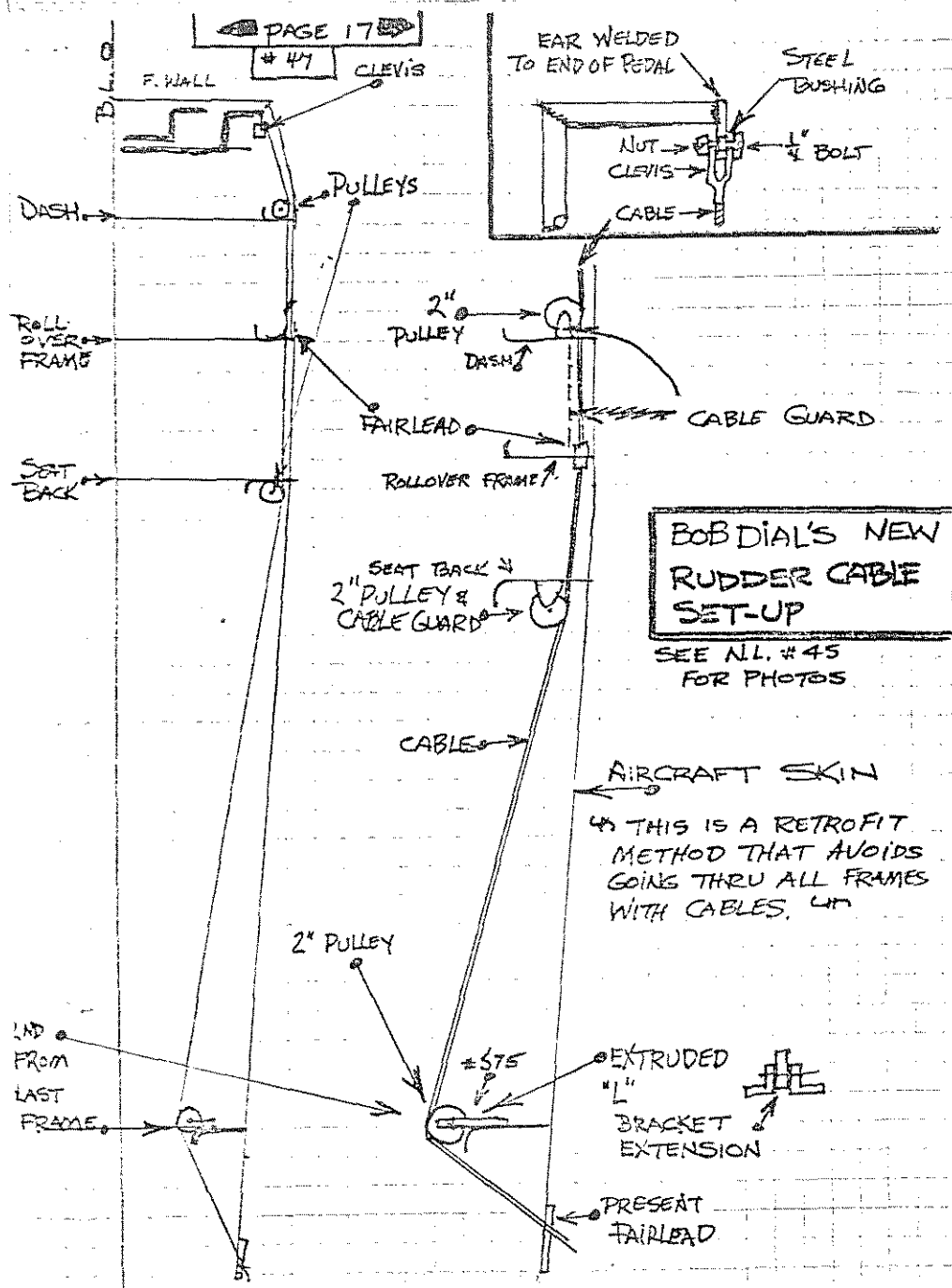
Protecting alum: It's an almost foregone conclusion that you'll scratch alum in the process of building. Unless you are going to have an unpainted T-18 the scratches are no big deal if they aren't deep, as they can be polished or sanded out with Scotchbrite (a pot scrubber pad made of plastic and found at groceries and Hardware stores) or sandpaper or Sandscreen. There are strip-off plastic films available that are sprayed on and later peeled off as a sheet, that do a good job protecting against scratching. One is Fabrifilm (Turco products). Another is "Spraylath", which is highly recommended to protect that brand new canopy from scratching. One of the places it can be bought is at a Sign Painter Supply house here. If you live in an area where such products are not available you might want to just go ahead and put a thin coat of primer on. Naturally, you'll want to Scotchbrite it and thoroughly degrease it before painting. There are several good 2 part primers on the market, that are much better than zinc chromate as a proper paint base. I'd get an etching primer. Sherwin-Williams and DuPont both have excellent ones. There are other good brands, too. Zinc chromate is very dangerous to inhale and as a result you can only buy spray cans of it at regular aircraft supply houses. Paint doesn't like to stick to alum, as the oil they use on the rollers at the mills gets into the pores of the metal. A simple test to see if you've properly degreased is to flood the part with water. If it beads up like your newly waxed car does you'd better repeat the process.

Never leave paper between stored sheets of alum. It absorbs moisture from the air and very soon you've got a crude galvanic battery going and soon you'll have corrosion on those new sheets. I've seen sheets ruined in one day's time. If alum is kept clean it doesn't hurt it to get wet. It's also a pretty good idea to keep alcohol around the shop to wipe off fingerprints each day. The acid in your perspiration will quickly etch your prints into the alum. No, I don't think bourbon would do, but it might be handy to have around if you need to console yourself after goofing up a part.

Routing Rudder Cables: Pg. 17 is Bob Dial's sketch of rudder cable re-routing. I now have a complete write-up on it for next N.L., plus drawings and write-ups on electric flaps, but we're out of space for this N.L. Also have 2 photo pages and write-ups on step-by-step spinner inst'n, 3 pages of specs on different T-18s now flying, an excellent method of laying out 2nd degree curves, plus a several other goodie subjects. I do need your tips, comments, experiences, your performance specs....anything. We'll keep M.A.S. going as long as youse guys send in items.

I PLAN TO HAVE N.L. #48 IN THE MAIL ABOUT NOV 1-15  
GOOD LUCK. DICK





**CHANGING PROPS AND SPINNERS:** Some of you will probably have this little problem to solve one of these days, so the following account might be of interest. There are other ways of doing this, but this method worked for me and it's simple to do. The pictures of it are sequenced in about the order of doing things.

"When I changed engines on my T-18 I also changed props. I went from a Sensenich metal prop to a Cassidy Pacesetter wood prop. The Cassidy prop was 4.47" thick at the hub, considerably thicker than the metal one. This meant that the front bulkhead of the spinner was now moved forward, so would now be too large to fit inside the spinner shell. The blade root profile was totally different, too.

Francis Richardson needed a prop and spinner for his new T-18 with the 125 hp GFC, so I sold these to him. I had a blank, undrilled spinner that I'd bought from John Tenzer back in '64, so I decided to go from scratch with it.

Scratch it was (head scratching, that is). I had to reduce the size of the front bulkhead, trimming the old flange off and adding tabs to be riveted to the shell and bulkhead. The problem was to determine the exact size of the forward bulkhead in its new position.

I dug out my Jan. '76 copy of Sport Aviation and re-read Tony Bingselis' explanation of installing spinners. It was excellent, but it didn't cover my problem. I also went back and re-read Bob Kaerger's account in T-18 M.A.S. newsletter #16 (pg. 4). It, too, was an excellent guide to spinner assembly, but also was no help in re-sizing the front bulkhead.

I could add up the width of the rear bulkhead flange, the prop thickness, the hold down plate on the front of the prop, to get the new position of the F&D bulkhead, but simply measuring that distance on the inside wall wasn't acceptable, due to the shell taper. This was the equivalent of measuring the hypotenuse of a triangle, instead of one of the legs. My calipers weren't that big, so I had to do something else.

I hit on the idea of the idea of an External Reference Frame. It consists of a flat plywood base with a couple of vertical risers spaced a little farther apart than the diameter of the shell. I added a cross piece at the top to stabilize the verticals and carefully squared it all up.

From the base of the ERF I measured the total thickness of all items and marked it on both legs of the verticals. With the shell centered between the verticals I measured horizontally to the shell from each vertical. Adding these two measurements together, plus the skin thickness of the shell on each side, and subtracting that total from the total distance between the verticals gave me an accurate diameter for the bulkhead's new position.

By clamping a piece of extrusion across the verticals and holding a pencil against it I could accurately locate this point on the outside of the shell by rotating the shell.

**Spacing holes for spinner bolts :** My only remaining problem was the precise spacing of holes to attach the shell to the bulkheads via nut plates on the inside of the bulkheads. To get this proper spacing and provide exact 180° reference points for beginning the blade root cutouts I used a piece of scrap aluminum about 2" larger in diameter than the spinner shell base. Using dividers, I scribed a circle on it the exact dia. of the spinner. Then thru the center point I scribed lines thru and beyond this circle, laying out lines 45° apart (via protractor). I could then sit the shell down on this circle and transfer those points to the spinner shell easily.

To do the same thing for the front bulkhead I duplicated the above procedure except that I cut the circle out. This left a "collar" that would slip on over the shell and allow me to accurately space the attach bolts. I could index a point on the

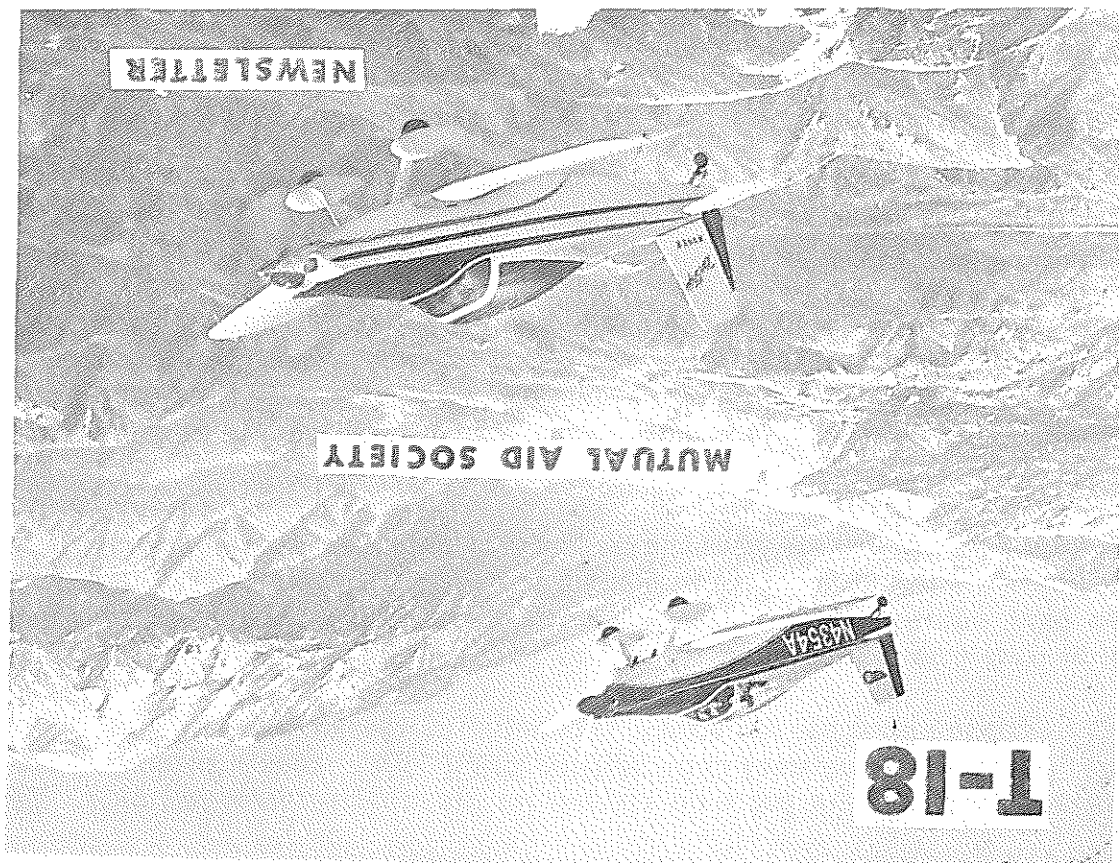
UNABLE TO ADD THESE TWO PAGES AFTER WEIGHING COPY, BUT BELIEVES AND OTHER ITEMS WILL HAVE TO WAIT UNTIL #48 COMES OUT.

**BOB DIAL'S NEW  
RUDDER CABLE  
SET-UP**

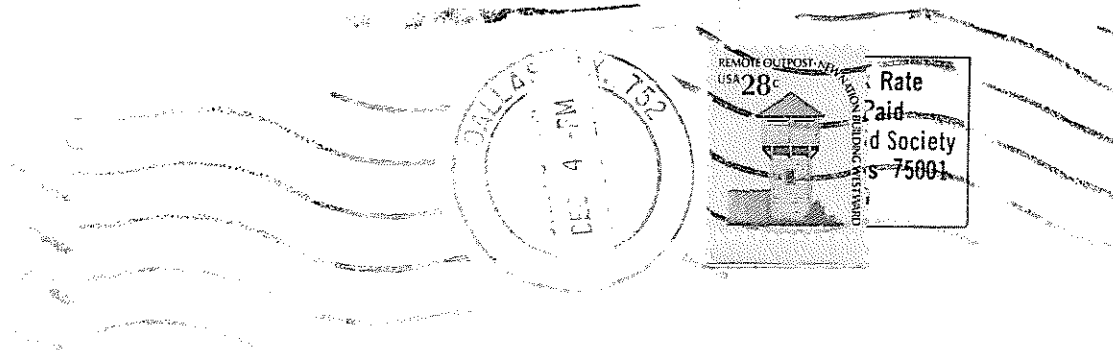
SEE N.L. #45  
FOR PHOTOS

THIS IS A RETROFIT  
METHOD THAT AVOIDS  
GOING THRU ALL FRAMES  
WITH CABLES.





T-18 MUTUAL AID SOCIETY  
10529 SOMERTON  
DALLAS, TEXAS  
75229



FIRST CLASS

Paul Crozier  
9730 Moorberry  
Houston, Tx  
77080

#179 FLIES! ROGER WESELMANN (4054 Suburban Drive, Waterloo, Iowa 50702) called me Saturday, September 22nd, fairly bubbling over with the news that his son had just flown their T-18 and that the fact he was delighted with it was the understatement of the year!

Roger's T-18 started back in the '60s and it was ready to fly in July this year, but the FAA put his final inspection off for 2 months because of priorities.

His airplane weighs 875 lbs. empty, is powered with a 150 hp. Lyc 0-320, and it swings a Sensenich wood prop and is closely built to plans. It is unpainted and without upholstery, radio, or gear fairings at present. He feels his empty weight will come out around 925# by the time he gets all those things installed.

His son flew it out of a 2000 ft. sod field, using about 1/3 of it for T/O and 2/3 of it for LDG with no braking (using flaps). It stalled clean at 70 mph IAS and a bit under 60 IAS with flaps. It has the COERR cowlings and has the fin-mounted pitot. His son had 70 hours total, most of it on a C-150, but had gotten tail wheel qualified in the process of taking aerobatics in a Great Lakes in recent weeks. Roger says he needs to take a physical and get a few hours of check out time to knock the rust off before he flies the T-18.

So, congratulations are in order, Gents, along with a gentle reminder to not get overly enthusiastic with it. While the T-18 is truly one of the finest airplanes ever built, it does have limits that should not be exceeded. It's a known fact that the really good airplanes sometimes lead pilots to assume they can do anything with it, but we all know this isn't true. I well understand this, as each time I fly a T-18 I have that feeling of exhilaration.

THIRD SEAT. I've had several requests for details on a 3rd seat, or combination baggage compartment and child's seat. DR. JOHN SHINN (835 John Anderson Drive, Ormond Beach, Florida 32074) sent in some excellent drawings, which we are reproducing in this issue.

KEN KNOWLES has an opened up #669 deck on his airplane and when I flew up to John's birthday party with him I noticed that it was very handy to get at things (like maps) in-flight. He has it all nicely upholstered and it didn't seem to affect noise one way or other. On the other hand, loose objects of any size in an open baggage area could be lethal if the airplane came to a sudden stop.

The uncut deck makes a good spot to mount radio speakers, so like everything else in an airplane, ya takes yer cherce. Ken has speakers mounted on each side of the cockpit sidewall, pretty close to one's knees. He cut out the top part of the seat back frame and replaced it with a bolt in tube (I think). I'll have to check with Ken on that for details.

Here in Dallas, KEITH (MACK) COBB, has done his fuselage deck cutout very similar to KEN KNOWLES, except that he used a T-section extrusion of 7075 as a seat back support and riveted each end to the W.L. 42 extrusion. The t-section size was about 2.5" X 1.25" X .063.

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#512 (N512S) FLIES! Lancaster, California has to be one of those T-18 hot beds. As of October 13th there are now 7 T-18s flying there and 5 others under construction. The last to fly is HANK STEIGINGA's 0-360 powered bird and it went off like a charm. He had AL CHIVERS and LYLE FLEMING flying chase on each wing. DAN DUDASH also flew up in his T-18 to watch the proceedings.

Hank hadn't flown for 6-1/2 years so Al, Lyle, and HOWARD GINN gave him a thorough check out in their T-18s so he was ready.

Hank's bird has a constant speed prop, the long gear, an aux gas tank (16 gals max) under the deck and has electric trim (with the '67 Camaro headlite motor) and weighs in at 1036 lbs. E.W. JOHN THORP did his weight and balance and the C.G. fell right in and no ballast was necessary. Construction time was almost 9 years.

Even at 7:30 am he had quite an audience for the first blast off in the chilly desert air. He'll send performance figures, etc., later. In the meantime, Hank, we offer sincere congratulations for sticking to it 9 years and for a thorough job well done. Hank's address is 45528 Newtree, Lancaster, California 93534.

DANGER ITEM\*\*\* A local Starduster builder had a power failure on 1st takeoff, due to blockage of Aeroquip fuel line. In installing the fittings on the hose ends it's very easy to cut off a little rubber "doughnut" that remains in the line and will block it if allowed to remain. Blow the line out, look thru it, etc., but make sure it's not there. The builder also inspected oil lines to the cooler and found them blocked also. A local Buecker builder flamed out on his first t/o for the same reason a couple years back, so don't overlook this item!

HARRY WHEELER, 2 Marion Road, Salem, MA 01970, recently bought N394AC (#1087) from AL CRICHTON, the builder, of L.I., N.Y. and to say he's elated with it is an understatement. It has 150 hrs. on it, is powered with a new GPU, has an Anderson (?) 68/68 prop, which gives it a cruise of 150 mph IAS at 2450 rpm. Weighs 840 lbs. empty and has all mods and updates. He keeps it at Beverly, MA and offers a ride to prospective builders in the area. He asks two questions: (1) "Is there a consensus of opinion as which prop is best for the GPU?", (2) "Has anyone come up with a tail wheel tow bar rig for ground handling?".

#1 really can't be answered, unless you ask, "The best prop for what? Climb? Cruise? Or Compromise?" The diameter should be 66-68 inches and the pitch in the 66-70 inch range. "I Believe."

Can anyone come up with an answer and sketch for the #2 Question? I'd like to know myself, as I am reluctant to do any pushing on the vertical or horizontal tail. I have a slight incline into my hangar and I've been known to wrap a rope around the tail skid and pull when I have to ground handle it by myself.

FITTING FIREWALL AND DASH FRAMES: In the fitting and aligning of all items between the #603 dash frame and the #604 firewall, I've found it very useful to make a large transfer strip (template) that covers the entire flat area on top of those 2 frames, or about 8 inches

Our newsletter was written just before Xmas, but it was decided to delay printing and mailing until January, so that our 3rd class mailing wouldn't get fouled up with heavy holiday mailings. We got a further delay in early January when our offset press developed the hiccups. As it stands now, we hope that this issue will be in your hands in mid-February.

We have also run a classified ad notice in Sport Aviation and asked H.C. to note the resumption of the newsletter in their Chapter Notice section.

### WING RIVETING SEQUENCE

In the meantime I had an occasion to build up another outer wing panel (st'd) and I again timed the various operations with nearly identical times I reported earlier in the newsletter, so it seems that a weekend per outer panel might be at least a bench mark to use in estimating time needed. I did record our riveting sequence, which follows below.

1. Cleco #2 and #3 nose ribs to front spar and then cleco the ribs and spar to the skin.
2. Rivet #2 and #3 nose ribs to skin.
3. Rivet front spar to skin, top and bottom.
4. Rivet #2 and #3 rear ribs to the #2 and #3 nose ribs (thru spar web).
5. Rivet BOTTOM flanges of #2 and #3 rear ribs to skin.
6. Cleco in rear spar and rivet entire bottom flange to skin.
7. Rivet #2 and #3 rear ribs to rear spar.
8. Rivet spar doublers to rear spar and aileron hinges.
9. Rivet top flange of #2 and #3 rear ribs to skin.
10. Insert #1 and #4 nose ribs and rivet to skin.
11. Insert #1 and #4 rear ribs and rivet to skin.
12. Rivet #1 and #4 front and rear ribs together thru spar web & fitting.
13. Final closure: Rivet entire top flange of rear spar to skin.
14. Stand back and admire your work while trying to remember if you might have left a couple of clecos inside.

In the above example, #1 rib is the most inboard rib and #4 is the most outboard one.

Our sincere thanks to Mrs. Peggy Cutler for typing our copy this month. I write about 30 pages of legal size longhand copy each month for our chapter 168 newsletter and Peggy diligently wades thru all that verbiage and turns it into impeccably typed copy (not like this page, which I plead guilty to).

I would appreciate it if you guys would feed the kitty promptly, as I'm footing the bill for this first issue and with over 1300 plans holders of record the printing and mailing costs for this issue will be in excess of \$330 to \$370. When you send your check would be a good time to send me a little story about your T-18 and some black and white pictures, too.

P.S. The baggage compartment drawing wasn't suitable for reproduction and will be re-drawn and included in the next newsletter. In the meantime if there is some subject you'd like to see developed please let me know.

DICK

on either side of B.L.O. When I make the flat layout of the skin above the tank (#580-2) I simultaneously drill in all holes for this area by laying the transfer blank under the skin.

Such a transfer template allows access to the forward and rear ends of the #528-2 channels above the tank for match drilling with the dash and firewall. It accurately fixes the fore and aft distance between the two frames and also holds them squarely in alignment. Mating the forward ends of the #528-2 channels with the top end of the tank cradles can only be done accurately while they are cleco<sup>d</sup> in position.

If you are building a wide body and split a standard dash frame at B.L.O. (for splicing in the extra 2 inches) you'll find the template invaluable. It's also a super-aid in installing your #526 fitting assembly accurately. If you use matched hole tooling and use pre-drilled #40 holes in the top of the side skins and outer edges of the skin you must be accurate in the "flat top" area of those 2 frames.

I always start at B.L.O., working outward with the drilling and cleco every hole. When I reach the outer limit of the flat area I remove the #580-2 skin and stretch form it to fit the 2nd degree curves on the dash and firewall. This greatly facilitates match drilling in those areas of curvature and is truly essential for proper fit around the two frames.

STRETCH FORMING THE #580-2 SKIN: The radius of the dash frame is larger than that of the firewall, so you are developing a tapered segment of a cone in essence. I've found two simple methods work well: First, "shoe shine" the area to be stretched over a smooth edge of a wooden work table. Practice with some scrap first, so you don't get a kink in the skin and I would also recommend you have an assistant or so that you have explained the procedure in detail to. Put the firewall down on the floor and by holding the skin up vertically above it you can see how close you are getting in the forming process. (Ditto the dash frame.)

The "shoe shining" method won't quite get you there, so you'll have to wrap the skin around some object (of smaller curvature) that's cylindrical to arrive at the final forming. I've used paper tubes that come in carpet rolls, etc., with good success. Here's where you'll really need an extra pair of hands or two to hand form the skin around the tube, but be alert and CAREFUL that you or your assistants don't squeeze too hard in a localized area and kink the skin. Bend a little and check, bend some more and check again, etc., and don't get in a hurry!

You'll find that attention to detail in this area will result in a first class fit and excellent alignment.

FITTING THE COWLING: If you use a fiberglass cowl you'll find that the rear edge of the top piece sticks up higher than the #580-2 skin over the tank. The reason of course is that the average fiberglass part will be from .050 to .070 in thickness and your cowl attach coublers are only .040.

You'll need to add an extra doubler of some thickness to come out flush — or you'll have to abandon the use of doublers and rivet a series of tabs to the front of the firewall. If you do the latter, leave the .040 doublers in (for strength) but cut them off flush with the forward face of the firewall.

If you add extra doublers you should also prestretch form all doublers prior to the match drilling of the skin and firewall. Adding doublers, or extra doublers, increases the radius of curvature to the extent that there will be a mismatch of any pair of predrilled holes. For that reason I never pre-drill holes in the dash or firewall in areas of curvature (only). I zinc chromate the dash and F.W. flanges and then draw a thin pencil line along the center line of the rivets. I can then look thru the pre-drilled holes in the skin and make any needed fore and aft adjustment to center the line in the exact middle of the hole before drilling. (The zinc chromate enhances visibility of the line.) Along the curvature, remember to drill at 90° to the skin at that point, too, pointing the drill at the imaginary center of the radius of curvature.

A NOTE ON FIBERGLAS: Always use more fasteners on fiberglass than metal. The object is to minimize the effect of vibration. Any hard fasteners will have some "slop" around it and any movement will cause the fastener to eat into the RFG matrix. The glass particles around the fasteners then become very abrasive and eventually enlarge the hole. Increasing the number of fasteners greatly restricts the initial movement.

Whenever possible, it's recommended to use a strip of metal on the back side of fiberglass, too, especially when riveting. The clamping action of a rivet is spread out away from the bucktail, thus reducing localized pressure somewhat.

DRAWING CORRECTION: I guess John Thorp is really human after all. After all these years a mistake in his plans has finally surfaced! "Drawing A-517L shows the -5 rib for the horizontal tail tab drilled and tapped for a 10-32 screw. Drawing A-521 'Tab Linkage' shows the screw to be an AN500-8-6 (8-32).

Since an 8-32 screw will screw into and hold (a little bit) in a 10-32 tap, it is a possibility that they could come out in flite, thus inviting tail flutter."

The above is from FRED SWAFFORD, of 120 Leewood Drive, Arkadelphia, Arkansas, and he has received an acknowledgement from John about the change, so check your project thoroughly.

UPDATE ON METAL COWLS: Excerps from a letter from MARC BOURGET, P.O. Box 88, Stockton, CA 95201. He pointed out that John Thorp spent months on cowl design, via integrated polynomial equations of pressure distribution that dictated the shape, as inter-related with the rest of the airplane. It was not a simple eyeball design and not only is it the most efficient cowl design aerodynamically, it is also superior cooling-wise.

The metal stamping dies for the cowl cheeks disappeared when the metal stamping company went out of business. The rest of the tooling is still available.

Marc says it will take approximately 20 orders to justify re-making of the dies for the cheeks. Right now he is soliciting commitments only, no deposits as yet. Deposits will only be accepted after he receives quotes from fabricators.

This is a NON-profit project with Marc and cowl cost will be based strictly on labor, materials, and tooling costs. When the minimum number of "orders" is received he will initiate fabrication and deposit checks will be requested. When actual fabrication starts he'll then ask for the balance, with delivery guaranteed within a specified period. Priority of delivery to be established on a first come, first served basis.



Cost is conservatively estimated in the \$600 to \$800 range, but if it comes out lower the difference will be returned to purchasers pro-rata. This is a one time deal and a gilt edged investment for those that want the very best of everything to make their custom built airplane a superb example of the finest craftsmanship.

He says, yes, the price is steep, but when the fiberglass copies of ~~Jana's~~ cowl cost \$400 and a new Cessna Cowl costs \$2757(!) it's not out of line. Marc already has his metal cowl and he's doing this job to further the T-18 reputation for design excellence and quality, only.

So, in summary, if your budget will stand the gaff, here's your chance to get in on a deal that won't be repeated at this price. Come to think of it, a metal cowl might be a good investment to "rat hole" for the future, probably better than CDs. At OSH this year one builder told me he had been offered \$1000 for his several years old metal cowl.

BAD NEWS DEPARTMENT: ED BURKE called me a while back to tell me about his trip into Connecticut the day after the tornado went through the airport and wiped out the Bradley Field Museum and many other airplanes. Sadly, one of the casualties was DAN CULHANE's T-18, which was wadded up in a ball and totalled.

I met Dan at OSH this year and his quiet sincerity and dedication to the T-18 made him an instant friend to all of us that met him. Dan has a large family and his T-18 was done the hard way when a little extra wampum was available above family needs.

To cap it off, he's the original hard luck guy, too. When he went to his Credit Union to borrow the money for his engine he was mugged and robbed of all of his engine money right on the C.U. parking lot! And now this to happen.

My heart goes out to Dan. I can only imagine how heartsick he was to see his once-proud T-18 a crumpled mass of junk. I don't have the damage and salvage report as yet, but I for one would like to help Dan get back in the air and perhaps some of you also feel the same way. If a bunch of us would contribute a small part, or a few bucks, toward the rebuild of his T-18, I know one red-headed guy up in the NE that would be eternally grateful to be a member of a very unselfish group of dedicated T-18ers. I'll be glad to act as a clearing house for anything you'd like to donate. I'll publish a damage report and full particulars in the next N.L. issue.

I was also very upset to hear that CHRIS FAST has just received a final turn down from the FAA on restoring his physical, even tho' he's now in better shape than 95% of us. He says it means that he'll have to put his superb T-18 up for sale, even tho' it grieves him deeply to do so. It's one of the best built ones anywhere and it has a brand new set of convertible (folding) wings, built by a real professional. You can call him at 213-454-9852 or write him at 507 Almar Avenue, Pacific Palisades, California 90272.

Chris also sent in some more of his excellent construction tips, as follows:

CONTROL SURFACE TRAILING EDGE ALIGNMENT: "It has been my experience that the most dependable method of producing a straight trailing edge is to use two 3/4" X 3/4" extruded angles of 2024 T-3 stock (.063 thick) drill 1/2" holes in them, matched to the trailing edge

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rivet layout (1/2" holes will take a cleco fastener ok), clamp them on each side, back to back (on the trailing edge), with only enough clecos installed to hold the T.E. together. Use only #40 holes up to this point. After the angles are clamped in place remove the clecos. You will find that the #40 hole alignment won't be perfect at this point, but will clean up when you drill them out with a #30 drill for final rivet size.

Next, with the angles still clamped in place with 2" C clamps, install 1/8" soft aluminum rivets with a hand squeezer. Be careful not to oversqueeze, as this will cause the T.E. skins to open up. DO NOT use heat treated rivets and do NOT drive with a rivet gun. Your finished T.E. will be straight as a die!"

Thank you, Chris, for that excellent tip. I can testify to its effectiveness, as I was given this tip by DON WINCHESTER (a professional metal worker) a couple of years ago when I was having problems with the T.E. of the flaps and called for help. We used a slight variation of Chris' technique, leaving every other cleco in and then installing rivets between the clecos before removing them.

NEWSLETTER INFO: I'll have to leave Chris' other tips until next issue, due to space restrictions in this issue. You will note that we are reprinting the last half of the #45 newsletter at the end of this N.L. The last half was chosen, as it contains the page detailing the riveting sequence to be followed on wing panels. The first half of N.L. #45 will follow when #49 N.L. comes out. #49 will be mailed just after January 1, to avoid problems with heavy holiday mail. Sorry to have to do it this way, but I grossly underestimated the heavy demand for newsletters and didn't print enough, so hopefully we'll get everyone up to date this way.

I'm beginning to get some good response for N.L. subjects from several builders and I'll use them all just as rapidly as space permits. Coming are long articles on laying out a 2nd degree curve and an excellent discourse on landing gear toe out vs. toe in, by John Shinn; a series of articles by Bill Johnson (Boeing Eng'r.) on developments and test results with new low-speed airfoils; and several other good articles. Keep them coming. We especially need detailed accounts of how to build the rudder, building the stabilator, all systems (brake, fuel, instruments, wiring, etc.) installation, so you guys that have done these things please sit down, take pen in hand, etc.

RIVETING TIP: Here's a little gem I picked up from a pro riveter: When a rivet is driven just enough to be perfect, you will see a shiny ring appear around the outer edge of the shop head. It has a polished look and is about .030 wide. If you underdrive it, it won't be there and if you overdrive it the entire face of the bucktail will get dark and rough looking. Try it and see.

Dick

FOR SALE DEPARTMENT

Here are some abbreviated descriptions of projects for sale. If you want to sell a project, engine, prop, accessories, clecos, tools, etc., we'll list it here. If you sell it we ask you make a donation to the N.L. (Honor System).

JIM PATTERSON, 2917 RIDGEWOOD DRIVE, HURST, TX. 76053 (817) 498-4426 has a raised round back fuselage, 0-290-D2 (135 hp) 0 Since Top, Sensenich M-76 Prop, Extension, Ken Knowles FG cowl, wheel pants, scoop. Engine installed. Fuselage on gear nearly complete, controls in, tailgroup finished. Wing parts complete but not skinned. Many other small parts. Asking \$5500. No time to complete. Call for further information.

KEITH COBB, 1400 SEMINOLE, RICHARDSON, TX 75080 (214) 234-4387. Airframe & Wings complete & signed off by FAA., .032 skins for 180 hp engine, 24 gal. reserve fuel in wings, completely flush riveted making this a showplace type of T-18. All fiberglass parts, Gee Bee Canopy & windscreen on frame, Cleveland wheels & brakes, Maul tailwheel, SS cross over exhaust system, SS mufflers w/Al heat muffs, 4" prop extension (can be used for metal or wood prop), Cassidy Pacesetter Prop, Al spinner & backplate. No time to finish due to job demands. \$9570. No time to finish due to job demands. Call for more info. KEITH also has for sale a 0-360-A4A (180 HP) Lycoming Engine, 188 hrs since new, accessories, factory log and operators manual. \$4700.

LOU FALCON, Aero engineer for LTV, being transferred to Boeing Seattle for 1-2 years. Can't afford to move or store. 150 HP 0-320 installed. Needs paint, upholstery, finish wiring to be ready to fly. Asking \$8500 with radio. Call me for details if interested (214-351-4604) or write and I will forward to Lou's new address in Seattle, etc. Leaving for Seattle November 15. Ship was begun in 1963 by Merle Soule, has high back, and older style canopy. Is zinc chromated inside and out.

Dick Cavin

## ALIGNING MAIN LANDING GEAR

by Dr. B. J. Shinn

It is my contention that in TAILDRAGGERS toe-out of the main wheels will give a STABILIZING effect, while toe-in will be an unstabilizing factor. The reverse is true for nose wheel aircraft.

Attached is an analysis for tail draggers. A similar analysis for nose wheel aircraft can be shown to prove the converse for them. I have had a lot of experience with Luscombes (8A, 8F, 11A) and my own T-18 with toe-out. The stabilizing effect is quite small, considering other stronger factors and the major concern is tire wear. With the original toe-out on my T-18 I wore out a set of tires during the first 8 hours doing taxi tests. I have had to use successively larger shims until I got it so I had uniform tire wear, (toe-out causes excessive tire wear on the inside edges of the tread).

Taildraggers with an unlocked (swivel action) tail wheel are inherently unstable. Any side force causes a swiveling action of the tailwheel, resulting in centrifugal force which reinforces the original side force. In short, taildraggers with swivel tail wheels want to ground loop! If you have a tailwheel controlled through springs it will have some swivel action. The weaker the springs the more swivel action.

The amount of effective caster in tailwheel swivel will also affect stability. The more caster the more sensitivity to turning from side loads. Another consideration is the amount of weight on the tailwheel and the coefficient of friction. For a taildragger which is almost balanced on the main gear any side load will cause the tailwheel to skid sideways and act somewhat like it had swivel action. Since grass has a lower coefficient of friction than pavement it will be worse than a paved runway. On the other hand a soft field with the tailwheel digging in will be more stable.

Finally, you must consider the amount of "gain" in your rudder and tailwheel deflection setup. This is mainly affected by the length of the tailwheel control arms. If they are too long, the amount of turn "authority" (or control) is too small; and this means you can't turn very small circles. Also you might have to make some highly exaggerated motions to keep control.

Too short of central arms mean higher pedal pressures and also high gain, so that you might tend to overcontrol and "get behind" the airplane action...especially if you also have soft tailwheel control springs.

In spite of all these factors the human is very adaptable and learns to adjust and become skilled with a wide variety of controls. I think this is the biggest factor in the said T-18 becoming a "pussycat". NO T-18 is a "pussycat"...you've got to keep on top of them and show them some skill. I think JOHN THORP did an outstanding job of balancing all the design factors and produced a very maneuverable, controllable airplane. My two boys soloed my T-18 at 16 years and my 15 year old daughter is now flying from the right seat.

ANALYSIS OF TOE-OUT ON A TAILDRAGGER

by: B. J. Shinn

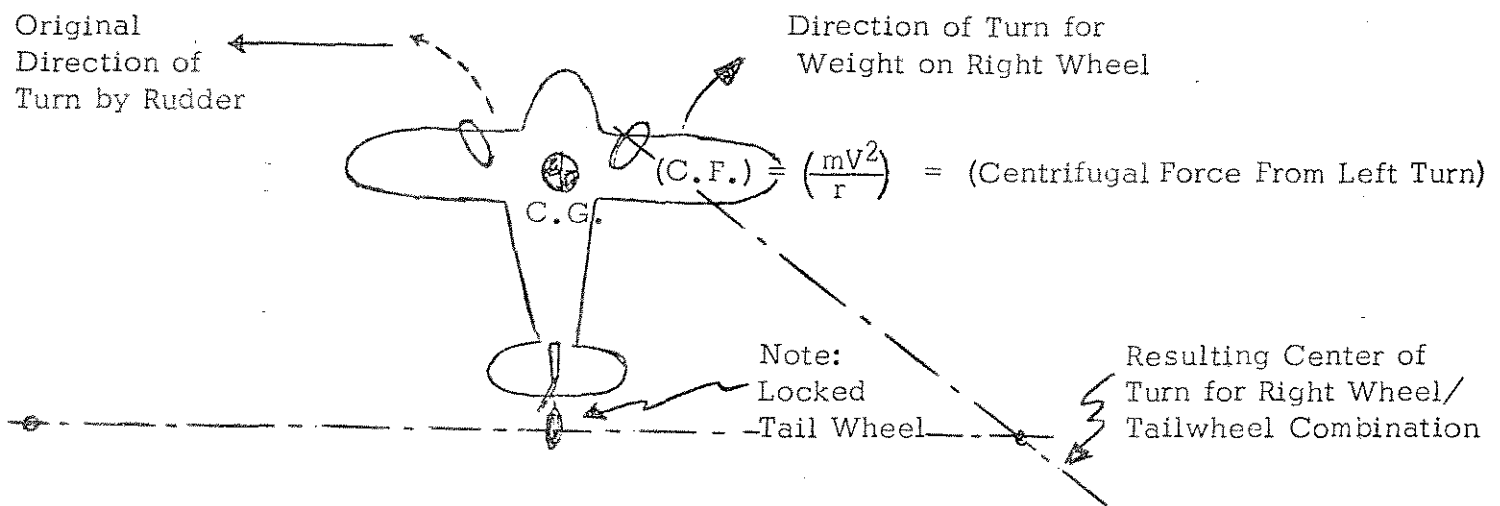
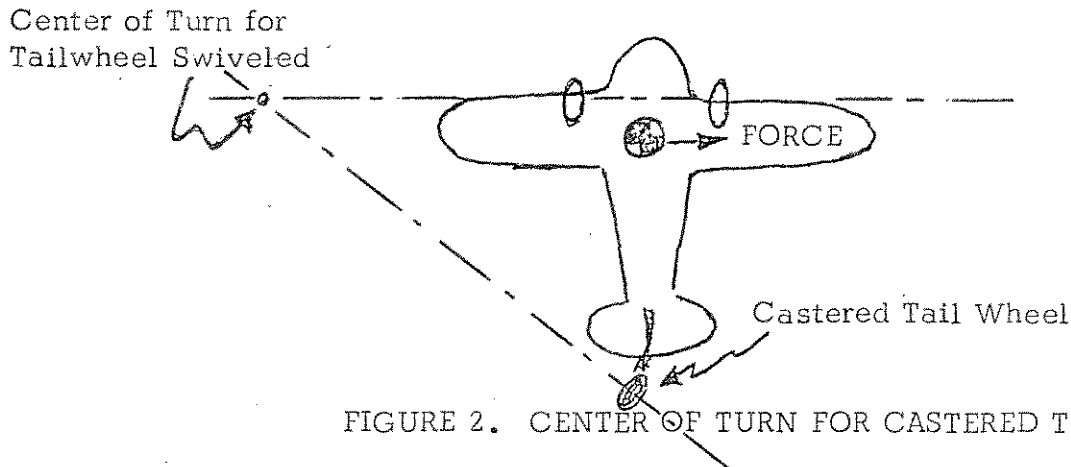


FIGURE 1. DETERMINING CENTER OF TURN

- (1) If the aircraft weight were only on the right wheel and the tail wheel, Figure 1, shows that toe-out would cause the airplane to turn to the right.
- (2) If the left rudder is pushed (or if something tries to turn the aircraft to the left) centrifugal force developed from the left turn will force more of the weight on the RIGHT wheel. This weight shift will cause the right wheel to have more traction and the left will have correspondingly less, and the aircraft will turn to the right as influenced by the turn radius as shown in Figure 1.
- (3) Once the aircraft starts to phase into a right turn, the centrifugal force will tend to shift the weight back to the left wheel, cancelling out the right turn effect.
- (4) Note that this action is stabilizing; i.e., it tends to oppose any force that would keep it from going in a straight line. (This is something like dihedral in wings, stabilizing the flight path.)

Caster Action

- (5) Note also that this analysis assumed a locked (non-swivel) tailwheel).
- (6) If the tailwheel has some degree of casting the situation shown in Figure 2 will result. Since the center of gravity (C.G.) of the airplane is behind the main gear any side force will cause a castered tailwheel to swivel. Unfortunately the direction of turn is in such a direction as to create a centrifugal force which reinforces the original force. If uncorrected, a ground loop will occur. With enough initial momentum (and assuming no wing would drag on the ground) the tailwheel would swivel 180° and the aircraft would end up going backwards in a stable condition. (Sort of like a "nose wheel" airplane from then on.)



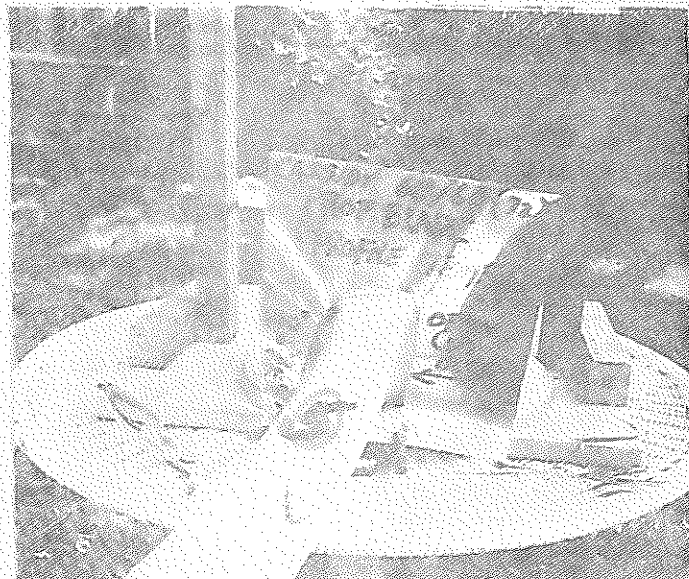
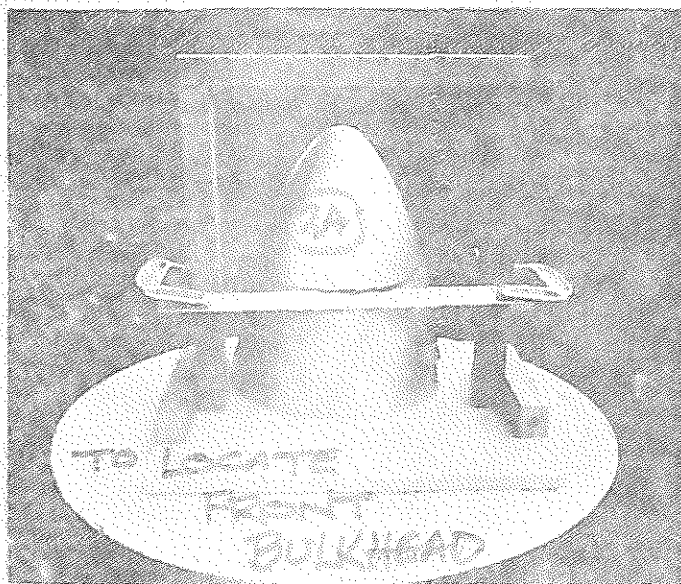
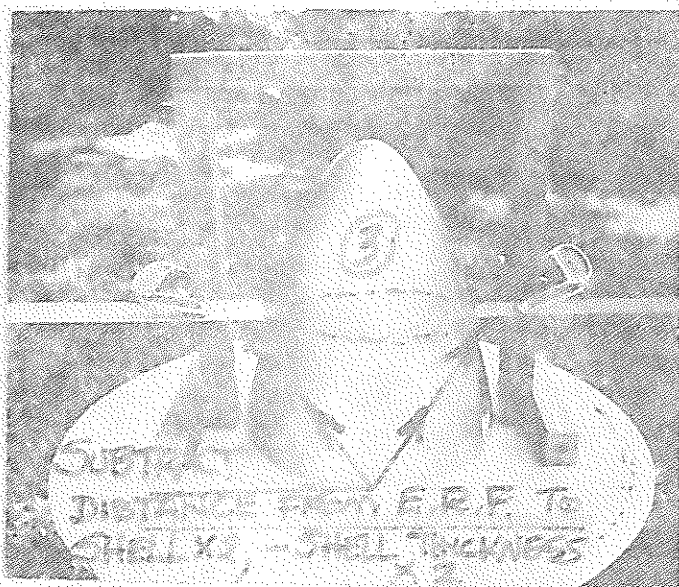
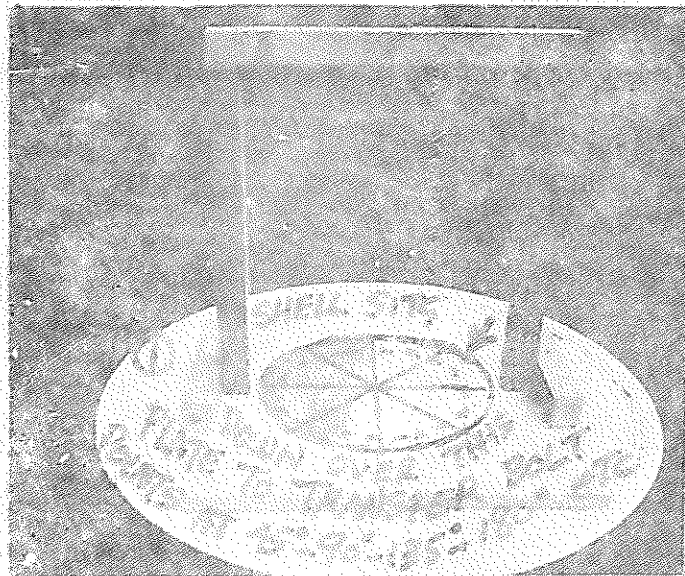
- (7) As shown in Figure 2, a force to the right causes the castered tail wheel to turn as though the left rudder pedal had been pushed. A new center of turn to the left is established, which causes a centrifugal force to the right. This is the same direction as the original disturbing force (which could be caused by rudder, brake, or other).
- (8) This analysis can be extended in a similar manner to show that airplanes with swiveled tailwheels tend to ground loop if they touch down with a crab angle, while nose wheel airplanes which land with a crab angle tend to turn and stably align themselves with the direction of ground velocity before touch down.

\* \* \* \* \*

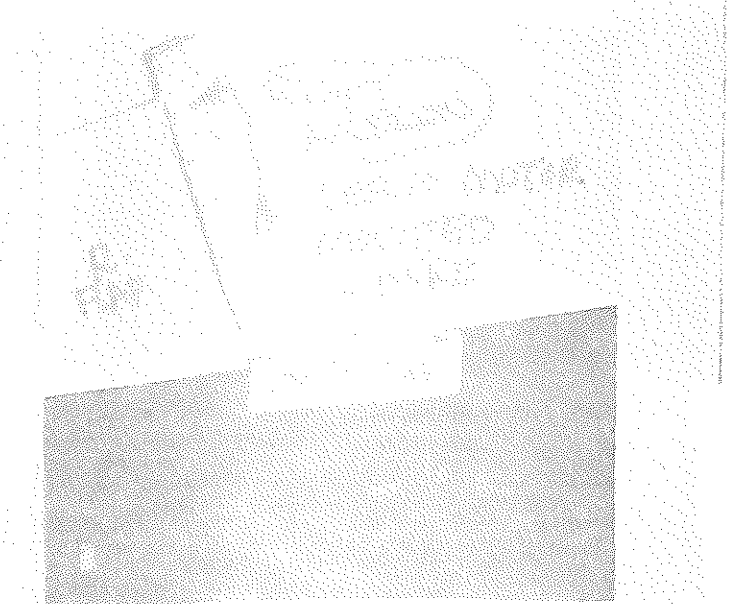
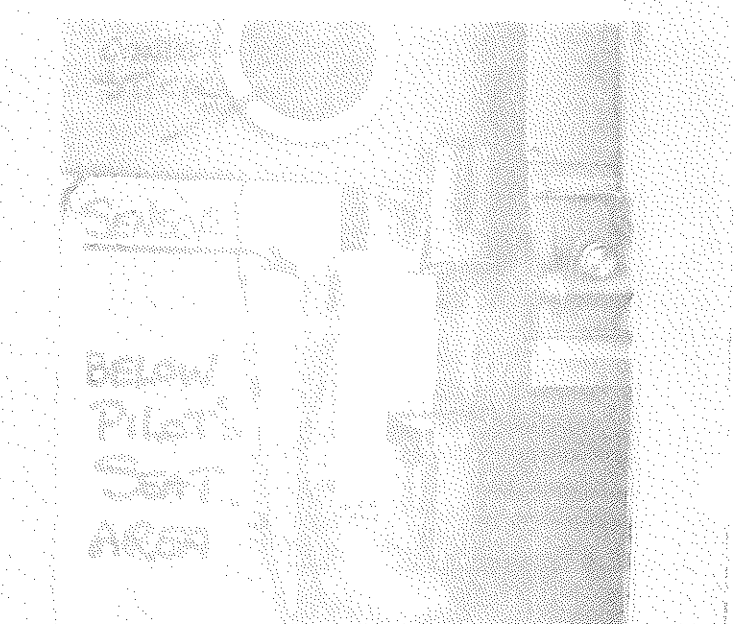
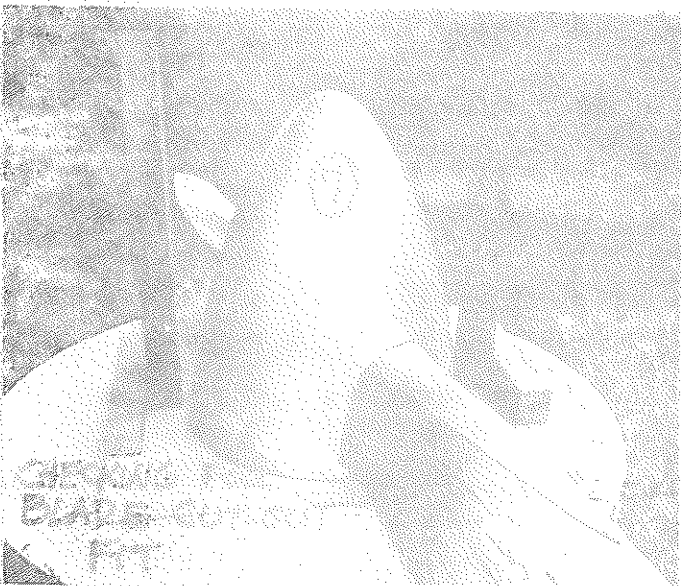
I think you'll all agree that the above was an excellent discourse, on a subject that has been misunderstood for years among the homebuilt fraternity.

Another factor that also radically affects the behaviour of a tail wheel airplane is the caster angle of the tail wheel fork. We are speaking of the vertical pivot axis ahead of the tail wheel axle. We won't go into a detailed explanation here except to say that the upper end of this vertical "axle" should never, never be aft of the lower point. It should slightly incline forward.

We also should point out that any and all assessments of gear or tail wheel alignment should be made with the airplane in its all-up weight condition.









I will have to say that the press was fair in their coverage of the '77 accident at OSH. It was properly described as a stall type situation that could have happened to any design and that even it would have probably been survivable if the gas cap had not popped out. Anyway that's all negative now and of very little benefit to dwell on our alleged scurvy treatment. On a positive note an annual T-18 (only) Fly-in was brought up frequently at OSH and great enthusiasm was noted. We'd like to have Your opinion on the subject. Please specify if you are an owner, builder, or plans holder, but above all please write us on the subject.

This brings up the subjects of where and when, as well as if. I heard one suggestion that it be held in a different city each year. This sounds like a good idea. The Bonanza and Cessna 172 owners Clubs do this I know. Very successfully too.

Just imagine what a wonderful sight it would be to have to say 100 T-18s lined up. Visualize, if you will, a half day of engine installation inspection, where all cowlings would be removed and the entire entourage could inspect oil cooler installations, fuel systems, engine controls, mufflers, heat muffs, air boxes, oil filters, voltage regulators, exhaust ramps, baffling, engine instrument probes, air filters, etc.

Also, wouldn't it be great to list and compare the dozens of the different props in such a gathering? The same for instrument panels? Or upholstery? Or radio installations? The variety of paint schemes would be an inspiration to those with projects in the nest, wouldn't it?

A nice touch would be the preparation of a T-18 "scrapbook" or yearbook, complete with pictures of the individual airplanes and the builders, and a detail box that would list equipment, engine, prop, empty weight, performance. Such a book and memorial plaque for all pilots present would really make a nice souvenir, wouldn't it?

The friendship formed would be one of the greatest benefits. It would be like the "old" days at Rockford, when it was big enough to be interesting and exciting and small enough so that we got to know and socialize with a considerable number of fellow enthusiasts. Lifelong friendships are inevitable by-products of such gatherings.

Events like efficiency flights to nearby towns and other semicompetitive flights could be scheduled. We could have scales on hand to do up-to-date weight and balances, etc. Various workshops could be set up, demonstrating several building operations.

As to where we'd have the T-18 fly-in we obviously wouldn't want to pick a busy airline terminal, but tower controlled airports, with limited airline service isn't a major problem, as I doubt if there is a single no-radio T-18 flying. There are several deactivated Air Force Bases in the midwest that might be selected and the long runways and large ramps and hangars (for protection) would make them attractive. Adequate motel space would be a must, since camping out probably wouldn't be too popular without facilities prepared in advance.

It would seem that the logical way to select sites would be on a state by state basis, listing the airports and cities that meet a certain determined set of standards.

We could speculate on sites for hours and not get anywhere, so how about you people that live in Iowa, Illinois, Missouri, Kansas, Oklahoma and North Texas - (or any of the states close to the Mississippi river) taking a sharp look at airports and town in your area and checking them out and sending in the results of your survey? It might be a good excuse to fly or drive somewhere and take the wife on a little trip, hey?

Let's try to choose a place that has a minimum of 4000 ft. of runway, with preferably a good crosswind runway, too, and adequate paved parking. Check with the Jr. C of C, a good motel manager, the airport manager, etc. Make note of any local sightseeing points that might be of interest, too.

Weather certainly should be carefully considered. The whole Mississippi Valley is well known as "Tornado Alley" and with good reason. From April thru mid-June there are violent squall lines that go as far south as southern Texas. After mid-June the weather moves north and in late July frequently stagnates into static weather fronts of low ceilings and fog in the morning and large areas of thunderstorms in the afternoon, from northern Missouri to the Dakotas on the west and to mid-Illinois and Michigan on the east. (This is usually a problem going to OSH). We can't outguess the weather months in advance, but we might try to give ourselves a break.

Now if you, and you, and you don't at least write in your views on such a fly-in there won't be one. We'll have to assume no one is interested if only 10 or 15 respond, so it certainly wouldn't justify the effort involved.

As an after thought, do you think you would rather fly into OSH to see the airplanes the first day or so and then fly out to say Rockford or somewhere else to the south of OSH for 2, 3, 3 or 4 days? That might be the simple way to get the whole thing off the ground the first year and then we can all get together and shake it all out. Anyway, please write!!

Let's remember that such a fly-in would not only be for the owners of flying T-18's, but also for those that are building and have to come in by car, rented plane, or airline. How about hearing from you builders? What, specifically, would you like to see and do at such a fly-in? What kind of forums or workshops?

Like I said before, tho', if you don't write there won't be a fly-in. We'll just have to assume that enough people aren't interested.

#### BAGGAGE COMPARTMENT

The subject of the baggage area is a little hard to make a decision on in advance and because the important question of aft C.G. is involved it might be a good idea to defer it until the airplane is given a preliminary weight and balance check.

Battery weight and location come into the picture. If your T-18 is powered with a 180 hp engine and constant speed prop you can be pretty sure of needing weight aft, so your battery will probably go in the bay just aft of the baggage compartment. If this proves to be so, the entire depth of the baggage compartment bay can be used, as long as a tunnel surrounds the push-pull tube and the rudder cables are protected.

I have a wood prop on my airplane and my battery is located in the baggage compartment

bay. My remote compass unit and inverter are also in this bay, so a baggage floor is a must.

In order to have access to the units under the floor a folding baggage floor was used. A fore and aft piano hinge forms the dividing line of the fold of unequal size segments. The size of the quick fold-up door is determined by the space above, forward, and behind. The smaller door segment will easily flop up and over the other for quick access to the battery, or if access is desired in the entire compartment the entire floor can be easily removed by loosening the dzus flush fasteners. (See sketch.) A baggage floor support "ledge" must be provided on all four sides. The ones on the side are joggled, so that the floor is flush with all "ledges".

Don't forget to insulate your floor and skins in the baggage area and to close off Bulkhead #571 with a removable rear wall for the baggage compartment. If you have some .016 or .020 sheet laying around, bend up some angles for stiffeners and pop rivet them on the back side of the light weight sheet closure. This will prevent the baggage area from being an effective sounding board for magnified noises in the tail cone area.

### COCKPIT CLUTTER

I don't have a radio speaker in my airplane and my microphone and earphone jacks are on the far left side of the dash panel. I normally use a Telex Mark II feather weight microphone/headset combo, with a push-to-talk switch attached to the switch with a wrap around velcro fastener. This leaves both hands free at all times. I despise the big, heavy "pillow" type of headsets. I like to leave my right ear uncovered to hear the passengers conversation, along with engine sounds. I've been used to this for years and I can hear the radio loud and clear via the little piece of hollow plastic spaghetti and ball shaped "nipple" that sticks in my left ear. I recommend this set up, but in case you prefer the heavier, bulky headphones, Telex also makes a double headset type with a fixed dynamic mike. My unit has an "elecret" mike with claimed superior noise canceling qualities.

I was recently giving PAUL KIRIK some left side time and to free him from distraction I used the radio. This cross-cockpit mess of cords made me wish for a mike/headphone jack on the right side, too. Like so many things, it would be pretty easy to do before installing in the airplane. I've seen a couple of T-18s with the headphone jack behind the seat on the deck and this looks like a good way to reduce cockpit clutter.

You might also look into wiring an intercom set up into your comm system. Easy, clear communication with your passenger without yelling is a definite plus.

On the subject of clutter, had you thought about one of the newer Alcor dual cyl. head and EGT gauges? In these days of low lead 100 gas, it has been proven to be very essential to lean the engine in a proper and precise manner to avoid the plug and valve problems, that are a definite problem with the fuel used now. The cost of the dual instrument is about the same as two separate instruments, but you save some instrument panel space and weight.

### PANEL PLANNING

While you are building your T-18 are you doing some definite planning on your instrument

panel? First of all you should really do some serious soul searching to determine whether you will ever make a practice of flying on "wet" IFR, making VOR and ILS approaches, or if your flying will primarily be VFR.

If you are going to go the full IFR route you are looking at probably 25-30 lbs. of extra weight (utilizing 2 to 3 sq. ft. of your 86 sq. ft. wing and raising the stalling speed) and adding a considerable amount of cost and complexity. You should (must?) have fail-safe, back up or dualization for all systems and radios. A separate battery should back up alternator failure, etc. In case of power loss, would you have a sufficient electrical back up for the vacuum instruments lost or vice versa? Are you prepared for the required maintenance cost of periodically validating instrument accuracy?

Perhaps you simply want to have your own "airliner", with a well equipped cockpit to enjoy and maybe practice with now and then. Well fun and pleasure is the name of the game and so if you are aware of the weight and dollar cost, have at it.

If IFR is your cup of tea, take a look at the basic airline "T" panel, adapted as a standard instrument arrangement long ago. I'll publish a typical layout and plumbing and electrical diagram if there is sufficient interest.

I can promise you that you'll like the way your airplane flies much better if you don't heavy it up. My T-18 weighs 927# empty and the empty CG falls at 20% M.A.C. It's a minimum equipped airplane but I can safely approach at 80-90 mph, it stalls at 60-62 IAS, it will true out 200 mph, it gets off in about 800 ft. loaded, has a 1500 ft/min climb with a Cassidy 68-66 (71) wood prop and is powered with an O-320 B2B 160 hoss engine. My radio is a Genave Alpha 200B and I have a remote compass with peanut inverter that powers the compass and cyl. head temp. I do have an Alcor EGT and feel that joint use of the EGT and CHT are pretty worth while to properly lean as per AVCO bulletins.

### TCP

I regularly add TCP to the 100 LL fuel as a bulwark against valve and plug troubles that plague so many nowadays.

I'm pretty interested in preventing troubles in that area, as last year after my return from OSH my GPU swallowed a valve (on the left rear cyl.) on my 1st takeoff after returning. Luckily I had another airport 2 miles straight ahead and had just enough power left to stagger in. The fuel was 100 LL and I had run out of TCP.

You may have heard that the Embry-Riddle flight school in Florida put TCP in half of their trainers and that half had no problems, but the other half had valve and plug troubles galore on the 100 LL. Results were definitely conclusive.

Because our printing set up is different from previous newsletter we won't be doing drawings that are adjacent to the printed copy. Sheets of photos and descriptive drawings will be added at the end of the newsletter, so if you need to refer to "Fig. 1" etc., just turn to the photo or drawing pages.

I've already prepared an outline for the next newsletter, which will be published and mailed just after the holidays, so that there will hopefully be fewer mail foul-ups than during the holiday rush.

### FUTURE NEWSLETTER SUBJECTS

Here are some of the subjects to be covered: Gas tank installation on the Wide Body; Filler cap door and flush filler neck; Scupper drain provisions; Access plate for fuel quantity sender unit; Heat muff and muffler design and installation; Placement and design of newer instrument panels, that allow room for radio installation in the panel ahead of the tank; Suggested IFR instrument groupings; Designee observations on running of battery cables, size and type, location and types of solenoids to be used; Location and design of cabin heat valve; New developments in baffling and air flow control inside the cowl; Location of accessories on the firewall and proper attachment procedures; Additional methods of fitting spinners; Comments on dash frame modification and stiffeners; Alternate seat design and attachment; Some pointers on upholstery installation, Comments and sketches on removable access plates and doors for the battery area, above the tank, tail area, bottom skin, forward floor, outer wing fittings, and tool access to the #522 fittings; Additional comments on N.L. #34 re the alignment of stick, stabilator, and trim tab; Designee calibration necessity for flutter prevention and related material; Reprints of Sport Aviation articles on flutter; Info on new brake line material; and comments on routing of brake lines; Complete commentary on improving cockpit room by removal of forward and rear tunnel (covering the installation of electric trim, electric flap actuation, rudder cable relocation); Ultra-light weight electric aileron and rudder trim; and some observations on fitting of canopies. In addition, we'll try to cover some of the unique problems relating to building the folding wing.

I solicit your comments on any of the articles we publish, including any criticisms (constructive or otherwise). I especially ask you to contribute any construction tips, submit even rough, freehand sketches, accounts of problems you encountered and how solved (or not solved), flight test reports, weight and balance reports, wiring diagrams, good sources of equipment or materials, etc.

We would also like as many good, sharp black and white pictures of your cockpit, cowl, engine installation, etc., as you can manage. Polaroid black and white are usually not sharp enough for good reprint and color pictures lose detail when converted to black and white. Don't write on the back of pix, as this will often show thru on reprint. We would like to start a complete "rogues gallery" of all completed T-18s and their builders. It would be a nice way to record your accomplishment and an excellent way for builders to become better acquainted with others. It would also enable new builders to get ideas on paint schemes and many other items. Please include pertinent details on the ship (i.e., date flown, hours to date, engine hp, prop pitch, empty weight, performance figures, etc.).

This wraps it up for now, amigos. Please send comments and other material to me at ~~P.O. Box 160, Addison, Texas 75001~~ **10829 SOMERTON, DALLAS, TX, 75229**

For the present, send your donation checks (\$8.00 min.) to Lu or me, but make them payable only to "T-18 Mutual Aid Society".

Best wishes, Dick Cavin

PLANS CORRECTION AND MODIFICATION SHEET

T-18C wing only: Lu Sunderland called me today (at the last minute before going to the plate maker) with a couple of mods on the T-18C wing that have surfaced in the building of the wings.

The standard T-18 wing uses a push rod to the aileron mast (actuator arm) from the bellcrank, that's mounted on the outboard rib of the center wing. It operates in the gap between the wings. On the T-18C wing, where the aileron push-pull tube must now be mounted inside the outer wing, it was soon seen that the rear spar was slightly in the way of the tube and that the rear spar would have to be "notched" to clear the tube and a doubler riveted to the spar around the notch.... To avoid this notching it has been decided to make a new aileron mast, in which the bolt hole that mates with the push-pull tube rod end is moved forward .6". You should of course leave adequate edge distance material around the bolt hole of the new mast, and slightly reshape it. Time doesn't permit a drawing at this time, but we will do it next month.

Also, at the other end of that same push-pull tube uses the standard T-18 bellcrank. This bellcrank now slightly interferes, so the pivot point of the bolt hole should be moved aft .1". These 2 changes mean that the push-pull tube is now .85" too long and should be shortened that amount. This .85" is more than the threaded adjustment, so you'll have to re-work one of the ends.

The new geometry means that there will be 1° less up aileron travel at the full deflection and at neutral, practically no change. I can't recall ever needing anywhere near full aileron travel on the T-18 (even in very strong crosswinds), so this shouldn't even be noticed in service.

The other change involved a super-tight fit in the "sandwich" type fitting of the rear spar, between the inner and outer wing. To provide a more practical fit, it was decided to terminate the .032 rear spar material even with the last rib and not continue it out over the fitting.

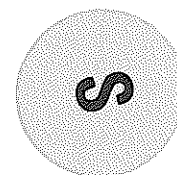
Lu has had John Thorp check out and approve these changes.

On the standard T-18 wing: In N.L. #47 we made note of a suggested (not mandatory) change re the change to 7075 T-6 material on the 537-1 spar web, or the option of adding vertical inercoastals (.75 x .75 x .063 angle extrusions), two between B.L. 21.0 and two between B.L. 35.25 and B.L. 50.25, four on each side total\*\*\*\*\* if you are too far along to use the 7075 web material. . In a recent letter to Dick Amseden, 16434 Concord, Fraser, MI, Mr. Thorp verified the above and also said that there had been no need shown to beef up the web inboard of B.L. 17.08 Dick sent along a nice drawing of angle mod and we'll print it next month.

See "HOMEBUILT AIRCRAFT" magazine for Jan. '80 for Lu Sunderland's fine article on NASA computer-generated airfoils, in which he tells the story of the T-18C airfoil selection and the impressive results of wind tunnel studies. There is also a fine article by Dan Downie about the Thorp birthday fly-in and another story about the Lockheed Little Dipper (circa 1946), a Thorp design, by Don Dwiggins. It's a must issue for T-18 people, so if you can't find it on the newstands, send \$1.95 to Werner & Werner Corp., 606 Wilshire Blvd., Suite 100, Santa Monica CA, 90401, and they'll send you a copy. There's some great T-18 pix in that issue, too.

Change of format: Starting with the next N.L., a portion of the copy will be foto-reduced to half size, with two normal pages on one sheet. This will enable me to do more stories and reports on now-flying T-18s, reproduce more sketches and drawings, and cover much more material per issue. As it is now, I'm constantly fighting space and weight per issue & so have to do much rewrite. **THIS ISSUE BEING MAILED 1ST CLASS, TO AVOID LOSSES IN HEAVY XMAS MAIL.**





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No doubt most of you were wondering when N.L. #50 was coming out. So was I.

About the 1st of February I started getting severe pain in my right wrist and it got worse each day. To make a long story short, the Doc found I have a disease that affects the tendon operating my thumb. He chose to put the hand and arm in a cast for 2 weeks. That brought nearly all my activity to a screeching halt. I couldn't write, dress myself, tie my shoes, etc. Boy! Was that a drag! I couldn't go fly, work in my shop, or even do any work around the house.

Now it's the first of April and I'm not much better off than I was in February. My wrist is only very slightly better and it's still painful to write and it looks more certain every day that I'll have to have it operated on, but I'm going to put it off — I hope. Right now I'm looking forward to flying my T-18 to the Chino, California fly-in April 26-27 and getting together with some T-18 people.

While out of the circuit I did some refiling of letters. In the process I noted that nearly 90% of the T-18 M.A.S. members are either building the convertible wing or are planning to, according to letters received. About the same number are also building the Wide body.

In view of this we will designate a special section in each N.L. to specifically deal with building the folding wing and wide body.

#### CONVERTIBLE WING ITEMS:

In N.L. #45, making a pro and con assessment of the CW, I made the statement that due to the 20 lbs. of weight added (over the standard wing) that G tolerance would be degraded. What I didn't know was that when the steel fittings were designed for the CW that this permitted an extension of the original G tolerance up to a 1480# gross weight (6.6 Gs).

I was told that the aluminum fittings on the original T-18 were closely designed and were the factor that limited gross weight for aerobatics, rather than the spar, as most everyone assumed.

Even tho' your T-18 CW is good for aerobatics up to a gross weight of 1480# it might be well to review some of the thoughts on page 5 of N.L. #46 before you indulge. I would also suggest you read JIM ROBERTS' story this issue (re:opening the canopy in flight).

#### TIP ON ASSEMBLY, OUTER WING (W)

CHRIS FAST recently passed on this single little change on assembling the outer wing. Normally it takes a super long arm and long bucking bar to get at the most internal rib, but if you'll reverse the direction of the flange on the 3rd rib out from the wing joint (#201 L or R) then it's the identical set up that you have on the standard wing (as far as flange direction is concerned). This way you never have to reach inside too far to buck the rivets.

Lu did the CW design a couple of years back but he's just now getting around to building his CW. He's getting close to finishing it now and is looking forward to flying it and making a precise analytical comparison in performance between it and the standard wing. JOHN THORP is still skeptical that the new airfoil will noticeably improve low speed performance to a significant degree and of course as yet we simply do not have practically any data to prove or disprove anything, one way or other. However, the softer nose (larger radius) on the new airfoil definitely improves the stall character. It is a slower developing stall, certainly.

Until we get several airplanes with the new airfoil on both the center and outer wings, and some hard numbers can be developed, it would seem to make good sense to control our enthusiasm.

Here's still another communique from our "Old Reliable" CHRIS FAST: In doing the annual on his CW Chris noticed that there was some "flex" in the aileron control system when both ailerons were restrained. The excess movement was traced to a wee bit of spanwise flexing of ribs (#210, #310, #320) holding bellcranks, while a fair amount of force was exerted on the stick (even tho' there is a vertical piece of 3/4 X 3/4 extrusion on the side of the rib opposite the bellcrank). Altho' the vertical piece does do a pretty good job of stiffening the rib, it has been decided that the "fix" is to add short pieces of extrusion (1.3" long) horizontally at the top and bottom of the vertical extrusion, but on the opposite side as the vertical piece. Chris has found that this completely stops the flexing of the rib. Lu said he felt that probably there wouldn't be enough play to invite flutter, but it didn't make any sense to it and gamble.



## SKINNING THE OUTER PANELS

I've received several letters asking for an assembly sequence for the CW outer panels (such as we published in N.L. #45). First of all, I wouldn't even consider doing any spanwise splicing of skins. Accurately forming the leading edge of a piece 6 ft. long "by hand" is very close to impossible. To even approach the ease and accuracy of forming pieces 4 ft. or less in width would require a great deal of extra material (aft of the spar) to be wasted and later cut off.

There is an easy way. Just wrap the skin chordwise, as is done on the center and outer panels of the standard T-18 and work from the inboard end outward 4 ft. After the ribs are clecoed in on this segment you can go ahead and temporarily put soft aluminum pop rivets in the outer rib. Flush rivets are required, as the outer 2 ft. wing skin segment fits on top of the inner skin segment at that rib thus making a neat lap splice over the rib. After the outer skin is clecoed to the outboard ribs you can then go ahead and match drill the skin and rib simultaneously. The rivet holes for the outer skin segment will fall in between the temporary pops in the lap rib.

Take note that just as on the standard wing outer panel that you do not drill into the front or rear spars until the entire wing is leveled and any twist taken out by shimming between ribs and spars! It's a good idea to repeatedly check the wing for twist as you cleco each rib in place.

After all ribs are clecoed in to the skin, go ahead and match drill the skin and spars simultaneously, to lock it together without twist. I would also emphasize that you put a cleco in every hole to discourage any build up of "slop".

Now you can disassemble the outer portion and carefully drill out the temporary aluminum pops in the lap rib. I personally prefer to use 3/32" solid rivets, rather than pops, and then when they are drilled out you can then clean the hole out to a #30 just prior to the final riveting of the skin to the rib.

When the outer skin is again put on for riveting, perhaps you might prefer to use monel pops at the lap rib to keep from reaching in so far to buck rivets.

If you will study the sequence carefully and mentally rehearse the procedure you will find it very easy and a very accurate way to build a wing without jiggling it up.

One other little point: I have found that it is best not to prepunch the lines of holes for the top and bottom of the spars (in the skin) until all ribs and spars are clecoed together.

At that time you can very accurately locate the lines of rivets so that they are in the exact fore and aft position as called for by the plans. If the prepunched line falls too far aft you'll have insufficient edge distance on the spar, and if it's too far forward there won't be enough room for bucktail of the rivets.

I've found the easiest way to do this is to make a transfer strip (template) out of a scrap piece an inch or so wide and as long as required to span the skin. I scribe a centerline and step off the proper rivet spacing with dividers. After holes are drilled in the transfer strip, clamp it in position and center punch the hole locations on the skin with the nibbed Whitney punch.

I've also found that I can eliminate this last step and simply use the transfer strip for a drill guide if I use a drill bit, ground with a sheet metal grind, if I am careful to drill 90° to the template. A regularly ground bit should not be used to drill through a template, as the point will wander and "wallow out" the holes and ruin the template.

Back in the "old days" I made up a set of fuselage skin templates that we shuttled around from one builder to the next and only charged a fee of \$3 to recover cost of material. By the time around 15 builders had used it the template was ruined. In spite of large printed warnings against drilling through the template, some did it anyway. I guess we should have required a damage deposit.

## SETTING WING DIHEDRAL

A builder recently wrote "How do you set wing dihedral so that both sides are identical?" I'm sure that there are several ways to do it. The way I've found to do it the easiest is when the spars are ready to get the fittings put on. I lay the spars out on the work bench and block them up enough to give C clamp clearance underneath. I then C clamp the fittings into position as closely as possible on one side.

To transfer the angle between them to the other side I take a couple of strips of scrap about a couple of feet long and a couple of inches wide. I join them at the end with one pop rivet, which acts as a pivot point. I put the two pieces against the top of the pair of spars to duplicate the angle between them. I then lock in the angle by C clamping the strips together. Another pop rivet or two makes the angle template a permanent one and it's a simple process to use it to set the angle on the opposite side.

Perhaps some of you have another way of doing it. I'd like to hear of it if you do.

#### FLAP RETURN SPRINGS

The forward end anchor point of the flap return springs are shown on the CW drawings, but the aft end anchor point details aren't shown. You can refer to the standard wing drawings as a guide. At present this is a detail left to the builder's option, but we'll have at least one detail drawing on it in the next N.L. In the meantime if any of you chums have solved this problem on the CW give us a whistle, huh?\*

#### PUSH-PULL TUBE CUTOUT ON SKIN

The assembly drawing shows the shape of the cutout for the aileron push-pull tube as it penetrates the bottom skin. However, you probably ought to mock it up with either cardboard or scrap metal before you put the skin on. Tape the cardboard to each adjacent, rib, slit the cardboard and gradually enlarge the opening.

#### MORE ON BILL JOHNSON HBJ2 AIRFOIL

In N.L. #49 BILL JOHNSON gave an excellent report on the effect of "strakelets" on his wing. Space didn't permit the entire report in N.L. #49, so here's his method of extending the root rib 5" mathematically (take note that this formula takes into account the tapering of the fuselage between the firewall and dash frame sections).

Foreward: The accompanying drawing is an arbitrary curve, shown as an example. The objective is to obtain a 5" extension where the leading edge nose line intersects the fuselage.

- (1) Draw leading edge full scale.
- (2) Mark off vertical lines at one inch intervals. Make the intervals less than 1 inch near the nose (as required for clarity).
- (3) Multiply X values by 1.29 to obtain X".
- (4) Replot X points on the Y axis.

(SEE DRAWING PAGE 2A)

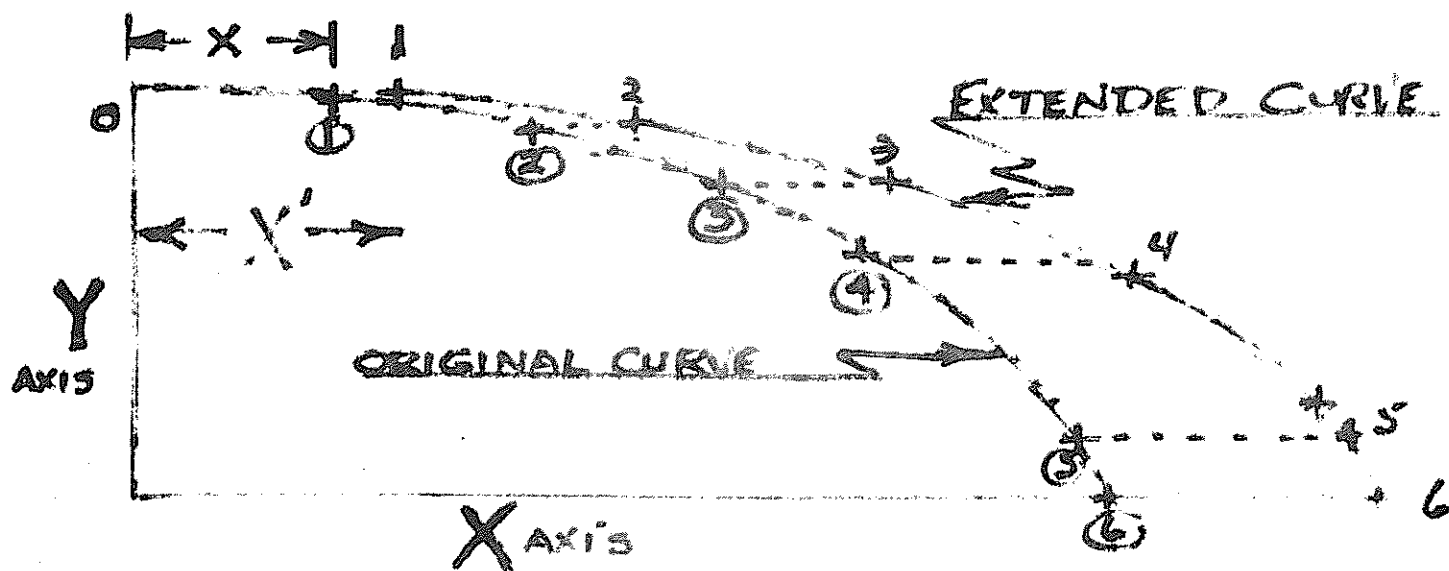
Bill also sent a copy of the ordinates for his HBJ-2 Airfoil and we are also printing them for your information.

(SEE ORDINATES PAGE 3)

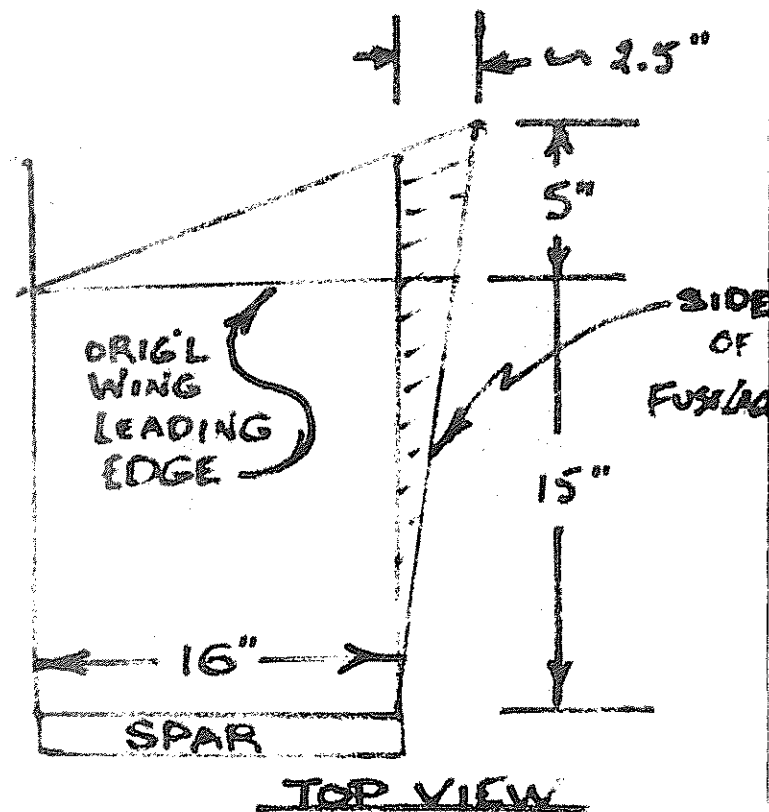
Thanks, Bill, for sharing your most informative experiments with us.

On the subject of wing root strakelets read JIM ROBERTS' story of his T-18 elsewhere in this N.L.

METHOD TO EXTEND LEADING EDGE: BY BILL JOHNSON



N	X	Y	X'
0	0	2.2	0
1	1	2.1	1.29
2	2	2.0	2.58
3	3	1.7	3.87
4	4	1.2	5.16
5	4.8	.5	6.19
6	5	.0	6.49



TO EXTEND ROOT 5" AT SIDE OF BODY, EXTEND  
FIRST RIB  $\frac{16}{16+2.5} \times 5 = 4.32"$

$$X' = X \cdot \frac{15}{15} + 4.32 = 1.29X$$

## HB (J) 2

(STATIONS AND ORDINATES GIVEN IN  
PERCENT OF AIRFOIL CHORD)

UPPER SURFACE		LOWER SURFACE	
STATION	ORDINATE	STATION	ORDINATE
0.000	-1.000	0.000	-1.000
0.270	0.0	0.500	-2.050
0.715	0.570	0.880	-2.300
0.954	0.755	1.140	-2.500
1.441	1.122	1.675	-2.690
2.670	1.784	2.913	-3.05
5.145	2.738	5.294	-3.550
7.635	3.463	7.458	-3.890
10.129	4.050	10.678	-4.250
15.123	4.970	15.386	-4.710
20.122	5.637	20.357	-5.080
25.126	6.106	25.324	-5.316
30.130	6.401	30.209	-5.457
35.136	6.530	35.253	-5.410
40.142	6.491	40.217	-5.349
45.147	6.299	45.182	-5.109
50.150	5.973	50.150	-4.767
55.151	5.530	55.119	-4.340
60.149	4.991	60.091	-3.849
65.143	4.370	65.067	-3.431
70.133	3.682	70.047	-3.017
75.120	2.984	75.030	-2.595
80.102	2.286	80.018	-2.177
85.080	1.714	85.010	-1.633
90.055	1.143	90.005	-1.089
95.027	.571	95.003	-.544
100.000	.000	100.000	.000

L.E. Radius 1.440

Slope of radius through L.E. 0.072

Note: The above airfoil section was the second of four modified airfoils in the series that Bill developed. The HBJ-4 is viewed as a state of the art advance over the HBJ2.

BUILDING THE OUTERWING MAIN BEAMS (CW)

The front spars present two unique problems; the nesting of the stub (doubler) extrusions within the inner radius of the outer spar caps, and the required change in width of the spar caps via sawing.

The removal of material from the "sharp" corner of the extrusion is the biggest problem. If you don't have access to a mill you'll have to resort to either filing or sanding. I've found a portable belt sander does the job quite well.

Put the extrusion on the bench (with it forming an inverted Vee), drive a nail on each side of it at the ends to keep it from moving around and go after it with a coarse grit belt. I made a profile template out of scrap and by holding it up to the light I could see how close I was getting. Obviously it should nest tightly.

The excess width of the extrusions is easily removed by sawing. I've always used my bandsaw, but it can be done with a saber saw, too, in which case it would be well to clamp it to a board and then saw the board and angle simultaneously. You could also do it with a skill saw or table saw if you were careful and if you used a non-ferrous blade (Sears) with no set to the teeth.

In any sawing of aluminum it's best to keep the blade coated with beeswax. This keeps the hot chips from sticking between the teeth. I also use it on rotary files for the same reason. It comes in stick form. Use an old candle if you can't find beeswax.

I've found an easy method to assemble the spar caps and web. I split a 2X4 down the middle and use the pieces to prop up the caps on the work bench. The caps are supported "on edge" so to speak, so that the web can be laid on top of both extrusions in its normal assembly position. It's necessary to "sculpture" the wood pieces, so that they conform to the inner shape of the extrusions and fit snugly.

Clamp the web to the caps (extrusions) at each end on one of the caps. Be sure the web is properly positioned with reference to the outer edge of the cap. Start at one end and match drill the web and cap together. The cap should be eyeballed for straightness before doing any drilling, of course. If it is bowed from the sawing clamp it to the bench top and "massage" it a little with your ratchet gun. You'll find there is quite a lot of flex in the caps and it's quite easy to spring the caps with reference to the web.

After you've gone down the line with one cap repeat the procedure with the other, springing it into position before drilling holes and inserting clecoes. Use a good set of calipers so that you keep the spar assembly straight and the specified width exact all the way. Your spar should be the exact height of the ribs or you'll have a bump or a flat spot on the wing at that point.

After you've match drilled the spar caps and the web, disassemble and clamp the doubler (nested with the caps) to the cap in its proper position. Then drill thru the caps and the doubler and cleco. That's it. Actually, it's easier to do than tell about it in several thousand words or less.

WIDE BODY NOTES

At Chino I had a chance to look more closely at KEN KNOWLES wide body. One of the new wide body builders had positioned the canopy frame in line with windshield frame (actually strapping the two frames together) and he discovered he had a gap of about 3" between the lower front corner of the canopy frame and the forward track and he was a little shook up, thinking a giant boo-boo had surfaced.

Ken explained that he simply drops a longer skirt from the canopy frame down to the forward track. The canopy frame for the wide body has a 5" long flat arm that goes from the forward lower corner downward (on the inside). The forward canopy rollers are bolted to this flat piece. The canopy skirt is stiffened (as required) by the use of little U channels of bent-up sheet metal.

The wide body windshield frame is raised up about 1-1/2" higher than the standard T-18 windshield frame. This in turn raises the canopy frame. These changes allow more head room and permit the use of the standard plexicanopy and windshield without excessive deformation. The canopy must be positioned a little further aft on the canopy frame than on the standard, to allow it to be as wide as the widened fuselage at the aft end. This in turn causes a very slight break in the profile of the windshield canopy just aft of the windshield frame (and I would emphasize slight). You'd almost have to have it pointed out to you to spot it.

I recently wrote about Ken's wide open baggage compartment. Having that area accessible in flight is a big plus. Ken cut the top off the seat back frame, even with the #669 deck, then cut the deck out in a smooth arc back to the forward end of the aft canopy rails, rolling or bending a typical flange of 45° on the cut edge. To pick up the lost strength of the cut seat back bulkhead and deck, he uses a 2" diameter tube that goes from one side of the bulkhead to the other. He has it attached to the front side of the #598 bulkhead, but he said he'd attach it to the back side if he did it again.

This tube is a shortened version of the long elevator pushpull tube. Fittings are riveted in each end and "bolted" to the #598 frame back together. The tube is mounted about even with the W.L. 42 extrusion and Ken has his pip-pinned at each end to facilitate quick removal for baggage loading of large articles.

One other little point: If you hinge the forward end of your seats on bulkhead #592 (so that they will tip forward to permit easier access to the baggage compartment) be sure and check that the seat back frame isn't so tall that it will hit the roll bar in its most forward position. Also, don't forget that you have several cubic feet of very valuable storage space under the seats at a most favorable CG position, an excellent depository for tools, tie down kits, spare oil, etc. One builder I know says he pulls his radios out and stows them there when he has to leave it tied down overnight. He also locks the seats down in some manner.

#### WE NEVER GET TO OLD TO LEARN DEPARTMENT

Recently I was demonstrating my T-18 to a new builder and on landing roll out he commented what great rudder control it had. I enthusiastically agreed and vigorously yawed it back and forth at 15-20 mph to demonstrate. After 3 or 4 of these it surprised me and took off for the boonies and despite full right rudder and brake (?) I couldn't stop it. It didn't go all the way around, due to our low speed, but it got my attention, as I could have dinged it some if there had been a runway light there.

I later simulated this in an open area and sure enough it did it again. I first suspected my Maule tail wheel had sheared the locking pin (as Dan Dudash's T-18 had done when I was riding with him once. He came very close to losing it then). The Maule checked out.

I had first thought I'd lost my right brake, but what I found was that it was very nearly impossible to suddenly get any brake application with full right rudder applied. It has been known for years that the brake pedal will hit the tank cradle under those conditions and can be corrected by notching the right brake pedal. Let me strongly recommend you do this, even if you move rudder pedals back an inch or more! When taxiing in close quarters, to make a sharp right turn I've always had to apply a little left rudder in order to get the right pedal back far enough to use right brake. Needless to say, my right brake pedal now is notched. Now before you say to yourself, "I'll just move the tank cradle," take note that it affects the channel over the top of the tank, the skin it attaches to, etc. Don't do it. The notched rudder pedal isn't unsightly and it gives plenty of room for even a big foot like mine.

Incidentally, Dan Dudash was so upset at the Maule that he took it off and replaced it with a non-full swiveling Lang. It takes a little more planning to maneuver in close quarters and to push in and out of the hangar, but he feels it's worth the extra peace of mind. The Scott seems to be the best and perhaps the extra cost is justified.

One other very important item: Tail Wheel Steering Springs: Use only the so called compression springs! These are double action and have one inside the other, acting like a solid link when stretched so far.

On my recent trip to Chino, I let Francis Richardson fly the leg into Pecos, Texas, where the wind was west at 30K. We landed on the West runway no sweat, but when he turned up the North runway to get to the gas pit he couldn't hold it and it would weather-cock into the wind and go on around in a super low speed ground loop. This took place 6 times before we got to the gas pit. The culprit was the single action tail wheel springs. They had stretched and had caused my problem the week before.

I had an extra set of double action springs with me, so we pushed it behind a hangar out of the wind and changed them. Boy, what a difference! When I taxied out to the runway I had perfect rudder control and never had to even touch the downwind brake, even with that 30K crosswind.

I talked to several T-18 owners about this at Chino and found they had all changed over for similar reasons, so, amigos, if you have single action springs throw them away and write Ken Knowles for a set of compression springs.

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One more little item on the folding wing: FLAP RETURN SPRINGS\*

Earlier in this N.L. we discussed the anchoring of the flap return springs at the rear. Ken Knowles anchors his to the bottom part of the flap actuator fitting on the vertical member of the fitting. Simple and effective, easily inspected, or installed, so that disposes of that problem.

KEN KNOWLES now has the complete folding wing with the LDS-2 airfoil installed, altho' he hadn't flown it yet when we got to Chino, but he has promised a flight report soon.

He now has his <sup>WING</sup> ~~former~~ complete wing (with the standard airfoil) for sale for \$4000. It's the folding wing, tips, ailerons, flaps, strobes, antennas, walking beam installed and ready to bolt onto someone's wide body fuselage. He'd prefer the buyer to come and get it. It's painted, too. Ken also has a new Hartzell C/S prop, with spinner and governor for sale for \$1500. It's for the 160hp engine. All these items are excellent buys, money-wise and quality-wise.

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Last N.L. we mentioned COREY SYLVESTER. Since then he has moved, left no forwarding address. One builder made a trip to Louisville to check out the facts of his offer to supply landing gears and other items. If any of you have sent him money and not received parts I'd like to know about it. In the meantime don't send him any money. When we locate him we'll attempt to find out what gives.

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Discussing this situation with others I have come to the conclusion that unless I know the person and have personally seen any of the for sale items that we won't carry them in the newsletter. An ad in Sport Aviation is inexpensive, so it's better that way.

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#### T-18 FLY-IN

AT CHINO,

I had several conversations with PAUL POBEREZNY relative to an all T-18 flyin at Rockford, Ill., the day before OSH started. Quite a few builders and aircraft owners had made this suggestion and at first glance it sounded like a great way to initiate an annual T-18 get together. The gyrocopter people had done this very thing for several years, so I got down to some serious and detailed planning along that line.

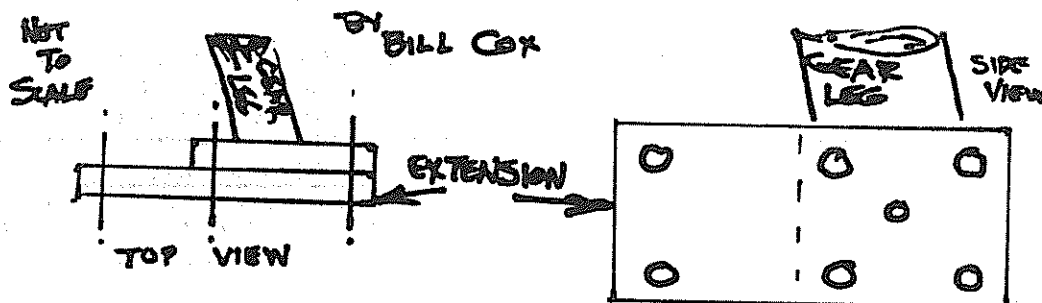
The subject of liability soon came up and it looked obvious that an insurance policy was mandatory unless some "left handed" way could be found to circumvent liability.

The Association has really had the course on this item, Paul said, and to make a long story short, anytime you extend any form of a written (or even verbal) invitation for such an event you incur full liability. Too bad!

I felt that since fuel costs were so high, plus regular convention fees and other daily costs that are normally incurred at the convention, that the cost of insurance for a 1 day get together at Rockford could well be the straw that breaks the back of a lot of people's budget camel.

It might be an item for discussion at our annual T-18 dinner at Oshkosh this year tho'. Incidentally we've recently received quite a few letters and calls saying let's make out T-18 dinner much less formal and without much ceremony, so that we have time to meet and know more people and do more hangar flying. In accordance with those ideas we'll keep all after dinner formalities to an absolute minimum.

In the last N.L. (#49) we published a letter from BILL COX, 419 Willow Lane, Baytown, Texas 77520 in which he told of a gear extension he used to move the wheels forward 1.4". The quickie sketch I made of this at Oshkosh last year was in error. It should have read that there are 6 (not 4) holes in the extension and below is a correct sketch.



Here are further excerpts from a recent letter from Bill:

A few other changes are necessary to get the CG right without excessive ballast. The battery was installed forward of Station 139. This is about 15" aft of what is on the plans. The installation hardware is basically a mirror image to the plans, since it is mounted on the front of a frame rather than the rear. A 5# lead bar is mounted at Station 195. It is bolted through the bolster plate for the steel tail spring. A 3/16 AN bolt on either side of the spring secures it.

With the C/S prop and 180 Lycoming, but minus radios, upholstery and wheel pants, the Weight and balance follows.

Empty Weight:	923#	Empty CG	60.7 In.
Fwd CG	62.1 In.	Rwd CG	70.6 In.
Gross Wt.	1650#	Baggage	100#

1650# Gross requires 2-200# people and 100# baggage.

2-15 we flew N3WC to Louisiana. Takeoff weight was about 1600#. We climbed at 125 mph for visibility. 9-1/2 minutes after takeoff we leveled off at 9500'. At 19" and 2300 rpm (about 55%) we trued 185. Fuel consumption was 7.9 gph. I have EGT and CHT on each cylinder and lean to 50° on the rich side of peak.

I am looking forward to getting the fairings installed and making a small cowling mod. I believe cruise will be about 200.

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Again, thanks, Bill, for your report. That's very valuable info.

Now here's a report in its entirety from BRYANT ROWLAND, 1007 Shell, Midland, Texas 79701.

Hello Dick,

Just got the newsletter and as usual, read every word.

The subject of my letter is the use of full flaps on the T-18. Please pass on the following in the newsletter as it well could save someone a very bad experience.

Some T-18s, mine included, has a very violent downward pitch, when full flaps are applied, or when speed is increased while full flaps are applied in a forward CG condition.



The airplane of course is at it's most forward CG with one pilot aboard, full fuel and no baggage (such as it would be for test flight) the downward pitch is very rapid and is totally un-controllable, not something that you would want to happen down close to the ground.

My airplane reacts this way:

- 1) With one 170# pilot aboard, no bags and more than half fuel which gives me a total weight of 1351 and CG of 63.2 In. Rapid downward pitch upon application of full flaps (300).
- 2) With two people on board, less than half fuel (and some baggage preferred) no problem with full flaps, meek as a lamb. This loading gives me 1397 total weight and a CG location of 66.1 In.
- 3) When the CG is something between the two above conditions, full flaps may be applied at a slow speed (80 MPH or slower) but will pitch down if the speed is increased. Stick buffet is the clue. If the stick buffet's with a forward tug, better get the flaps up or have a very tight seat belt and be ready to ride through the first half of an outside loop.

By the way, my empty CG is 61.6 In. and empty weight is 1013#. For flight I call 1500# max. with 62 In. forward limit and 70 In. aft limit. My weight and balance is good, I have double checked it on freshly calibrated aircraft scales. What I am suggesting to New T-18 pilots is to explore the full flap and CG locations at altitude before any landing are attempted.

All of this has proved to be no problem to me, its just a limitation that I have learned to respect. As you know, I fly airplanes for a living and have for most of my life. I fully agree with all the good things that are said about the T-18 and wouldn't part with mine for anything.

I will be doing my annual inspection in April and plan to take the pictures of the auto-pilot installation while I have it opened up and I will send them to you with a small write up for the newsletter.

Will give you a call next time I'm in Dallas. The MU-2 has been down for a hot section overhaul, but we are flying again now so should be over that way before long.

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Not many airplanes have encountered this problem, but please note that the 2 conditions necessary to overpower the horizontal tail are a nearly full forward CG and excess air speed. I've known of one T-18 builder that always kept a 75# tool box in his baggage compartment, primarily because of the forward CG he had as a result of the heavy C/S prop he had and a battery located under the seat.

It should be emphasized that every airplane is different and just because you have a GPU and wood prop doesn't automatically guarantee that there won't be such a problem arise. Check it out at altitude several times, varifying the speed.

Now here's a letter from GLENN YOUNG, a gritty young man who doesn't let a little thing like M.S. dampen his enjoyment of life in general and in particular for his enjoyment of building and flying his own T-18. Equally noteworthy is his wife, ETHEL, who not only helped him build it, but also has learned to fly it. She is also painting a large painting of the T-18 in the air and hopes to submit it for a Sport Aviation back cover soon.

Glenn had to tie a rope to one of his feet to lift it sometime back, but persevered and got the T-18 built and now flies it since his leg is better.

I wonder if their story doesn't say, "If you really want to do something, you'll find a way". If you get a little discouraged with progress on your T-18 once in awhile (who doesn't) pause a moment and think that Glenn and Ethel certainly had moments of discouragement many times.

Serial #802 started in September of 1971 when I developed a health problem and our doctor advised us to sell our Jurca Tempete, as he felt that the chemicals from the glues might aggravate the problem. The Tempete is an all wood single place, low wing aircraft, designed by Marcel Jurca from France. Ours was past pre-cover and we were covering the wings with plywood when we sold it. We looked at all of the metal airplanes available and thought that the T-18 was the best one for us to build.

My wife, Ethel, has about 260 total flying hours, and about 25 hours in the Thorp. She helped with all phases of the construction. We used AN-AD rivets for fabrication as the cost was less than "pops" and it brought Ethel into the project from the start. She drove the rivets and I bucked them.

We started with the ailerons to gain the necessary expertise. If we ruined them, the cost would be negligible. We soon found that working with metal was fun, and not as difficult as we first thought. The airplane was built as close to plans as possible. The first flight was July 14, 1979 by Glenn and the final inspection was November 13, 1979. Both inspections were by Ron Wojnar of the Chicago engineering department of the FAA, of whom I have great praise. As of February 1980 we have 55 hours on the Thorp. Power is from a Lycoming O-290-G with a Sensenich W66LM74 wood prop. Static run-up with full power is only 1950 to 2000 RPMs but climb with 1 person aboard is between 1000 and 1150 ft per minutes. With 2 persons aboard, it is about 900 ft/min. This was timed from lift-off for 1 min. at 100 miles per hour indicated airspeed. The temperatures were around 65°F to 75°F and the field elevation at Litchfield is 1116 ft ASL. Cruise RPM is 2250 with 21" manifold press. It indicates about 140 MPH to just under 150 depending on the outside air temp and the altitude. True airspeed appears to be near 150 MPH. There is a nice buffet prior to stall and neither wing drops off first. We do not have any stall strips on the wing. Stall occurs at 58 indicated with 2 notches of flaps and about 60 without flaps. The empty weight prior to paint and sound proofing was 842# and after paint and 3M acoustical tape, the empty weight is now 860#. The empty CG is 15.1% of chord. We have basic instruments but no radio. The paint is Sherwin Williams acrylic enamel, with the hardner added at the time of spraying. The primer is Sherwin Williams Vinyl Wash with a sealer primer over that. So far, it appears to be sticking well.

The only bad habit that we have found with the Thorp is that when flying solo, the CG is more forward than with 2 persons. It is within limits, but it causes a pitch forward and a buffet on the elevator when 2 notches of flaps are extended above 80-85 indicated. Below this speed, the buffet disappears. A call to John Thorp on this confirmed that others have had this same problem when the CG is forward. John assured me that this would probably disappear when I put 2 persons in it. With 2 aboard, there is no buffet below 100 indicated. Both Ethel and I usually use 1 notch of flaps when flying solo as there is no buffet or pitch down in that configuration. The aircraft is based in Litchfield, MN, which has 2950 ft of asphalt runway. We frequently go to Paynesville, MN, and they have 2300 ft of sod runway. The airplane does very well on both runways.

At present, we are putting together an angle of attack indicator, designed by William E. Brown, of Wichita, KS. His article on this may be found in the SPORT AVIATION magazine in September 1975. It gets the indication from a light and photo cell with a shutter in between. The gauge is a millamp meter. We hope to have this complete by the time the weather warms up, and will send more information on this as we learn from it.

As with all projects, we had a great deal of help and advice. Ed Tvrdik, a close friend, gave us much help with the technical aspect and almost all of the machined parts. Ed is a retired shop instructor and has a lot of experience with milling and lathe projects. Ron Zimmerman, now from Bloomer, WI, has given us much advice with "how to" projects. Also, Ron provided us with wing tips and cowlings all through another builder in Minneapolis. Ron also gave me some dual in his T-18 and let me solo it before flying ours. Fred Davis, Chapter 25 designee, until his death in December 1979, gave us many hours of counseling with both projects. The newsletters are very valuable in all areas on construction and flying the T-18.

We feel that it was a group effort and that was part of the fun. It was an excellent family project also. Ethel did a good share of the work and the kids helped as much as they were allowed. We feel that the T-18 is an excellent airplane and the people that we have met have all been great and very helpful.

As for my health, I still carry a medical 1 year at a time. The problem appears to be Multiple Sclerosis. I have had some problems, but have regained full function each time so far. With "Gods" strength, I hope to be able to fly for many more years. Ethel flies the Thorp very well also so we should be able to keep it in the air.

\*\*\*

I first met JIM ROBERTS at Oshkosh a few years back, when he and his wife made a 1 day visit at the convention with their T-18. They were on the way home from a transcontinental trip that had taken them to Florida and the Bahamas from their Van Nuys homebase.

Due to the short time they were there, I didn't get to study his airplane like I wanted to, but last year at Chino I spent considerable time with Jim going over various features of his unusual T-18. I prevailed on him to write a story on his T-18 and his experiences in the pin feather days of the T-18. After some persuading he agreed to, so here it is:

Hi Dick:

I apologize for not answering sooner. As you so pointedly put it, "Today is a good time to write," even tho' it's months later.

Dick, since our last meeting at John's T-18 reunion party, many changes have taken place. The company I work for (Volpar, Inc.) has been bought out by another company and we have been going through growing pains, overhauling and outfitting Boeing 720s and 727s to executive configurations. But back to the subject of my T-18, N249R.

To start at the beginning of my love affair with the aircraft, another man that worked for me (Earl Love) and I started construction and flying of N299V which was built for DICK HANSON, of Volpar.

During the early days of testing and EARL LOVE was flying it, the flutter problem surfaced. Earl was (prematurely) doing a high speed run when he encountered a severe vibration. Fortunately he reduced power soon enough and by having a constant speed prop he was able to come back in one piece. The only casualties were a bent stabilizer and a badly blistered hand caused by the rapid stick movements.

The spar was reinforced and the problem studied while John put a 180 mph temporary red line in effect. The flutter problem came to a head when a Texas builder lost his life diving in on an airport at far over 200 mph and encountered tail flutter (Documented facts later showed the builder had not complied with recommended changes on the stabilator in several areas, i.e., ribs were not even riveted to the spar - Ed.)

At this point a full blown flutter investigation was initiated by JOHN THORP. STAN ROSMUSSEN and SANDY FREZNAR (vibration experts) were summoned to do the testing. Strain gauges were mounted on the spar tube and the tape readout unit strapped in the right seat. I performed the first series of flight tests, which were done off the coast at Malibu.

My instructions were to set the speed, tap the stick sharply, and flip the switch to "record" increasing the speed in 5 mph increments. Before I started the actual tests I searched out the highest speed that I could still open the canopy to get out in case of an emergency.

John indicated that there is an aerodynamic forward reaction on the canopy. I found I could not move it back above 120 mph, so I took along a big steel wrench for breaking out the canopy--just in case.

My 3 trips up expanded the speed up to 180 mph, where John took over. He wanted to take the risk himself above 180, as he felt responsible. The rest is history, as you know. The results showed a definite flutter at the higher speeds.

2 fixes were called for -- one by moving lead weights to the outer forward surface of the spar from the center (or embedded into the leading edge). We chose the L.E. The other was a beef up of the tab rib.

The second precarious incident in N299V occurred after I installed the flaps and was making an approach to Whiteman Airpark at 90 MPH IAS. I set flaps to 40° (30° wasn't in the system then) when suddenly the nose tucked down steeply, narrowly missing obstructions. Only by dumping flaps did it recover to normal attitude. After this incident John suggested the approach speed of 90 MPH was too high for the 40° position. (In short, I ran out of elevator effectiveness.)

(This subject discussed at length elsewhere in this Months N.L. We might note that a maximum of 30° flap extension is now recommended. Again, take note that the nose down pitch is a combination of too much speed and a far forward CG that overpowers the horizontal tail - Ed.)

Dick, I did a serious study of a few things as I was planning my T-18, so will briefly outline them. Above all I would express that these changes do not reflect any criticism of the standard T-18 aircraft.

In my calculations I discovered I could increase elevator effectiveness from 10 to 12% by just lengthening the fuselage 12". With this change I could have more baggage area, or 2 extra (limited weight) jump seats - up to 170# within the CG range. Also, I would be able to eliminate the need for lead weight in the tail to static balance (common on A/C with constant speed props and big engines).

During the ground vibratory tests on N299V data revealed in the natural frequency mode that longer fuselages could produce more flexing, but 12" was acceptable (with proper reinforcement).

Another study was on the wing. One modification was forward sweeping of the wing leading edge at the root ("skewed" as you called it. or "strakelet") This would move the center of pressure inboard and slightly forward and would also produce a small definite buffet 5-6 mph before the stall, with all indication of lowering the stall speed, of which I'll explain later.

This extra area also provides fuel space for 14.5 gals. each side. The span is increased 3" on each side, but this small increase in span with no beefup reduced my limit load of 6Gs to 5.4 Gs at 1250# GW.

Flush NASA type air scoops on each side of the cowl (just ahead of the firewall at about foot level) supply fresh air to the cockpit (via ducts and "eyeball" valves) very effectively and will flow well on the ground with the prop turning fairly slow.

During the early development of the cowl John furnished the top and bottom contours and suggested easy access to the engine for frequent service, so I designed the first cowl by mocking up the forward cowl rings using styrofoam coated with a hard coat, then forming by hand the first set of metal cheeks. The rest was done by filling with straight lines coordinates, yet with the appearance of curved lines. The first cowl assembly was John's. Then I tooled up then fabricated 18 cowls in my garage and sold them from \$225 to \$275 each before I turned the project over to John and Fred Barnes.

They refined the cowl and retooled with an even better looking cowl.

My cockpit area features several advantages, such as form fitting seats that are easily removed in 5 - 10 seconds. The instrument panel and supporting bar is quickly removed with electrical cannon plug on each end. All this to reach the fuel tank. An oxygen system (22 cu/ft) capacity with 2 outlets installed. It sure is a comfort to have.

The performance of this A/C is still uncertain, as I have not accurately performed an airspeed calibration using a pitot boom on a measured course. The only check I did in early days was to pace John's aircraft, starting at 70 mph through 165 mph.

Below 70 is unknown, so I cannot make accurate claims. However I did some close speed checks and stalls early with LEE HAMLIN as passenger. I started at 8000' in slow flight, 20° flaps, approaching a stall, holding the nose just above the horizon, with just enough power to stabilize. I then waited for the speed to reduce. To our surprise we were still steady at 50 IAS. At 45 a slight buffet was felt, (trying to stall at the wing juncture and fillet area). I plan to tuft the wing and check further some day. At 39-40 IAS it started to break and I caught it before the max pitch down.

Dick, as I've said before this is not a valid set of numbers, because of the static system. The pitot head is a Piper and is mounted under wing and the proper position could be off. It does indicate steady up to the very last, tho'. I think I will try flying side by side with another aircraft and see who hangs in there the longest.

One expression about the airplane so often used by other people and myself is that it is very docile, BILL WARWICK is one person to have flown it and he used that expression.

My aircraft now has 570 hours, 5 trips to Orlando, Florida, the Bahamas, and the greater part of the States with many happy flying hours. The average running time from Van Nuys to Orlando is 12.5 to 13 hours. The longest single flight was from Van Nuys to El Paso, Texas with tail winds, my takeoff weight averages 1800# for the long flights. This includes 57 gal. fuel and 135# baggage, plus my wife and myself. The first hour is slow at 184 mph at 8500 ft. at the end of the second hour the speed picks up to 190-194 mph. As we know, the lighter the aircraft the faster we go any my aircraft is capable by space and fuel capacity to carry more.

Well, Dick, I really did say more than intended. I have tried to be conservative in things listed and some day I will have more legitimate performance data. My paint is deteriorating, so will be repainted soon, maybe with new styling too.

Enjoy your newsletters and am looking forward to the next ones. In the meantime, take care, y'here?

Sincerely, Jim Roberts      \*\*\*

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Thanks a million, Jim, for a fine report and for the bits of history thrown in. There were several real gems of wisdom still applicable today.

I believe Jim probably has the very best location possible for his fresh air intake. He doesn't pick up heated air where his scoops are located, nor exhaust fumes either.

I'm interested in the details as to how he makes his instrument panel fairly quickly removable. That's a pretty tough problem to be easily solvable. If you have figured out a good way to quickly tilt the panel back or remove it how about an account of how you did it along with drawings, sketches, or pictures, if possible? It's a lead pipe cinch that sooner or later you'll want to either remove the panel or tilt it to get at something on the back.

I'm also interested in what Jim finds out about the low end figures when he calibrates his airspeed and also how he comes out in a "who stalls first" contest with another airplane.

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#### T-18S AT OSH

We would like to repeat GALE ABEL's suggestion that on Monday (at OSH) from 12 noon until 2 pm all T-18s will observe "COWLINGS OFF". I think that's a great idea, even tho' on some airplanes it may be quite a chore (mine is) but I'd certainly be willing. At least we might remove enough of the cowlings to permit the new builders to take well lighted photos and make sketches.

There are so many decisions for the new builder to make up there in the engine room that everyone needs all the help they can get. So let's give it a whirl, hey?

MONDAY 12 NOON to 2:00 PM

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Here's a set of stats from LYLE BROOKS on his T-18.

LYLE BROOKS, OWNER, 12015 S. Circle Drive, Whittier, California 90601

SPECIFICATION DATA

May 25, 1976

THORP T-18	N2751	SN 300
Engine:	Lycoming O-360-AIC	
Fuel:	91/96	
Rated Max Cont.	180 HP @2700	
Oil Pressure	60 - 90	
Max Temp	Cyl Temp 500°	Oil Temp 245°
Prop	Sensenich 76DM (Modified) (Metal, Fixed Pitch)	
	Length 68"	Pitch 83"
Wing Span	20' 10"	
Length	18' 6"	
Height	5' 1"	
Tread	63"	
Fuel Quantity	27.5 Gal	
Empty Weight	872#	EW CG 60.7
Datum	Wing Leading Edge Stat. 55	
Mac:	50" Leveling Means: Stiffener on Side of Cockpit	
CG Limits:	61.0 to 71.0	
Gross Weight	1468	
Started	1965	
Completed	1976	
Purchased	3/78 from Jim Fleming, Builder	

\*\*\*

Thanks, Lyle. When you get time to run some accurate performance tests on top speed, stall, R of C, etc., let us know, please. Another good item of interest would be to get someone to measure your average takeoff and landing distances, solo and loaded, best rate of climb speed, sink rate at various speeds, etc. Fuel consumption at various power settings is still another valuable piece of info.

M.A.S. COST INCREASES

For all of you that sent in \$3.00 back when we started the new news letter series, most of you said "Lemme know when and if you need more money." We're getting to the point where we'll be needing to ante up again, as most of our original costs have just about tripled since we got #45 out and the P.O. Department says they're going to raise postage again soon. A lot of you have sent in \$5, \$10, or \$15 to the general fund and you've certainly done more than your part, so I'm not writing this to you guys and it's not meant to be a dun to anyone. We'll continue the newsletter as long as we have something in the kitty.

There were several of you that sent donations to the DAN CULHANE fund, combined with your contribution to the T-18 MAS. Dan had insurance and was grateful for your help, but now I need to return your donation to you. Please drop me a note and tell me the amount you sent in for Dan, so I won't have to take time to go through each and every letter in the files. (That would take me weeks.) I file each and every letter I have received and that includes the ones I got back in the early '60s.

I was gabbing with a mechanic servicing an Aero Commander I was flying that day and his rich British accent moved me to ask where he was from. He came from Barbados in the British West Indies. He saw my T-18 and told me someone had built one of those airplanes at Barbados and he took me into the office and showed me a picture of it in his scrapbook. I remembered corresponding with GORDON BUTCHER there in '64, but lost track of him. It took him 7-1/2 years to build, but he's done quite a lot a flying in it and has been most pleased with it. It is registered as 8P-BGB. The 8P is the Air Registration Board's number for Barbados and I suppose the rest means, Barbados Gordon Butcher. I'll try to visualize the discouragement in building a T-18 on a remote island and I also think about how much of the flying would be over water. Their nearest neighbor island is St. Vincent in the Windwards and it's about 110 miles away over water.

John G. Walton  
5726 Boyce Springs Dr  
Houston Texas 77066

April 28, 1980

Mr. Richard Cavin  
T-18 M.A.S.  
Dallas, Texas

N.L. # 50

Dear Dick:

A few months ago you wrote in the M.A.S. NL regarding the 1978 accident at Oshkosh in which a T-18 stalled on downwind base in a low, slow turn to a landing. It consequently impacted inverted on the runway. A fire resulted after impact and this was, I believe, considered the cause of both fatalities. In the NL write-up you mentioned that the fire probably would not have occurred if the gasoline tank cap had not released (i.e., come out on impact).

I have been giving this event a lot of thought as I've been completing my T-18. I do not know what type of gas cap was involved in the above failure. I do know that a lot of them are like the one supplied on my aluminum tank from Ken Knowles. A picture of this is attached as shown on the copy of a page from the Aircraft Spruce Catalog. The cap in question depends on a tapered disc to compress outward a rubber inner cap. The compression action is achieved by the squared cam-shape of the locking tab on the cap. This is adjustable by an internal AN 365 nut. There is no detent or lock for this tab such as is present on many military-type caps (e.g., T-33 wings and tip tanks) and others.

I have found that this cap will pop out simply by dropping my gas tank from a height of 3' on my lawn. I should mention that the adjusting cap nut was set for maximum compression in the lock-position while still allowing room to remove it when in the relaxed position. I do not know whether the subject aircraft in the accident had this same type of cap, but if it did, the release of the cap is not a great surprise based on the casual tests I made on my own tank.

N.L. #50

April 28, 1980  
Page Two (2)

In order to improve this situation, I have designed a restrictive "stop" on my flush cover over the cap in the cowl skin which rests against the top of the tank cap when in the locked position. The only way the cap could come loose with this stop in the cover would be as a result of a combination of the necessary impact force vectors and significant skin distortion. The enclosed sketch might help to illustrate this description.

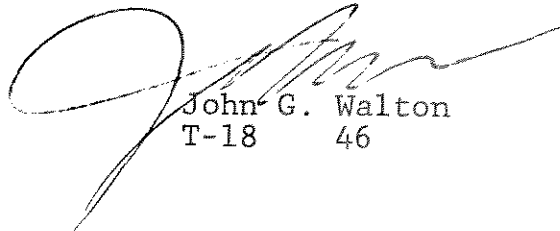
It is my feeling that this style of fuel tank cap is vulnerable to this type of release.

A positive lock on the cap itself might be preferred to my modification to my cover for the ultimate in corrective action. It is felt that the simple stop, as shown on the cover, will greatly reduce the potential of this type of release in almost all circumstances.

Has there been any other discussion or corrective action suggested in this area coincident to, or as a result of, the subject accident (or others).

What do you think?

Sincerely,



John G. Walton  
T-18 46

JGW:db  
Enclosures

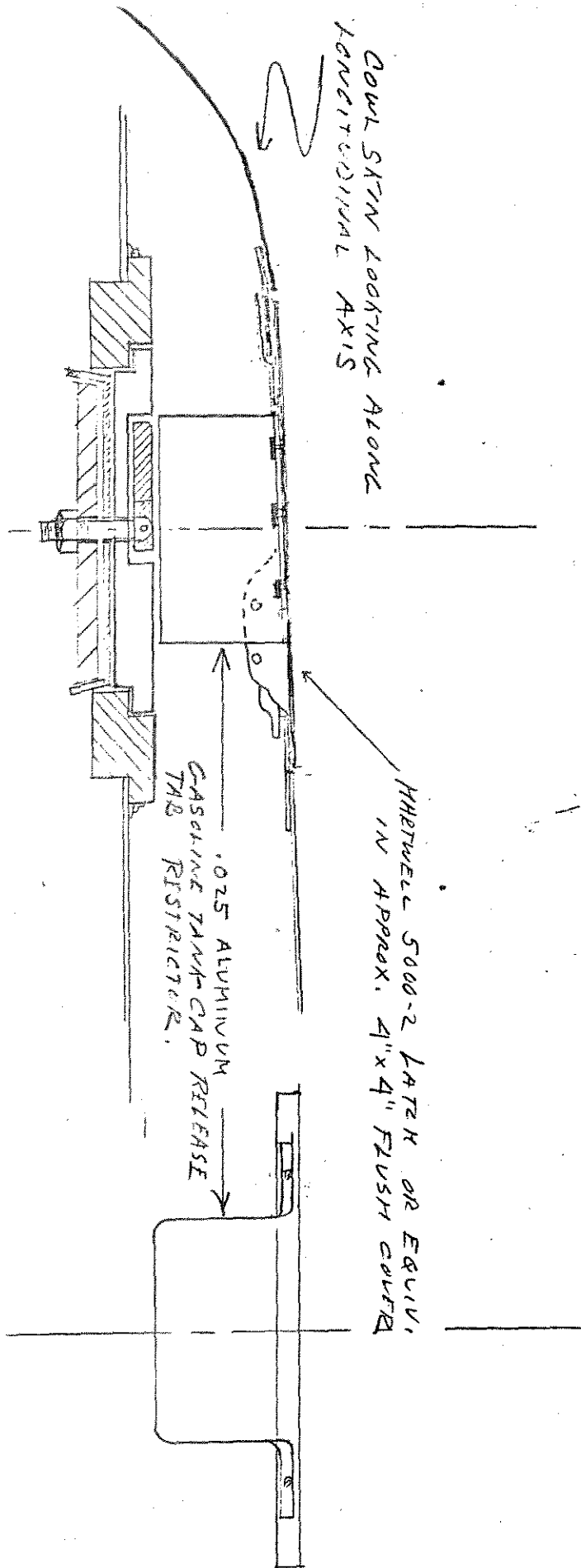
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LAST MINUTE INSERT ON AVAILABLE SPACE:

Glenn Young, 703 Park Ave, Litchfield, Minn. 55355, called me the other day to tell of an engine roughness problem that's come up with the advent of hot wx. His O-290-G has an ~~O-310~~ oil pan (which influences the quantity of flow in the induction system) and his MA4, 10-3678-32 carb works fine in cold wx, but is too much in hot wx. John Thorp told him one of the MA4 carbs that were used on the wartime O-435 Lyc would probably be better. If any of you know of a 10-3323 or a 10-2827 carb he'd sure like to talk to you. If you have one, he'd accept a collect call. Some O-290-G users have fitted a piece of tubing that fits in the induction throat of the carb when using an O-320 sump. It is machined from a piece of tubing and reduces the inside dia. from 2.362" to 1.812", as per the drawing on pg. 95 in Don Pridham's book, "Converting the O-290-G to an aircraft engine". If any of you can offer your experience with this problem, it will be appreciated. I once had a similar problem, solved by blocking induction air on my RV-1.



COWL SKIN LOOKING ALONG  
LONGITUDINAL AXIS



HARDBELL 5000-2 LATCH OR EQUIV.  
IN APPROX. 4"x4" FLUSH GATE

.025 ALUMINUM  
GASOLINE TANK CAP RELEASE  
TAB RESTRICTOR.

N.L. #50

DRAWING NOT TO SCALE

TECHNICAL

4-25-80

LTR. TO RCHINE ENCL.

# KEN KNOWLES Wide Body Panel

SHAPED TO FIT  
STANDARD BODY  
.032 DOUBLER  
BONDED TO BACK  
AS STIFFENER

ALL FITTINGS  
MADE FROM  
ANGLE STOCK

1 ea AN 4-17A  
 1 AN 960-A16  
 1 AN 365-428

2 ea AN 3-6A  
 2 AN 960-10  
 2 AN 365-1032

1 ea AN 3-5A  
 1 AN 960-10  
 1 AN 365-1032

SIDE VIEW →

STA. 67.928

3 ea AN 426 AD RIVETS  
 OR

LOAD MOUNT  
# 8 - 2 HOLE

470-5

N-L 42.0

W-L 42.0

470-4

2 ea AN 426-AD 4-6

RIGHT SIDE BRACKET SHOWN

STA. 70.25

SCALE: FULL  
NOT PRECISE

COMBINATION SHOCK MOUNT & HINGE  
 INSTRUMENT PANEL - THORP T-18C

DESIGNER FRANK SNEDEKER

DATE APRIL 23 1980

WEIGHT 80Z TWO REQUIRED

LEFT SIDE FUSELAGE SKIN

RIGHT SIDE FUSELAGE SKIN

WHERE DOES IT ALL STOP? A year ago a Lycoming O-360 A1A (180 hp) list price was \$7464. One could buy that same new engine from Norm Bender, Inc. for a delivered price of \$6375, which included mags, harness, plugs, carb, fuel pump, and starter-no vacuum pump or alternator. The same engine cost \$8420 list and \$6895 from Bender this year. He advised me that July 1, 1980, that the list price will probably be 9685, an increase of \$1265 in one year! That's a 15% increase. Norm said his discount would be in line with past years. Norm's address is P.O. Box 30343, AMF, Memphis, Tenn. and the phone is 901/365-6611.

latest info on metal cowlings:

FOR YOUR INFORMATION

Dear Dick,

My research into the cowling project has revealed the following information. It is of such significance that I felt this letter was necessary.

John's original cowling design was a simple fairing over the engine case, leaving the cylinders exposed. A further development was the addition of cowl "cheeks". These were considered optional at the time. Flight tests demonstrated their need and all T-18's are so equipped today.

To restate what I included in earlier letters, the original drop-hammer tooling used to form the inlet "cheeks" has been lost. Our original estimates regarding the replacement of this tooling was in error. Our prediction, considered pessimistic at 2-3,000 was proven laughable by quotes ranging from \$4-5,000. Our good faith estimate failed to consider recent "independence" among local metal stamping facilities. (similar to that exhibited by the oil companies) This, together with the fact that the original cowling was labor intensive, led me to ask John about possible forms of relief. In his opinion a single inlet cowling is superior aerodynamically. Since a different forming process may be used tooling costs are back to our original estimates. This will hopefully allow the completed cost to remain within the \$6-800 figure I originally contemplated.

Although I have stated a design "change", the cowling will be John's original design except that the paired inlets will be moved to a single inlet below the spinner. This change will allow for easier oilcooler installation and better induction filtration. Everything else will remain the same. I am now planning to handbuild an example and hope to have it on a T-18 by the end of summer. This change will have some effect on you purchasers. Some may wish to have John's original design only. Unfortunately economics have rendered it extinct. To facilitate further progress I request that you send me your opinion on this new development. Whether you will pay up to \$800. for such a cowling. Whether you would pay more (indicate amount).

I still request that you send no money. Just self addressed stamped envelopes. (5x9). When I get firm prices from suppliers and tool makers, and after I have assembled 1 or 2 to get an idea of the time involved I will set the price. I will then ask a deposit of \$2-300. with balance a set period before delivery. This first production run will be for costs only. Later purchasers will have to pay fair value.

Thank you for your continued interest. I look forward to your responses.

Very truly yours,

*Marc Bourget*

Marc Bourget

Marc Bourget  
P.O. Box 88  
Stockton, Ca. 95201

FORMAT THIS ISSUE: We had to revert to the older format this issue, as our masters got typed by mistake on legal size paper and when we reduced it to put two pages on one, like last issue, it was too small to read easily. I have a considerable amount of material on hand for the newsletters and I will begin assembling the next newsletter just as soon as this one is in the mail I plan to have it in the mail no later than July 1st. The P.O. Dept. has 14 days to deliver 3rd class mail, so if you don't get #51 by 20 July, let me know.

I had delayed mailing this issue for a few days to allow time for the photo-engraver to find the double photo page that got lost in his files somewhere. So far, it's still lost, so I may have to get new photos from Jas. Ciciora, Glenn Young, Bill Cox, Bob Furrer, and Hank Steiginga. I'd like to encourage all of you with airplanes flying to send a photo (black and white preferred, but a very sharp one in color will sometimes do) and a complete report on the building and flying of your airplane. If you bought it from someone we'd still like to have a complete report & photo, what trips you've taken in it, how you fly it, how it performs, any problems encountered. Next issue I'll have a very good one from Walt Giffen. We now have the space available in the N.L.s to print everyone's T-18 story, so take pen in hand, etc! Other builders really are interested.

Again, I apologize to you gents for taking so long to get this issue aloft, but it's been a rough year so far, but now that my arm is a little better I think I'll be able to crank out about four more N.L.s the rest of the year and maybe five more....if you guys keep sending in material.

Next issue will have some dope on EXPLOSAFE, an aluminum honeycomblike material used to fill gas tank cavities that suppresses fire and explosion. Harlo McKinty will have a booth at Oshkosh and the Explosafe people will be there to explain it. Harlo also will have samples of Temperfoam, a space age foam used for seat cushions. Both products are excellent and I'm sure you will want to learn more about them and see the real thing.

LAST MINUTE ITEM FROM KEN KNOWLES: Had a note from Ken saying that he had now flown the complete wing with the LDS-2 airfoil and finds that it stalls 5 mph slower than the wing with the LDS-2 airfoil on the outer panel only (It in turn stalled about 5 mph slower than his wing with the standard airfoil/wing). It starts to buffet about 10 mph before stall, giving very good warning and a very gentle and mild break. He thinks he may have to approach at the same speed as before, as the sink rate gets higher at the slower speed and could give a good bounce if one flared a little high or too slowly. We'll have more on this later when more experience has been accumulated.

The FOLD-DOWN INSTRUMENT PANEL drawing shown was designed and built by Frank Snedeker, who lives at 53-102 Halai St. in Hauula, Hawaii, 96717. Frank will be retiring from Aloha Airlines in a couple of years and plans to have it flying before then. All airline equipment has quick-tilt panels or pull-out panels for quick change of instruments at short stops. We have a bit different problem, true, but it shouldn't take as two days to get at the back of our panels and this area deserves a lot of thought. Frank's solution is certainly a step in the right direction and we are truly grateful, Frank.

The next issue will also include a reprint of an article I wrote for our chapt. newsletter, called "Understanding Flutter". I doubt if you'll understand flutter after reading it, but if it makes you more cautious and respectful during the building phase it will have served its purpose.

PLEASE RE-NUMBER ALL PAGES  
IN THIS ISSUE

*Stick*

CONGRATS TO LEE REILLY, WAGNER, OK. ON 1ST FLITE--

My apologies, gents, for being so tardy in getting #51 cranked out. My wrist problem really got me behind this year, but I got it cleared up a few days before RMA. I guess old age might have been a very small factor, too, even tho' some doctors I know say that it is young. Right after OSM I had the symptoms of a severe health problem pop up and by the time I went thru all the tests and got everything more or less under control again another 3 weeks went by. I was already playing "catch up" before all that and so I had to just do the best I could and take care of first things first. Anyway, I'll try to get some more stuff out before the first of the year, so be patient with old folks. It may be slow, but usually we get there.

THE ANNUAL DINNER, OSM '80: It was really great to see so many of you there again and to meet some new T-18 friends. To no one's surprise, we were outnumbered by the Mariesses this year, but what we lacked in numbers we made up in fun, friendship, and an almost fraternal camaraderie. Our T-18 dinner was again a ball out and a whopping success, due to people like John Walton and Jerry the Jnr. Jerry even started a T-18 Annual dinner album, where everyone signed the guest book below the picture that was taken at each table. The T-18 Annual Dinner is really a great idea to get acquainted with our T-18 buddies and their wives (and kids, too). I don't know how to explain it, but I think we really have a super bunch of people in our group.

Open House conducted the T-18 Forum and did an excellent job, too. Now that over 300 T-18s have been built and flown, and the total accumulated flight time is probably approaching 150,000 hours, we're accumulating a very large pool of experienced people. This means there is a great wealth of construction knowledge and pilot experience, and that means we don't have many unknowns. There are remarkably few "AIs" in the past 16 years of flight experience. No factory built could even come close to that record. I think the designer and the builders can be justly proud of that fact.

On Monday at noon it was "Cowling Off" time and about three fourths of those present very generously opened up their cowlings for a couple of hours. I'm sure the rest would have, but probably forgot about it or didn't know. Anyway, next year we'll have some printed reminders to give to plane owners as they arrive. The Hotchkiss people were all smiles at the sound of clicking cameras and the new builders were a happy bunch to see how the old pro's did things. A lot of the old pro's were very pleased to see how the other guy did it and I think everyone learned something, which was what it's all about.

A great many non-T-18 builders came by our area and were enthralled by the idea. Several said, "Wouldn't it be a great idea if everyone here would open up their cowlings?" It really would be great, wouldn't it? We should have done this long ago. Our hat's off to Gale Abels, whose idea it was originally. He wrote a letter to RMA a couple of years ago, suggesting it. It was published in the "Letters to the Editor" section of S.A., but as is often the case, inertia prevailed.

We spend a tremendous amount of time and effort in educating everyone about the minutest details of airframe construction, yet only the skimpiest info is available on what must be done from the instrument panel forward. One case in point: Should the intake air box for the carb be aligned with the plane of B.L. 0 or with the center line of the cowling, since the engine is offset? Observing a large number of T-18s, you'll not only find devotees of both schools of thought, but also some that just split the difference. Some even pointed the air scoop forward, but angled the intake box.

Other cases: On the front cylinders, what per cent of the cylinder barrel do you cover with the inlet baffle and what is the optimum shape? What is the ideal oil cooler location? Ditto the landing light location?

In the past two years I've received 40 or 50 letters from builders wanting info on the above subjects, especially baffles. I'm sorry to say that so far no one has volunteered baffle patterns. It would be so easy to make a set of cardboard or paper patterns while you were doing yours up, wouldn't it? Simply lay your flat layout on a piece of paper and trace it. Send it to me and I'll make up some duplicates to send out to the troops. Be sure to identify the engine and type of cool used, as there are some differences....P.L.M.E.

NEWS OF POPE ENGINE: A considerable number of you have written about the possibility of using the Javelin Ford (Pinto) engine in the T-18...to me, it's too heavy. However, the engineering concepts that have been thoroughly tested and explored in this engine have an exciting promise for the low budget builder. Hope is not only on the way, it's practically here.

DAVE BLANTON, the president of Javelin Aircraft, recently called me and asked me if I'd like to come up to Wichita and fly the Javelin Ford powered Oscura 17. Is the Pope Catholic? I hopped an early morning airplane the very next day. After a walk around pre-flight and quick briefing I got to fly this remarkable power plant, and to put it mildly, I was very impressed.

There was no point to comparing airplane performance with a standard 172, since the airframe has been altered by the addition of a belly scoop housing the radiator (for a specific engineering purpose only). It would be like comparing apples to oranges, but I certainly was interested in a number of things about the engine from an operational standpoint.

It starts on the very first blade, without the usual violent shaking. It's incredibly smooth at all rpm's. Warm up time was very short in the 95° heat. In T/O I could definitely notice the difference in initial acceleration the 222 hp made, even tho' the belly scoop was all but dragging in the high grass. It felt much like a C/S prop was on the nose. The sound is completely different, what there is of it. It is not only much quieter, but the sound is more nearly like a turboprop. You hear mostly prop noise, with some noise coming from the turbo and the belt reduction drive. When the engine is turning 3400 rpm for T/O the prop is turning 2700 and the turbo 110,000. The turbo is an excellent muffler of exhaust noise. When you come back to cruise power of 4600/5500 rpm the noise level drops drastically. On final it's almost ghostly.

Its throttle response is excellent. Severe yawing of the airplane produces no noise or vibration. The automotive carb gave no problem in a near vertical nose climb and positive or negative G's were completely uneventful. I was also a little surprised how much airframe noise one hears, power on and off, much like a car at highway speed. There was much less heat in the forward cabin area, too. Dave says the hot water heater works great and keeps the cabin toasty in even the coldest wx.

You've all read the Javelin Ford story in Sport Aviation, as well as the story of Dave's ultra-sophisticated dynamometer, how he took a stock 140 cu. in. Pinto engine and made an economical, dependable aviation engine of 226 hp. out of it. (Auto racers have gotten as much as 300 hp out of it for an entire season). Its weight compares favorably with an aircooled engine of like power and it burns 35% less fuel! (Now if fuel hits 12/gal. and it saves 2 gals./hr. that adds up to \$4000 for a 1000 period. Another way of saying it is, if you fly 150 hrs./yr. that \$4/hr. it saves would buy you a \$600 radio). The 222 is .30w per hp/hr, as compared to .57 for an aircooled engine. Still another bonus of a liquid cooled would be an increase in range of 52% on your stock tankage.

This engine has primarily been only a test bed for the newen, smaller Ford engine Dave has known about for several years and THIS is THE engine of the near future. It is the 96 C.I.D. you can see NOW in the Ford Escort or Mercury Lynx. Unaspirated, it put out 100 hp and weighs (complete) within 15 lbs. of

a Cont. 0-200 (100 hp). In 1951 the CID will go to 110, will have a Porsche turbo as factory option, will put out 150 hp, and with coolant, radiators, etc. will be considerably less than a Lyc. 150 hp 0-320, and you can hang it in your airplane for less than \$2000! Moreover, you won't need a prop extension. It is also dimensionally small (23" w x 12" h x 22" all), so it will not only go easily inside the present theory cool and still have room for radiator(s).

Will it take prolonged running at high rpm? The answer is a resounding YES! Ford randomly ticks this engine off their production lines (in Europe, where the engine has been produced for several years) and runs them WIDE OPEN for 3000 hours! All engines are balanced to perfection. If one of them has the slightest vibration they junk it, along with all accessories. (You'd have to experience it to believe how smooth the engine is. Like an electric motor. The secret is it retains the flywheel and the turbo does the rest).

One of the things I learned was that turbocharging actually adds to engine life, contrary to popular opinion. Turbocharging GREATLY reduces reciprocating loads and thus gives longer life, as hundreds of thousands of turbocharged car owners already know. There are many thousands of turbocharged trucks that routinely pull 25 lbs. of boost (21"), while Dave's engine operates at a very modest 6 lbs. boost (4.2" for 1/3). Sucking air into an engine accentuates the power on power off recip loads, while a turbo will almost "blow" a piston down.

Dave has the highlights, but if you want the complete story I'd suggest you get Javelin Aircraft's SS info pack, complete with 7 torque charts, as drawn by Dave's super dyno. It's really an education, I promise you. The address is P.O. Box 16181, Wichita, KS, 67218.

CONSIDER A NEW IN PROGRESS: I didn't get to fly my T-18 to OSH, as a volunteer "mechanic" accidentally knocked a hunk out of my prop. Dean Cochran loaned me his extra Cassidy prop, but I ran out of time. While talking to Bill Cassidy about a new prop and learning it takes about 6 months to get one, he told me of his "plan" to sell a prop "kit" to builders at a considerable price reduction. His prop kit is a prop blank, with a pre-drilled hub, and finish-profiled on the thrust side, with all but about 1/8" of wood removed on the other side. Using simple hand tools and a vibratory finish sander, the builder completes the profiling and finish sanding. The prop is then varnished, tipped with fiberglass, and balanced. He furnishes an excellent 21 page manual with the kit, that takes the builder step by step to the final balancing and it is profusely illustrated by drawings and photographs. It looks easy. All materials and several of the tools are supplied with his kit (for \$240).

I found the booklet an education and I'm looking forward to making a spare prop this coming winter. As I've said before, I'm really sold on Cassidy's Pacesetter prop on my 160 hp. engine. It gives me a measured P.A.S. of 197 mph at 2725 rpm at 15000 ft, with an OAT of 71° F, along with a quick 1/0 and climb. His prop was also on Kent Paser's Mustang II that clipped off 225 mph on 150 hp at OSH in '76 in the Pomary Efficiency Contest.

While a wood prop is more easily damaged than a metal one, it's much lighter and I can have at least 2 (and maybe 3) of them for that a new metal prop would cost me. Above all else, I like the peace of mind that it gives me. A cut-down and retatched metal prop can be lethal if it isn't tested to define the rpms that can cause it to self-destruct, as most of you well know.

I'm not belittling other wood props. I have had experience with Cassidy's, so I'm simply passing on my personal opinion. I'd like to publish other builder's findings with their props. Be sure your tach is accurate when taking data. I would suggest a minimum 5 mile course 90° to the wind for accurate timing. Also, take about 5 runs and then find the average speed. Use a common spot on the wing L.E. to start and stop the time. Also, if you'll fly the airplane loaded

well towards the aft CG limit for that little bit extra speed.

GROUNDING OF WIRE TO AIRFRAME: It's a very basic thing, but perhaps it's often neglected. My 160 hp engine is a high compression engine and requires a geared starter to take thru compression with authority. For the last several months it has been a pain to start (intermittent y). I took everything off the airplane and had it checked item by item. All to no avail. Eliminating these items pointed to a power deficiency problem, between the battery and the starter. The problem was finally tracked down as an inadequate ground between the engine and airframe. By adding a flat braided wire between the necessary case and the upper landing gear bolt the problem was eliminated.

When we had "cowls open" at OSH I noticed that only 2 of the T-18s there had used any engine to airframe grounding wires. Discussing this with an old pro mechanic from the '20s and the '30s, he told me they really had trouble starting the big radials when they first came on the scene...until they tied things together with multiple braided grounding straps. He also said auto racers using magnetos could not get anywhere near top rpms without grounding to the frame. In fact, he said they found the trouble while running the engine in the dark and saw sparks jumping from the engine to the frame at high power, so maybe this really isn't a little thing. If any of you have any additional info on the subject, let me know, please.

OFFSET CONTROL SPICKS: This subject has been mentioned before, but I think it's worth repeating. I'd sure recommend the offset sticks if you're building a standard width T-18. Every time I get a big guy in the right seat and let him fly he nearly rolls us when he pulls the flap handle (even tho' I brief him in advance). If you are carrying any left adheron on approach it's a problem. It's a big help on the left side, too. If you are small you'll probably tell yourself you don't need it, but I guarantee that the first guy you'll have in there will be a giant. When and if you go to sell it it's a lead pipe cinch that the potential buyer will be 6'5" and weigh 260 lbs. The problem is really the tunnel on the left side and on the right it's the distance between the flap handle and the stick.

NEW AIRFOIL LAYOUT: On the following page you will note that we have a table of ordinates for the new airfoil. In case you go thru the complete table of wax yourself and make your own ribs, etc. I'd like to refresh you on a very basic, but significant point: If you will look at your nose rib drawing very closely you will see that the rib and the skin are shown. Remember that your form block must fit inside of the rib. The airfoil ordinates are never the form block size, so don't make the mistake of making your form blocks the size of the ordinate layout. Your ribs would be taller than the spar and also too long. Visualize the rib as being the exact size of an airfoil shaped door opening. It must fit that "door" snugly. That door opening is the wing skin. Now you must remove the rib thickness from the form block all around. So how in the world do you scribe a line either .025 or .032 in from the outer edge of your template? Here's one way.

Take a small piece of scrap of the same thickness of the rib stock. Take another piece of scrap of any thickness (but preferably much thicker than the rib stock. Now either rivet them together or use a small c clamp to hold them very tightly together. (second piece will be somewhat longer than the one that's the thickness of the rib stock). Now you have a simple little marking gauge. Just hold the longer piece tightly against the outer template edge as you slide it along and hold your scribe against the inner piece and you can make a good, sharp line to go by. Don't forget to lean the scribe at an angle, so you aren't marking more than you should. It's easier to do than tell about it.



## NEWSLETTER INDEX OF SUBJECT MATTER IN ALPHABETICAL ORDER:

Feb. 5, 1980

Dear Dick,

Thank you for sending the newsletters out so fast, I really appreciate it. I have just made a quick index on the earlier N.L. and since I haven't started construction yet I'm not sure which of the items supercede older ones. If it's any help though here's a copy. By the way "x" refers to the cancelled N.L. of 1-12.

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ZZZZZZ: whenever you can find time.

I'm sure I missed some other things that may be needed but anyone that is interested enough in building the T-18 will surely read all the N.L.s anyway.

Thanks again Dick and I hope to see you at Cshgosh 1980.



Bob Jaeger  
2405 Melrose  
Melrose Park, Ill. 60164  
312-455-0787

You might want to photocopy these two Index pages and put them as page 1 and 2 of your bound volume of T-18 Newsletters. Note that the new newsletter series from #45 onward are not covered in this index (Ed.)



Howdy Pard.

THAT YOU MITE USE THIS IN THE NEWSLETTER,  
LOTS OF FOLKS THINKS ITS A BIT SILLY BUT IF  
YOU HAVE EVER SEEN WHAT LOSING A CHINESE  
PROP CAN DO, YOU'D BELIEVE IN IT. I HAVE,  
AND I DO.

THE BOYS IN THE PRPA CAME UP WITH THIS  
A FEW YEARS AGO AND ITS MANDATORY ON ALL  
THE FORMULA ONE'S + BIPLANE RACERS.

THE MAIN IDEA IS TO GIVE THE ENGINE  
ROOM TO THRASH ABOUT UNTIL IT GROANS WITHOUT  
BREAKING THE CABLE, SO DON'T SNUG IT UP  
TOO TITE. ALL IT HAS TO DO IS KEEP THE  
ENGINE FROM FALLING OUT.

BE SURE THE LUGS ARE BOLTED TO THE  
LANDING GEAR ATTACH + NOT THE ENGINE MOUNT.

I'VE HAD MINE IN FOR YEARS NOW. GIVES  
WONDERFUL PEACE OF MIND + CHEAP INSURANCE.

~

BOUGHT A CHUTE OF ARIZONA, GOT A  
3000' HARD TOP RUNWAY, GONNA START  
BUILDING HOUSE + HANGAR SOON AS I CAN.  
ITS CALLED "EAGLE'S ROOST" IN AGUILA ARIZ.

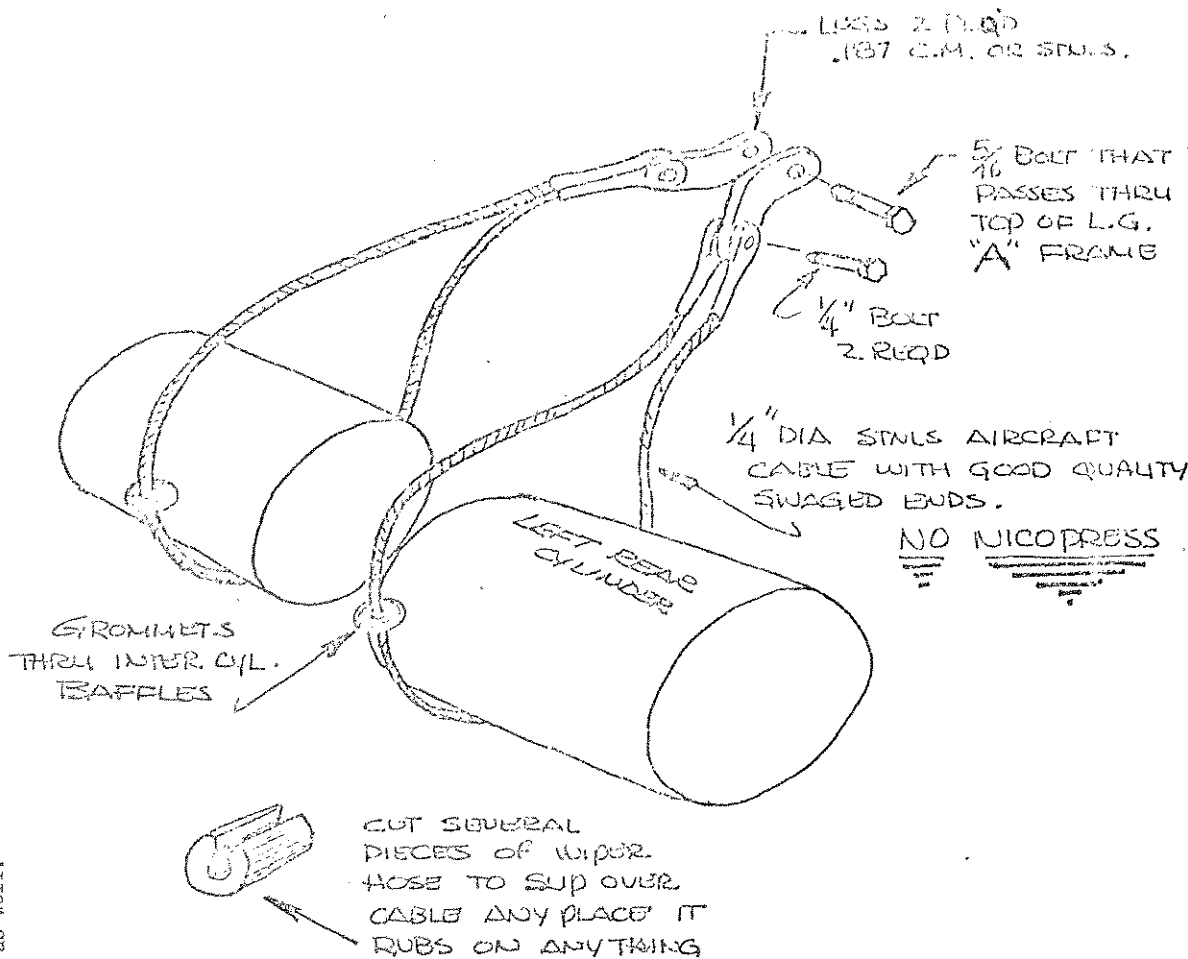
LOVE IT!

SEE YOU IN CHANDO

BILL WARWICK

P.S. IN 3 MOS. OL TIGER WILL BE 16 YRS OLD!  
IMAGINE THAT!

Thanks, Bill, for some very important advice. I lost a good friend from this  
very cause several years ago. He "planned" to put the restrainer on when he  
got back from the XC and had more time. He never made it. When the prop let  
go it shook engine, prop, and cowl completely out of the airplane and it pitched  
up into a stall and augered in. It also shook one aileron off and the windshield  
as well.



REMARKS ON THE SPARK INDICATOR: Glenn and Ethel Young, 703 Park Ave., Litchfield, Conn., have been using the 7-16 at CTR again this year and shortly after they got their 7-16s they were drawing a small crowd of 7-16 builders around their yard. They were talking about the version of the angle of attack indicator that was described in the 7-16 issue, 7-16 issue of Sport Aviation. They are still evaluating it and seem to be using it and that far they are beginning to have confidence in it and feel that it will be a very valuable tool in its final form. They have the air-foil shaped vane mounted on a short boom out near the left wing tip. I believe Glenn told me he had used a damping device in the boom transmitter to eliminate flutter sensitivity and that the whole package was very inexpensive. Around \$25, I think at that. Anyway, he said they will soon write a report for the KAS 11's. An angle of attack indicator can be a very valuable instrument for precisely controlling minimum safe speed on final approach. Several 7-16s that I've flown have practically zero stall warning buffet. Especially if you gradually "weak" the airfoil on final and were a little careless about setting too low. I have had a number of incidents and some accidents when some of the low wing 7-16s flared too high or flared too rapidly. Some lean too far the other way and come in with much too much excess speed and flop so far down the runway that they "use up" all the runway and hang their neck on fences at the last minute.

A stall indicator can also be tied into the circuit and this could be used to give the pilot an audible warning on approach or flare when his attention is diverted. Present type of stall warnings are inadequate, as they don't give the pilot the time to close with the critical angle. They only tell him that he is close. I once flew a research airplane of Prof. Sargent's that had a stall indicator that went up in frequency as you increased the angle of attack. It soon may not be able to carry a tune, but they can certainly make a very effective musical notes. As the notes go up the scale, even one degree change in A of A is very evident.

Since A of A indicator is also valuable for selecting the proper climb angle and for speed control in turns. It might even save your life if you had a power indicator and needed to maintain the best L/D without approaching an inadvertent stall, which is almost 100% fatal at low altitude. It might well be the best \$5 any of us ever spent, especially if your 7-16 is one of those with zero stall warning. I mean to put one on mine, not only for the above reasons, but also for what I will be teaching in cruising flight.

I've recently have a copy of the Sept 175 S.A. and can't get the form EAA HQ has requested. Sam Bergeson will photocopy specific articles for 20¢ per page. He is the one who puts out indexes for Sport Aviation 1 advertisements in S.A.

REMARKS ON THE SPARK INDICATOR: As we have had several hundred new builders and readers come into our group in the past few years, perhaps it's time to again define the score, intent, and purposes of the newsletters.

First of all, the 7-16 K.A.S. newsletters are an information exchange only. We occasionally make random builder's experiences, methods, opinions, and suggestions and then pass on to the group. Then it's up to the individual if he chooses to use or reject the information. When circumstances warrant, we will directly ask other builders for information, if it involves the OW. Otherwise, please keep in mind that our material is in the "free-for-all" condition.

In the past we've made typographic errors and hopefully we've caught all of 'em and corrected them. Since the writing, editing, printing, collating, folding, addressing, and mailing of several hundred newsletters each time is a one man operation, we are all of you will be tolerant of our irreverentions.

In the cases of Grams corrections, or recommended modifications from the design-  
(7-16) ~~team~~

We'll not publish the information until our written copy is cross checked for accuracy, even tho' it incurs a delay.

Time is a stressful factor in my writing the newsletter and I have to do some of the writing in the wee hours when it's quiet. I write about 30 lines each month for our chapter newsletter and edit it. I also spend some time on various newsstand materials. Mainly mine my own 7-16 and talking some 1-10 comments up now and then takes up about all the rest of my waking time. Now my old friend, ONY SIGARELLS, is prodding me to write a book on building metal aircraft. If I do that I'll need to get a hobby to take up the rest of my time.

In light of the above and to summarize, please consider the newsletter in the light of good friends and fellow builders exchanging experiences and technical opinions. Don't set it in the light of an inadequate authority representing engraved sterling silver tablets of instruction, that is the way I view it. I have a story to tell about aircraft matters. He'd probably deny it, but I've never seen him even hesitate when someone asks him a question about airplanes. He's the right answer right off the top of his head. As far as I'm concerned, he knows the right way to solve any of the problems we face and others have the same high opinion of him that I do.

NOTE ON BUILDING THE FRONT SPARS: In the last 7-16, we discussed one of the ways of assembling the front spars and we mentioned using a large elastic weather caliper to maintain the exact distance from outside to outside of the spar caps. Get an extra looking "minder" for you construction square, since it or the black and you've got a super caliper that will stay put where you set it. When you have the distance set, check the height of your spars against your own height with your new caliper. They should be EXACTLY the same or you'll have humps and bumps where the skin crosses the spar...and that's a big no-no.

To repeat another caution: Be sure and check and re-check the angle (15°) before being attached to the spar cap. It is NOT a right angle, but it is 15°! If it has happened, in case of doubt, label every thing as to front & back, etc.

NOTE ON THE ANGLE OF ATTACK INDICATOR: As I was writing the article on the Glenn Young A of A indicator I was trying to recall where I had read something else on the subject. It finally came to me. It was in the 7-16 issue from two years ago in the July 170 issue. It was by Jerry Guehl and was entitled "Aces and A's" and well illustrated. It illustrated a non-specific type of instrument and the article dealt with all the various uses of it. You probably won't have access to that issue of S.A., unless you are the fortunate type that has that I am. I never throw an Aero mag away. Anyway, I think the article is so informative that I'll reproduce it and the other S.A. article in this issue.

THOUGHTS ON SERVICE AND MAINTENANCE: Now, while you are building is the time to plan ahead on service items. Here are a few of those things to consider: PLANING OF THE WING: Had you considered how and where to place a jack if you need to change a tire or work on brakes? I carry a little jack in my 7-16 at all times for that very purpose...just in case I have a flat or some such out in the woods. It's a variety of a piece of 1 1/2" tube (slightly more than 4' of the tubing circumference) that fits the landing gear leg fairly snugly. It has a piece of flat 4130 about an inch wide welded to it. The flat piece is about 2" long and is bent in the shape of a V...only the V is turned over on its side. The part of the V that is horizontal is where the jack is placed. Both ends of the V are welded to the tube segment. Works fine. Of course I have to take the gear leg fairings off to use it, which is a little time consuming the way mine's made. Maybe there's an easier way to do it. How can you do it? Just like an auto, you don't want your jack point too high up for fear it will fall off the jack.



Feb. 20, 1980

Dear Dick,

Sorry to be so long getting a letter to you.

The engine making exhaust kits & systems and have been doing quite a few for all kinds of airplanes. Just completed development work with the Pitts factory on a new crossover system to meet the new noise reg's and am currently supplying their kits systems for the S-2.

The T-18 has kept me from anything but basic maintenance on my T-18. It still looks the same as it did at Oshkosh. I do hope to get gear fairings & upholstery before this year's flight. This winter forced me into a cabin heater. It's only 2 sq. ft. by 5" long held onto one tailpipe by an Aero Champ. It works about like an old VW heater- warm enough under cover but cools quickly on letdown.

The airplane performs quite well here in the Buryer area. Ron Rogers stopped here on his way home to Australia from Jax. Last year, he reckoned it didn't perform as well as his T-18 but when he worked it out on a computer the density alt was 1000' that morning.

It's a great pilot (does airshows in Aus. with his bird) and should be a fine pilot, say's it feels like he's in maneuvers. We've got it over the hump to the western slope several times as our son is attending a flying college at Rangely, CO.

Returning back a few years trying to nurse a Luscombe or P-18 up over that same rockpile there is just no comparison. A lot of fuel, some baggage, the wife & I can leave Jaffco, climb at about 1000 ft, go right up over the top and still be climbing 700 ft at 12,000 ft. The 200 mi trip takes an hour & 15 minutes.

When I was 100 ft with a Cassidy 60X60 prop. It's making up a 60X60 for me now as I think I can still get respectable climb with better economy. Being from the old school, I can't bring myself to let an engine run very long above 2500. The current prop gives close to 2900 giving a true 0.195 (calibrated by running with 2 Bonanza's).

Passing back over this letter it sounds boastful. I don't mean it to be as I am just T-18ized and do think I was pretty clever to have picked an airplane 17 years ago that still suits me today. Bill Cassidy said it was the only plane ever test flown in the age hardened condition.

Good to the great job on the newsletter.

Best Regards,

Dean Cochran

Dean

They say that when it rains it pours. I guess that's true. After years of drouth trying to get some of our members to make up a good index for plans and also a subject index on N.L. topics, we got in a bunch. I had received one from Paul Helling on the N.L. index and was in the process of copying it and turning it up when others came in. First was the one by Bob Casper, closely followed by the very complete one by Jim Vail. Both of these are in this issue. I had received one from Elmer Hyman and still another from one (whose name I lost). It had a notation at the top which began "Not in file at time of typing" and was dated 3/1/78. I apologize for losing your name and if you'll send me a card and identify, I'd like to give you credit. I usually scribble the donor's name on the back of articles, etc., as letters and articles frequently get separated in the pile of T-18 stuff on my desk. Lord Lull had sent me a couple of electric system schematics some time ago. I published one of them, but the other got "lost" in the area of my desk for several months, but I'll have it in #52. Anyway, guys, I go thank you for your time and trouble in compiling the lists. They are really a big help in researching a subject or finding a particular drawing.

FILING PLANS: For years I've kept my plans in a filing cabinet in my shop. I keep them in numerical order, with the drawing number on the upper left corner as I face the cabinet. The number is inverted of course, but this is no problem when I stand alongside the cabinet and look down. I've seen others use this method, using a box they'd built out of scrap plywood for that purpose. Now that you have some good indexes to refer to it'll be a snap to get a drawing out in jig time. \*\*\*\*\*NEEDED\*\*\*\*\*

Another item we need very badly is an up to date material list. If some of you that aren't engaged in building your T-18 right now for one reason or another would go thru each drawing and list the raw material or parts needed for that particular sheet it would really help. As a suggestion, in figuring sheet steel requirements, don't forget to allow for flanges, etc., and to figure to the nearest rectangle size. Where there are several identical parts (i.e. flap hinges) it may be possible to save a little material by some dovetailing of irregularly shaped parts. If there are material options (i.e. side skin thickness), so state.

By the way, I still get questions about Hi-Shear rivets from some of the new builders. Yes, it IS okay to substitute aircraft bolts for Hi-Shears. If you have the tools and can get the Hi-Shears, sure, go ahead and use them. They are time savers, which is primarily why factories like 'em.

Anyway, if you've got some extra time right now to spend on the material list problem, it'll not only be greatly appreciated, but it's also a most excellent way to become familiar with the drawings, where the parts go, what sequence is used in assembly, part numbers, what tools are needed, etc. If you'd like to volunteer for some of this, please write me and I'll coordinate on who does what drawings. In that way it won't be too big a burden for any one person.

Torque wrench use: Bolt torque is important on almost all aircraft applications. An experienced mechanic can make a pretty close guess by feel, but if you are not really experienced it'd be a pretty good investment to buy a torque wrench. If you have a mechanic buddy perhaps you can borrow one. Example: Do you know how much to torque the prop bolts on installing a wooden prop? Torque 'em too much and you'll crush the wood fibers. Too little and it'll slip and char the wood where it's in contact with the prop flange. The answer given in the mechanics handbook is 200-225 in./lbs., depending on density of wood used in the prop.

Cover picture this N.L. is Glenn and Ethel Young's T-18. I hope to have N.L. #52 in the mail in about a month. Adios.

10301 Colsonet 86  
P.O. Box 3128  
Burbank, Ca 91504

-PAGE 8-  
T-18 N.L. # 51

To: Mr. Harold Streater  
From: Ron Taylor  
Transcribed: August 19, 1979

\*\*\*FLASH...at press time Ron Taylor had made it ok to Hawaii & was enroute to the next stop on his round trip flight from U.S. to Australia & return !!!!!!!!!!!!!

## SUBJECT: PUTTING FUEL IN THE WINGS:

Hi, Harold. I remember our very pleasant visit at OshKosh, and I have your letter of 2 August. Thanks a lot for writing. I think I will go over your letter first and give you the name of the people and then I've got some remarks. It's so much trouble to put all this on paper that I thought I'd let you have this tape--it would be a lot easier for me, if you don't mind. I've been having a little trouble with this recorder; I'm going to play this little first segment back and see how it is. Okay, it seems pretty good, Harold.

The gentleman you met from Arkansas was probably Lloyd Toll, an old time aviator, a builder from way back, a heck of a nice guy. He sure had a lot of pretty good suggestions--a real nice type.

Oh, the Dealer. I've dealt with these people only by phone, so I don't have the address but I have the phone number and the company so I will give you that. It's PRC. It's called PRC--that's the product. And I got it the Aircraft Tank Service Company, Burbank, California. My contact was Mr. Mike Fuller Area Code 213-875-0686. I understand the company has been sold but I am sure it is still in business because it's a good little company and I am sure whoever bought it is going to work it. I would suggest you tell them what you are doing and ask them for exact instructions, but just in case they don't tell you this, you seal with their compounds only places that will leak, such as rivet holes. If it is solid metal, just leave it alone. Start with the metal as clean as you can get it. I think I cleaned it with MEK or something like that. Anyway, ask them how to clean the metal so that their material will stick. Now where you have a solid sheet of metal, it's a solid sheet that obviously will not leak. Don't do anything to it. Just leave it the bare metal. Some people have been very carefully using PRC and then when it's all through they pour on a half-gallon or gallon or so of this ? slushing compound to finish the job off. This is absolutely wrong. The two do not mix and then you have problems. Just use their sealant and where you don't use their sealant you just have clean metal. It's inside the tank--it won't rust. And if they forget to tell you this, it's very important.

---NOISE FOR A LONG TIME---

ON THE TAPE

... is right in the same area and it comes out of the top of the rib with an L-shaped fitting, down with a plastic tube and out the bottom of the tip. Another L-shaped fitting that points forward into the wing ( ). I think it gives you a tiny bit of pressure and the hole size is only  $\frac{1}{8}$ " --it's not very big. And that's how I wanted the outside leading edge.

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Then I went to the inside rib nearest the fuselage. I took that and at the very bottom of it--staying out of the radius, of course--I put an outlet there. It goes straight through. That goes to a hose which goes across the gap to the inner panel which is No. 532. It doesn't go straight through. There is a fitting in the way. If I remember right, there is a sort of a U-shaped loop...I used Hercon tubing from Ryan Hercon in Burbank. It's extremely good tubing and it's been in four years and it's fuel resistant/cold resistant. I'll get you their address in just a minute in case you want to use some of their tubing. I believe it's  $\frac{3}{8}$ " diameter (inside).

Now on the print 532 which is the assembly, center wing, John took the main spar and out about 11 rivets--that is from the fuselage out, that's where the spar is thickest--we doubled the rivets up. Now somebody told me since then John had said "Don't taper the spar until you get almost down to the fitting--the bell-tank ? fitting on the outer rib --that's rib 536-- don't taper until you get almost out there and then just cut a circular corner out of it. And then double those rivets all the way up. Now I'm pretty sure that somebody told me John says to do that now. I didn't, and my wing's been okay.

Now on my center wing only the 3 bays forward of the spar are wet. That gives me about 12 to 12 $\frac{1}{2}$  gallons of which about 10 is useable. Now in this, also, he had every rib go up to the next size larger. For instance, for an 025 rib, go to an 032. Now if a rib is 040, leave it alone. It's okay. And we didn't go from any 032 to any 040 ribs. But that makes that stronger there. Now the skin here is also 032 instead of 025. In this case the inlet which faces the 8 degree outer panel we just talked about, in the bottom of it, forward of the fitting, which is the high point of an airplane that's flying--that's the highest point--I mean the lowest point--so the fuel can flow across to the bottom of this tank --that, the aluminum fitting--staying out of the radius--is just off the bottom there. It comes in from the outer panel to the (back??) Now there is no filler cap in my inner panel so the problem was how to get the air out of it. If I didn't have an outlet, a vent, the tank would never really fill, and that means that the --in the center sections, the panel is formed by the inside ribs--these are the 544 ribs--it would never vent properly and the tank would never fill all the way.

So what I did was come out--I'm talking now about the inside rib forward of the spar, it's a 544 rib--Again, everything is figured for the plane to feed fuel in level flight. It has to fill with the tail down, but it flows in level flight. So in talking now about the 544 rib next to the fuselage in the leading edge, my outlet is in the bottom of that. It's a straight through bulkhead type fitting. Of course it's sealed off on the inside with the PRC. And then go straight through and then I cut a hole in the fuselage and that goes to the Christiansen valve that sits down between my feet. And it's the same on both sides. And then I put hose across where they meet the Christiansen valve and then from there I came around the outlet of the Christiansen valve --that's a single outlet--it comes up in a U-shape with a one-way valve in it just so the main will never feed back into the wing-- and it goes to a T fitting.

Now this T fitting--I come out of the main down to the T, and one part of the T--top T--goes back to these wing Tanks? I'm talking about. But it can't flow because of that one-way flow valve. And the other side of the T goes right on from there through the fire wall to the main fuel (Stack). Now that's now I did it.

Now the question came up of how to vent these leading edge tanks on this inside section--this 532 section. Off the top of it I made another outlet straight through another bulkhead fitting. It's on the inside rib, forward of the spar, nearest the fuselage just above the outlet. From there I ran another line (this is nothing but a vent line) through into the cockpit. I think there might be another way to do this. You asked about this in your drawing... I went back to your letter. It says "Another suggestion in Oshgosh was that if you were going to seal the area forward of the beam and between the two most innerboard ribs," Yes, I did that. "If you were to include an additional rib an inch or so from the fuselage to give room for air vent into the cockpit." This is a possible suggestion. I can't really tell you how to vent this section. Well, this all goes back to one thing. What are you going to wet? If you are only going to wet the center section, leading and forward of the spar, then you've got to have a vent in there. Okay, now, here's one suggestion. Why not just come up--there's about a

of overlap skin from the inside rib next to the goes right to the fuselage where the rubber seal is. Why not just take a fitting straight through --a 90° fitting, rather--forward of the spar and that inside rib and turn it up and just come out the top of the skin somewhere. Now that piece of skin has got no stretcher in it. It's simply overlapping a rib and getting next to the fuselage to seal it. Anyway... anyway you want. What I did on mine was, I went--you don't want to do this probably--I went into the cockpit around to the panel that as I sit there is on my right side (I forget the name of the panel) but back through that and I went aft and I brought it up to the top of the fuselage behind me and then down in a big U-shaped bend with my plastic tubing again and out the bottom.

-----NOISE-----  
ON TAPE AGAIN

...535 that you don't wet the back of the spar. This puts a lot of strain on the fittings and John doesn't recommend this. If you wet only the center section, you get an additional 10 on each side --20 gallons total. If you wet the whole leading edge, then you ~~should~~ get 10, 10, 10 and 10. That's 40 extra gallons. I don't know what this will do to your CG because, like I say, I have my outer panel aft wet. But don't do this, it's way too much. I'm not sure how much extra fuel you wanted. Let's see. That gives you some idea of what I did.

Oh, let me run through some miscellaneous stuff. I'm back to print 532. The 544 ribs from the spar forward, they are also on the bottom. I had put in between every rivet that's on the print another rivet. I doubled the rivets on the leading edge

coming clear on up almost to the nose. It's too hard to do them right around the nose radius, but from there on down to the bottom they are all double riveted. Now to construct these I also cut a hole--a 3" hole--with a back-up plate and I can take the inspection plate off each of the bays, there are three bays for fuel in the leading edge on this 532 print. Now this was for construction. You have to seal the PRC from the inside of the tank, not the outside. When you start laying the skin around the top of the main spar, as you rivet you are going to come to a place where you can't put the sealant in before you rivet. It's impossible unless you have these three construction holes. I hope you looked under the bottom of my wing because each of the panels that I wet--that's on one side it would be 3 in the leading edge, inboard, 3 in the edge outboard and 3 in the back of the outer panel--that's 9 inspection holes on each side--because each panel has an inspection hole for construction. It looks like hell, but if you take your time and make the back-up plates right and flush them, I haven't had any trouble with those either. But like I say, John suggests nobody wet the full wing like I did because when I fill the thing with that's 48k gallons on each side, it's extremely heavy on takeoff and could cause a lot of trouble and there is no need for it unless you want to go over 1,000 or 1,200 miles. Of course I have the regular main tank too, also.

Part of that tape had a bad spot in it and I can't remember what I said there so I will quickly review.

When I suggested putting that wing vent between the innermost rib and the fuselage pointing up, be careful that you don't get it in a fire hazard area. It's going to have gasoline vapors there. It might be a bad place for it. Maybe you ought to run it through the fuselage and then aft back clear through the... somewhere back aft so you can get rid of the vapors away from the engine. Mine are way back in the aft and are no problem so be careful with that suggestion I just gave you. It might not be too good. See the point is, you have to vent... if you are going to wet the outer panel, you've got to vent it in such a

way that the vent is much higher than the tip to get the damn thing out and its got to be from the inside...from the inner panel too.

I've gone over your drawing and you have an extra rib showing in there. I don't see anything wrong with it. I didn't do it. I don't think it is necessary to put the extra rib in there. But it's possible if you put it too close to the fuselage if there is any bending at that point in the main spar for any reason, then it might hit the fuselage and wreck the skin a little bit. By the way, my fuselage skin is 032 also. In other words, the airplane has been beefed up all the way around. I think this is a good idea.

I think in the bad spot my wife said that it was the name of the tubing company. This is plastic tank tubing. You can get any kind you want, just specify what you want and how you want

airplane and it had to be flexible. I would like to see through it and use it as a sight gauge and it had to resist 100 octane fuel. They sell it by the foot in any size you want and it is tremendous stuff. I've had it in there for about somewhere over 6 years now. My contact was John R. Bernier. The company is Ryan-Hercos Products Corporation, 1311 West Magnolia, Burbank, California 91506. The phone is area 213- 849-1143.

-PAGE  
13-

The tape's been a little bit better. Here's some more rough ideas and comments.

I tipped the wing upside down on two padded sawhorses, sealing as I riveted. Now what I did was I started at the back beam and riveted the bottom around ... came on around as I did it. I used regular AA rivets for this because they seemed to seal better. John told me don't cut any holes in the main spars or any of the spars. Now, he said it might weaken the spars. It's possible if you cut a hole in a spar and put a big back-up plate on it it will do the job, but I don't have any holes in my spar ---none. The way I got the fuel, there are no big holes in my ribs---they are solid ribs. I drilled enough small holes in them so actually the fuel just leaks through from one bay to the other. It's a little bit slow. I wish I would have put a few more holes in it. But they are spaced so that at any level the fuel will run through from the outer panel into the inner panel.

When I tested the tank, I used water. I used 2-2½ pounds of water and if I remember right, my hose was up 6 or 7 feet. Something like that. I did it so the wing skin started to bulge slightly and there were no leaks. By the way, I used water because it was safer. When I did one panel the first time with gasoline, I had a leak and it ran all over the garage floor---scared the heck out of me. And I also had to go back through these inspection holes---probably twice on each one at least. On one I know I went back three times trying to get all of the little holes sealed.

Also, where your ribs go in, the way the drawing of the ribs are, they are not meant to be sealed. You have gaps on both ends. Anywhere on a rib that goes to, say a main spar, especially the outer rib and the inner rib, because it has to be sealed off, I made little metal plug inserts and put in there, and things like that. You're going to have to be a little clever about sealing. Sealing material is not meant to seal big holes, so if you have a big hole, put something in there, some kind of material in. If it's round, I put an aluminum rivet or I put an aluminum plug or something like that. You'll see where she's going to leak. It's quite apparent.

Well, I got over your letter and I think that these are some ideas. Sure not all of them by any means. And if you can meet any body else who has sealed the ~~outer~~ wing, it would be good to talk to them too. I had good luck with mine, and I don't think I would change anything I did, or I wouldn't do it any other way. That's probably the best recommendation I can give you. If you have any more questions or problems or whatnot, just write me another letter or give me a call. I hope this has helped a little bit. So, good luck. We'll see you later.

By the way, this is the end of the tape and there is nothing on the other side. Hope it's clear enough and it will help you out. Hope to see you in Oshkosh again later. Good luck. Let me know how your wing comes out.

T-18 NEWSLETTER #51

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T-18 MUTUAL AID SOCIETY  
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LP-ENGINE 0-290 GPU, KEN MORGAN, 439 LOUELLA DR., HUNST, TEXAS

A great deal of information is available on the 0-290G power plant. Most agree that it is a reliable engine, if properly overhauled and maintained. Recently, less interest has been shown in the engine due to its scarcity and the availability of spare parts. Some T-18 builders may have GPU engine planned for installation in their aircraft. If so, the following information may be of some value.

I just completed a top overhaul on a GPU engine installed in my Starduster 2-place. The engine had about 160 hours total time since new. The compression check was good; however, oil fouling of the bottom plugs on #1 and #4 cylinders prevented proper operation of the power plant. Disassembly of the cylinders revealed excessive valve stem to valve guide clearance. Don't believe the GPU manual on the clearance that is acceptable. Refer to the Lycoming overhaul manual for guide to stem clearance specified for the 0-290D. The search for replacement parts ( intake and exhaust valves, guides, rings, and top gasket set ) went from the typical aircraft distributor to the salvage yards that once sold GPU engines and spare parts. Gentlemen, inflation is definitely with us. However, after some extensive shopping the following sources of supply were used. All furnished airworthy components, at the most reasonable price.

1. Rings and top gasket set was purchased from Mr. Carl F. Baker, 14837 Aetna St., Van Nuys, Ca. 91411, Phone 213-786-3120. Service was excellent with same day shipment of parts, even C.O.D. Mr. Baker also has standard aircraft components if desired.
2. The prop reinforcement flange is available from Aircraft Spruce and Specialty. This is a bargain for about \$ 30.00, and possibly the cheapest insurance you will ever buy. They also have the longer driving lugs required if the flange is used.
3. Valves and valve guides were purchased from El Reno Aviation, El Reno, Oklahoma. These are original GPU valves and perfectly suited to aircraft use. John Thorp has indicated these valves were, in his opinion, equal to aircraft quality valves. El Reno has most any other part required to convert and/or overhaul the GPU. This includes items such as the accessory case, mags, pistons, rods and bearings, and other misc. components required for GPU conversion.

I recently made a business trip to San Francisco and had the opportunity to visit with John and Kay Thorp. I am happy to report they are doing very well and John is still busy tending to T-18 inquiries. This visit was a dream come true for me as I had wanted to personally meet this fine gentleman and thank him for the great aircraft he has given to us. During our conversation, Mr. Thorp related his experience with the GPU having personally overhauled approximately 35 to 40 engines. His opinion has always been, and still is, that the GPU makes an outstanding aircraft power plant, if properly overhauled and maintained. With the cost of certified engines going up daily, it may be time to dust off the old GPU.

My T-18 project has been on the back burner for almost a year as I have spent this time on the restoration of an early Starduster 2-place biplane. This work has been completed and the T-18 fever is abuilding once again. Present project status is: Fuselage riveted and on gear. Vertical fin and rudder complete. Horizontal tail ready to assemble. Electric trim in place. 0-370-B2B high compression 160 HP engine in crate with 1176 hrs. Will go folding wing, but no components or material in work. I vote YES for national T-18 Fly In.

*Thanks, Ken, for the 0-290 Prop.*

When and if we get a complete bill of materials, and if there is sufficient interest, I'll do all the indexes and list full size in a separate mailing. If only a few request it I'll send you the list photocopied full size. Allow 12¢/sheet, plus about \$1.25 for postage and envelope.

NEXT  
ASSY

NUMBER

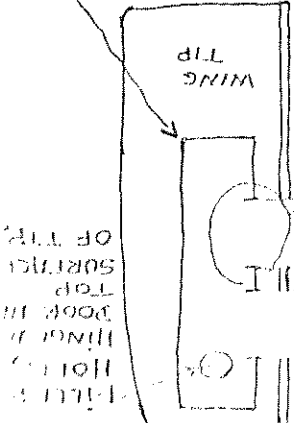
TITLE

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5" DIA. ALUM. INJECTION PIPE - APPROX .050 WALL. WING TIP

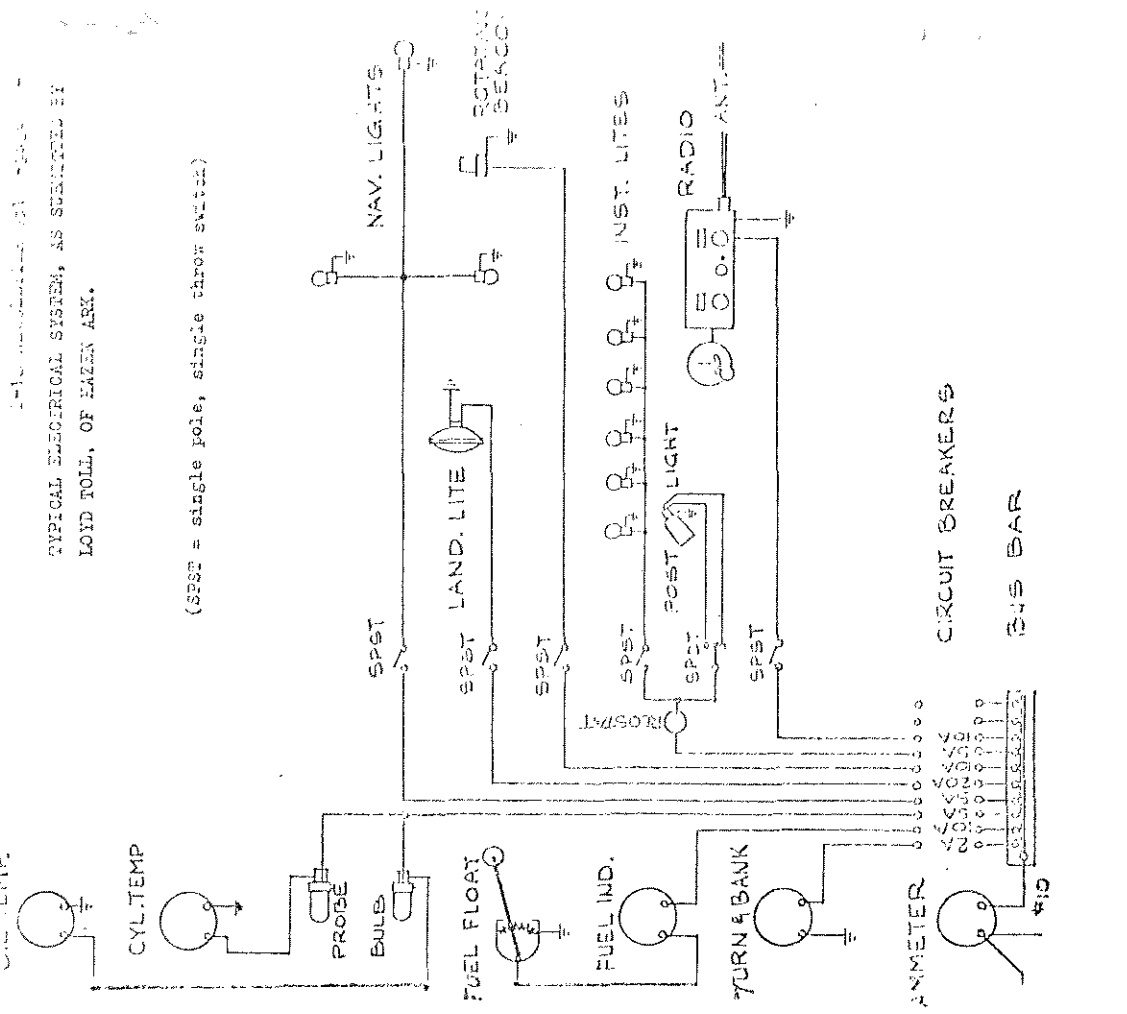


CONNECTOR - FILLER BOX INSIDE TIP MADE FROM .050 SOFT (TIN SHOP) ALUMINUM, HELIARCED,

WING TANKS, AS USED BY CALHIE WOOD IN HIS "FOURRUNNER" HIGH FUEL CAPACITY AND THAT THE INTEGRAL TANK WAS THE BEST SOLUTION FOR THE F-19. EVERYTHING CONSIDERED. "THANKS FOR THE TALKING" CALHIE

EACH 5" PIPE HOLDS ALMOST A GALLON/FT OF LENGTH. THE FOURRUNNER WING PANELS HOLD ABOUT 22 GALS PER SIDE.

2 TAPPED END PLATES 1" DIA. 1" DIA. 1" DIA.



# ACCESSORY ELECTRICAL CIRCUIT (INSTRUMENTS, LIGHTS & RADIO) WIRE SIZE NOT SHOWN, TO BE #15



Paul Grozier  
9730 Moorberry  
Houston, Tx  
77080

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T-18 MUTUAL AID SOCIETY  
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DALLAS, TEXAS  
75229



You have all heard about the best laid plans of mice and men...well, that's the way it's been here the past couple of months. My wife and I took a much needed trip to Hawaii in late Oct. She hadn't had a vacation trip since I retired in '76 and since we could go for a small airline pass fee it didn't dent our retirement budget too badly.

We got back the 6th of Nov. and I had every intention of getting N.L. #52 in the mail before heavy Xmas mailings started. We had a nice little chapter fly-in on the morning of Nov. 8th and that evening I was in the emergency room of the hospital getting prepped for an emergency operation to relieve a strangulated surgical hernia that I had left over from a gall bladder oper'n several years ago. The oper'n and recovery went very well, except the Dr. shot me down when he said not to lift anything heavier than a quart of milk for two months. (How do you get out of a T-18 cockpit without lifting? You don't). If all that wasn't enough, my wife's father died at Thanksgiving time and all the ensuing details ate up another couple of weeks. By then it was too late, as mixing our 3rd class mail with holiday mail would have been an even worse problem than it is normally. So here I am now, hoping no more major problems arise before I can get this issue printed and in the mail. In the interim I also have a chapter newsletter to write and print at the same time I do this one, as well as a couple of magazine articles to crank out.

**BACK ISSUES:** I constantly get a stream of letters saying, "I didn't get N.L. #.... etc". Getting these back issues to you has been almost as much of a problem as getting the N.L. itself out and some people haven't even gotten the requested back issues when I sent them to them first class mail! While I was recuperating I worked out a long overdue filing system for handling all of your correspondence more efficiently. Here's the new plan: If you are closing any of the newsletters (or pages) between #45 and this and future issues, send me a postcard (not a letter, due to filing space requirements) telling me what issues you are missing and I'll enter your name and the no. of the missing issue for the next newsletter (if it gets to me in time) and I'll get it in mailing with the next N.L. If you receive the N.L. but no back issues please send me another postcard and I'll get it to you. If your card arrives a few days after the N.L. mailing we'll event the postage to you and send it 1st class. A good copy of the newsletter is in the N.L. haven't noticed N.L. #45 in last N.L. either, but I'm sure it's somewhere. I'll look for it. I'll also look for N.L. #46, #47, #48, #49, #50, #51, #52, #53, #54, #55, #56, #57, #58, #59, #60, #61, #62, #63, #64, #65, #66, #67, #68, #69, #70, #71, #72, #73, #74, #75, #76, #77, #78, #79, #80, #81, #82, #83, #84, #85, #86, #87, #88, #89, #90, #91, #92, #93, #94, #95, #96, #97, #98, #99, #100, #101, #102, #103, #104, #105, #106, #107, #108, #109, #110, #111, #112, #113, #114, #115, #116, #117, #118, #119, #120, #121, #122, #123, #124, #125, #126, #127, #128, #129, #130, #131, #132, #133, #134, #135, #136, #137, #138, #139, #140, #141, #142, #143, #144, #145, #146, #147, #148, #149, #150, #151, #152, #153, #154, #155, #156, #157, #158, #159, #160, #161, #162, #163, #164, #165, #166, #167, #168, #169, #170, #171, #172, #173, #174, #175, #176, #177, #178, #179, #180, #181, #182, #183, #184, #185, #186, #187, #188, #189, #190, #191, #192, #193, #194, #195, #196, #197, #198, #199, #200, #201, #202, #203, #204, #205, #206, #207, #208, #209, #210, #211, #212, #213, #214, #215, #216, 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-ition, causing roll-overs to be "uniquely". You might check with John Moore on this because he has always told us to set the wheels to track straight or slightly toed out, but never in. But be sure to do the measuring with the ship fully loaded and the tail on the ground, as in a landing configuration. I did this on my ship this way (cut shims until I was blue in the face) but it is about as doable to land as any T-18 I know. Best regards, Chris.

Chris went on to say he'd been turned down on his medical by the FAA and was selling his T-18. (It later sold to Jim Hernandez, of Seattle, WA, and he wrote me a long letter telling me how much he loved flying it. Jim is an airline pilot, flying internationally, and also a sailplaneer from way back).

Thanks a million, Chris, for all the info. We are all greatly in your debt for all that outstanding super information. These things you laid out will make life a lot easier for the new T-18 builders and maybe it will inspire some of the older builders to jog their memories and write in how they did some of the things. Anyway, we'll all be looking forward to the flap and horizontal stabilizer articles. Making the flaps was a bogger for me and quite a few others, too. Another builder told me of that method of alignment of trailing edges on the last set of flaps and ailerons I made (with a slight deviation in Chris's technique). I used a cleco in every other hole, but left them in there until I had driven a rivet in the adjacent hole. I had a bucking bar that had a round bar of slightly under 3/4" dia. inserted in it at one end. I drove the rivets very lightly. I then removed the remaining clecos and put rivets in the rest of the holes. I used a hand rivet squeezer on these and finished squeezing the others. I did use heat treated rivets, but they were all relatively soft, as I had them freshly annealed and heat treated and used them straight from the deep freeze. I got reasonably straight trailing edges, but probably not as perfect as Chris's. The same builder that gave me the tip had used an epoxy to bond all parts together, but for some reason I don't remember now, I chose not to use epoxy. It's self-evident that anytime you drive a rivet with a flush set that you are going to thin out the metal adjacent to the rivet. That thinned, excess metal has to go somewhere and the only place it can go is in between the rivets. I used universal head rivets (not flush) for that reason. I have seen a lot of builders that expunged the parts together and then countersunk both sides of the .040 fillet strip and dimpled the .016 skins. They used 3/32 rivets and wound up with a flush head on both sides. Such excursions from the norm may be OK, but they may not be either.

**MORE ON FLAPS:** I finally got good results, but the biggest problem I found was getting the leading edge skin bond to fall in exactly the right place, with the proper radius of bend that matched the contour of the flap nose rib exactly. To bend up the flap skin correctly it takes quite a lot of excess material on the P.E. of both the top and bottom skin (even tho' it's all in one piece). An additional amount must be added to the bottom skin, just like we do on the wing skins. This extra amount, which is trimmed off after bending, makes the shape of the flap rib a symmetrical airfoil shape for the moment of bending (only). The trailing edges of the top & bottom are cleco'd together and the leading of the skin is formed as described in Chris's article on the flap in this N.I.

I believe it would be 100% easier to bend that skin if it was .020 instead of .025. Someone told me that they had talked to John about using .020 and that he felt that .020 would have been adequate for the flap skin, but that he had called out .025 so that an additional size of aluminum wouldn't have to be purchased for that one component only. I haven't had a chance to verify that with John, but will do so at the earliest opportunity. The much smaller flap segments on the folding wings make the whole operation much easier, even with .025 skin.

You may be interested in the dimensions I used to make a symmetrical airfoil

Chris says he'll get around to doing a piece on the flap and stabilizer, too, so stay tuned. He says he'd do them right away, except that he claims he is lazy. Don't you believe it! I got a note from him the other day and he had recently built a whole new wing and tail group for serial #7, that had been bent up some time ago in a ground loop. He had just completed a new flight test program on it and here's his note in part: "Just finished flying off test time on #7 and it's going well. One problem is tail heaviness, which is due to

0-200-G with wood prop; lightest configuration

1. wood prop lighter than metal
2. steel tail spring 3 lbs. heavier than alum spring
3. the battery (most important of all) is located aft of frame #57, whereas it should be located just behind Sta. 94, at the forward end of the baggage compartment.

4. Another contributor is the location of the EPP aft of frame #57. We will move the battery pronto and that should take care of it. Altho' I am not a wood prop fan, this one works well except for slow acceleration on the ground (too much pitch) and the engine is very smooth. I built a new wing and tail for this one and James Bony (owner) has given me flying privileges, so now I can stay current. " (Best attitude adjuster there is, Chris-3d.)

Now if that isn't enough, I have part of another letter from Chris several months ago with several other sage observations on T-18 building:

1. Seat upholstery: Creature comfort can be greatly improved if the center seat and back panels are covered with cloth fabric material, not vinyl or nautical vinyl. This is because the cloth "breathes" where vinyl does not. It makes a significant difference in hot weather.

2. **AILERON HINGE GAP SEAL:** Most builders have sealed this gap with 3M tape, which is quite difficult to install properly. A better and simpler method is simply rivet an .016 or .020 alum strip to the bottom trailing edge of the wing skin. It should be about 2" wide and be 2024-T3. Paul White first did this to his "Kongo", but he hinged the strip and sprung loaded it. We found that this was not necessary however, as the 10' down throw of the aileron doesn't deflect the seal strip enough to warrant the extra hinge.

3. **CONTROL SURFACE TRAILING EDGE ALIGNMENT:** It has been my experience that the most dependable method of producing a straight trailing edge is to use two 3/4" extended angles of 2024-T3 .063 stock. Drill 1/8" holes in them to the trailing edge rivet layout. (2" holes will permit using clecos in them) clamp them on each side of the P.E., back to back, with only enough clecos installed to hold the P.E. together. Use only 240 holes at this point. After the angles are clamped in place, remove the clecos. You will note that the 240 hole alignment won't be perfect, but will clean up when you use the #30 drill for final rivet size. Next with the angles clamped in place (2" C clamps) install 1/8" bolt alum rivets with a hand squeezer, being very careful not to oversqueeze, as this will cause the P.E. skin to open up. DO NOT USE HEAT TREATED RIVETS AND DO NOT DRIVE WITH A RIVET GUN! Your trailing edge will be straight as a die!

4. **Landing light location:** Most of our T-18s located out here at Fernex, Ca., have the light mounted in front of the R.H. front cylinder battery, where it shines thru the prop. It does not restrict airflow intake at this location, gives good lighting and is very simple to install. No holes to cut, complicated wire runs, etc. Bill Warwick first told me about it and Bill Smith made the mounting bracket for my ship, so they might be able to furnish some dimensions, etc. (We'll have a dwg later-Ed.)

5. I was a bit baffled when I read about the discussion of wheel toe out con-

out of the flap rib shape. Measuring from the center line of the trailing edge rivet holes on the top side of the skin to the center line of holes (punched for the express purpose of mating with a like series of holes on the bottom skin) I added exactly 10.00 inches. From the center line of the trailing edge rivet holes on the bottom skin I added 10.9 inches. I had a local sheet metal shop layout man verify these numbers before I made my template and I also made up a 6" wide piece, clecoed the trailing edges, and bent it up and the leading edge bend fell where it was supposed to. The whole procedure is identical in principal to what we used on bending the wing skins to properly locate the L.E. bend.

If you make a template and go the matched hole tooling route you will have to be exceptionally accurate in laying out all lines of rivet holes, or else you will wind up with a twisted flap, and you surely don't want that. It could plague you with lateral trim problems from now on out. Be sure that all lines of rivets in one direction are absolutely parallel to each other (tram) and that the other lines are exactly 90° to the other lines.

Actually, in my opinion M.H.T. is more trouble than it's worth for the flaps. The simplest thing is to just order your flap skins and ribs, etc. from Ken Knowles. He has already done all the tedious layout work and everything is already center punched, ready for you to drill and assemble. Here again as Chris pointed out on the fin, etc. it's recommended you first drill with a #40, assemble, then drill out to 1/8" or #30, as the case may be (depending on whether you flush rivet or not).

If you're the stubborn type and insist on making it all the above method of skin bending will work well for you. You should lay out the two "dummy" lines of holes the very last thing and I would recommend you clamp a transfer strip (about 1.5" wide) under the top line of holes when you drill, so that you drill both parts at one time. When you use the transfer strip to lay out the 2nd set of holes....CAREFUL....be sure to keep the strip in the same plane as when drilled. Don't flip or flop it or your holes will not match. Label it before you unclamp it. I would also review all older write-ups on flaps, in N.L. #15 and #17 in particular. Incidentally, as I was using our new index in N.L. #51 some of the quoted page no.s didn't jibe with the pages in the N.L.s, but I found the info at some other page in that N.L. Anyway the index is a BIG help to all of us, even if it does nothing more than identify the # of the N.L. that the subject is in. I still like to review a complete newsletter when I have occasion to look up something.

UPDATE ON THE NEW JAVELIN FORD ENGINE: I was able to put Dave Blanton in touch with an Austin firm (Jet Industries) that buys new cars, takes out their engines and installs electric motors, (for leasing thru their dealers) and they had just finished with two new Ford Escorts. Dave bought both of them and says he will have the conversion running on his dynamometer by March 1st and the other one flying in the Cessna 150 test bed by May 1st.

The first engines will be unaspirated and he feels that it will put out 110 to 120 hp. (Since John Thorp has repeatedly said you shouldn't put less power in a T-18 than 125 hp let's not even consider this version in a T-18, please?) Dave is confident when a turbo is installed that he'll easily get a 50% power increase and we can safely plan on it being a 160 hp engine...that will burn 35% less fuel than an air cooled engine of like hp.

Ford has scheduled this engine to be produced with a factory installed Porsche supercharger in late '81. Whether current economic conditions will affect this projection significantly isn't known yet, so don't rush out and buy one just yet.

What will it cost? Dave paid \$800 for new engines and he feels you soon will be able to buy low mileage engines from insured "totals" for less than that. A complete engine (converted) shouldn't cost over \$2000. The savings don't end there, tho'. First of all, you won't need a \$100

prop extension (it's built right into the reduction unit). If fuel goes \$2/gal. as forecast soon, it'll save you at least \$4/hr. That'd save enough to buy a complete avionics package in a couple or three years... pay for your insurance, etc. In fact, if this little engine lives up to expectations, I can foresee people removing their gas hog engines, selling them, installing the Javelin engine for the considerable economy of operation (know people right now that have drastically cut back on the hours they because of fuel costs). As to overhaul costs, they obviously would be g. You could even scrap the block assembly and get a new one for far less would cost for an aircraft engine major overhaul.

What will it weigh? The whole package, with all accessories, plus coolant system, will weigh LESS than a Lycoming O-320 of comparable hp. Lyc will weigh 278# dry, the Javelin engine wet, will weigh 270#!!!! Th of the Lyc as given may not include accessories (source, Jane's), but t of the Javelin includes everything, even the radiator.

You can safely produce 5 hp/cu. in. in a liquid cooled engine (1.7 in t Javelin), but an aircooled engine's top limit is only .5 hp/cu. in. jus of the potential of the liquid cooled engine!

You might be interested to know that the complete weight of the radiator coolant, and hoses is only 18 lbs.

With the present T-18 tank you could have the option of extending your by about 1/3, or you could add 35% less fuel to keep the present range save about 60 lbs. in the process...the wt. equivalent of starter, alt and coolant system combined.

Will it be reliable? Won't turbocharging strain the engine and degrade. On the contrary. A turbo-pressurized intake manifold maintains a constant pressure and greatly reduces recip loads on all internal parts. An engine air pump and it has been found that sucking air into an engine is the wrong way to do it. Thousands of trucks are supercharged and pull 25# or with far greater reliability than unsupercharged ones. The Escort engine operate with only 6# of boost for t/o.

Temps are higher, yes, but the turbo engine not only has the finest quality valves and other parts, but also has forged pistons. The real difference the liquid cooled engine's advantage in hp is the ability to cool all parts of the engine evenly, while hot spots (i.e. valve guides) limit the air cooled potential and require much extra fuel just to cool them.

The engine will have dual solid state ignition (one as standby) which is at least 4 times stronger than the best mag. By the FAA's own figures, the of magnetos are responsible for 30% of the internal failures of aircraft.

If you are interested in this engine I'd suggest you write Dave and get complete story. They have an excellent info book on the subject and it's 50 pages of excellent technical information. Write Javelin Aircraft, Box Wichita, KS, 67218. It'll be one of the best five bucks you ever spent. I education in itself and it's written by one of the most highly respected in the business. His motive is to bring out a good, low cost engine for homebuilder, not make a lot of money. His other business interests bring in a comfortable income and he has invested quite a lot of time and money the research program and he hopes to eventually break even. We'll all owe a big debt if this engine proves out like it looks like it might.

I will have an article on this engine in the April issue of "Homebuilt A magazine, describing it in a little more detail and my observations on the Javelin powered Cessna 172 test bed. There will be a follow-on article about mid-summer when I fly the Escort powered Cessna 150 in early May. I want copies of that issue you can write them at 606 Wilshire Blvd., Suite Santa Monica, CA, 90401.

According to more items on the Javelin engine: The Garrett engine is 15" narrower than the Lyco, and 3" shorter. I calculated there would be an additional 3000 cu. in. of space available inside the present T-12 cowling. That would allow more than adequate room to put the radiator next to the firewall, with a fan and shroud just ahead of it. All cooling air could be taken in via a flush back type scoop on the belly and exited via the present gills. The solid state ignition packs lend themselves to a variety of mounting spots.

With a turbo installation you won't need a carb air box, as no carb heat is needed. The standard air cleaner is acceptable, as is the oil filter, if a full flow by-pass is installed.

I was pleasantly surprised by the lack of noise while flying the Javelin. There is a turbine like whine of low intensity that comes from the turbo itself. The prop itself is the greatest noise producer and a four-bladed prop would cut that down considerably, too. An acoustically treating the inside of the cowling I believe you would have a cockpit noise level that would be no higher than the average auto at highway speed. You'd certainly pay a lot more attention to air leaks in the canopy.

An cooling duct is a significant part of total airplane drag, closing up the present intake air openings in the cowling (or greatly reducing them) would seem to suggest that there could be performance gain.

I have had a new instrument on the Garmin. I flew a coolant system pressure gauge that read in psi. A big red warning light was also hooked into the line pressure switch and give an instantaneous warning of loss of coolant pressure or a loose filler cap. It would give one plenty of time to get down someplace with greatly reduced power. They should put it on automobiles, or at least make it available as an option.

WOOD PROP: Woodford Handicks, Seattle, WA: After more than 400 hours my 104 Handicks wood prop needed a new finish. I made formels, one piece, brass leading edges 2 1/2" long and glued them on (no rivets). These look neat and have been tested 4 hours. (dated July '80). No other details. I assume he means epoxy when he says "glue". How about an update, Ford? How thick are the brass pieces, how wide? Did you recess the wood so that the brass fits close with the prop blade? How many hours since then. Etc? Did the brass tips cost you any? Previous reports on brass tipped Sensenich wood props indicated there was approximately a 100 rpm loss, as compared with a flush fiberglass 219.

UPGRADE ON CABIN HEATER BOX. From Gale Aoles, 1226 Pennsylvania, Boulder, CO 80329

Due to the rather limited space available on the firewall for the heater opening (below gas tank, above landing gear reinforcement bar, either side of tunnel, away from gascolator and etc.), I strongly recommend that the firewall beka. lines be positioned first. These are determined by the positions of the brake cylinders and the fact that aerodynamic noses from the cylinders to the firewall fittings don't flex in a torsional manner very well.

The heater valve can be located between the rudder pedals on either side of the tunnel, and the heat gets around pretty well without additional ducting.

I recommend that the heat valve and housing be jugged together using a 5" x 9" pc. of .025 alum. to simulate the fire wall. Check for clearance and ease of operation, then remove the 5" x 9" pc. and use it to position and as a drill jig on the fire wall.

The following is an excellent example of a good description of the airplane and the builder.

(1)

Flight Report Serial 865 - W8MO - Walt Uffin, Co. Urbana, Ohio

Construction of "Memphis Mojo" (Red Rivers) occurred between Sept. 1972 and June 12, 1979, the date of the first flight. All critical structures are stock T-12 including the bullet construction on the tail, standard length gear and tail-mounted pilot-static system. Much of the interior details and non-structural items reflect my own ideas. The engine is a Lycoming O-290-12 (135 hp) driving a wood Sensenich 720 channel cam, VOR, glider, marker beacon, wing-tip strobes, and landing light. It meets FAR requirements for both instrument and night flight. The paint is red, white and black from with a sunburst design on the wings. The empty weight is 923 with the empty c.g. at 60.77 in. (19.518').

The airplane handles beautifully. It will cruise 170 mph (135) at 2500 rpm at 1500 ft. Top speed at full throttle (2550 rpm) at 2000 ft met with OAT 70F as determined from recorded runs over a 4.69 mile measured course averaged 182 mph. The airspeed indicator has been calibrated by flight test and is exactly correct at 160 mph IAS with approximately 5 mph error (near fast) at 100 mph. The accuracy speaks well of the tail-mounted pitot-static system. At 30F and 1000 ft. VSI sold it all per the rate of climb at 2000 fpm. The longest sustained measured ROC was at full gross on an 80F day from 1000 to 7000 ft. met when the average was 1000 fpm. The best rate of climb airspeed appears to be about 110 mph, although a cruise climb of 130 mph is nearly as good. Cruise climb gives a very flat attitude with over-the-nose visibility excellent. Stalls occur clean at 70 mph IAS with plenty of tail rotation prior to the break. The stall is abrupt but straight ahead. The wing-root fairings installed on this plane may contribute to the pre-stall tail buffet. The aircraft has been spun with normal recovery and flows through a basic a/c sequence. Max roll rate appears to be about 150 degrees per second.

My normal approach speed is 100 mph slowing to 90 mph with full flaps over the fence. One can approach slower but the plane feels more comfortable to me at the higher speeds. My usual landings are 3-point. Moderate crosswinds are no problem with a wing down, one-wheel type touchdown.

W8MO was shown at Oshkosh '79 and her picture is on page 36 of the January 1980 issue of Sport Aviation. I now have over 90 hours on the airplane with no major squawks. Fuel consumption every that I've had averaged 7.5 gph. It is a very responsive airplane which demands your attention but rewards you with unexcelled performance. It easily meets all the aspirations I held for it during the construction years. I have repeatedly thanked John Thorp for assigning such an outstanding aircraft and for his indulgence of my many questions during construction.

#### About the builder

I am a Professor of Industrial and Systems Engineering at The Ohio State University. I rebuilt an Aerocraft 740 as a teenager and earned my Private license in that aircraft in 1953. That effort was made possible by my airport manager father. Since then I have owned several different

(Wall Giffin story cont'd)

(2)

aircraft, including a 1940 Culver Cadet. I have also added to my ratings and now hold a Commercial License with Instrument and CFI ratings. At the time the T-18 was completed, I had no recent tail-dragger time; the last being logged in the Culver Cadet in 1960. I prepared for the T-18 test hop by shooting two hours of touch and goes in a Citabria and taxiing the T-18 for nearly four hours at a variety of wind and speed conditions. In my view the high speed taxi tests were great preparation and were probably more demanding than the first landing. My wife Bev is a Private Pilot with about 350 hours but no tail dragger time. We are cautiously checking her out in 78WG. She should be ready to solo as soon as the flying weather in Ohio improves.

#### Canopy Vent Control

Saw an AN155 barrel (turnbuckle) in half. Rivet the two pieces to opposite ends of a proper length .25 in. tube. Attach one end to the canopy cross member and the other to the hinged vent door cut in the rear of the canopy with appropriate forks or eyes. The tube can be easily reached and turned from the pilot's seat to adjust to any desired vent opening.

#### Carb Air Box

The carburetor air box from a Grumman American AA-5 was adapted to fit my C-290-D2 under a Rattray cowl. The front of the box must be trimmed at an angle to accommodate the engine mount offset and cowl opening. A foam filter element was attached by a holder of my own design. The foam element contacts the cowl opening for a positive seal.

#### Arm Rest

A padded arm rest hinged at the rear has been attached to my rear tunnel. The arm rest is lifted exposing a skid resistant step on top of the tunnel for clean and easy entrance and exit from the cockpit. The tunnels are all constructed in three pieces from sheet and angle stock with removable tops for control system inspection.

#### Dual Brakes

The brake hook-up suggested on p. 12h of Aircraft Spruce and Specialty Co. 1979 catalog was accomplished after the airplane was assembled. Scott cylinders with built-in reservoirs were used on the pilot's side. Cleveland cylinders salvaged from a Cherokee were used on the passenger side after milling appropriate mounting tabs from their normally cylindrical base. It would have been much easier to install during construction, but the resulting system works fine.

#### Breather Line

To keep oil off the belly and reduce the number of tubes exposed, I like many others elected to run the breather tube down a gear leg

(3)

fairing. However, rather than run the tube all the way down and past the interfering clamps, I ran the tube only a short way into the top of the fairing. The fairing itself provides a trough for drainage the rest of the way down. Air flow and wheel pant plate are such that no oil accumulates on the brake drum.

#### Float Repair

A careless fuel attendant knocked the float off my fuel gauge sending unit. (Since then I do my own refueling.) In order to avoid removing the tank to replace it, I relied on two thermos bottle corks, some epoxy glue and my wife's thin arm. The two corks were glued together with an appropriate well carved at their juncture. The assembly was given two coats of clear shellac. After the well was filled with fresh epoxy my wife was able to reach through the filler neck and jam the whole assembly over the exposed float arm. The arm was held horizontal overnight for drying by means of a welding rod hook. The aircraft has since accumulated over 75 hours flight time and the fuel gauge works fine.

#### Seat Design

My seats are constructed from 1x1x.062 aluminum angle, aluminum honeycomb and foam cushions. The angles forming the frame are riveted together with corner gussets. The backs and seats are square but of the same overall dimensions specified in Thorp's plans. They are adjustable and tip forward for baggage access by use of the fittings designed by Thorp. The upholstered cushions snap onto the honeycomb slabs used for back and bottom. The slabs are attached to the frame by plate nuts and screws. This permits either cushion to be removed to accommodate an appropriate parachute. The entire assembly (2 seats) weighs 11 pounds.

#### Wing Construction

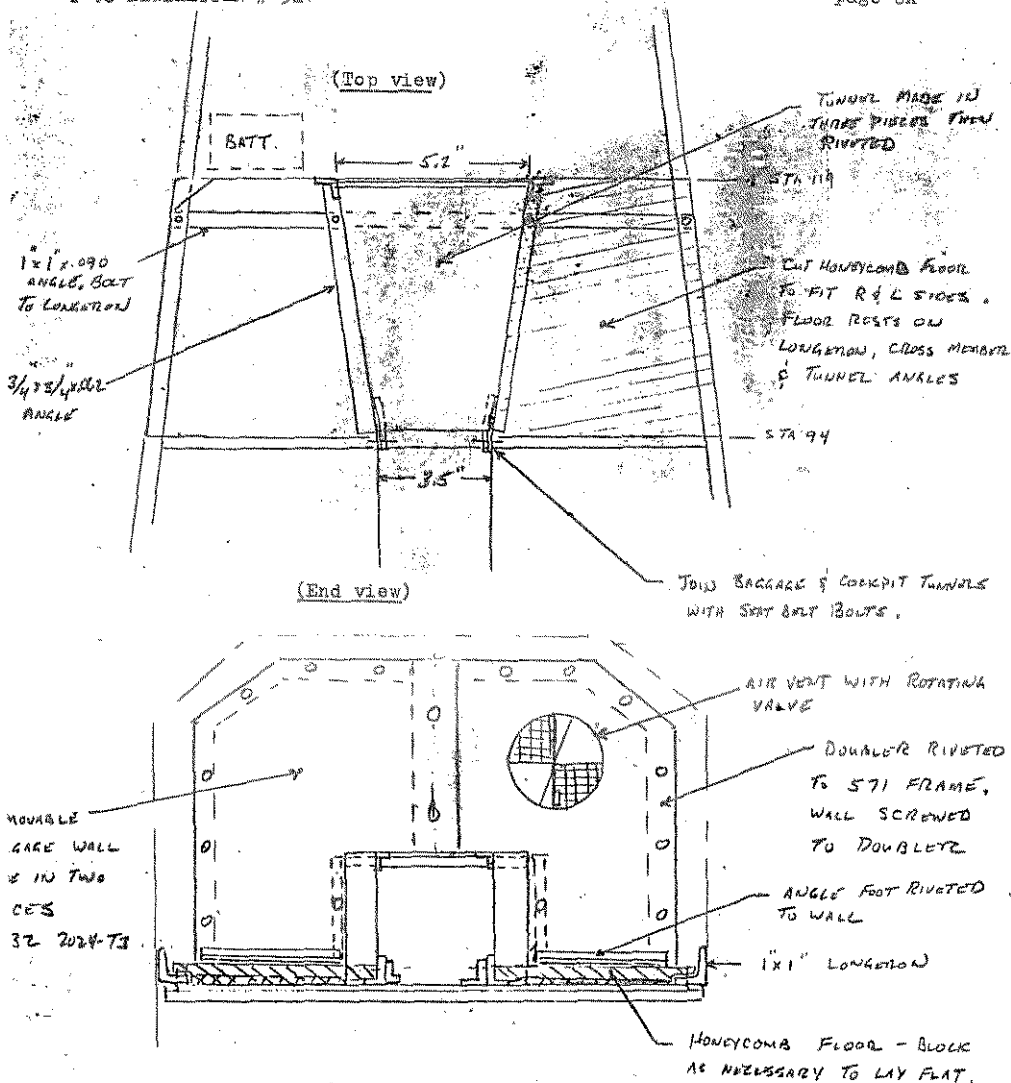
My wing skins were bent in the manner described in earlier newsletters then were pulled over the spar-rib framework by means of 4 gear pullers working against a 2x4 placed against the rear spar. The pullers were attached to slots cut in the excess skin overhanging the rear spar. The nose ribs were held in position by a threaded rod with nuts and washers on each side of each rib to guarantee proper alignment. After carefully adjusting for zero twist all rivet holes were line-drilled through skin, ribs and spar. After drilling, the skin was removed for deburring and dimpling (and the threaded rod was removed). After re-assembly and riveting the resulting wing panels had virtually no twist and a drum tight skin. This approach was suggested to me by Larry Larcom of Delaware, Ohio, an early T-18 builder.

#### Baggage Compartment

Details are explained on the attached sketch.

JIG METHOD





FLOOR CARPETED, TUNNEL, BATT WALL  
& SIDE WALLS UPHOLSTERED.

BAGGAGE COMPARTMENT - NALT GIFFIN - N78WG.

Paul R. Shifflett

143 W. Farmington Rd., Acconk, MA 02607

December 13, 1980

USE OF THE IO-320-BLA, BLB, B2A, B1C & B1D 160 HP ENGINES

These engines require a dynafocal ring whose dimensions are different than generally found. Lycoming Specs refer to this as Type 2 Dynafocal mounting.

Recalculation of the X, Y, and Z location dimensions as given for the 733-2 jig pads is necessary because of differences in engine dimensional and angular specifications. Also the engine mounting points are recessed, 1 1/2" diam. surfaces requiring four 2" x 1 1/2" .750" thick, round spacers, drilled for the 7/16" diam engine bolts. Lycoming refers to these as Lord mounting adapters.

### 733 JIG CHANGES

- 1) The 733-2 pads are inclined 18 dg instead of 30 dg.
- 2) The 5/16" hole centers (at -2 surfaces) are raised .722" from 2" to 2.722".
- 3) The 5/16" jig hole centers (at -2 surfaces) are located on a 15.308" diameter circle centered .22" in the Y direction (towards the top of the 733 drawing, from the engine thrust line intersection point on the jig surface).
- 4) On the 733 jig drawing, the 5/16" holes in the two top -2 pads and the two bottom -2 pads are displaced up and down respectively from the center of the 15.308" diameter hole center circle, as located in 3) above.
- 5) On the # 733 jig drawing, the 5/16" holes in the two right and the two left -2 pads are displaced left and right respectively from the center of the 15.308" diam. hole center circle.
- 6) Above dimensional changes are taken and derived from, J. Thorp T-18 drawings #733, 727, and Lycoming IO-320 B1A installation drawing # 66197, and are for use with dynafocal engine mounting bushings # 50401-3 as supplied by Ken Knowles for T-18 aircraft and Aircraft Spruce and Specialties for HOME BUILT AIRCRAFT with 2 3/4" ID retainer.

Bushing compressed dimensions affect the jig -2 pad locations. A different compressed dimension will alter the required pad location in all three dimensions, X, Y and Z.

Due to different mounting dimensions, different length engine mount bolts are required. With dimensions detailed above and on my IO-320 B1A wide deck engine, I need AN7-44A bolts with 3 15/16" grip and 4 19/32" long.

After welding up the -1, -2 assemblies per dwg # 727, I bolted them on the modified jig 733-2 pads with a layer of asbestos paper between pads and spools. I bent, cut and ground fit the 727-4-5-6 tubes to fit the 733-1, -2 spool weldments. I tack welded tubes to the spools. I removed the tack welded ring from the jig and completed welding. After welding I refit the ring to the jig pads by heating and bending the top -5 tube to correct welding distortion as required. I bolted the two spools on either end of the -5 tube to the 733-2 pads and reheated the -5 tube to a cherry red in center to relieve any tightening strain. With the two -5 tubes still bolted to the pads I made similar corrections in the -4 and -6 tubes to bring the spools at their ends in alignment with the other two pads. I bolted these last two spools to their pads and finished by heating the -4 and -6 tubes to relieve any bolting strain. After the above procedure the ring was a perfect fit, first try, on my engine.

Paul R. Shifflett 143 W. Farmington Rd Accokeek, Md 20607  
Dec. 13, 1980

USE OF IO-320-B1A - - - 160 HP Engines-- Continued

PAGE 7A

T-18 N.L. #52

Jig dimensioning is critical and calls for a precise layout on the flat plate surface. The surface is leveled and any elevation irregularities, (bumps, dips etc) noted. The 733-2 pads were located over the scribed layout at the proper 18 deg angle. I used temporary side lugs on the pads to hold them in position in the tedious location process. With table level I used a small plumb bob with fine thread (I made it) hung above the pads and down thru the 5/16" pad holes. The support must be stable and adjustable, up and down and sideways, to permit positioning the plumb bob point at proper location. Then center the 733-2 pad hole symmetrically around the thread (the upper surface of the hole is the one centered and it is an ellipse because of the 18 deg angle. Patience! the 2.722" vertical dimension and 18 deg angle were EXACT preadjusted into each pad with the temporary side lugs mentioned above. They were checked and this was all that was needed. (I had to be sure to obtain the 2.722" dimension. It is not a hole here to have precisely cut or machined the pads so that the hole occurs precisely at 2.722" above the plate at a pad angle of 18 deg. The slant length of the pad from the sharp (acute angle) end to the center of the hole is 8.809", which is  $(2.722") / \sin 18 \text{ deg}$ . If the plate is perfectly flat this is the correct length. However you will probably find you will have shim or file to accommodate surface irregularities. Some point on the plate will be your zero elevation point from which all vertical measurements should be referenced. Welding pads in place; make welds short in length & time; check dimensionally until securely tacked. Don't let the plate get hot; tack corners first; arc or hell arc weld it. I have not built the engine mount yet. My landing gear is not back from the heat treaters yet. However I have the 733-3 post and lug welded in place on the jig, also located with the plumb bob.

-end-

See dimensioned sketch on page 7B

Thanks very much, Paul, for a very complete report. I know of several builders that have had a great deal of trouble getting an engine mount to fit in that series engines.

To answer your unspoken question, no, I do not know whether Paul would be willing to build a complete (or tack welded) engine mount for anyone else. If he sends me further info on the subject I'll be glad to publish it, his phone no., price, time for delivery, etc.

TYPICAL ELECTRICAL SYSTEM SCHEMATIC: See page 8

This one was sent in by John Walton, 5726 Boyce Springs Dr., Houston, Tx, 77066. John said he worked this one up from the one shown in Tony Bingelis' fine book, "The Sportplane Builder". He originally sent me a drawing that was two pages, but we couldn't readily reduce it in size and make all details clearly readable, so John re-drew it to fit our N.L. page and we are printing it full size so everything is readable without a magnifying glass. Thanks, John.

And thanks, Tony, too. Tony is also a member of our M.A.S. and his fine article each month in Sport Aviation is a gold mine of information. His book is even more so. I would strongly recommend that each one of you have a copy of his book in your shop library. It's an authentic reference on a wide range of subjects and is profusely illustrated. It's no 3rd hand re-hash of some WWII training manual. Give yourself a birthday present of Tony's book if you've been wanting to do something nice for somebody lately.

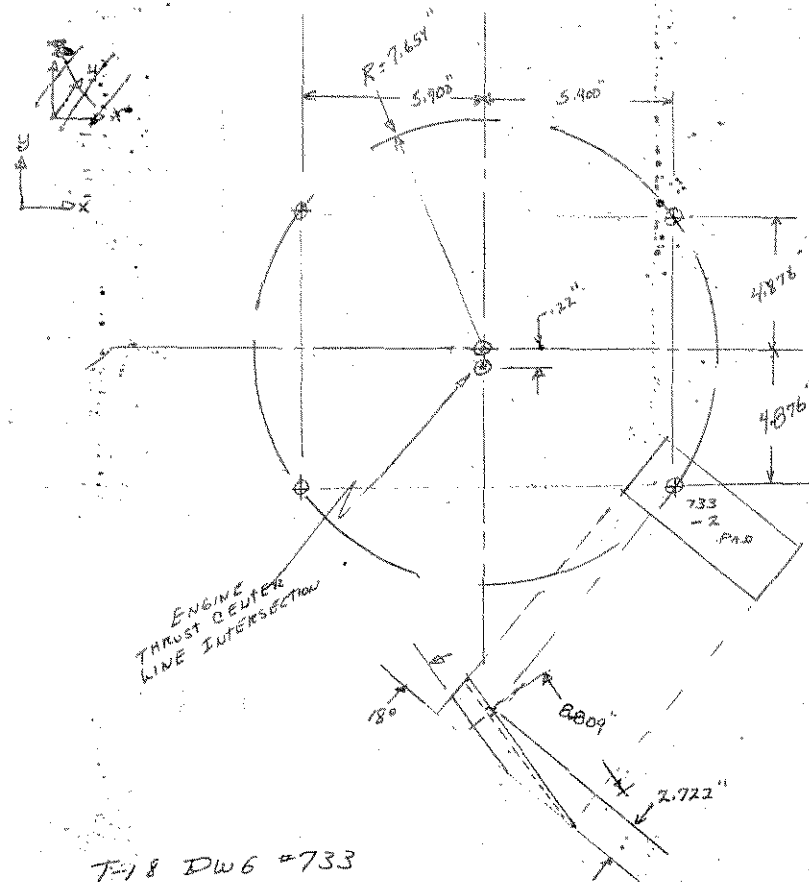
(SEE TONY'S AD IN SPORT AVIATION)

PR Shifflett  
143 W Farmington Rd  
Accokeek, Md.  
20607

733-3  
Post

12/13/80

T-18 NEWSLETTER #52 PAGE 7B

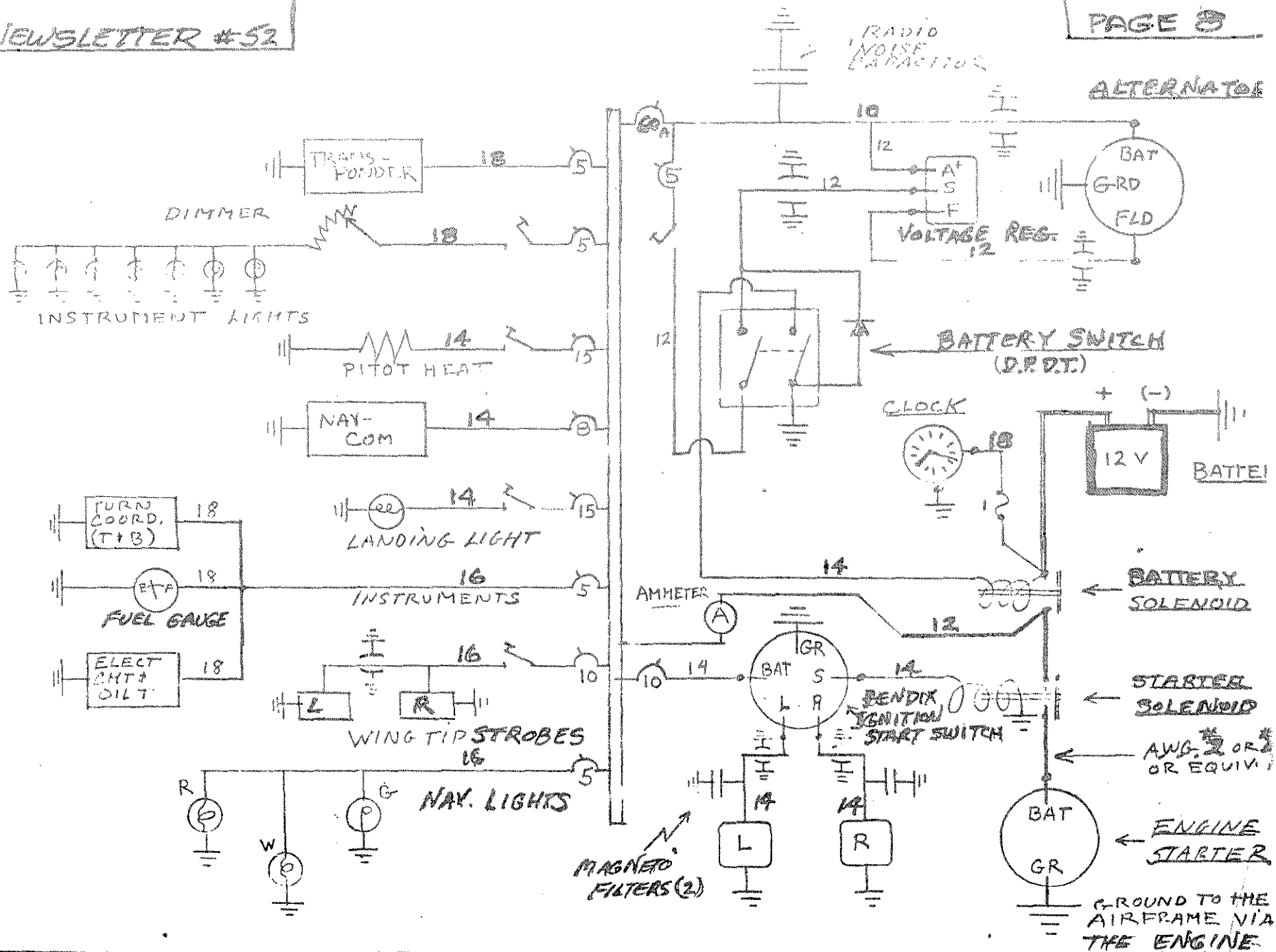


T-18 DWG #733

MODIFICATION  
DIMENSIONS FOR 160 HP

IO-320-B1A, B1B, B2A, B1C & B1D  
DYNAFOCAL RING FABRICATION-  
- USING 50401-3 MOUNT BUSHINGS

(CHECKED BY B.C. ROEMER & JOHN SHINN)



~~~~~ CIRCUIT BREAKER  
 ~ FUSE: 1 AMP  
 ||| SHIELDED WIRE  
 ||| ALTERNATOR ARC DIPOLE

~ S.P.S.T. SWITCH  
 ~~~~~ MAIN BUS: 3/8" COPPER  
 14 WIRE GAUGE: AWG

T-18 STANDARD WIRING  
 12V ELECTRICAL SYS  
 JOHN WALTON

HOW MANY TIMES YOU WISHED FOR AN INSPECTION PENING TO YOUR STRAIGHTEN TRIM SCREW TRACK SSY OR TO LOCATE IT.

WITHOUT DISTURBING YOUR STRUCTURE INTEGRITY, THERE IS NO NEED TO REMOVE RUDDER & FIN TO INCORPORATE INSPECTION OPENING.  
USING ACTUAL SIZE SKETCH SHOWN & FOLLOWING THE SEQUENCE OF OPERATIONS LISTED YOU CAN AVOID MISMATCH HLS.

MAKE DETAIL DOUBLER FROM .032 .2024-T3 TO OUTSIDE PERIMETRY & INSIDE CUTOUT ONLY.

MAKE DETAIL DOOR FROM .032 .2024-T3 TO OUTSIDE OUTLINE & (4) #40 HLS FOR NUTPLATE SCREWS.

POSITION DETAIL DOOR ONTO DOUBLER, SPACE EQUALLY ALL AROUND CLAMP & DRILL THE (4) HLS THRU DOUBLER. TAKE DETAIL DOOR ONLY, POSITION ONTO 510-10 FAIRING ABOUT MIDPOINT BETWEEN STAS 191.75 & 199.75, WITH PENCIL MARK OUTLINE OF DOOR CUTOUT.

TRIM CUTOUT TO PENCIL LINE USING #40 DRILL A CHAM OF HOLES, BUT THRU WITH HACKSAW, POWERED ROTARY STONE OR HALF ROUND FILE, FINISH WITH FINE EMERY CLOTH.

POSITION DOOR TO CUTOUT TO MATCH OPENING, SHOULD NOT BE MORE THAN .020 CLEARANCE. ALL AROUND.

LAYOUT & DRILL (14) #40 RISET HLS ON 510-10 FAIRING ONLY FOR DOUBLER ATTACHMENT.

WITH DOUBLER & DOOR CLECO'S TOGETHER, POSITION TO FAIRING CUTOUT, SPOT MARK FROM FAIRING TO DOUBLER (14) #40 RISET HLS.

REMOVE DOUBLER & DOOR MESSY TO BENCH & FINISH DRILL FROM SPOT MARKS (14) #40 RISET HLS.

DIMPLE (14) #40 100° ON FAIRING & CTSK ON DOUBLER.

OPEN (4) NUTPLATE SCREWS HLS TO 5/32, ATTACH NUTPLATES WITH 8-32 SCREWS & FINISH DRILL (4) #40 EA. NUTPLATE THRU DOOR FOR RISET, REMOVE NUTPLATES & CTSK

CLEAN UP, PRIME & RISET NUTPLATES TO DOOR. POSITION & RISET DOOR TO SKIN.

ON DETAIL DOOR OPEN (4) 5/32 SCREWS HLS & DIMPLE, ATTACH DOOR TO FAIRING WITH 8-32 FLAT HEAD SCREWS.

SEE SKETCH PG

FOR SALE ITEMS: Pete Beck, 5972 Jan Mar Dr., Falls Church, VA, 22041 (703/578-0484) has a 2.5" longer gear, tapered version, split gear (2 pc) design as per Lu Sunderland. Heat treated, welded together, ready for mounting. \$350 +shipping.

Darwin Franklin, 510 Oxford Park, Garland, TX, 75043, has a standard width fuselage (skins and formed bulkheads only, cleco'd together) and an unused set of plans for sale at his cost. No time to complete because of his new business. \$600 call him at 214/270-8393 evenings or weekends.

Pat Keller, 5446 Connecticut Ave., La Mesa, CA, 92041 now has a 180 lvc & c/s prop in his T-18, so no longer needs the Sensenich motor finish 67x68 prop he had on it when he had a 125 GPM in the airplane. Will sell for \$395. He also has a Narco transponder for \$150.

John Phillips, 3130 S. Rose Ellen Rd, McAllen, TX, just bought a flying T-18 so he now wants to sell his project and plans. His mailing address is P.O. Box 546, Allen, TX, 76516 and I don't have his phone no., but it can be gotten from the McAllen opt. (see P.S. note for price & details) John Hardy, Box 292K, Natchitoches, LA, 71457, has installed electric flaps in his T-18, so he has a complete flap handle assembly that he will sell for \$65. His phone no. is 318/352-5702.

Moving rudder cables outboard: Steve Riffe, 5208 Astoria, Amarillo, TX, 79109 writes: "Dear Dick, Here is a sketch of how I hooked up my rudder cables when moving them outboard. I slipped a 5/8" O.D. tube inside the rudder pedal tube and will hold them in place with two long rivets. I drilled a hole thru the tube at an angle, so that the cable will be in a straight line to the pulley

disregard this line please  
behind the dash frame. I welded a piece of bushing stock into this tube and fitted it with an eyebolt (A143-11). This eyebolt connects to the rudder cable. I did use a longer barrel on the turnbuckle (AN-153-16L). The standard cables Ken Knowles supplies are fitted with short barrels. The extra length (about 2") is just about what is needed when moving the cables outboard. (See Fig. 1)

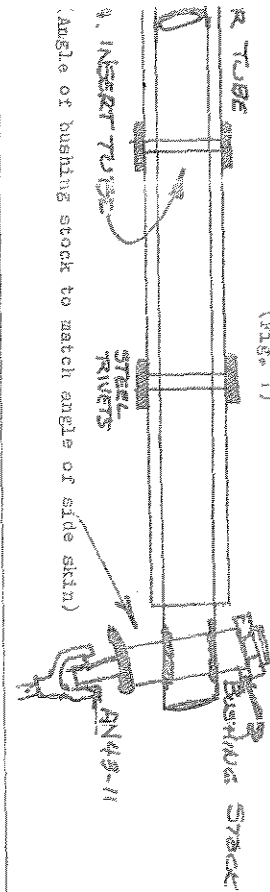
At the rear bulkhead (#574) I used three pieces of 3/4 x 3/4 x .063 angle extrusion to make the pulley brackets. (see Fig. 2)  
where the cable goes thru the rollover frame I used a bored nylon rod for a bushing (fairlead). The fiber fairleads have such a large dia. that I felt that a hole that size thru the frame would weaken the frame too much in the event of a rollover. I drilled a 9/16" dia hole thru the center of the 1/2" dia nylon rod. I then turned down one end of the rod to fit then a 3/8" hole in the frame.

In mounting a pulley just aft of the seat frame, I discovered the cable needed to change direction in two planes at that point, turning inward and down, too. This required tilting the plane of the pulley downward about 30°. I attached the bracket to the side skin with only one cleco and left the pulley seek out its correct plane of movement before drilling the second hole to lock it in its proper position.

Hope this will be of some help to those moving their rudder cables outboard (You'd better believe it will, Steve-Ed.). I remember now why I had such a terrible time in drafting...hope the sketches aren't too bad. I think it's much easier to make the part than to draw it."

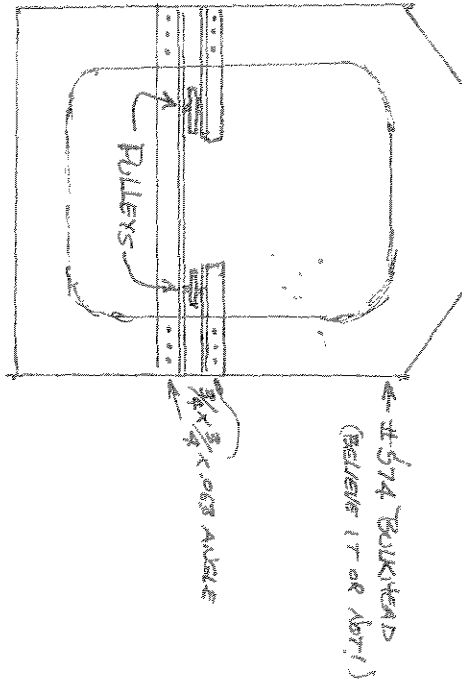
Thanks a million, Steve, and the sketches were very good. You're much too modest. (See page 10A for the sketches)

(FIG. 1)

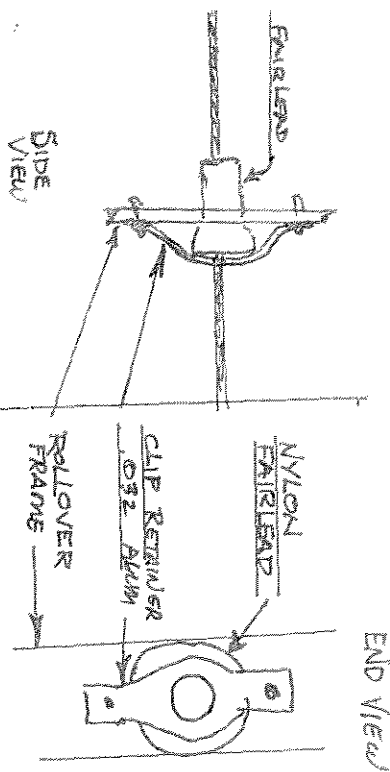


PAGE 10A

(FIG. 2)

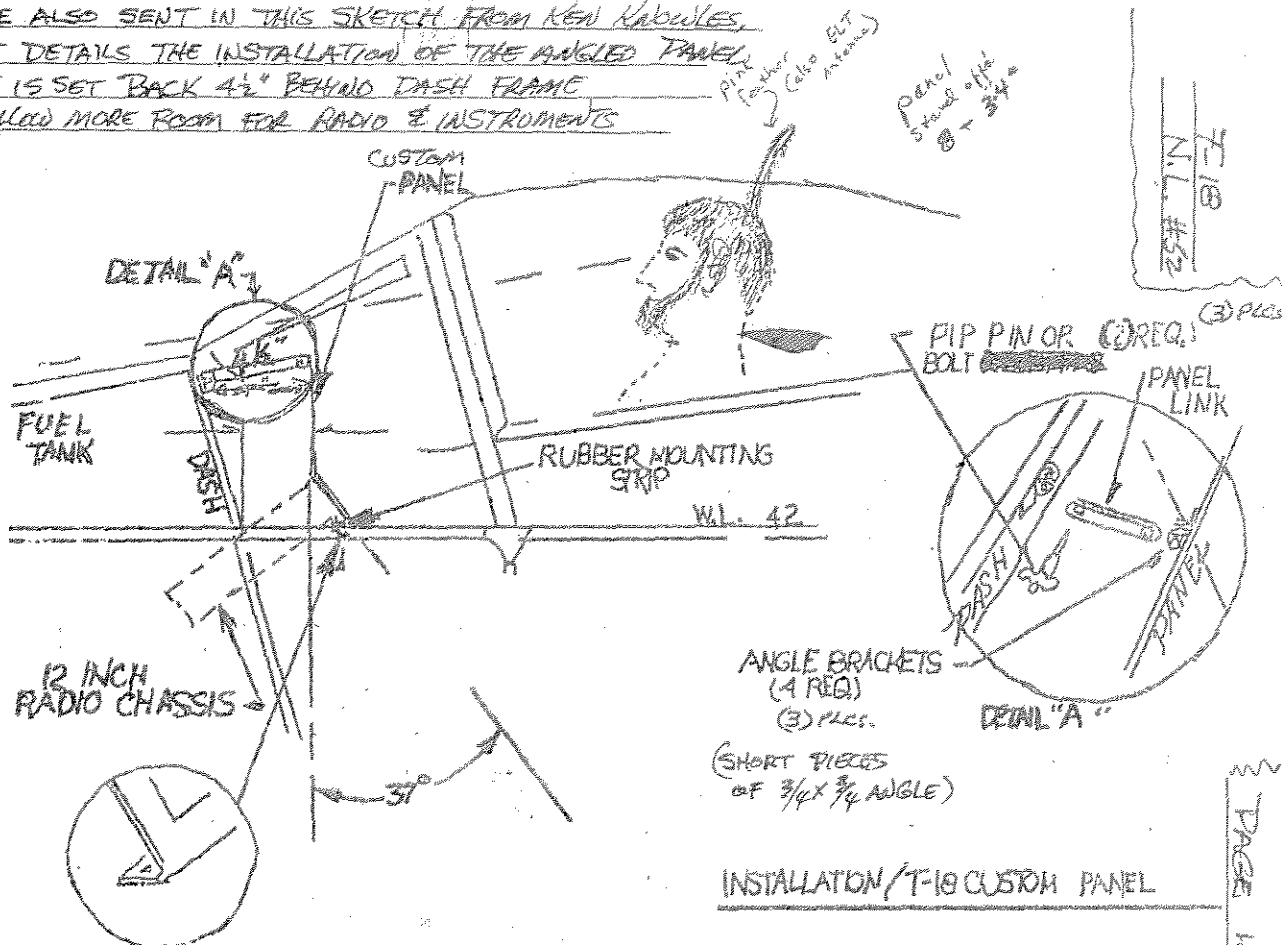


(FIG. 3)



BY STEVE RIFE

STEVE ALSO SENT IN THIS SKETCH FROM KEN KADWILES, THAT DETAILS THE INSTALLATION OF THE ANGLED PANEL THAT IS SET BACK 4 1/2" BEHIND DASH FRAME TO ALLOW MORE ROOM FOR RADIO & INSTRUMENTS



INSTALLATION/T-18 CUSTOM PANEL

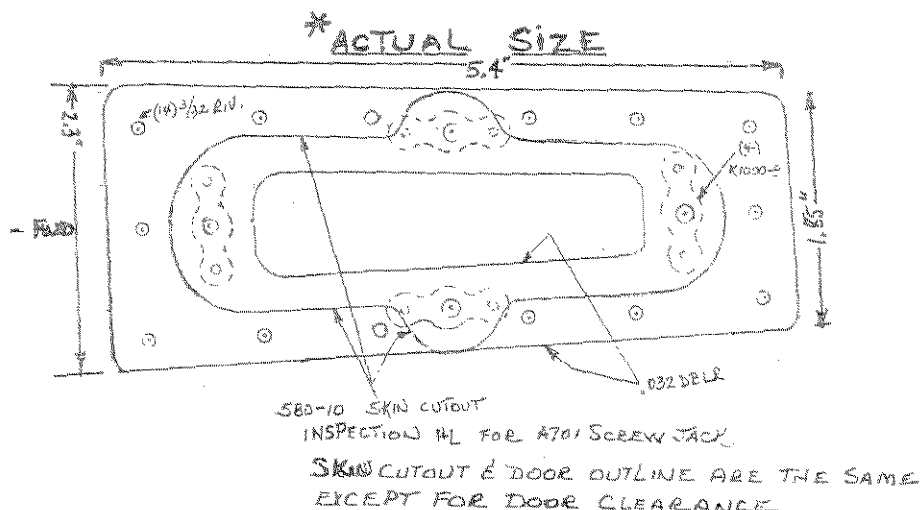
PAGE 10B

**MOVING RUDDER CABLES, CONT'D:** Note that Steve's sketches are not to scale. He will soon have a follow on article on what he did about mounting his fuel shut-off valve now that he's eliminated the front tunnel. He was concerned that a shut off valve mounted in the bottom of the tank might cause cracking of the tank around the fuel outlet, due to the weight and vibration. Perhaps an "L" shaped bracket of .040 attached to the firewall would do the job. Bob Dial, and others of you that have moved your rudder cables outboard, what did you do?

Obviously it's a whole lot easier to move the rudder cables on a project when it's being built, and you can get the bottom skin off, than after it's flying. John Hardy's was all nailed together when he decided to move the cables, so he measured the height of the rudder "bar" above the lower corner extrusion and marked it on the outside of the skin. By tying a string to his rudder mast and bringing it forward to the mark for the rudder bar and taping it in that position he could accurately locate the height of the pulleys at the various stations. He allowed for bringing the cable on top of the #592 and #596 bulkheads, of course.

#### JOHN KENTON'S DRAWING FOR INSPECTION DOOR: (cont'd from page 9A)

\*Note: John's drawing sent to us was labeled "Actual Size", but since we have to reduce the dwg. size we have added some of the dimensions. I believe you can determine other dimensions by comparison with those shown.



**ALMOST READY TO FLY?** How many of you out there are reasonably close to being ready to fly? Some that I know of are John Hardy, Natchitoches, LA; Paul Kirik, Moline, IL; Ken Rhoads, Peoria, IL; Frank Spedecker, Honolulu; Stan Billotte, Excelsior Springs, MO; Bob Roper, Garland, TX; Dan Culhane, Windsor, CT; Lou Falconi, Seattle, WA; John Ford, Grand Prairie, TX; Harlo McKinty, Lincoln, NE; Ed Poe, Phoenix, AZ; Lea Skillman, Parkersburg, WV; A. H. Sivaslian, Newport Beach, CA; Rik Keller, La Mesa, CA; Fred Swafford, Arkadelphia, AR; Tom Kerns, Arlington, TX; Francis Richardson, Denison, TX; John Kenton, Renton, WA.

There probably are others. Would like to hear from you if so! PLEASE!

T-18s recently flown: Curtis Kreps, Willmar, MN (date?); John Walton, Houston, TX, (Jan. 3rd); Harlan Cavin, Miami, OK (Dec. 18), Randle Woolaway, Cassville, MO (Nov). Anyone else? Robert Furrer sent me a note some months back that his had flown for the 1st time. Also, Lee Reilly, Wagoner, OK flew in early fall.

**People item:** Dan Culhane came down to Dallas several months back and bought Keith Cobb's project after his ins. co. settled with him and he was delighted to find a project so near to completion with such excellent workmanship. Keith and Judy made a contribution of \$100 to our MAS fund to show their gratitude for the newsletter getting the two parties together. We, too, are grateful for their generous contribution. That'll buy about 3 boxes of the paper we use.

**Comparing Insurance costs with other builders:** I found my costs of insurance were relatively low. My liability coverage is 100,000-300,000 and I also have comprehensive coverage for fire, theft, windstorm, etc (not in motion) and the whole thing costs \$360/yr. How does that compare with premiums in your area? About a dollar per day. If you are interested in getting a quote, let me know and I'll put you in touch with my agent. I called the co. that EAA had written about in Sport Aviation and their quote was 'way over \$500 for the same thing.

**Good Guy Award:** My nomination for the good guy of the year goes to my old friend, Dean Cochran, of Broomfield, CO. My one and only wood prop got damaged in the hangar just before OSH and knocked me out of flying my T-18 up there. I almost made, tho'. Dean generously offered me the use of his spare prop and if I had had just one more day to work on re-fitting the spinner I could have made it. I did get to go to the SW regional at Kerrville, tho'. We've got a lot of good guys in our T-18 MAS. Steve Eby, Wichita Falls, TX, is another. He sent his prop down to as soon as he heard about it, too. My old buddy, Ray Hegy, of Marfa, TX, repaired my old one, so I now have a spare. A lot of the prop makers run from 6 to 9 months behind on orders, so a spare isn't too bad an idea. That's one thing that appeals to me about wood props. The other is the price. You can have two or three wood props for what one metal one would cost.

**"Don't Do" Item on the #526 Fitting:** The #526 fitting is the "backbone" fitting that goes down the center of the airframe on top of the gas tank. It receives the top hole of the landing gear at the front end and ties the roll bar frame to it at the rear. It's a good idea NOT to pre-drill the hole that mates with the landing gear until you have the landing gear in position, or you may likely have a mis-match of holes. Center punch the hole location and then when the gear is in position you can peek thru the hole in the gear and check for alignment. If you've already drilled it and the holes don't match all isn't lost. You can drill the hole well oversize, make a steel plug to a press fit in it and then drill the hole in the plug, using the gear itself as a drill guide. (The hole in the plug would not be in the center of the plug)

Most everyone now agrees that it makes a much neater job to bend the flange on the skin over the tank and slip the windshield in behind it, instead of putting it in front and making a separate flange piece to install in front of the plexi. There's only one problem with doing it that way: There's not quite enough room between the center tube of the rollover bar and the over-the-tank skin to accommodate the plexi and seal. The solution is to move the center tube down and back to allow clearance. To make this work you'll have to remake the little angles that fit on the aft end of the #526 fitting, so the holes that mate with the roll bar are moved downward (about 1/2"). Or maybe you can come up with something clever to keep from remaking the little angle.

Coming up on the next page is an article by B.C. Roemer that'll raise T-18 stock a few more points in your esteem.

News Letter Item?

B. C. ROEMER

Let's talk about the "Hot" landing T-18.

A lot of the builders probably have the same feelings that I had when building -- that perhaps I was building an airplane that I couldn't handle -- Just too much for my experience level and that I'd never be able to hack it. My advise -- Forget that line of thought. This doesn't mean to go out, hop in, fire up and off you go when it's time. No. 1: Have some one experienced test fly the airplane. Then get your self checked out in it before you solo. I did this and it sure beats the high pucker factor -- Wet palm route. T-18's are very easy to fly -- when you know how. Anything that goes 200 MPH sure is going to fly different than a J3 that goes 80 MPH. And another thing -- After you had your dual in your T-18 and you make your first solo takeoff -- concentrate on only one thing. -- Flying the airplane away from the earth, period. Get altitude and then feel it out and play around a bit -- I definitely wouldn't advise take off, getting 15 to 30 feet high and landing again. Pulling the power creates a vast control feeling change and gets you slow, sloppy and settling all at the same time. This is not the place to be learning how to fly a T-18. Try this in the airplane you are used to flying and see how you like it. Sure, some people may disagree but it just ain't the place to be learning about anything. Add to this the unknown of a new machine (and anything can go wrong -- I had the elevator control jam at 20 feet on take off, because a mike fell in between and blocked it -- was flying with cover plates off) and you really have to do a lot of sorting out in quick time to save everything.

How hot is the T-18 landing?

Let's take some cases. Landing normally full stall is no sweat. Wheel landing are fine -- they burn up a lot more runway and you got to be more precise as to feeling for the ground or you get bouncing especially with hard tires but works well when you get it down pat.

How about landing with only one brake? A number of people have done this -- Most times there was not a problem. Of course, landing with no brakes will use a lot of runway but should give no unusual problem.

What's the worse condition possible to land a T-18?

How about one wheel locked dead and one wheel zero brake? Want to ride through that condition? First you're probably saying how could that condition ever exist in real life. Rest assured, it can and did.--

I landed with zero brake on the left and locked brake on the right on bare blacktop.

The result was one worn out tire, a mild ground loop and the tying up of the main runway at downtown St. Paul, (a jet port) in Minnesota.

Our home port is grass and is not plowed for snow. We had about 5" on the ground and normally this is no problem, however, the snow gets in the drum brakes we have and the water soaked linings give no braking.

I knew the wheels were full and figured they would freeze in the air. (Temperature was below freezing), but they always broke loose upon landing in the past but not this time.

The left wheel broke as expected but was iced up and the zero brake.

The right never broke and created a nice curved black skid mark until we ground looped. Not violent, but mild (1 1/2 turns). The wing didn't even come up. I had to find some heat to warm up the brake drum to unfreeze it before I could move off the runway. When I did, the locked wheel was worn through 3 plys of the 4 ply tire.

So now, no one has to be afraid of the "hot landing" T-18.

There's not a lot you can do in this situation except opposite rudder and wait for the ride.

*Doesn't that make you have even more confidence in the world's finest sport plane?*  
Dick

Sincerely,

B. C. Roemer

**MORE FOR SALE ITEMS:** John Chandler, 12513 Madely Ln., Bowie, MD, 20715 is reluctantly having to sell his T-18. (serial #645, N5SP). Some of you saw this beauty at OSH, painted cream and yellow in polyurethane paint. Here's the vital stats: Powered by IO-320 fuel injected B1A, 160 hp, 140 hrs. since 1st time overhaul. All new parts in engine except crankshaft, has Dean Cochran cross-over exhaust. Prop is Sensenich 68 x 78, wood with metal L.E.s, will turn 2900 rpm. Rattray cowl, Brock spinner. Has brakes both sides. Strobes. Ken Knowles wheel pants and fairings. Landing lite in wing. Electric trim. All new gyros (will certify IFR). All vernier controls. Avionics: 720 ch. King 175B, 360 ch. King 170, King KA-20 switching panel, 3 lite marker beacon, transponder. King 201C and 201B VOR heads in panel; G meter, fuel flow meter, manifold pressure ga., EGT, plus all other std inst'ts. Interior is vinyl suede with velour trim, tan and white dash, all post lites. Has 70 lbs. lead-vinyl sound-proofing tape installed, plus vinyl-foam in cockpit. Price is \$17,950, which he says is negotiable. His phone # is 301/344-6787 or 262-9769. (That's a good price for an airplane as well equipped and built as this one, friends)

John Kleber, 213 Sheffield Dr., Danville, Ind., who also flew his beautiful N58K to OSH last year, is building a folding wing for his bird and will sell his present wing (standard) for \$3000, plus crating & shipping. It is complete, ailerons, flaps, etc., just like it came off the airplane. It is also painted. (That's another good buy, chums. If you have a fuselage pretty well under way this could help get you in the air a lot quicker, too).

Frank Lanier: P.O. Box 195, Colorado City, CO, 81019, has a Cessna flap motor for sale for \$30 plus shipping. He's decided to use an American Yankee flap motor instead. He also has a set of fuselage form blocks that he'll let anyone use, as well as part of the rib form blocks. Frank just retired and is building a house and 2 T-18s and really enjoying life in the mountains.



s another enthusiastic testimonial to the performance of the T-18 by lder who recently flew his:

light report from Randle Woolaway, the owner of Timberline Airpark, Cassville 5625, dated 11/4/80. Randle is a semi-retired FBO, with his home and rip on the very edge of the Ouchita Nat'l Forest in SW Missouri. He is a -alike" for John Thorp and formerly built and flew a Pitts off his strip, is a one-way turf runway that slopes upwards about 20°, so unless the is 25 kts. you takeoff downhill and land uphill. Randle is also well known is fine work rebuilding engines, and airframes. ear Dick, I have just now gotten the airplane so it will fly handsoff. I flown it 2½ hrs. to date. First it was nose heavy and left wing heavy. I n engineer friend figure the wt. & balance for me and I had to add 8 lbs. ad in the tail, which took care of the nose heaviness. My E.W. is 1026 lbs. he G.W. is 1632 lbs. (He has an O-360 Lyc. & c/s prop).

gets off our field in 300 to 400 ft. and climbs like a homesick angel. uises 180 easily and will indicate 210 wide open and it stalls at 60 IAS. 't have any soundproofing in it yet and the noise is terrible, but my y fits good and doesn't seem to be leaking. The air vents work great and ee the heater. I have landed it with a tail wind and also in cross winds t is very easy to handle on the grass strip or the pavement either. The ell prop is 72" dia. and has 6½" ground clearance with the airplane in flight position (standard gear). Has about 14" clearance taxiing. This is about 1" further forward than most Thorps I have seen.

don't have any fairings made for the landing gear yet or any wing fairing ght some from Ken Knowles, but they didn't fit over my brake line fittings. very proud of the airplane, prop, and engine combination. I also have ric trim and so far I'd say it's a "must". I am sending you a picture of d wish you could get back up here and see it. I wrote John Thorp a letter ng about the airplane, the weights, and changes I've made, but I haven't ime to here from him yet."

e's N # is 5585X and I'm sure you'll see it at OSH this year. He has a iful paint job. It's basic white, with deep royal over the cowl back to indshield. The royal blue stripe flows back to the tail in a gradual . A light blue tapering stripe just below goes back as far as the seat and begins at the front of the cowl, with the dark blue diamond at the front. Another tapering darker blue stripe runs from the tip of the r forward and around the front of the cowl under the spinner and it's the lighter colored stripe. Matching stripes on the top of the vertical and wheel pants set it off.

PAINT SCHEMES: While I was writing this, a good friend dropped by, that is ustrial designer and commercial artist and illustrator and I was showing arious T-18 pictures. He was highly complimentary of quite a number of He explained the basis for his reasons and in the process of explanation at into the basics of art, as applied to modern industrial design. It ves fooling the eye as to what it sees. The idea is to draw the eye away parts of the airplane where lines and mass are not truly pleasing and ct the eye to areas that the eye sees as pleasing. Being a pro at the he instantly picked up things that most of us aren't really aware of. id the basic profile of the T-18 comes thru as too short for its depth, major areas of mass out of proportion to adjacent areas. That the nose looks too long and out of balance with the area from the firewall to the baggage comp't. He said that this was why a wide stripe (or group of es beginning at the very front of the cowl breaks up what the eye sees s it runs back the full length of the airplane, tapering in proportion

to the vertical thickness of the fuselage, makes the entire profile appear perfectly balanced to the eye and makes it appear longer and lower as well. The miniature stripes on wheel pants and the top of the vertical tail are in the same horizontal plane and complete the illusion and help the eye to not see them.

It was quite an interesting session and very educational to me. He also told how the pros use combinations of color to soften or accent what the eye sees. In the process I found out why my own paint job always looked so ugly to me. He said a very few people have the natural ability or training to design an aircraft paint scheme and he's probably right. As he put it, "You didn't choose a rank amateur with his first ever design when you chose the designer of your the airplane you chose to build, did you? Well, don't do that with your paint job, either. At least go to some art teachers, (artists) with the blank profile of your airplane and get their ideas on stripes and colors. Above all, don't throw a sketch at your wife or girl friend and tell them to whomp up a paint scheme for you. If you have a local aircraft painter go get his ideas, too. At least get his comments if you have several schemes you're considering. He is a pro, also, and experienced in colors, proportions, etc. And when you zero in on what is perhaps your final design or two, show them around to several friends and get their honest opinion--only don't tell 'em its yours, if you want their honest reaction. Tell 'em it's a friend's airplane. He also said that if you have a model builder friend, have him build you a model and and take colored paper and paste on stripes, etc".

There was much, much more than what I've put down here. I tried to get him to sit down and write a few pages and do some object illustrations, but he said he didn't have time and besides that the people that already had paint schemes different to his suggestions would probably get their feelings hurt if he pointedly criticized certain points. He's probably right. Anyway, maybe I can corner him again one of these days and fire up the tape recorder for more of his observations. Sure wish I'd talked to him before my airplane got painted.

Speaking of those with natural ability, John Walton's 12 year old son, Lee, designed the paint job on John's airplane and it truly is excellent. It also is basic white, with two contrasting shades of blue used to make a wide tri-color stripe running from the very front to rear in a gradual taper. Very simple, but most effective. Oh, well, some of us have got it and some of us don't. Guess I'll have to get young Lee to design my next paint job.

Most of the builders with very attractive paint schemes I talked to at OSH have used either DuPont's "Imron" or Sherwin-Williams "Acrolid". Both are polyurethane two-part paints and retain the 'wet' look without chalking. What other brands and types of paint have you out there used and what are your comments? I'm told that paint and related materials for a T-18 paint job (with either of the two brands above) will cost about \$400 at today's prices. What about some of the acrylic enamels that some of you have used. They are almost universally used on automotive applications it seems and are probably less expensive. In our area a professional aircraft paint job on an airplane the size of a Cessna will run from \$1200 to \$3000. I think this is too steep for most homebuilders and a lot of them do the prime coat themselves and get it all ready for the final spray coat before taking it to one of the pros, thus cutting the cost very drastically. If you haven't done a considerable amount of paint spraying it's not recommended that you cut your teeth on the final coat on your T-18. A good many boys go to a local body and paint shop and make a deal with one of the pro painters and that makes pretty good sense to me. They'll have their own production type spray gun, too, not one of the Mickey Mouse ones you get when you buy a compressor. That's \$125 to \$150 you won't have to invest, too.



DON TAYLOR DOES IT AGAIN! No doubt most of you have either read about it or heard about it by now, but just in case you haven't..... Don and his T-18 arrived back safe and sound on the Big Island of Ammureeka, as we used to say when sighting the west coast. You really can't comprehend what a tremendous feat it was to fly and navigate an airplane of that size over that distance unless you've flown out there. In many ways it was more impressive than his round the world flights. The distances involved on some of the legs and the challenge of hitting a tiny target hundreds of miles away is no little cut and dried thing. When I flew out there we used Doppler to navigate by and periodically checked our position and updated the Doppler by taking Loran fixes at 300 mile intervals. Don had no means to detect his deviation from track until he was within ADF reception range of his target and ADF reception in the Pacific is about  $\frac{1}{4}$  on a scale of 1 to 10. We had to maintain a compass accuracy of one tenth of one degree. No light airplane compass system comes within one or two degrees of accuracy and it certainly is not possible for the world's best pilot to fly that accurately for hours on end, much less be making constant power adjustments, tuning the radio, plotting positions, figuring fuel burn and reserve, and a dozen other things. There is no accurate way to check the wind effect, drift angle, and ground speed. It's all just a guess until you get close enough to pick up the beacon or VOR and little errors can add up to a big miss. One degree is 1 mile wide at 60 miles, so a  $1^{\circ}$  error on a 1200 mile leg is 20 miles. If your error is  $3^{\circ}$  you miss by 60 miles. Stir in a bad guess on wind direction by metro and you could miss by over 100 miles! If the ADF or VOR went kaput about that time it could get pretty sticky.

I called Don a short time after he had gotten back from Australia and I told him my hat was off to him for even being able to sit in the airplane for 17 straight hours, much less do everything else required. His last leg from HNL to the U.S. was a cliff hanger. He had 15 gallons left, but it was spread out so that he didn't have an accurate indication and he was afraid to push it the last 40 miles and so landed at Half Moon Bay instead of OAK.

The U.S. denied him permission to use Johnson Island (west of HNL), so he flew to Fanning Island, and then to Penrhyn, Pago Pago, Fiji, Nandi, New Caledonia, to Brisbane, then flew to Sydney, Melbourne, and back to Sydney. While in Australia he received word of his mother's death, so flew home for her funeral and then flew back to Australia to begin the return trip. His route home was over the Tasman Sea to New Zealand, to Tonga, Pago Pago, and then to Penrhyn, Fanning, Honolulu, and the U.S. Whew!!!

Don said some of those ADF "beacons" he hung his neck on were frequently a wire strung between two palm trees, with a wire running down to a shack in the center. A gasoline powered generator was the power source in several cases. He said he could usually pick them up two to three hundred miles out (unless precip static drowned them out) and one he was able to get 1000 miles away. Some of those islands are pretty tiny and very hard to spot when there are lots of cumulus clouds about to cast shadows, making it easy to miss seeing it. Don said he nearly did miss one and he was only a few miles away. Wake Island is one of the larger ones out there and you could put the entire airport inside of Wittman Field OSH.

Weather becomes more of a factor as you approach the Equator. The Inter-tropical Convergence generates widespread thunderstorm activity at certain times of the year.

Don's going to write a book about his trips and it should be a real pulse pounder. I thought Clive Canning's book about his T-18 flights to England and back and around Australia was the most exciting thing I'd ever read and I'm sure Don's book will be equally gripping.

Anyway, Don, our sincere congratulations for a tremendous achievement.

You might or might not know that Don's seat was a gas tank. He was over at Ken Brock's plant to have a tank made to go under his seat. Describing the tank to Ken, he said, "Make it stick up about this much above the carry-thru bulkheads in that area", and he held up a thumb and forefinger to illustrate. Ken didn't remember just how much Don wanted, so he made it a wee bit bigger. That tank held 15 gallons, the amount he had left at Half Moon Bay! And he said Ken refused to take any pay for the tank ...one of the many fine EAA types that pitched in to help Don.

I understand that Don's plane may go to the Smithsonian Museum, to join other famous planes of history and it rightly should.

Perhaps some people don't quite understand how such flights demonstrate the exceptional quality of the T-18. For one thing it shows that the T-18 is a rugged airplane, is a stable instrument platform, is capable of flying in almost any kind of weather, can carry a huge overload of fuel, climb to altitude, etc. It confirms what we all know, that the T-18 is truly one of the great airplanes of our age. When we stop and remember this little airplane was originally conceived as plain jane little open cockpit airplane, that was designed to be powered with the O-290-G engine, with no gear fairing, no pressurized cowl, canopy, or flaps close to twenty years ago. Now it has evolved into a high speed, sophisticated airplane capable of spanning oceans and continents. The fact that it was capable of accepting these major changes is quite a tribute to John Thorp's skill and knowledge of his craft.

They Never Get Too Old Dept.: Here's a letter from H. E. (Ace) Hibbard, of Fayette, ID, that you'll enjoy.

"Since I am out of the crop dusting business and just turned 72, I am trying to get started on #1313. Even tho' I have known John W. from the time we started engineering, I have been too busy with my own flying business to get into EAA. Thorp and I spent many hours in my Valie Monocoupe back in the early '30s looking for backing to build some of his outstanding designs. I have flown his Skyscoter and have found nothing that flies any better. (Just wait until he flies a T-18)

I have found a fine group of EAAers here in the Treasure Valley and we are planning on forming a chapter." Very truly yours, H. E. Hibbard  
His license no. is 16050, A & P # 15314

Lord Mounts: Note from Harlo McKinty, Lincoln, NE. "Dick, re the numbers for the Lord mounts for the Lyc 180 for those using the larger size ones, the number is J-9612-8-6-69. I assume the last two numbers are the year of mfg. These mounts come one side smooth, the other side "stepped" (in other words, two different diameters on the same rubber biscuit). The stepped side goes where the stress is....backside of the ring on top and frontside of the ring on the bottom. These mounts have a jelly type bushing that fits inside. Geo. Leider told me that John called these out for use in the Derringer and John Thorp told me that the engine probably would have less vibration.

I stopped off in Moline and sat in Paul Kirik's bird....he sure helped things by lowering and rounding the tunnel. It almost seemed like a wide body.

Making Templates: We've covered this before, but we continue to get letters indicating some of the builders don't quite understand. In making the template size a rib or bulkhead (for the purpose of making an exact size duplicate form block) you must take off the skin thickness of the part being formed and you must take off this thickness completely around the entire form block (and template).

**VOLTMETER-AMMETER:** Don't know whether you noticed the article in the Oct. '80 issue of Sport Aviation about the miniature voltmeters and ammeters that are available from Radio Systems Technology, 10985 Grass Valley Ave., Grass Valley, CA, 95945 for \$16 for the kit. I just received mine and am delighted with them. They take up practically no panel space and are feather light. I would strongly recommend you read the article again, particularly paragraph #2. Most A & Ps nowadays agree that you probably need a voltmeter worse than an ammeter, now that we have alternators and transistorized voltage regulators. I am going to leave my present ammeter in the panel, but rewire it, so that it functions as a loadmeter. Incidentally, the pictures of the little meters are very close to actual size (about 1" x 3/4"). I plan to mount mine vertically, side by side.

**Clocks:** Aircraft and auto clocks are notorious for going sour pretty quickly. I just bought one of the newer liquid crystal type clocks. It's wrist watch size and can be attached to the panel with velcro tape. It's battery powered and costs about \$30. I make mine do double duty, also using it in my airport car. When I fly I always set my wrist watch to 12 o'clock just before rolling on takeoff. This gives me a quick and easy check on elapsed time to compare fuel burn with gauge indication and for ETA's, etc. If any of you want one of these and don't know where to order it from, drop me a post card & I'll order one for you. The size is about 2" x 1" x 3/16". (Don't send me any money, Plz).

**T-18 Annual Dinner at OSH:** John Walton sent me a copy of a letter that confirms our reservation at Butch's Anchor Inn again during the 1981 convention at Oshkosh.....Date is Tuesday, August 4....If there are any questions after you get to OSH, contact Stu Tribbey at Butch's Anchor Inn (414) 233-1733. We had a full house last year, so get your reservations in early. Send Geri Knowles a card and tell her how many of you will be there. Her address is 5398 Trail St., Norco, CA, 91760. We all had a great time getting acquainted with other T-18 builders last year, so don't miss the fun. We'll again have the T-18 'Family Album' there. This year we'd like to start an album that has a color picture of each T-18 with its builder beside it. If you have a good shot of you and the airplane please send it in, whether you'll be at OSH or not.

**Cockpit size:** I continue to get letters from builders (or prospective ones) that wonder how they'll fit in the cockpit. Some are well over 6 ft. tall and weigh over 200. Some are very short. Put your doubts to rest, gents. There are several tall and big guys flying their T-18s and they have no problem fitting inside. I also know of several that are around 5'6" that simply moved their rudder pedals back a little and made a bigger cushion for the seat.

**Flight Report:** James T. Ciciora, Box 1202, Vineyard Haven, Mass, 02568, writes "I first flew my T-18 on 11-28-78 and am very pleased with it. I have a Lyc. O-290-G with a Sensenich prop (66 x 74). It is too much pitch for the engine. I'd like to change props with someone that might need more pitch and would like to trade. I'd like to go back to about a 68" pitch."

In March of 1979 he had 5 hours on it and liked it better each time he flew it (who doesn't). His paint scheme is basic white. It has a double stripe down the side of the fuselage, one blue and one red. Both stripes sweep upward at the tail and widen out. His N no. is 64628. At that time he didn't have wheel pants installed. The canopy was tinted green and the cowlings appeared to be a Thorp type. His pitot tube is mounted in the vertical fin. The prop he spoke of was wood, with what appeared to be fiberglass tipping. Each of the outer wing panels had a fore and aft stripe. His comm antennae was mounted just ahead of the fin on the top skin, which seems to be a nearly standard location. He had an OAT gauge protruding from the windshield and an external canopy latch handle. A Key canopy lock is located at the front left corner of the canopy.

**Another Flight Report:** Ed Rogers, 2512 S. Mulberry So., Sioux City, IA, 51106 has serial # 674. He writes, "I finished my T-18, N71ED, in July of 1978. As of Sept. '80 I have put 54 hours on it and I love it. I spent 10 years building it. It just flies beautifully. It's powered by a Lycoming O-320, 160 hp. and I have a Sensenich wood prop (#W66LM). Top speed in level flight is 164 mph at full power @ 2700 rpm. True airspeed at that power is 174 mph. My empty weight is 948 lbs. It has a full panel, with 2 comms and 1 nav and I also have a transponder."

Ed also has his pitot tube on the top of the fin and his comm antennae just in front of it. He appears to have the modified tail and a Scott tailwheel. He has a Rattray cowl and wheel pants and his spinner is unpainted. Most of his airplane is unpainted except for a very wide red stripe around most of the cowl, which tapers back to a narrow stripe at the tail. A wide whitestripe goes over the tank area and it also tapers back to the tail on top of the red stripe. He has very neat looking gear fairings (also unpainted). His external canopy latch looks like the one in the plans.

**Earl Ody:** who lives at 28903 Gunter Road, San Pedro, CA was serial #480 and his airplane is N8952. He wrote about another great trip that he and Ollie Smith (IN N104X) took in their T-18s. They went from Los Angeles to Austin, TX, then over to Houston. Then it was up to Oshkosh for the Fly-in. After that it was over to Cleveland, OH, back to Rapid City, SD, Logan, UT, Seattle, WA, then down the Pacific Coast back to home plate in Torrance, CA. All of that in two weeks! Can you imagine how long that would take in an auto and what you'd feel like after it was over? He also says, "We'll be forever grateful for this beautiful flying machine that John Thorp designed for us". That's the way we all feel, Earl. I'm sure many of you have seen Earl's airplane. It's been around quite awhile and still looks superb. He, too, has a very eye-pleasing paint job and interior.

**Cliff Matthews:** 7832 Olive St., Fair Oaks, CA, 95628 has serial #712 and in early 1980 had put over 100 hours on his bird, N6CM. He wrote that he had just received his Repairman Certificate and had gotten it with no delay from the FAA.

I remember having a nice visit with Cliff at OSH in '79 and having him show me various features of his bird. He had an O-290-G engine in it and a Hegy 68 x 70 wood prop. This gave him a 75% power cruise of 160 mph and it would climb 1500 ft./min. solo. His battery was mounted forward of the firewall. He had an MA3SPA carb on it, too. I remember that, as I had an MA4SPA carb on mine when I had the O-290-G in it. I also remember he had an extra center bar at the rear of his canopy, as an extra guide and hold down I think. He also had it insulated with 3M and that's about all I remember about it, except that it was a fine looking airplane. He also had a Jack Haines fiberglass cowl and he had made his wing root fairings himself, using water based clay for molds and he also had made a nice little fairing at the base of the fin, using the same technique, and he had made a nice little fairing for the tail spring. I also recall his using Ditzler polyurethane paint and his saying something about it being very fast (to apply?). I also dimly remember something about him having a clamp plate for the throttle and his having a Garland Root canopy cover. (I remember Garland telling me out at John's birthday party that he still made 'em, for about \$40 I think). How about an update and a complete report, Cliff?

**LEE REILLY:** Rt. 3, Box 198A, Wagoner, OK, 74467, is one of my nearer neighbors with a flying T-18 and his report follows. The Cassidy 68 x66 prop is really the equivalent of a 68 x 71-73, as Cassidy measures pitch differently. He must be doing it right, tho', as a T-18 gets with it with his props.

Nov. 17, 1980

Dear Dick,

Thanks for the invite for a fly-in visit. I was going to do just that on Sat. 2 weeks ago, but after several phone calls decided you were gone for the weekend.

I've got 50 hours on the bird now and am enjoying it more each time I fly it. The flight characteristics are much the same as I've read in many pixeps on the T-18.

The plane has an O-320 E2D engine (150 H.P.) with a Cassidy 68X66 prop. (made from a kit) It checked in at 904 lbs. that was with an M-74 blade. It's 15 lbs less now with the Cassidy Prop. That includes all instruments and radio (one KX-145). It's equipped for instrument flight although I don't intend to use it that way. (I like to keep in practice).

I've checked my airspeed using the sectionalized cow pastures around here and it seems quite accurate. So based on that I get a corrected airspeed at 5000 ft. of 188 mph all out. Top rpm is 2700. I generally cruise at 2350, which gives me 158 mph corrected. I burn about 7.5 gph. I would say I'm using about 65% power. It's quieter and more comfortable at this speed.

As everyone says the first flite is a real thrill. I had't flown a taildragger for 10 years, being a happy Mooney owner. So I spent several hours of taxi work getting the feel. Then I took it out on the runway for tailup taxi runs. You guessed it I had't gone a hundred yards or so and I was flying, even at half throttle. I figured it would have been more difficult to land it from 2 ft. than from a full approach, so I took it on out. At 3000 ft. I felt it out, stalls with and without flaps, etc. It felt as though I had just taken delivery from the factory. No problems. It stalls at 65 and with plenty of warning and straight ahead. The stall characteristics are as good as the Mooney's.

The two things that impressed me most is the climb, initially 1800 fpm full gas and no passenger, and the stall. From some pixeps I had read I expected no warning and a nasty break. It never happened. With full flaps and power it gets tricky but then you have to stand it on its tail to get it stalled.

About the only thing I could say about handling this aircraft that might be difficult for first time operators, is the rollout. Half way through it would swap ends if you're not quick on the rudder pedals. This of course is true on any short coupled taildragger.

The only problems I've had to take care of since first flite was to warp the ailerons, the left wing was heavy, the out side bracket on the wheel fairings, pulled the rivets through the fiberglass and I have yet to make a tailpipe snubber that lasts more than 10 hours.

That's about it Dick, it's all been said before, but then anyone who builds (took 5 yrs.) and flies one himself can't help but say it again.

Regards:



P.S. Here's a picture. That paint job was done in the garage. It came out pretty good for a novice.



Lancaster, CA is a hotbed of T-18 activity, with about 9 of 'em flying there now. Here is a flight report by one of them:

Allen Chivers (N18AL) 45108 11th St. West, Lancaster, CA, 93534, writes, "My T-18 has been flying for about 4 1/2 years and I am very happy with it. The comment I might pass on is that the performance is somewhat compromised at both ends of the speed envelop by the 150 hp O-320 and the 68" x 76" pitch prop. I only can get about 2200 rpm (100 hp +) on the takeoff roll, while at cruise I have to throttle back to keep the rpm under red line. I could probably use more prop pitch, but I don't want to compromise the climb performance any more than it is, due to the high (and hot) country I usually fly in.

Cruise works best at 7500-8500 ft at 2600 rpm, which gives 175 mph True, which isn't too bad, but it could be better if I could use all the available manifold pressure at altitude. If I stay up with the T-18s with 180 hp engines and 85" or 86" pitch props I will use as much fuel per hour as they do."

Al didn't say what type of prop he has, whether metal or wood. There are so many variables in a situation like that that it's hard to know where to begin. I was recently having lunch with a pretty savvy FBO friend and telling him about differences in various T-18 performance with same engines, different props, etc. He surprised me by saying he'd found many factory airplanes that supposedly cruised faster or slower than the norm and the very first thing he did was to pull the tach out and check it and in several cases the problem ended right there. If the pitot/static system checked out he'd then swap props. Seems that there frequently is a considerable difference in supposedly identical props, even tho' the pitch at stations checked out pretty closely. His next approach was to go into the induction system and then the baffles. The airframe was the last place he checked out, with high or low aileron rigging the first place he'd look, with flaps next. He said he had no easy answers to any of those questions, but if he had any sage words to pass on to homebuilders it would be to get all engine instruments certified accurate and don't skip by buying used instruments. Makes pretty good sense, doesn't it? Thanks for the report, Al, and how about an update if you swap props or....? That would be interesting to the troops, even if nothing changes.

Calibrating Indicated Air Speed: I've talked to a lot of T-18 builders in various parts of the country and one thing that surprised me a little was that very few of them have ever run a low altitude check on their IAS vs TAS. A lot of them tell me I verified airspeed by flying alongside of a Bonanza, etc. That's not too bad if you know for sure about the accuracy of the Wichita type, but there's an easier way to check it out wide open or at various crz rpms. The Bonanza method isn't a bad idea to see how close they compare near the low speed end of the dial, as both airplanes stall about the same.

To run a measured course you should find a stretch of highway of about 5 miles in length preferably. It should be oriented crosswind and have a prominent intersection or geographical feature at each end (radio or water tower). Next, run it a couple of times in your car and note the mileage carefully. Then take your dividers and measure the course out accurately on either a county map or a sectional chart. Stick a piece of tape on your canopy as a sighting point and also one on the L.E. of the wing for an accurate gunsight effect. Begin the run about a mile away from the first point in order to stabilize the speed, then with the airplane in trim maintain your altitude within 20 ft. Record your time to the exact second on both ends, reduce power to cool the engine a bit and then do the same thing in the opposite direction. You should make a minimum of four runs, add up the total and then divide by the no. of runs to get a good average that allows for small errors in timing. Don't forget to put max weight in your baggage compartment. An airplane will fly a little bit faster if the CG is farther toward the aft limit, you know.

A recording stop watch that measures fractions of a second is essential if you want to be accurate. A 1 sec. error on a course in the 5-6 mi. bracket can make an almost 2 mph difference in A/S. Also, to be most accurate, use your little calculator and plug in the formula:  $\text{Speed (in mph)} = \frac{\text{Distance} \times 3600}{\text{Time (in seconds only)}}$

Measure and record distance in the formula as accurately as possible, to the nearest tenth of a mile. (The 3600 in the formula is the no. of seconds in 1 hr., in case you are wondering). When you get all thru, ask your Bonanza friend to let you go along with him on the same course and calibrate HIS A/S. You may be surprised at what his TAS actually is, and I'm sure he will be.

You may feel (and rightly so) that you don't really need to know how accurate your airspeed is. You find a number on YOUR dial where it will stall, and a no. where it's safe to approach at, to make steep turns at, etc. and for most every day use that's good enough. This may be good enough even in planning a cross country, but if you do aerobatics it's not good enough, nor is it really good enough if you fly at high altitude at high speed. Remember...flutter is a function of TRUE airspeed, not indicated A/S. The T-18 can pick up A/S superfaster out of a busted aerobatic maneuver or spin recovery and you might be using up your safety margin without realizing it. Besides, it's a lot more fun to really know how fast this fine little bird goes.

Hank Steiginga, 45528 Newtree Ave., Lancaster, CA, 93534, (805/ 942-3046) first flight of his N512S (s/n 512) was on Sat., 13 Oct. '79, very early in the morning, a chilly and windy morning out at Fox Field in the desert, but even at that hour he had quite an audience. His wife, Frances, was prepared, tho'. She had baked cakes, banana bread, cookies, etc. and gallons of coffee and cold drinks. By noon the 60 assembled spectators had watched a successful test flight and polished off all the goodies. Hank said the more people arrived the more nervous he got. Finally it was go fly time and he bit the bullet and went, with T-18ers, Lyle Fleming and Al Chivers flying chase. All 3 A/Ss matched very closely and it went perfectly for 50 min. Dan Dudash had flown his T-18 up from Whiteman Airpark, Lyle and Shirley Trusty flew in from their ranch. Howard and Elaine Ginn would have T-18ed in from Mojave, but their Datsun slung a rod on the way to the airport, so they drove to Fox later in another car. Hank hadn't flown in 6 1/2 yrs., so Al, Lyle Fleming, and Howard Ginn gave Hank a lot of dual in their T-18s in the weeks preceding test time. Needless to say, Hank was very grateful for their patience and help.

Hank's T-18 was about 9 yrs in the building. Lyle Fleming got him stirred up to build when he gave him a ride in his T-18. He said Lyle has now been flying his T-18 for 11 yrs. and has over 850 hrs. on it. The 1st year was spent at John's shop using templates and making parts. Eventually it all went together and he has powered it with an O-360 (180) Lyc, C/S prop, Thorp metal cowl, with Narco 11B comm, Nav 12, & transponder. It has an aux fuel tank under the deck (no details on this), a beautiful white paint job with a yellow gold stripe with a spear in the front.

There's quite a colony of T-18s out there at Lancaster, including John Thorp's N18UT that John sold to Larry and Barbara Lilly, and they have a ball going interesting places together. I got acquainted with most of them at the surprise birthday party for John in '79. Hank was getting close to flying then.

I got a letter from Hank in Dec. '80 and he had just annualized N512S and he said he's convinced the T-18 is the most trouble free airplane in the skies. He and Frances have had several really nice trips, where they went in formation with others. One trip was to Coalinga for 'horny Toad' races, another was to Watsonville & Santa Cruz. Also Merced, Porterville were on their ports of call.

LYLE FLEMING: All the Lancaster people agree that Lyle Fleming is the chief T-18 fomenter and agitator in that area. Here's some excerpts from a letter from him:

"I first flew my T-18 in January 1968. As you can see, it's been flying 13 years now. In 1978 I had 900 hrs. on the tach. That's a low per year average, but I have been traveling 3 months each summer for several years, which has cut into my flying time.

It has been a lot of fun and satisfaction. I was at Rockford in 1968 and flew 20 hours there in 5 days, giving rides to future T-18 builders. I believe I have given 500 rides in my T-18." (From what his buddies tell me, it's probably closer to 900).

Anyway, it's obvious that Lyle is a very generous man, that's pleased to share the joys of T-18 flying with his fellow pilots. Lyle has 180 hoeses in his T-18 and the way a 180 snatches a T-18 off the ground right into a 2000'/'" climb and an indicated cruise that is up close to 200 15 impressive. I can still well remember my impressions of my first T-18 experience with Bill Warwick in the early '60s. It was so impressive that I raved about for several pages in Air Progress magazine. Can't you just imagine how it affected Lyle's T-18 guests that had never ridden in anything more exciting than a Cessna? Wonder how many new T-18 starts Lyle is responsible for?

Lyle has an in-flite adjustable aileron trim tab on his left aileron. It is at the outboard end of the aileron and is an integral part of it. Maybe Lyle will favor us with a short story and drawing about it soon. To my way of thinking, about the only things that the T-18 needs to make it perfect is trim tabs for the aileron and rudder. They are such an important part of flying to airline pilots, that it's almost unthinkable that all airplanes don't have them. Of course, such tabs aren't to be approached lightly, because of the ever present flutter monster that's always lurking just around the corner to bite the unwary or careless.

If you are out Lancaster way, stop by and say hello to Lyle. He lives at 46035 20th St. E., 93534. His T-18 tail No. is N252F.

Still another T-18 family in Lancaster are Howard and Elaine Ginn, 44140 No. Gillan Ave., Lancaster, CA, 93534 (N11HG). When I talked to Howard at John's birthday party and we were watching Elaine slick their T-18 in on a landing I asked him how they decided who in the family would fly the T-18, he answer, "Well, she lets me fly it occasionally, very occasionally. She spends half her life in it. I think she has flown it about 400 hrs. herself now". Elaine very certainly qualifies as Mrs. T-18, with that much time in it. I watched her T/O and landings very closely and she's sharp with the bird. Her story of flying the T-18 ought to make some magazine editor flip.

Elaine is from Hawaii originally, so guess what very logically is painted on the vertical fin of "Son of a Ginn"? Why, a Hula Girl and a pineapple, natchery. They've made 3 trips to Oshkosh in it, plus many other very enjoyable trips. Besides their T-18, there are 6 other T-18s flying at Fox Field and 5 others under construction in Lancaster. Bob Hovey's N6651 is the other one I haven't mentioned (Bob is the designer of the Wing Ding & Beta Bird). All in all, I'd say they have quite a gang there and really know how to enjoy their T-18s to the very fullest. The social angle of sport flying is a very important part of it and making good friends in far flung places is one of the most rewarding parts of it, too. The T-18 people generally enjoy an almost fraternal relationship and are a much more closely knit group than any other group of builders that I know of. To begin with, we respect the judgement and good taste our fellow builders have in selecting one of the world's best airplane designers ...

Cont'd

Naw, let's scratch that statement and say what we all REALLY think ...He's the world's best, not one of the best, and I'd be hard pressed to think of a personal type airplane that is any better, wouldn't you?

Hank Steiginga sent another letter a few days back telling of still another trip they and several others had made over to Marana, AZ, and on the way back they stopped in Eagles' Roost, AZ, where Bill Warwick and some other T-18 ers from Torrance are planning to do their roosting in the golden years and he said there are some beautiful homes and hangars there already and that it looks great.

Hank also pitched out an idea that he wanted to see what kind of response it generated in the N.L.s. He says, "Has anyone tried to form some kind of overnite lodging system for T-18 travelers? We have an extra bedroom that would be useful for this purpose and I have an idea most everyone has one, too. I'm sure most T-18ers would be interested in such an arrangement. It would be a great way to get to know other T-18ers well and would be a great service to those that enjoy traveling in their T-18s. At today's motel prices, one night's lodging bill would buy a full tank of gas (and who of us wouldn't rather buy gas for our T-18 instead of paying so much out for just a place to hang our hat? Ed.)"

Well said, Hank! Sounds like a good idea to me. What do you guys think? Talk it over with your hausfrau and drop a line. Either sign it or don't sign it, as you prefer.

Several people have advanced the idea that there ought to be a T-18 owner's association. What do you think? Nearly all the factory built have sizable owner's associations. Would there be any particular value of a separate ass'n for owners of flying airplanes only? We now get a certain amount of input from owners of flying T-18s in our HAS N.L. I frankly don't know whether this would increase or retard the flow of info and I'd like to hear some of your ideas on the subject.

**RIVETING TIP:** A good many people have used a strip of masking tape to pre-insert a long line of rivets prior to driving. This not only holds all the rivets in position until you are ready to drive 'em, but it also keeps the set from jumping around and provides some cushioning between the skin and the set, thus preventing marring. Glass filament tape, which is commonly used in commercial shipping, is even better. It requires less clean up after riveting and is much stronger and more cohesive.

Harlo McKinty called last nite to ask a question and in the course of the conversation we discussed his aux tank in detail. It's a 15 gal. tank and is mounted underneath the seat. Harlo is the one that had the booth at OSH this year to demonstrate Explosafe fireproofing honeycomb material for inerting fuel tanks and also Temperfoam, that great new controlled resistance foam that drew so much favorable comment for its use as a seat cushion foam from OSH visitors that tried it at the booth. Harlo has agreed to write a complete report on both the aux tank and the seat material, so you can expect this in N.L.#53.

**Great News from Javelin:** Dave Blanton called last nite to tell me some exciting news about the Escort engine. Ford engineers had called him to tell him that the Escort engine had just been tested on the dynamometer (unaspirated) and it had put out a whopping 182 hp....not the originally estimated 110-120 hp!!!! This was at 6500 rpm, the rpm that previous estimates were based on. Dave said to think in the terms of SWEPT VOLUME, not cubic inches.

The other news he had concerned the resumption of Ford in the racing program and the institution of a class that fits the Escort engine exactly. What it will mean, he says, is that 700 race car owners will have Escort engines in

their race cars all season long and at the end of the year there will be thousands of hours of the cruelest sort of treatment an engine can stand to pour in the experience pot. You can well imagine what kind of testing that will give pistons, valves, gears, crankshafts, etc. when those guys turn 'em 10,000 rpm and more.

#### INSTALLATION, OPERATION, and MAINTENANCE INSTRUCTIONS

**WOOD PROPELLORS FOR INTEGRAL FLANGE CRANKSHAFTS:** By Robert Bristol, propeller engineer for Sensenich Corp. (from Aviation Mechanic's Journal, Nov. 1980)

*Editors note: This month's Tech. Library is Part II of the additional information supplied to the Journal by Mr. Robert Bristol, propeller engineer for Sensenich Corp.*

Sensenich wood propellers are manufactured from aircraft quality Yellow Birch and the laminations have been bonded with high strength, water-proof resorcinol glue under closely controlled conditions. Assembly of Type Certified propeller/engine-airplane combinations must be accomplished by personnel holding the appropriate FAA license.

Installation of the propeller will require a front face plate of adequate stiffness and with an area approximately equal to that of the engine crankshaft flange, a flange adaptor in some cases, and a set of attaching bolts of the proper length. Also, confirm that the crankshaft flange drive bushings will project into the counter-bored holes in the propeller a distance approximately equal to their diameter and that they will fit snugly (i.e. 5/8" diameter drive bushings should project 5/8" into counter-bores). If the drive bushing length and fit is not correct, contact the engine manufacturer to obtain the proper bushings.

An aircraft engine imparts its driving torque to a wood propeller through the static friction which is available between the steel flange and the face of the propeller hub boss. Therefore, maximum engine torque can be transmitted if the wood hubboss has been pre-loaded

to the maximum compression which it can withstand over a long period of time. Although the drive bushings provide a back-up system, they are capable of carrying the driving torque loads for only a short period of time.

Forest Products Laboratory<sup>(1)</sup> data for Yellow Birch wood shows that the optimum compression pre-load of the propeller hub is 0.006 inches per inch of hub thickness (i.e. a propeller hub which measures 3.375 inches thick before installation should be compressed 3.375-X-0.006 equals 0.020 inches, or to a thickness of 3.355 inches when installed). Knowing the hub thickness and the number of threads per inch of your attaching bolts, it is possible to calculate the number of turns required to tighten the attaching bolts the correct amount after they have

begun to compress the wood. For the above example, 3/8-24UNF bolts should be turned 0.020-X-24 equals 0.48 turns after the front face plate, the hubboss, and the steel flange are in contact. See the examples below:

Generally recommended wrench torques to achieve the same compression are shown in the following table. However, the table assumes clean, dry threads, and does not allow for variation in thread condition nor for the differences in hub compression area:

**CAUTION:** Over-tightening propeller attaching bolts will cause the wood of the hub to crush. This may break the moisture seal by cracking the finish and slightly reduce the drive-torque capacity of the insulation.

| Hub Thickness | Bolts       | Total Compression | Total Wrench Turns |
|---------------|-------------|-------------------|--------------------|
| 3.375         | 3/8-24UNF-3 | 0.02025           | 0.486              |
| 5.375         | 3/8-24UNF-3 | 0.03225           | 0.750              |
| 5.375         | 1/2-20NF-3  | 0.03225           | 0.625              |

| AIRCRAFT BOLT Specification | Diameter (inches) | RECOMMENDED Wrench Torque (in.-lb. ±25) |
|-----------------------------|-------------------|---|
| AN6                         | 3/8               | 200                                     |
| AN7                         | 7/16              | 250                                     |
| AN8                         | 1/2               | 300                                     |

**Wood Propellers, cont'd:****Installation:**

The following installation procedures are recommended:

1. Locate the propeller on engine crankshaft in most convenient position for hand cranking.

2. Remove a spark plug from each cylinder, check wheels.

3. Install propeller attaching bolts "finger tight" (so that the front plate, hubboss, and steel flange are snug, but compression of the wood hub has not begun). Check track of the blade tips by rotating the tips past some fixed object on the floor. The tips must track within 1/16-inch of each other when the installation is completed.

4. Track should be corrected to within limits at this time by snugging up the bolts nearest the blade which is forward. This will result in a common starting point for all the attaching bolts.

5. Proceed to tighten the attaching bolts in small increments, moving diagonally across the bolt circle. It is good practice to check track frequently during the bolt tightening procedure. Take care to tighten bolts on opposite sides of the blade axis evenly so that the propeller will not be pulled out of edge alignment (conformity of angles blade-to-blade).

6. Since a small part of the compression of the wood hub is plastic, it is good practice to loosen the bolts, and to allow the wood to relax for an hour. Retighten following the same procedure.

7. Install safety wire through bolt heads in pairs (not a continuous length) twisting the wire between bolts.

**Operating Tips:**

The following practices will add to the service-life of the propeller:

1. Do not use the propeller as a tow-bar to move your aircraft.

2. Avoid running-up in areas containing loose stones and gravel.

3. Place the propeller in a horizontal position when parked.

4. Inspect frequently for scars, bruises, or other damage to wood and metal tipping.

5. Protect your propeller from moisture by waxing with an automotive type paste wax. Check the drain holes in the metal tipping to be sure they are open.

6. If your propeller is subjected to any kind of impact, do not operate it until it has been thoroughly inspected by qualified personnel.

7. Inspect and check bolts for tightness at least every 100 hours or annually. More frequent inspection may be necessary when climatic changes are extreme.

8. Have all wood and metal tipping repairs accomplished by the factory or by an approved propeller repair station.

9. Check balance of the propeller whenever there is evidence of roughness in operation.

10. If your propeller begins to show any of the following marks, it should be retired from service:

- Cracks in hub bore.
- A deep cut across the wood grain.
- A long, wide, or deep crack parallel to the wood grain.
- A separated lamination.
- Oversize or elongated hub bore or bolt holes.
- An appreciable wrap (discovered through inspection or through rough operation).
- An appreciable portion of wood missing, or
- Obvious damage or wear beyond economical repair.

Refer to FAA publication AC 43.13-1A for further information.

(1) Forest Products Laboratory  
U.S. Department of Agriculture  
Madison, Wisconsin

## Wood Propellers For Integral Flange Crankshafts

### Installation, Operation, And Maintenance Instructions

**More For Sale Items:** Hank Steiginga, 45528 Newtree, Lancaster, CA, 93534, has the following items left over from his project (1) 2 6" Cleveland wheel brake cylinders. (Cassna) \$125 (2) Two Cleveland master cyls Mod 10-4, 6 5/8" long \$50 (3) Two Scott master cyls Mod. 4408E, 7 3/4" long \$50, (4) 5" wheel pants 38" x 10 1/2" deep with mud baffles, pair \$60 (5) 12 volt Bendix fuel pump (new) \$35 (6) Comm antennae, plastic base, new rod type \$30 (7) Pitot assembly #796 \$25 (8) Fin tip #570-4 hydro-pressed alum \$20 (8) Walking beam #551 \$30 (9) Carb air box, valve, intake, complete with cone shaped Filtron element, like round the world, Don Taylors \$180 (10) Prop extension for Lyc. O-360 #1072 \$135 (11) C.H.T. gauge "Westline" new \$20 (12) 1/8" Nyloflow tubing for brake lines, 2500 psi bursting press, 10¢/ft. (13) Flex shafting .200 & .150 \$1/ft. (14) 3/16" Nylo-flo tubing 12¢/ft. .... Item # (1) is model 30-55A

**Leroy Holt, Box 238, Savanna, OK, 74565, (918) 548-3812** has a few extra parts for the folding wing. He's a machinist for the Naval Arsenal and he made up a couple of extra sets when he made his. . He stopped by and showed me his work and it's first class. If you write him, plz include a s/sa envelope.

**Garland Root 3863 Mission Ave., Carmichael, CA, 95608 (Sacramento area):** Has an O-20 150 hp. Lyc with 50 hrs. SMOH for sale. It's the one he removed from his T-18 when he installed the J-360 and is complete, excluding the exhaust system. He also has the prop extension and a "Derrick" (?) 68 x 72 prop, with face plate and spinner. He would like to get \$2500 for the engine, but would make a deal for the whole works. He says, yes, he is still making the canopy covers and will continue the \$75 price until the present material is gone. You can call him at 916/ 481-5483 between 10 am & 3 pm his time (no collects, of course).

He mentioned that he'd talked to John about a gear leg-tire alignment problem and John again said to not have any toe-in at all. Have wheels set straight forward with the airplane in the 3 point position.

**John Walton, 5726 Boyce Springs Rd., Houston, TX, 77066, (s/n 46), N51863 flies!** 7 yrs. a-building, this beautiful airplane flew in Jan. '81 and flew absolutely perfect the first time. He sent me an excellent story on it and we will run it in N. L. #53, which I hope to get out in about a month after this one.

**Ed Kempkey II, 1044 Lorraine Drive, Napa, CA, 94558,** sends this excellent and well written report: "Dear Dick, I am really ashamed of myself for taking so long to write and send my money for the news letters. I really enjoyed your first news letter. It was a real production. I just talked to Bill Cardoza the other day and he tells me the 2nd letter is out. I just hope everyone else is not as bad as I am about writing.

I know you are getting a lot of feed back mail, so I am sure it can get confusing as to who and what their T-18 looks like. Our T-18 (Bev, my wife, and I) is serial no. 658, I.D. no. N118EK. It has a 160 hp. engine, with constant speed and has been flying since '74. We missed going to OSH this summer ('79), but were there last year and also in '75. Last year we flew in a group of 3 T-18s from Calif: Bill Cardoza, Jim Baarlaer, and mine. I enjoyed meeting you then and was delighted to hear you would be getting out the newsletter again.

Altho' I make no claim on being a good letter writer I have been faithfully working on T-18 parts for another one that my son is building down in Redlands, CA. It is really great for me, as it is like having a second chance to build with hind sight to help make all the improvements and changes that you wished you could have done the first time. I am committed to the game of building all metal. It is not the fastest way of getting in the air, but to me it is just more satisfying. Besides that, I am a metal shop teacher and it seems only proper that I go the all metal route.



Ed Kempkey, cont'd

When I talked to you at OSH you were interested in my baggage compartment. I mentioned it to you again at John's birthday party and you still were interested in it, so I started to get the details together on it, but just can't get it all together for this letter. This is the 2nd baggage comp't I have built & it seems to supply my needs. It is light, made in 2 halves, R & L. has floor (bottom skin) to deck space, and can be removed completely in a couple of min's with hand turned cam locks. This quick, easy, and complete removal is amust for me, as the battery is way back and not easy to get to under the best of conditions. I will try to get some pictures and a drawing as soon as I get organized back at school.

About Exhaust Gas Temp and Cyl. Head Temp gauges: I have not had very good luck with the cheaper ones. They have been erratic and not dependable. I have also talked to other people that have reached the same conclusions.

I once took a ride in Oats Tackle's T-18, in which he had a K&S EGT. I was very impressed with the magnitude and instant response it gave to leaning the mixture. It is driven off a 12 v. system and seems to be very effective. I have just finished replacing the EGT and CHT gauges with K & S equipment. Their factory is in Hayward, which is close to me in NAPA and I was able to visit and talk with them. They are a small enough company that when you talk instrument needs, you are talking direct with the president of the company. They gave me about a 25% discount. I made the suggestion that other T-18 builders might be interested in purchasing instruments at a discount. They would prefer to extend a discount to a single shipment, but said they would extend a discount to anyone who writes in saying he is a T-18 builder. If any are interested, write to K. Savionics, Inc., 25216 Cypress Ave., Hayward, CA, 94544, Att: W. V. Simpkinson.

Mr. Simpkinson is the president and makes all decisions on what the discount will be, based on the size of the order. Just tell him what you want and that you would like a Thorp T-18 builder's discount quote.

Again want to say I sure enjoy the newsletter and am enclosing \$10 for a subscription for myself and my son, Edwin Kempkey III, 1444 Elizabeth, Redlands, CA, 92373. He has plan #1175.

In your last letter you talked about electric trim tabs for the aileron. I am wondering if you have talked to John Thorp about this? The reason I ask is that I was talking electric trim tabs to him about a year ago and he really was not too happy with the idea. He figured someone would sooner or later do it, but he didn't want anything to do with it for fear of possible flutter problems. I have looked at Lyle Trusty's system and thought it looked very good and am looking forward to any future information on them.

One more time, I'd like to say I think it's great you are taking on the newsletter project. I look forward to reading them more than any thing else that comes in the mail. I just hope it doesn't become too much of a burden to you. I appreciate your attitude about accepting information and ideas in practically scratch pad form. I'm sure that it will make more of us more willing to write and share ideas. Thanks again."

Thanks for all the kind words, Ed. I hope your letter will stimulate some of the other builders to take a few minutes to sit down and scratch off some reports of some kind for the N.L. If everyone just sat and waited for the other guy to send in material, the Newsletter would go down the drain pronto for lack of material. If you & you know of a T-18 flying or under construction in your area it would help if you'd send me their name & address. I could then send them a complimentary copy and perhaps they'd respond.

FROM T-18 Newsletter

10/25/80

Aileron Control System

When the T-18C plans were first drawn, the original Aileron Mast was retained. This required that the rear spar, outer wing be notched for clearance. A new Aileron Mast, drawing 331, has been made which moves the actuator tube attachment hole (#12) forward 0.6 in. This provides rear spar clearance without a cut-out.

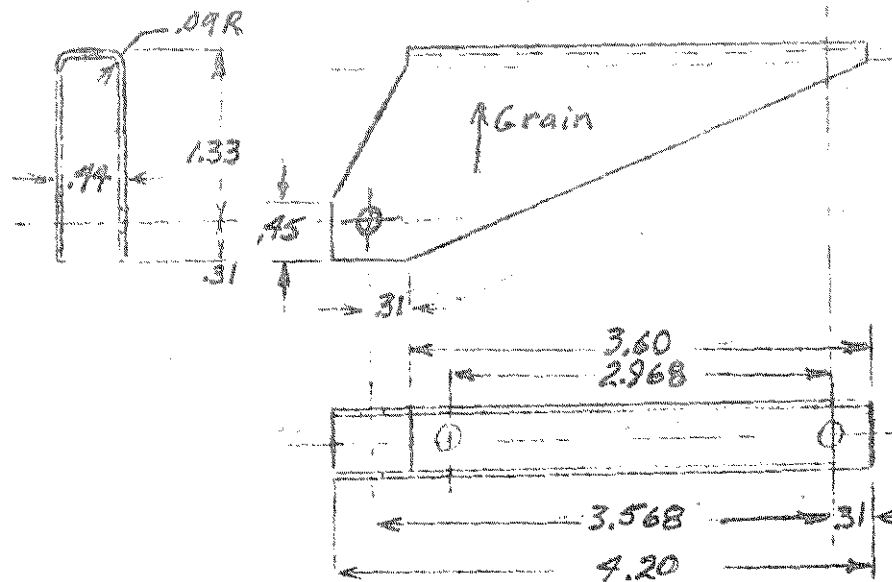
Also, the 498 Bellcrank had a slight interference with the main spar web requiring that a clearance hole be made in the web. On January 1, 1980 rib drawing 320 was changed to move the Bellcrank pivot aft from sta 74.0 to 74.25. These two changes require changing the length of the 501 aileron Actuator Tube from 24.6236 to 23.77 inches.

These changes are not mandatory, but if you do not have a new Aileron Mast 331 drawing and would like to have one, just send me a self-addressed stamped envelope and I'll mail you one free.

Please note that the length of the #106 Aileron Actuator Tube should not be changed. It should be 32.06 inches. Several of these drawings were sent out incorrectly changed.

New Airfoil Test Results

The new LDS-4-212 airfoil has been flight tested by Ken Knowles and it proved out just as the computer predicted. With this airfoil on the complete wing, the stall speed was lowered 10 mph. Stall was very gentle with about 10 mph of buffet warning. There was no secondary stall. Top speed was the same as for the original airfoil. Tests were conducted with Ken's wide body T-18W fuselage. When making the leading edge skin bend, be sure to use a template and get a good fit. Use something like plexiglass for the template so it won't scratch the skin.



#12 DRILL - 4 HOLES DWG 331

Rec'd from Lu Sunderland

The preceding was a bulletin from Lu Sunderland, the designer of the T-18 convertible wing (CW) and the wide body modification for the fuselage.

Metal Cowl update: I have not rec'd anything new from Marc Bourget in regard to progress on the metal cowl project. His last letter was about a year ago and at that time he stated that efforts were continuing and that the new cowl price would be within the old cowl price range of \$600-\$800. In a recent phone conversation with John I asked him if he knew of any progress that Marc had made on the cowl and he replied that Marc had been very busy on his law school studies. To recent, the new cowl design would have a single opening under the spinner, similar to the Derr-Garrison effort, and would be all metal.

Fitting and Shaping the #580-2 skin over the tank: I've gotten several reports from new builders of their difficulty in getting this skin to fit correctly. Apparently some of the new builders aren't aware that this skin requires a fair amount of pre-forming. It must fit the radius of curvature of both the firewall and the dash frame, which requires that a segment of a cone be formed on each side of the skin. Here's the way I've done several of these skins and altho it's a little time consuming, it's a safe and relatively easy method:

- (1) After the skin has been cut to size and trimmed, I turn it over on the bench, with the inside surface up.
- (2) From the previously located B.L.O point at the firewall and dash frame locations, measure outward to the point where the "flat" ends and the curvature begins and make a mark with a 'Marks-A-Lot'. Pick off these distances from your firewall & dash frames for accuracy.
- (3) From the beginning point of the curvature, measure the amount of the curvature at each location until the "flat" begins again on the vertical part of both frames. Again make a mark.
- (4) Draw fore and aft lines that connect the points where the flat ends and where it begins again. You have now defined the shape of the cone segments. Make a mark in the approx. center of each of these areas to be curved.
- (5) The next part requires at least 2 people to avoid possible buckling.
- (6) Using a thick cardboard tube of 3" to 5" dia., lay it across the center of curvature marks you made and carefully hand form the skin around the tube a little at the time.
- (7) This 'wrapping' of the skin around the tube requires allowance for the considerable amount of springback and after each wrapping operation the skin should be positioned on the two frames and checked for conformity to the curvature of the frames. DON'T HURRY IT!
- (8) When approaching the proper radius of curvature of the skin, pay particular attention to the area between the two frames, as this area is more resistant to bending than the ends.

Before starting step #6 I find it helps to initiate the process if we hold each end of the sheet and "shoe shine" the area to be curved over the soft edge of a wooden work bench. The bench edge should be rounded and free of any thing that might mar the skin. With hands on each side of the curved area, use moderate downward pressure as you shoeshine it (in unison). You can achieve a considerable amount of stretch forming of the metal in this manner and thus reduce the amount of hand squeeze-wrapping around the tube. Just be VERY careful to avoid too much pressure in localized areas and thus avoid buckling. Don't get careless and you'll come out with a perfectly fitted skin.

The first couple of these skins I made I had access to a sheet metal roller of 5 ft. capacity in a commercial metal shop and it was a simple matter to tighten the roller a little more at one end to get the required radius. I took my firewall and dash form blocks along and used these to check with.

Next issue we'll show you a simple way to lay this skin out in the flat.

I've had quite a few requests for lists of builders near them. This would be much too time consuming on an individual basis, but as time and space permits I'll publish lists by states of MAS members. If I know the person has an airplane flying I'll underline his name and address. Be aware there are quite a lot of airplanes flying that we have no record of. I'll try to print the Calif. builders next time, as they are the most numerous, by far.

#### Alabama:

Mac Booth, P.O. Box 580, Daleville, 36322  
Gordon Cronin, 1800 Panorama Blvd., Mobile, 36609  
Jerry Findell, Rt. 1, Box 68, Pansey, 36370

#### Arkansas:

Donald Collins, 2000 Reservoir Rd., Apt. 66, Little Rock, 72207  
Sylvan Keebler, 121 Pebble Beach Dr., Little Rock, 72212 (N99SK)  
Fred Swafford, 205 Forest Park Dr., Arkadelphia, 71923  
Lloyd Toll, P.O. Box #303, Hazen, 72064 (N)

#### Arizona:

Hal Kavang, 3612 Camino Blanco, Tucson, 85718  
J. S. Chocolas, 1216 W. 20th Pl., Yuma, 85364  
Rob't Deering, 7637 Jupiter Way, Chandler, 85224  
Roy Fonk, 2419 Whitton Ave., Phoenix, 85015 N7HMF  
Ed Poe, 402 E. Braeburn Dr., Phoenix, 85022  
Chas. D. Pressman, 11823 N. 76th Way, Scottsdale, 85260

#### Alaska:

John Cooley, 2231 Lord Baranoff Dr., Anchorage, 99503

#### Colorado:

Kendle Wilson, 30643 E. Barnett Rd., Pueblo, 81006  
Frank Lanier, P.O. Box 195, Colorado City, 81019  
Pete Gonzalez, 1318 Server Dr., Colorado Springs, 80910  
John Evans, 1530 S. Valentine Way, Lakewood, 80228  
Dean Cochran, 255 Hemlock, Broomfield, 80020  
Gale Abels, 3100 6th St., Boulder, 80302 N23GA  
Guy McSheffrey, Tall Timbers, Boulder, 80302

#### Connecticut:

Rob't Lanoue, 72 Mattabasset, Meriden, 06450  
Richard Keyt, 6 Black Walnut Dr., Newtown, 06470  
Joe Gauthier, 9 Kowal Dr., Cromwell, 06416  
Geo. Durkota, 629 Wilcoxson Ave., Stratford, 06497  
Dan Cuihane, 146 Hillside Dr., So. Windsor, 06074  
H.E. Combs, Jennings Rd., So. Kent, 06785

#### Kansas:

Norman Buehler, Rt. 3, Scott City, 67871 N25002  
Steve Egbert, 2332 S. Greenwich, Wichita, 67207  
Wm. McCoy, 613 Farmington, Derby, 67037  
Steven Mead, 7901 E. Lincoln, Apt. 408, Wichita, 67207  
Norman Spillman, 4735 SW 17th St., Topeka, 66604

#### Louisiana:

Larry Bulot, 122 Lake Park Dr., Belle Chasse, 70037  
John Hardy, Rt. 1, Box 292K, Natchitoches, 71457  
Tony Russell, 406 Cardinal Dr., Slidell, 70458

Also be aware that not all names are bonafide T-18 builders. Some may be subscribers to the N.L. only. Before planning to visit any of those listed, common courtesy would suggest a telephone call well in advance for permission

*Dick Cowan*

END N.L. #52



Just returned from Cape Canaveral, where about a million of us gathered to watch the launch of the world's fastest and high flyingest homebuilt, the Columbia. I don't have to tell any of you how beautiful the re-entry and landing was. The evening before I left, Hank Steinginga and his wife came thru Dallas in their T-18 on the first leg of a transcontinental tour to celebrate his recent retirement from NASA. What a beautiful airplane he has! Most of you will have to wait until OSH to see it, tho'.

Here's a little scoop for you: I just talked to Clive Canning, who lives in Victoria, Australia, and he told me that Peter Hodgson and 15 other Aussie homebuilts will be brought to OSH this year in the cargo compartment of a Quantas 747, (along with about 260 BAA types) and the 747 will open the show with a low pass down the flight line. Clive said that Pete's newest T-18 (Tie-ay-teen, as they call it down under) is truly a show piece, so look for it. I mis-figured the time, so my call to Clive came in at 4 AM, much to my embarrassment. Please, Clive and Joan, forgive me. By the way, if any of you don't have Clive's book of his adventures while flying his T-18 around Australia and the round trip to Great Britain, you really should have it. I can guarantee you that you won't put it down until you've read it from cover to cover. He recently sent a shipment of the books to Ken Knowles (a few dozen I think) and I don't know what the price will be, but his account of the Syrian Mig jets jumping him is a cliff hanger and worth whatever the book costs. (Title: "Charlie Mike Charlie").

I now have occasional access to an outward WATS line during daylight hours and also on the week end, so if any of you have T-18 building problems you need help on, send me your day and night phone numbers and I'll call you as soon as time permits. (Yes, I can call internationally, too!).

I'm trying to get this newsletter airborne before the middle of May when I have to go back to the hospital for more surgery to make a permanent fix on the surgical hernia I got from a gall bladder operation. The Dr. has told me to cool things for two months afterward, so maybe I can get another newsletter cranked out in early July while recuperating. I would sure appreciate your input on any areas of engine hook-up or airframe building, no matter how the subject has been written up before. If some of you made patterns for your baffling, how about sending them to me? I'll make some full size tracings from them and have them run off on a giant size copier I have access to and make them available to the troops. I'll return your patterns of course. With over 300 T-18s having flown, the law of averages surely would mean that one or two of you would have baffie patterns and be willing to do his bit to help out his fellow men, wouldn't it?

REDY ADLER: One of the pioneer T-18 builders, whose airplane was the subject of several national magazine articles, is flying again!!! Rudy's kind and pleasant disposition made him a favorite with all who knew him and when it was learned he had cancer several years ago it grieved all of us, but in recent months his cancer has gone into remission and he is rapidly returning to good health. I called him at his Palm Springs home recently and he sounds great and says he has been feeling well enough to fly his airplane quite a lot the past few months, so that is really good news. He lived in the Burbank vicinity when he built his T-18, which was powered with one of John's CPU conversion engines, and was well known for his skill in metal working. When he retired he moved to Palm Springs. If any of you are in the area I'm sure he would be delighted to hear from you.

John Thorp: John has now moved most of his Sun Valley shop equipment up to the family home in Iodi, CA, and will soon have it going full speed again. He had a large concrete floor poured in the old barn behind their house and in the very near future there will be some lucky T-18 builders happily turning out parts

I don't know just when John's shop will be open to new builders, but what arrangements he plans to make, but I do know he's never happier than when he has a gang of T-18ers working in the shop like busy bees, so if any of you that are lucky enough to live in the general area and would like to start building your T-18 under the tutelage of the Old Master himself, you'll never have a more golden opportunity. If you had thought of a California vacation, maybe you can kill two birds with one stone, so to speak. Mind you, that I'm saying all this without John's knowledge, but knowing him as well as I do I know he's delighted when a new T-18 starts. Incidentally, plan sales have now passed the 1450 mark and are continuing to increase at a surprising rate. That speaks pretty well of the T-18's reputation when one considers that John no longer advertises plans and people have to do a little scratching to find him. Just in case you have a buddy that's interested, his address is "Thorp Engineering, Drawer T, Lockeford, CA, 95237". His phone no. is 209/ 727-5792. My Calif. buddies tell me John looks better than he has in several years and they say that the shop has really been a tonic for him.

It's hard to pin down all the factors influencing the upsurge in T-18 building, but no doubt Don Taylor and Clive Canning's flights have had some impact. Speed and economics are probably the biggest factors. With prices of new and used high performance airplanes going completely out of sight, it's no wonder that a 200 mph airplane as rugged as is the T-18 can be had for less than the price of a year old Cessna 150, has become popular. Apparently the wing folding feature is also a big plus, as hangar rents everywhere have gone crazy (When you can even find one). No wonder some are calling it the "Poor Man's Mercedes". If the Javelin Escort engine lives up to its advance billing, you can bet your ailerons that there will be a real upsurge in T-18 building.

Escort Engine update: Dave Blanton recently called to tell me that the Ford engineers had called him to excitedly tell him that they had just finished a dyno test on an Escort engine and that it had put out 185 hp at 6500 rpm, unaspirated! It had a special camshaft and it would be premature to draw conclusions at this point, but it's beginning to seem that the potential of this little engine has been understated. EPA emission requirements have been relaxed to the point that it now appears certain that the Escort engine will be available this fall with the factory installed Porsche supercharger. In the meantime everything is on schedule in the preliminary testing phase at Javelin. One of the engines is now being installed in the dynamometer and the other engine will be installed in the Cessna 150 test bed in May. Dave expects to begin flight tests with it in late week in May. If no problems arise he hopes to have it at OSH with about 150 hrs. of test time on it.

I wrote a rather long article on it for the April '81 issue of "Homebuilt Aircraft Magazine" and if any of you are interested in getting copies of that issue you can send \$3 to them at 606 Wilshire Blvd., Suite 100, Santa Monica, CA, 90401 and they'll send you a postpaid copy. It's a newstand mag in some areas, but any of the flying mags are getting hard to find on the newstand these days, so the best bet would be the publishers. (I hope I build airplanes better than I type).

CHRIS EAST: Our "Old Faithful" has come thru again! On the next page you will see Chris' step by step procedure for building the wing flaps. The flaps are probably the most difficult part of the airplane to build in the opinion of many T-18 builders and even tho' Chris' assembly sequence is predicated on the use of parts supplied by Ken Knowles. As many of you may know, not only are the rivet holes located via punch marks, but also the skins have several inches added to locate a synthetic trailing edge. These lines of holes are added for the sole purpose of making the nose of the bend fall in the right place. It is much more critical (difficult) to get the bend to exactly conform to the nose of the ribs than on the wing skins, not only because of the tightness of the bend, but also because the camber difference between the top and bottom skin is so great. The main idea is to add enough material to the flat bottom side to make top and

bottom curvatures identical. For bending purposes it converts it to a symmetrical airfoil. This excess is then cut off after bending is complete. The horizontal tail skins are symmetrical airfoils, so we don't have to add any for bending. Since the flap chord is so much less than the wing chord it's necessary to add nearly a foot to each trailing edge in order to get enough bending leverage via the 2 x 4 pressed down parallel to the L. E., etc. Here's Chris' sequence now:

1. Cut & trim #632-1 skin and drill (or punch) all holes with #40 drill/punch. Note: DO NOT make #634 & #635 hinge bracket cutouts until after skin formed.
2. Cleco trailing edge of skin together at forming index line (cleco every other hole) and mash/crush it down to the approximate shape of a nose rib by using a flat particle board 1" thick x 12" wide x 4.5 ft. long. (Remember that the ends will tend to crush faster than the center, so don't get your knees too close to the ends). This will give you the approximate form you want, but not entirely. See the next two steps.
3. Drin the skin back to the final trailing edge line and cleco the trailing edge holes together (like you did the index lines of holes).
4. Very carefully crush the skin a Very small amount...just enough to change the crown of the top leading edge to give the nose rib a good fit. Note: If you overdo the crushing it may cost you a new skin. It can't be unbent!
5. Open the skin and install (rivet) all of the -2 stiffeners (upper & lower).
6. Re-cleco the trailing edge together...do NOT install the -4 .040 filler strip yet. Use #40 clecos.
7. Fit the #636 beam to the top skin, using #40 holes & clecos. Then open holes up with 1/8" drill and install 1/8" clecos. NOTE: before attaching the #636 lower flange, it will be necessary to RE-FORM both top and bottom flanges slightly to fit the skin contour perfectly. Connect bottom flange and skin with #40 clecos, then open up to 1/8" as on the top skin. NEVER try to go thru with with a 1/8" drill first! ! !
8. Remove #636 beam, attach #662 nose rib assembly to beam with clecos and re-install both assemblies in skin, in order to locate # 662 nose rib in skin for final holes. \*\*\*\*\*see note at end (ED)
9. Remove trailing edge clecos and beam assembly, deburr and dimple all holes. Zinc chromate as necessary.
10. Re-install #636 beam & #662 nose rib assembly & attach to upper skin. Use only AL rivets in the top skin. Riveting is done with the trailing edge held open for access with bucking bar at this point.
11. Close trailing edge (still with #40 clecos and with NO -4 filler strip).
12. Attach lower skin to bottom flange of the #636 beam with clecos and rivet with MONEL pop rivets. This method guarantees proper alignment as long as it is done with the T.E. clecoed together.
13. Now with the #636 beam riveting completed, open up the trailing edge and fit the -4 filler strip, still using #40 holes & clecos.
14. Clamp the T.E. to a straight heavy aluminum angle, drilled out to the T. E. rivet pattern to clear clecos. With T.E. securely clamped to backing angle remove the #40 clecos one at a time and drill holes out to #30, installing 1/8" clecos as you go. Now SQUEEZE in SOFT alum. rivets.
15. Remove clamps and backing angle. Your flap will have no twist and the T.E. will be straight.

(Here Chris made a note to me that he thought the problem I wrote about in a previous newsletter came from fitting the #636 beam without the T.E. closed).

## CHRIS FAST FLAP SEQUENCE cont'd

16. Fit and install end rib assemblies # 634 and #635 last
  17. Caution note: Do NOT drill the hinge bracket holes until you fit the flaps to the aircraft, as they may not fall dead center, due to accumulated tolerances. It's very important that the flap aligns with the wing properly.
- \*\*\*\*\* After writing the above I talked to Chris and he reviewed the sequence and suggested that the nose rib installation (riveting) be done before the final installation of the skin and that it be done with pop rivets. I believe Step #8 would be about the right place to do this, alas I haven't had a chance to check it out.

As we said before, building the flaps is a tuff. We would appreciate builder comments or further suggestions from any using this sequence. Also any of you that built flaps from "scratch", it would be appreciated if you'd write an account of it as best that you can remember. By the way, if any of you don't want your name used when you send in a tip, please specify. No problem. The main fact that's behind the N.L. is to pass on useful info to the next guy. I would venture to say that 99% of you have been benefitted by something you read in the N. L.s, so doesn't that seem to make YOU just a little bit obligated to repay that debt with an item or so that would help the next guy???? Most builders tell me they have good intentions to do that very thing and many have, but when it comes to getting one of these N.L.s together all those intentions result in blank paper. (Rant)

FITTING FLAPS TO WING: In N.L. #46, pages 13 and 14, we ran Paul Harigis account of the use of incidence boards in properly aligning wings and flaps. To again describe an incidence board briefly, it is a carefully squared board about 6 or inches longer than the complete airfoil. It is also about the same amount wider than the airfoil height. The inside of this board is cut out to the exact size and shape of the complete airfoil, so that it can be slipped on a riveted wing and a level put on the top edge to read any deviation from squareness at whatever point on the wing selected. This board is split into two halves, with the chord line as the dividing point. The ends are locked together with some sort of external brackets with quick removable pins or bolts. The incidence board is especially useful for holding flaps in perfect alignment with the wing while the flap hinge brackets are match drilled. This requires the use of proper thickness shims between the rear spar and the flap nose, of course.

If you are building a wing with the new airfoil and are too busy to lay out the wing profile to make yourself a set of incidence boards, perhaps help is on the way. One of the brand new builders in our area told me he would volunteer to scribe a profile on a strip of .016 and send it to you for the cost of materials. .016 would be used, as it could be rolled easily and put in a cardboard tube for mailing. Drop me a postcard to let me know if you want one and I'll have more details in #54. Actually you really ought to make your own from the coordinates shown in the previous N.L. It's not that hard or time consuming to do. These incidence boards have another use, too: They are mighty handy to check the bend radius at the skin L.E. when you are doing that little job. Another very important use for it is aligning wing tips when being installed. It doesn't take long to misalignment to make an airplane wing heavy.

John Kleber, 213 Sheffield Dr., Danville, IN, advertised a standard wing, (just removed from his T-18) in N. L. #52. It's now sold and already installed on Dave Ray's fuselage (3206 Xenia Blvd., Mishawaka, IN, 46508). This will put Dave's T-18 in the air pretty quick now. He has a 160 hp Lyc. already mounted in the fuselage and as soon as he gets the engine hooked up and his canopy installation complete he'll be close. Dave also has another almost complete airframe nearly ready to rivet. If one's good, two's even better.

JOHN WALTON, 5726 Boyce Springs Dr., Houston, TX, 77066 sends this story of the life and times of his beautiful T-18:

January 23, 1981

T-18 N51863 (Plans #46) was test flown by Del Hainley and Dick Cavin during January, 1981. The aircraft was built by John Walton, with the help of his sons, over a seven year period.

Plans #46 passed through the hands of at least 2 different owners before surfacing again in a classified advertisement in Sport Aviation shortly after the 1973 Oshkosh Fly-In. Some may recall that that was the year that John Shinn arrived in Oshkosh with his beautiful N4784G, which won the admiration of all as well as an EAA best upholstery award.

John Walton has been an EAA member for several years and had talked about as long of building a T-18. John Shinn's aircraft and wife Barbara's reminder, "You had better do it, you aren't getting any younger!" finally cast the die. Plans #46, along with T-18 newsletters and some aluminum were soon on the way to their home in Neenah, Wisconsin. By January, 1974, with generous help from John Thorp and Lu Sunderland, the plans and newsletters were brought up-to-date and the early hesitant steps of construction began.

This project was to be accomplished in their basement. Successful stories about getting boats out of the basements abound, and we all know that a boat is larger and clumsier than a T-18. At any rate, this was a scant problem when construction triumphs were the completion of a few ribs, a practice rivet strip, and the first Aileron.

Gradually, the assortment of parts began to evolve into finished assemblies, as many builders already know. Son Bill, then in high school, had learned to be an excellent rivet buckler. Youngest son, Lee, a toddler when the T-18 began, has grown up with her and has been very involved in helping with the final stages of construction and assembly. In fact, the final colors and painting scheme was designed and supervised by Lee. He did such a nice job with the T-18 that a Houston RV3 builder commissioned him to do the paint design for his aircraft, now also flying.

Construction progressed steadily during the mid-seventies, with time out for a house addition project and a major rebuild for one of the cars following an accident. By 1978 the basement looked as if it had grown much smaller. The fuselage was on its gear, with Lycoming hanging up front, and wings and tail bolted in place. It filled the construction area, and suddenly looked very large in that low ceiling basement.

The following Spring, the Waltons were to move to Houston, Texas. The time was thus forced to make good on the promise that she would indeed come out of their basement. Fortunately, the window framing in Barbara's dining room was 3/4" wider than the T-18's standard fuselage. All that remained to do was to roll up the carpet and remove the floor, which easily gave way to a power saw; thus making an adequate 4' X 10' opening. This was no problem for the T-18, she came out willingly and without a scratch; although the inflexible real estate people, trying to show the house, imagined a wide variety of ominous problems throughout the operation.

The fuselage, wings, engine and other components were carefully crated for shipment on the moving van. The crates easily outweighed their contents several times over, as they were built to protect the Thorp from almost any disaster. Everything arrived in Houston in perfect condition. Before the dishes and clothing were unpacked, the Thorp was out of her crate, (after all, they needed all that plywood to deck the attic), back on her gear and at roost in the garage shop which had been prepared to receive her. During the final sixteen months, engine hook up, wiring, brakes, plexiglass, upholstery and painting were completed. The upholstery was done with the help of a commercial walking-foot sewing machine rented for a month from a machine dealer in Houston. This rather feared phase of the project turned out to be a lot of fun and much easier than John had expected. This was achieved through some valued coaching from John Shinn, who is a master at this task.

The big day, the move to the airport, was in October. After

assembly and taxi tests, John Selgraph of the San Antonio FSDO signed her off in November. One note of caution to uninitiated future builders. The newsletters are full of comments warning of the tendency for the Thorp to be squirrely in slow taxi. This is especially true with power off. The controllability in this situation is to a considerable degree, affected by the amount of tension put on the tail wheel springs. Don't leave them sloppy - they should be compressed about  $\frac{1}{2}$  of their original length.

Del Mainley and Dick Cavin kindly performed the test flights. Both have been a great help in evaluating the aircraft during the test period and their assistance is deeply appreciated.

T-18 #46 is configured with the standard fuselage and standard wing. (It should be noted though that Barbara gave John a set of Lu Sunderland's folding wing plans for Christmas 1980.) The landing gear is extended 2" and the canopy roll bar raised  $\frac{3}{4}$ ". The baggage compartment is converted to a small passenger jump seat, similar in concept to the descriptions in the Newsletters #35 and NL #49. The seat itself easily snaps out to provide battery access or to remove the baggage floor installed over the flap rigging.

The 571 frame is bulkheaded with removable panels to reduce tailcone noise. The cockpit is fully lined with  $\frac{1}{4}$ " foil-faced urethane insulation/sound dampening. Snap-out panels of .016" aluminum, covered with lightly padded upholstery fabric complete the cockpit. The seats have fold forward backs and are upholstered with matching fabric and flame-retardent Naugahyde trim.

The Gee Bee light-smoke tint canopy and windshield were fitted with their covers overlapped at the roll bar as stressed by speed-artist, B. C. Roemer. The canopy frame also has two additional hold-down lugs installed to mate with dowel pins at the 571 bulkhead, when it is in the closed position.

Many of the components were supplied by Ken and Gerry Knowles. These include the Thorp cowl, tips, fairings, Dynafocal engine mount and landing gear. Needless to say, the T-18 newsletters were another indispensable contributor to the final configuration of the aircraft.

The exterior paint is DuPont IMRON because of its durability and flexibility. This was applied over Alodine surface treatment and Colar zinc chromate epoxy primer.

The panel includes a King 170B Nav-Com, transponder, the usual complement of flight instruments with gyros driven off a dry vacuum pump. Engine instruments include CHT and EGT.

Cockpit ventilation is provided by two leg level eyeball vents bleeding outside air from wing leading edge intakes. A vent is also installed in the back of the canopy. Cockpit heat is ducted from an exhaust pipe heat exchanger.

A Hush-a-Com headset/intercom system supplied by Revere Electronics enables a high degree of cockpit ear comfort and normal voice level conversation while not interfering with radio communications capability. The transmitter is keyed through a switch on the left stick.

The Lycoming O-320-E2A carburetted engine swings a 68 X 72 M-76 Sensenich propeller. This prop was vibration-tested to determine its harmonics prior to installation.

#### Vital Statistics:

|              |          |
|--------------|----------|
| Empty Weight | 989 lbs. |
| CG Empty     | 63.87"   |
| CG Forward   | 64.50"   |
| CG Rear      | 70.97"   |

(72# Baggage Limit)

(Uncalibrated) Air Speed Data -

|                      |                                   |
|----------------------|-----------------------------------|
| Stall, No Flaps      | <u>40</u> MPH IAS                 |
| Stall, 20° Flaps     | <u>59</u> MPH IAS                 |
| Cruise, RPM          | <u>2450</u>                       |
| Top Speed            | <u>193</u> MPH IAS                |
| Rate of Climb FT/MIN | <u>1500</u> SOLO <u>1200</u> DUAL |

As of January 20, 1981, the aircraft has flown 14.0 hours. There have been no squawks nor modification required to date.

Dick Gavin,  
T-18 Mutual Aid,  
10523 S. Smarton,  
Dallas, TX.

T-18 NEWSLETTER #53 PG. 5A

"Fairhaven",

Droxford Road,

Shirrell Heath,

Southampton SO3 2JN

England.


Mid March 1981

Dear Dick,

Thank you for most of XL 45-49 which got here O.K. I have got copies from Ron Miller of parts the postal services destroyed. Enclosed is another £ 5. According to the stamps they cost more than £ 5 to send.

When I had made all the flap parts and read everything I could find I still could not see how to relate beam and ribs accurately to the skin. I think I have now found a way.

Use 2" dowel clamped over the 25 thou. sheet to make the first bend for the skin as is shown in diagram 1. Use progressively larger round material, moving the clamping block back as one does so to achieve an accurate section. I used broom handle then two progressively larger sizes of plastic plumbing material. If you are careful you can get two flap skins out of a 48" width.

Make two accurate nose ribs of  $\frac{3}{4}$ " or thicker hardwood and saw a tough piece of  $\frac{3}{4}$ " x 2" hardwood cut to  section a few thou. smaller than to fit immediately behind the beam. Screw 5 pieces of  $\frac{1}{2}$ " x  $\frac{5}{8}$ " hardwood to this false beam as shown in diagram 2. The bottom skin is placed on a flat, true 1" or  $\frac{3}{4}$ " x 6" board with the L.E. parallel to one edge and clamped to it with the dummy nose ribs, beam & false beam as shown in diagram 3. The nose ribs should be opposite the outer  $\frac{5}{8}$ " thick blocks according to whether you are building the outer or inboard segments.

Raise wedges between the false beam and the clamping block at F with the two large 2 cramps gripping lightly via another true board. You may need to take it all apart and go to work bending again but finally you will end up with a good fit. Once your vernier shows the same distance x both sides note this and make sure it is the same for all four segments. Now the clamps 2 can be tightened. Using the protruding ends of the false beam ~~as a guide~~ (face 'A') as a guide, measure  $\frac{1}{4}$ " forwards. This is your rivet line for the beam. Drill and cleco  $\frac{3}{32}$ " (no. 40). Now mark the position of the false beam inside the skin.

Unclamp and carefully edge the whole issue forwards until you have space to work from face 'A' on the under surface. Clamp all up again, replace wedges and reestablish dimension x both sides and line up the marks inside the skin with the false beam, sighting carefully along the now unsupported face to make sure it is not twisted before drilling and clecoing up the lower face of the beam. This box will not now twist.

T-18 NEWSLETTER #53

Page 5B

Using the beam rivet lines erect perpendiculars as far as the T.E. where ribs and stiffeners go. Measure  $7\frac{7}{8}$ " from the beam rivet lines on the upper surface and  $7\frac{3}{4}$ " on the lower surface and rule spanwise lines. Sight along

these, bringing the T.E.s together where they coincide and clamp up. Your flap should be without twist. If it is it can be adjusted when you drill the rib and T.E. holes or when you drill out the beam attachment holes to 3.3mm. (no.30).

Tap the ribs firmly towards the L.E. and the ends of the mainspar or clamp a wood block to the edge and lever them. Use a vernier or depth gauge to ensure that the edges of ribs are parallel with the rivet lines before drilling and clecoing. All the upper clecoes can now be removed, releasing the hardwood nose ribs. The already assembled aluminium nose ribs can be inserted at the correct stations and drilled. If you have pre drilled the hinge attachment holes in the ribs it is easy accurately to make the holes in the skin. Measure from the edge of the skin to the outside face of the rib. Add .15" and make a pencil line parallel to the edge of the skin. Use calipers to measure from the attachment holes where the fore and aft faces of the hinges will come and mark these positions on the ribs. Sight along a square to mark these positions on the line parallel with the edge. This gives you the centre line and edges for  $\frac{1}{2}$ " holes.

I must say I found making good flaps easy this way with the minimum of jiggling. I hope this may help others.

Best wishes,

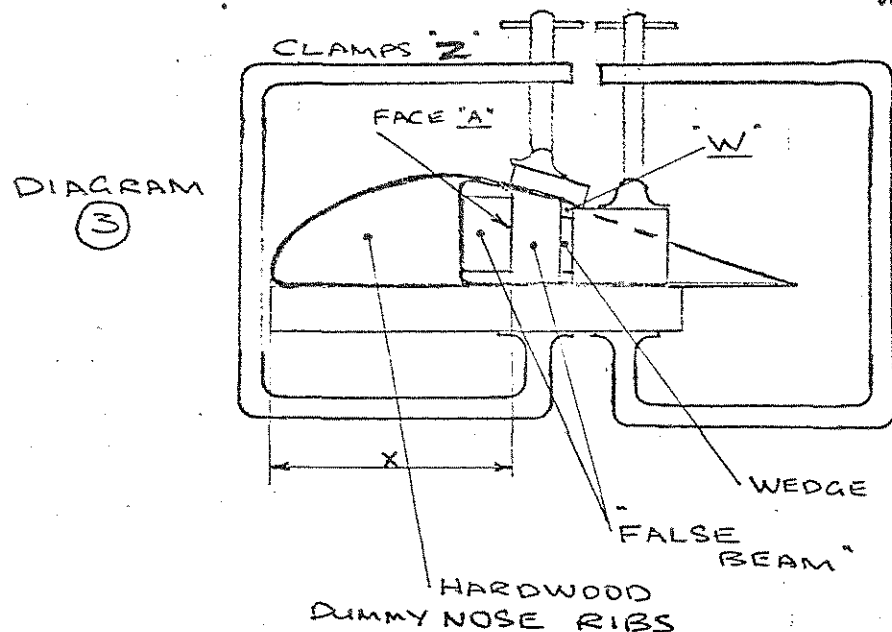
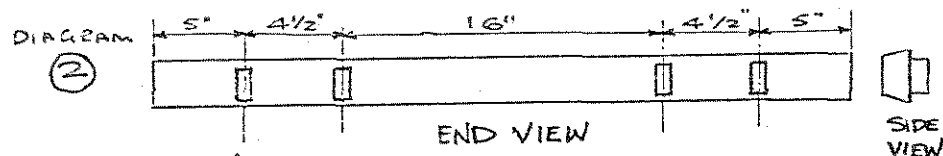
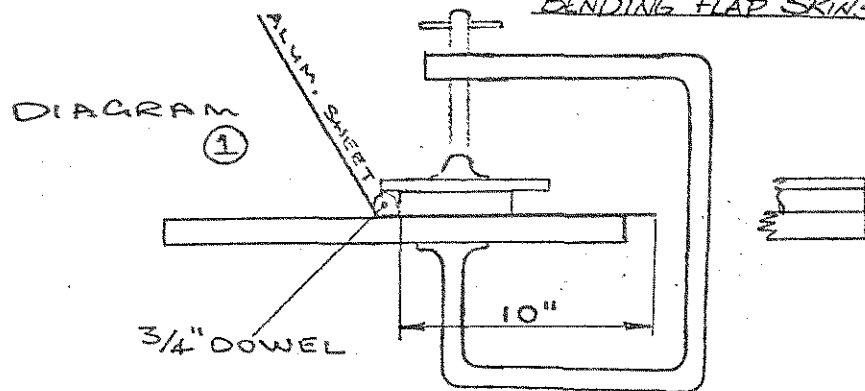
  
JIM WALLER

Thanks a million for a very well written report, Jim, and also for the excellent illustration that should make everything quite clear. We do appreciate your efforts. I certainly hope this will be a shining example to more builders to contribute material.

It's so easy to assume that "Everybody knows how to make a flap (or aileron, fin, rudder, etc)", but everyone doesn't know that. This article also highlights the fact that there are more than one or two ways to build things and no one method is necessarily better than another. In any case, such presentations will certainly enrich your knowledge store. In all the years I've been associated with T-18 builders one fact has repeatedly surfaced: The rank amateur builder is a very ingenious person and even tho' the pro's have told him, "You can't do that", he'll figure out a way of doing it.

SEE SKETCH PAGE 6A

## BENDING FLAP SKINS



THANKS TO JAS. WALLER

ENROUTE UPDATE THIS NEWSLETTER : I had intended to have this newsletter in the mail prior to my hospital visit in late May, but I guess that too many higher priority items got in the way. I've just had my 1000 mile checkup from the Dr. and he says everything is ok and on schedule today (June 23rd) and if I keep on being a good boy I can go fly my T-18 in mid-July. At any rate I hope to get this N.L. mailed before then. Thanks for your patience in the meantime.

BUILDING OUTER WING FUEL TANKS: Tony Russell, 406 Cardinal Dr. Slidell, LA. 70458, sends the following account of how he went about making his outer wings "wet": "I added an extra nose rib just outboard of the attach fitting. I didn't want to have to go into the tank in the future if I had to remove the fitting for any reason. Aviation Products, Ojai, CA (address ?) sells a good little book on the sealing of integral fuel cells and they also sell the PRC product that is used by all manufacturers to seal floats, fuel cells, and pressure cabins. Use 1422 B2 for all faying surfaces and 1422 A2 for brush sealing. Also get a large bottle of MEK to use for cleaning, as that stuff sure is messy! Also wear your wife's apron because it will NOT come out of clothes. Pop rivets will leak. Driven A2 rivets will not. I sealed all the faying surfaces with the B2 as I assembled the wing. After it had dried for a week I leak tested them. I only had a couple of seeps to re-seal. To do this I used a hole saw to cut oblong shaped access ports in the bottom of each section. Through these I used the A2 liberally to seal all the places where it could leak. You can thin the A2 with MEK and it will run down in hard to get places. The MEK will then evaporate, leaving the PRC. The filler neck is at the outside rib (highest point). I attached a piece of .25 alum plate to the rib and used a 45° fitting I picked up at a surplus place in Wichita.. Access will be thru a door in the wing tip. Inside the tank I put an .040 doubler at the top and bottom of the two inside ribs for the fuel and air to go thru after I cut 1" holes in them. The tanks fill okay and I also put an air vent at the top of each outside rib by the filler neck, using AN fittings. Each tank holds a little over 9 gals, roughly 2.25 gals. per running foot in the standard wing. The access holes are closed and sealed using B2 sealant and making covers with #8 metal nutplates and shaping a piece of .025 to fit the cutout for streamlining.

I hope this will help some of the other guys that need that extra fuel for the 180 hp engine."

A very good report, Tony. In case you didn't quite understand all the details you can probably reach him at night at 504/ 641-8152. Re the access doors I assume he meant oblong plates of .040 were cut to be about 3/4" larger than the hole, pushed thru the hole and bolted with the #8 nutplates to the skin, with the .025 carefully cut to the shape of the access hole, to fit flush with the ou outer skin, and it is probably riveted to the .040. I'll check this out with Tony and advise later. Tony said this part of the operation was the most labor intensive job he'd gotten into yet on the project. I've also heard others make such statements. Some FAA people might insist you put a tank drain at the low point to drain any water that might accumulate below the fuel outlet point and the bottom skin, as water could pool as much as 1/2" deep there. Needless to say, an adequate screen strainer of rustproof metal is a must at the fuel outlet point.

A variation on Tony's method I've seen is access panels (removable) mounted in each rib with nutplates. The ones on the outer ribs used a flat rubber gasket for sealing. These plates were mounted on the outside face of the ribs, rather than the inside like Tony did, but there is no reason they couldn't be attached to the inside of the ribs, using PRC sealant like Tony did. I don't have any authoritative info on the relative merits of the access door location, do any of you?

THE PROBLEM: BUILDING THE LANDING GEAR " I was faced with the same dilemma as a lot of other guys trying to save a few bucks here and there to apply on the buying of one of the sky-high priced engines for my T-18. The \$545 price of a store bought gear from Knowles or Brock seemed like a place I could get a few bucks put aside in exchange for my labor. After talking to aircraft welders and reading all the BAA books on the subject, I decided to buy me a rig and learn how to weld. I figured I might learn a new skill in addition to saving some money. The first thing I learned was that the most comfortable type of torch had the valves at the tip end of the body and not at the hose end. I found that welding 4130 takes a lot of practice and patience, not magic as a lot of professional welders would have us believe. Also I got a lot of practice by welding up a lot of the small fittings used in the T-18. I also got a lot of satisfaction in the making of parts out of steel.

Back to the gear: I looked at a lot of sources of 4130 tube, including the ship and oil industry here in New Orleans. After all that time and trouble I found the best place, as far as price and delivery goes was from Ethel Ferree at Airparts in Kansas City. I used my 4 x 8 work table for a jig and laid it out according to Mr. Thorp's instructions. I learned that you shouldn't cut the legs to the final length until you have fitted all other parts first. The grinding and filing was made very easy by using a Sears Heavy duty grinder, with an abrasive wheel that all the welding shops use. It is very easy to take off too much of the steel if you don't watch it. I tacked the gear together on the table and then welded it. The only place that was difficult to get hot was the inner-outer tube joint. I used a #4 tip for welding and also another torch (very large) to help preheat. Also, when welding the pads to the legs the legs twisted BADLY. After one had twisted so bad I didn't weld the other. I used the grinder and took off the old pad weld.

I called Mr. Thorp and asked him about some comments a local pro welder told me. The welder said he welds chromoly tubing on motorcycles with a low hydrogen rod with very good results. John said that the best way to go was to heli-arc the pads on and avoid as much heat as possible, but that he thought the low hydrogen way would be alright. This statement was an opinion only, with the final decision and responsibility left up to me. John's opinions are worth their weight in gold, but I would hate for someone to take one that I pass on as being the recommendation from the designer as a way to do something. He has been too unselfish and free with his time for us homebuilders for anyone to read something into his opinions that may or may not be there! (Amen-Ed.)

After welding the gear I looked for a place to heat treat it. Dominy in Dallas wanted .180 to do it. I called several places in Houston and they would do it for their minimum charge of \$25 and take a couple of weeks to do it. These places deal mostly in oil field equip't and they are really set up to handle it. As it turned out, they had trouble getting my gear hard enough. I sent a sample to the mill and they confirmed it was the proper material. The heat treater then used a different method to quench it and this time it checked 42 and 45 on the Rockwell scale (C). They didn't want to fool with it any more, so they didn't charge me for their work. Also the gear had some nice bows in it, so I put the gear in a press used to straighten prop blades and finally got it straight or near enough to it. The only problem was a crack at the outer tube at the bottom and a couple of cracks in welds. Again I imposed on John and he said the best way to go was to anneal, re-weld, and re-heat treat. He said to remove all the old weld before re-welding. I asked him about using the heli-arc, since the legs were harder than called for and he said it probably would be alright if I checked the hardness of it about 1/2 inch from the welds. After talking to the welder again, he talked me into the low hydrogen way again by saying that there would be less heat

with one pass of low hydrogen than several passes with the heli-arc. Also John said that if the gear failed it would not fail all at once, that there would be some warning. Cracking, I suppose. Again, this was an opinion from John, not the Gospel. I guess the only way to really know if the gear is good is to finish the T-18 and fly it. If I had to build the gear again, I would not hesitate to do it myself. Also I failed to mention that the legs can be cut very easily and accurately by using a horizontal band saw found in most welding and steel working shops.

Dick, I'm in the process of overhauling my O-360 engine. I find that Superior Airparts has the best prices on engine parts anywhere. They are in Addison (TX) as you know, and stock new exhaust valves and pistons, etc. at very good prices.

I am still shooting at flying this summer. I started the project 2 years ago in April. You know, I work as a pilot and Director of Maintenance on King Airs and a E-S 125 jet and I can say that the average homebuilder who has completed or nearly completed a metal airplane has a greater working knowledge of airplanes than 90% of all the A & P mechanics I talk to.

It's really great to read the ML and take advantage of someone else's experience. John Thorp, Lou Sunderland, and you have been so free with your time and thoughts during the life of the T-18 that we all owe you all a debt we can never repay. Hope to see you in OSH this year if I can get John Hardy to give me a ride in his T-18."

Best regards, Tony Russell

Thanks for all the kind words, Tony, but there is a way that all of us can repay our debt....and that's to pass on our knowledge and experiences to the new guy, just as you just did in the two excellent reports above!

I would like to add a few comments on building the gear: About ten years ago 3 of us pooled our labor and money to build 3 gears. Money wise we came out quite a bit better than the store bought gear, but it turned out to be a lot of hard hours of work. We had grief with the heat treat co. here (Dominy). At the first attempt they carelessly threw away the alignment jigs we had fastened to them to prevent warping and the gears came out a mess. We made them anneal them and do it all over and demanded they do all of it in our presence. They came out okay this time. We had had ours heli-arc'd all the way by a skilled pro welder that worked for one of our trio. All gears were the extra long versions (21 to 31 in. longer, as per individual) and all of us tapered the outer tubes. I retained the inner tube wall thickness clear down to the axle, while the other two also tapered the inner tube some down to the axle. We all left a "cannon mouth" lip on the very bottom of the outer tube, for greater resistance to cracking at that point. All have held up fine in service. Further, I would strongly recommend the longer gear in every way. I also believe the gear extensions to the shorter gears are a definite plus, altho' I haven't flown one. Most builders agree a longer gear is not only softer, but allows slower, shorter landings and takeoffs.

The major drawback to building your own gear these days is the lack of suitable heat treat facilities. (I might add reliable to that, too). Lu Sunderland was able recently to get 3 or 6 gears heat treated by some firm in his area and I think their work turned out okay. I think it would also be well to consider building the gear in two pieces (as per Lu's drawing in an earlier ML) because of the problem with finding a heat treat oven of sufficient size to handle the gear in one piece. As to building your own vs buying one, it's the old question of which drummer you march to. Do you trade your labor and time for dollars, with possibly poor results, or do you opt for a known product of professional labor for what at first seems like more shekels than it should be?????If you want to get the T-18 airborne quickly, the choice is obvious.

NOTE ON ENGINE MOUNT BUILDING: Bob Dial, 5175 Wing Lake Rd., Bloomfield Hills, Mich., 48013 writes:  
 "Dear Dick, got your good #52 NL today and thought this a good time to make some comments.

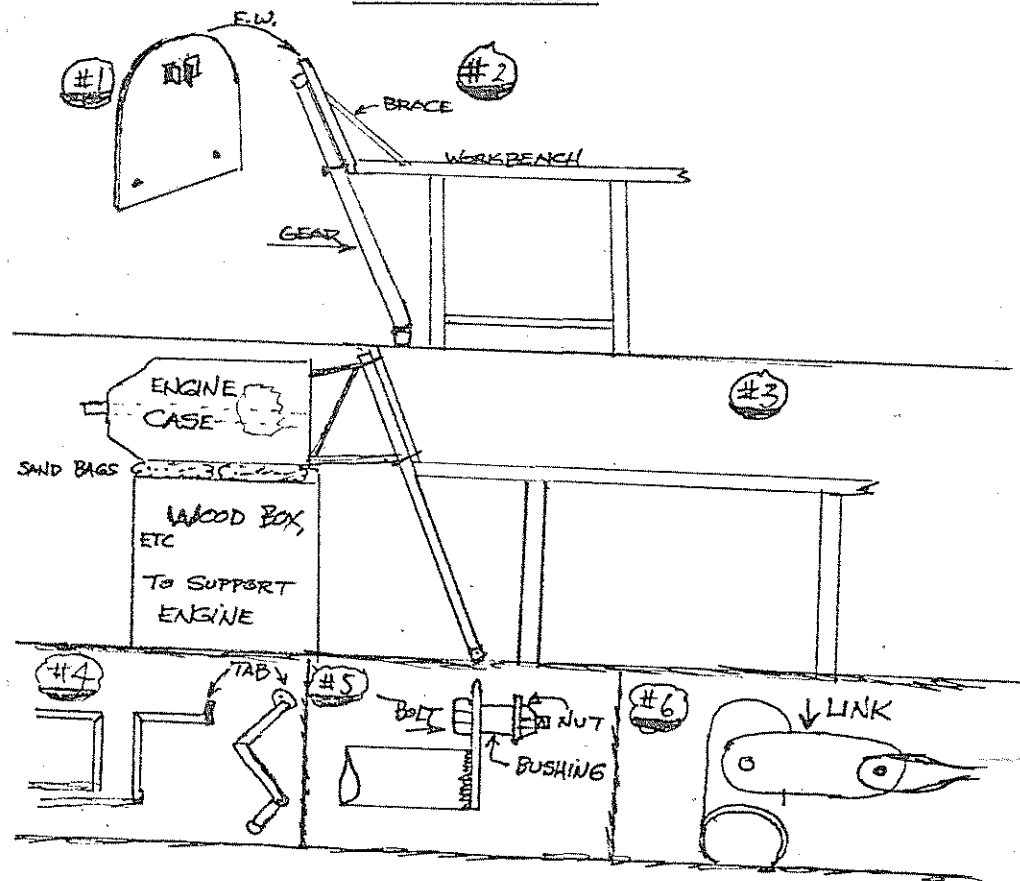
I just read Paul Shifflett's excellent and very technical article on how to make the motor mount very accurately. I well appreciate the time and effort he put into not only the article itself, but also the amount of study and research he went to. He very obviously is an engineer and most competent at his trade. However, I couldn't help but reflect that I couldn't have made my mount from his technical description, as I'm just a plain ole' farm boy and my mind goes into automatic "reject" if something seems complicated. I guess I really look for the easy, lazy way out. (That's understandable, Bob. All of us that have been professional pilots all these years obviously are lazy and felt that it was better than having to work for a living....Ed.) Instead of the precise measurements and compound angles, here's how I did it.

I first made a plywood mock-up of the firewall. Using scrap angle extrusions I located the landing gear attach points like this (see sketch 1). I then bolted the gear on this form and set the whole rig on the end of my work table like this (see sketch 2). After making sure the "firewall-landing gear" was properly positioned, I simply took my engine case and positioned it at the proper distance from the firewall, with the proper amount of down thrust angle and right thrust angle. The case center line will give you a reference line for right-left angle measurement, while a modified broomstick in place of the crankshaft gives you a good up-down reference. I had already made up pads, which I bolted to the engine mount holes in the back of the case and I had bent up tubing to make the ring that connects these pads. I tack welded the tubes to the pads right on the engine, (careful with the torch) thus it had to fit perfectly. (Some store bought mounts take a little extra persuading to fit sometimes). I then simply cut tubing to the proper length and 'laced' the engine to the firewall and landing gear...no measuring...no sweat...and everything fit perfectly, because it was all done in place.

This method may seem crude, but it is easy, requires no jigs or fixtures and very little measuring. It has worked for over ten years for me and my Thorp metal could fit perfectly at the spinner opening and firewall."

See sketches on page 8B for further details. The method Bob details is a time honored method used on many, many types of airplanes and you could have every confidence in it if you chose to use it. Here is demonstrated the value of the newsletters to the builder, with two different methods of getting from point A to point B being demonstrated. No matter which method you choose your knowledge quotient has been raised by simply studying both methods. I again urge you to contribute your way of doing some operation. Also, don't be bashful about telling about what went wrong, too. All of us have made mistakes before doing it right and if you don't really believe that, just talk to any builder that has finished a T-18.

Bob also had some details on eliminating his front tunnel and re-locating his RUDDER CABLES TO THE OUTSIDE OF THE FUSELAGE: "I was fortunate to have welded the tabs on the ends of my right rudder pedals when I first built my airplane, so it was a simple matter to use them. I then made a link out of .063 4130 that was about 2" long to account for the additional length needed for moving the cables. The clevis on the end of the cable is attached to the other end of the link." (See 82 for details). Bob also said he is working on his second T-18, a partly completed project he bought, and he hopes to fly it late this summer. It also has 160 hp and a wooden prop. He may sell one or both, depending on how his application for getting his physical back goes. Thanks again, Bob, for the info.



SEE NEWSLETTERS # 47 & # 52  
 FOR PULLEY SIZES AND LOCATIONS



LETTER FROM NORMAN BUEHLER, A SUPER-EXPERIENCED BUILDER:

June 15, 1981

T-18 MUTUAL AID SOCIETY  
10529 Somerton  
Dallas, Texas 75229

Dick

Enjoyed our telephone visit very much and hope that by now your hospital time is all over and that you are doing fine. This is a little later than I intended, but this seems to be a busy world.

The T-18 has been nearly completed for nearly 5 years and is the second of three airplanes that I built. The first was a Jodel and the last a Varigze. The further away that I get from the building the less the problems seem to be. That, and that the problems of the three seem to run together.

I still do remember the rudder, the leading edge of the flap, and triangular fuselage skin just below the deck. I just remember the problem but am afraid to say just how I got it done as would be sure to leave out some important step that would goof someone up. It seemed like I tended to make everything over before it suited me. My wife seemed to think that I was too particular and made a suggestion that I might try if were going to build another homebuilt. Build two of them and the parts that didn't quite suit would go on the first one and then after you know how make the pieces for the second one. Seal the first one as it would please most people and keep the second one as it would suit me. She isn't quite right though as I have seen T-18s that were several notches better than mine.

N172 is pretty much built as Thorp's plans. I've never quite figured how Cessna let that N172 number get away. Anyway, it has 160 hp non dynafocal mount engine with Sensenich wood prop., cc-75. I probably get out of my grass strip better with 76 pitch but it is sure nice after one gets off. Rate of climb never was one of my top priorities unless of course there were trees down at the end of the runway. In level flight with full throttle at 4000 msl the engine will turn 2900 rpm.

Over measured distance at full throttle it will go 192 mph TAS. Calculated 25% of power (2525 rpm) it will go 172 mph TAS. Everything sounds nice to me at 2400 RPM and at that speed I get 165 mph TAS. It has a dry empty weight of 955 and I did all my certifying and testing at 1550 gross. That gives me 412 lbs of usable load after it is full of fuel and oil. I regularly fly it out of my 2500 ft, 3000 ft altitude grass farm strip. When testing I flew it out at full gross on a 80 degree FPM. On a warmer day for safety's sake one would need to either lighten the load or put on a lower pitch prop. At least those are my safety numbers.

I varied from Thorp's plans in the following:  
I didn't install the battery until I determined cg and then mounted it on the firewall as I saw a Mooney installation. I did this for two reasons, one- I liked the cg figures better but mostly to shorten the starter cable. Several T-18 owners had told me to get a geared starter because without it was difficult to get engine turning. I thought that the long battery cable was the problem and I guess it was

mine turns the engine better than the geared starter T-18's I've seen.

I beefed up the tail wheel fuselage attaching point and used the steel spring. I figured that I needed to do that because of the regularly used grass strip. Also mounting the battery on the firewall helped to keep the cg right.

I thought that the engine ran too cold on cold days so I designed and put on cowl flaps on the gill openings. Haven't had any trouble with them and does keep the engine warmer on the cold days. I didn't have them on when I was doing my speed checking and have never given them a good speed check. However if they increase the speed it wouldn't be much or I would notice in my regular flying.

Trim control is pretty much Thorp except that I used a right angle drive and a couple of flex joints. Seemed to have less slack that way. Would still like to have some system to identify the trim setting that would work on my system but still haven't come up with one.

Instead of using the metal strip at the base of the windshield, I built up a fiberglass strip, blending it in with the fuselage. Looks much better than the metal strip and has given no problem.

I sort of went overboard on soundproofing which probably added 10 or 12 lbs to the empty weight. I used double aluminum tape on the firewall and single over the entire cockpit as well as the baggage compartment. Glued the Ken Knowles insulation kit to the outer skin and firewall. I then glued 3/4 in fiber glass to the ix .016 inner skin including floorboard skin. Must be pretty effective as the first thing my homebuilding friends talk about when I take them a ride is that it is the quietest homebuilt they ever rode in. Maybe though they just haven't rode in many homebuilts.

I put a landing light ~~on~~ both the right and left wing leading edge as well as wingtip strobes.

I used countersunk rivets and filled them with a filled epoxy and sanded smooth. Took a lot of work and I probably wouldn't do that again. Painted with Alumigrip and that is when I found some of these build up in a persons system and you've got problems.

I only get about 25 hours a year on it. With three homebuilts and one family Cessna, hours on any one plane don't build up much. Product liability lawsuits keep me from selling the homebuilts and I am reluctant to tear them up and sell the parts. I probably will do that some day soon though. I couldn't afford to keep them now if I had to pay hangar costs.

Dick, I'll enclose a picture of the three of them and give you my impression of the three different airplanes. I know that everyone's impression would be different but thought you might like mine as we are about same age.

HAVE KING RADIO & TRANSPONDER & 9400 INSTRUMENTS

The first homebuilt was a Jodel D-11. I had no airplane building experience and no knowledge. In fact I had never seen a homebuilt until I had this one done. The Jodel is, of course, a wood plane. It has a cont. 75 hp engine, razorback covering, and covered the plywood fuselage with a light fiberglass and polyester resin with a lot of red color in the resin. It isn't painted, only the red resin. Pretty nice as there are no scratches as paint would get. I flew this to Rockford twice and to Oskosh five times without any problem. It has about a 30 mi per hr touchdown speed and 105 mph cruise. I put on big J-3 tires and this is the plane I want to be in when the engine flies apart.

As I've gotten older and seen so many low time pilots building planes I've about decided that the Jodel type planes are the ones they should be building. One would just about have to fly into something to hurt themselves in it. It has an empty weight of 712 lbs I forgot the gross but there isn't room enough in it to exceed it. The only things that change the cg are amount of fuel and baggage and that very little. Pilot and Passengers sit right on CG. A well built and excellent low time pilot plane. (after they have checked out in tailwheels)

The last homebuilt was the Varieze. I built this one mainly because I had built a wood airplane, a metal airplane, and wanted to try the only other material left. At the time I bought plans, Rutan was advertising a 100-hp Cont powered 525 lb empty weight plane with a 1050 gross weight. Sample cg loading in the middle of the envelop. This gave me nearly as much useful load as my T-18 had. Needless to say, the finished airplane never came close in any of this. Although I built this plane as skimpy as possible without cutting structural strength, 610 lbs was my empty weight. In order to get the cg in the middle of the envelop (both Jodel and T-18 in that range) I had to add 33 lbs in the nose to the 610 empty weight. With a full fuel tank it is a single seated plane with a lot of baggage room, unless you want to cheat on the design weight. You can sit at any flyin and watch guys do that all day long. When I ask them about it the answer I get is, "Oh! it'll handle it", and I guess they do. I've never seen a Varieze lighter than mine and when I watch them I'm using my empty weight so they are even more over gross than I'm figuring them. I could spend at least one page telling you how serious epoxy poisoning is. Another one on how difficult to use Rutan's new Saffy Epox. It doesn't poison and seems to do good work if you can take the difficulty. I could tell you about landing and takeoff being like driving a car looking out the side windows at eighty miles an hour. Makes good landing though just nerve wracking. Fast building? there is no way to build an airplane good, fast.

It has two great things going for it though. It goes fast on low hp and it draws a crowd every time I fly it anyplace. If those two things are ones top priority then it is the plane to build. For myself these two advantages over T-18 aren't near enough.

Norman Buehler  
RR 3  
Scott City, Ks 67871

tel 316-872-3019

N172

T-18 N851LT

Lyle Trusty  
7500 N. Ave. A  
Lancaster, Ca.  
93534

2-17-81

Dear Dick:

Remember a couple of years ago you asked me to make a drawing of my aileron trim tab installation? Several other people have too so I finally attempted to put it all together. It turned out to be a bigger job than I thought. It took me longer to design it than it took me to actually build it!

At any rate I'm enclosing a sample of what I ended up with and, rather than put out part of the information and get someone in trouble, I asked Ken Knowles to sell a complete set of plans and provide the motor and materials at reasonable prices, which he agreed to do.

The plans consist of five 11" by 17" drawings, including a wiring diagram, and will sell for \$20.00. Ken intends to stock the motors, etc., which will appear in his next catalog.

I suppose I should say a few words about the operational end of the installation- 851LT requires a trim change between takeoff and cruise airspeeds, due to wing twist that came with the wing skin templates so I imagine a lot of T-18's have the same problem. Secondly, I have 65 pounds of fuel in the right side of the baggage compartment, fly single or two place randomly and carry considerable baggage on the left side occasionally. The trim tab has handled all kinds of asymmetric loads with only about half travel. I've never had to trim to the limit of travel for any loading, but do want to retain the limit switches as good insurance against the motor tearing up the planetary gears due to a mechanical jam at the end of the jackscrew travel. The sensitivity is good with the tab as designed in that you need to hold the switch for two or three seconds to notice the difference. This lets you trim to a "hands off" condition easily without overshooting. I have flown 851LT for over 700 hours with this installation and have not had a single problem. Zero maintenance. I recommend annual lubrication though to keep the reliability high.

One last item, which everyone can try for themselves, is to determine trim drag due to flap extension. I massaged the ailerons per newsletter so the aircraft flew hands off with no trim and two people aboard. I then had just enough "flap trim" to compensate for me, single place. I found it took 6 to 7 degrees of left flap extension and it cost me 3 to 4 miles per hour cruise speed. In other words the airplane would pick up that much airspeed if I just cranked out the trim when flying by myself. I still carry the trim knob as a manual backup if the motor would quit but have never had to use it.

Best Personal Regards, Lyle Trusty

LYLE TRUSTY LETTER CONT'D

One other item.....

I'm also enclosing an information sheet on a new 2 1/2 inch 2 in 1 CHT/SGT instrument which I've installed in my T-18. It's very accurate and gives you the ability to really pin down engine operating temperatures and the efficiency of your cooling system as well as precisely lean the engine for best power, best economy or whatever you want. I found, after tedious calibration that I had an 18 degree error in my original CHT gauge, from 320 degrees to 450 degrees - right where I didn't need it. Ken is going to carry these gauges also or they can be ordered direct from me. The price is \$45.00.

All of us are very grateful to Lyle for taking the time and effort to make the aileron trim drawings available and to make arrangements with Ken Knowles to stock the drawings and the parts. If you haven't flown your T-18 as yet, and if so you may not fully appreciate what a great thing this little gizzy is. I'm not "putting down" John's slick little flap trimming method of laterally trimming the airplane, but it does have limitations, as everything on an airplane does. First of all, the moment arm is relatively short, so it takes quite a lot of deflection to do the job and this does result in a noticeable increase in drag. It also lacks authority to handle very much and causes a bit of yaw when most of the trim is used.

This may seem like an insignificant thing, but it really can get pretty tiresome on a long cross country. A good many of us that have flown bigger equipment over the years got a little spoiled, I guess, as all airline and other large airplanes are trimmable on all 3 axis, so to say I'm delighted to see Lyle make his plans available is the understatement of the year. After I got my plans from Ken I want to take a long look at the feasibility of adapting the unit to the rudder, also.

The other thing that got my attention was Lyle's enclosure on the combo EGT and CHT with the digital readout for real pin point accuracy. The 2 1/2 inch display is a big plus, too. Panel space for instruments and radio gets pretty tight for most everyone, so every inch saved adds up. The proper use of a combo EGT/CHT can justify its cost several times over in engine life extension in normal operation of the airplane. It goes without saying that it is an invaluable trouble shooting tool in any sort of irregular engine operation.

~~I would have included the operating instruction sheets in this NL, but the printing is already quite small and wouldn't lend itself to any further reduction.~~

The brochure doesn't specify whether more than one pickup is available, but I feel pretty sure that they have multiple pickups available, so EGT and CHT can be monitored in each cylinder.

Now if this isn't enough from Lyle, take note of the next four pages:

Some fuel system basics by Lyle Trusty, Designee #52.

There are several things missing from your plans when you open them up. Maybe you've noticed there's no fuel system schematic (let alone plans) no electrical diagram and no instrument hook up information. No matter, that's a long way off. Right? The reason given is because every one is going to have a peculiar engine installation, unique to his (or her) airplane. Well, that kind of unloads the designer but it doesn't help the builder in finishing his airplane. Here are some helpful hints, tip, do's and don'ts concerning a gravity feed fuel system like most of us use.

1. You need 0.5 psi at the carburetor inlet, according to Marvel-Schebler in order for the carburetor to function properly. What that translates into is; without that amount of pressure you won't have enough fuel flow to run the engine at full power for a go-around. (14 gallons per hour is about 15 ounces per minute)

Without considering ram air pressure, it takes about 17 inches vertically (The height of the bottom of the fuel tank above the carburetor inlet) to provide this head pressure.

Ram air pressure will provide 1/7th of a psi at 100 mph (.14 psi) but the rest has to come from head pressure or fuel pump. Starting to get confusing, huh? Let's unscramble with a neat little trick that's easy to understand.

When you get ready to run your engine up before going to the airport, block up the main gear, lower the tailwheel into a ditch or whatever you have to do to get the airplane into a 12 to 14 degree approach attitude. Put a gallon of fuel into the tank, put a container under the carburetor, disconnect the fuel line at the carburetor and see how long it takes for that gallon to run out.

$$\frac{14}{60} \text{ as } \frac{1}{N}, \text{ Therefore } N = \frac{1 \times 60}{14} = 4.28 \text{ minutes}$$

or 4 minutes and 17 seconds per gallon.

That's what it takes for a 150 horsepower Lycoming at sea level, full throttle. In order to avoid problems you really should flow about 150% of that required to run full throttle.

2. The above is the end result of having built a good fuel system. How do you get there from here? Here are some rules of thumb:

All fuel lines must be at least 3/8 inch. 5052 aluminum line and AN 6 fittings, tees, elbows and etc. make a good combination.

A short piece of flexible hose at the outlet of the fuel tank will avoid cracks at that point.

Don't mount the fuel shutoff valve on the bottom of the tank. Each time you turn it on or off your'e straining the tank boss and eventually it will crack out of the tank. Mount it where you can turn it off from the seat.

The fuel line must run downhill, without running uphill, all the way to the fuel strainer and the fuel strainer must be mounted at the lowest point in the fuel system. It must be lower than the carburetor float bowl in order for any water in the system to flow to that point (and not on into the carburetor.)

You must have a strainer or gascolator drain so you can drain water out of the system. It has to be drained on preflight each day so make it easy to use.

You must have a finger strainer in the bottom of each tank at the outlet. This is a MUST. I've heard of cases where a flake of resin or scale blocked the tank outlet causing fuel starvation when there was no finger screen installed. A friend of mine with a Stits Playboy learned this lesson the hard way.

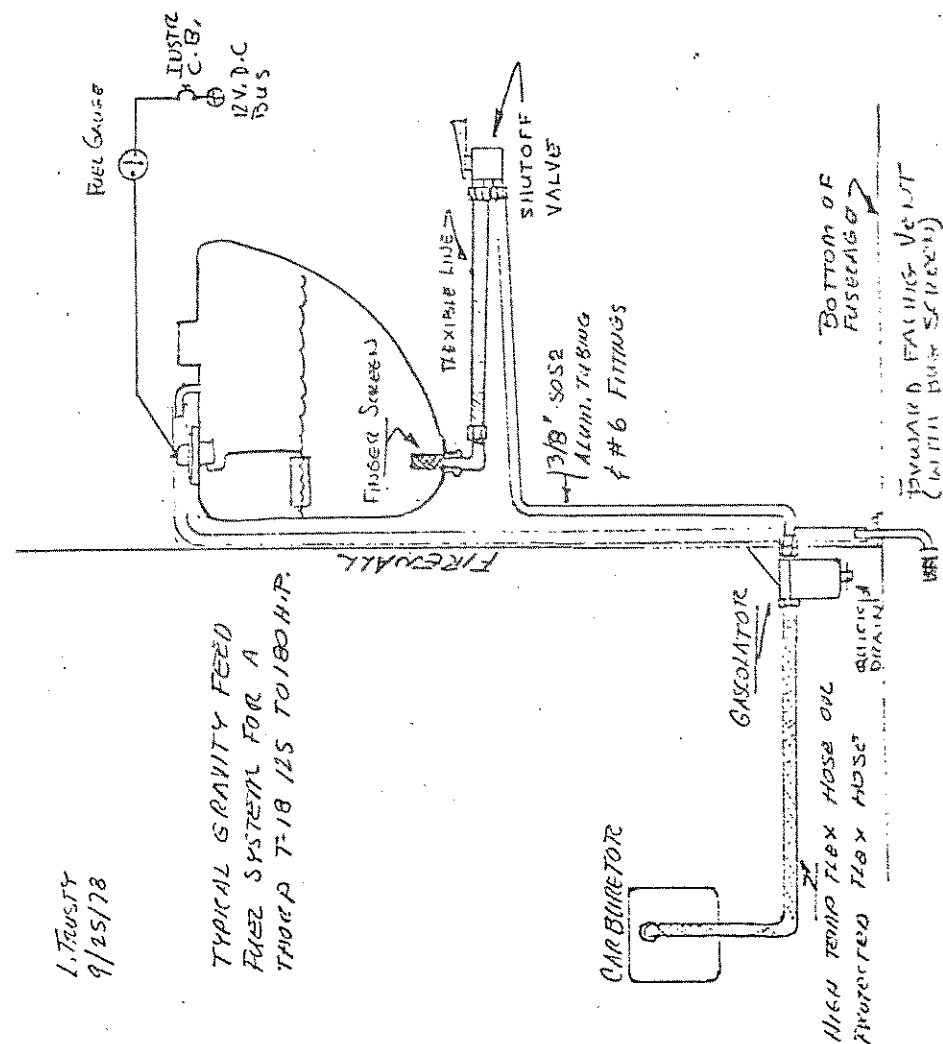
There must be a tank vent. It should come off the top of the tank, vent overboard where it cant re-enter the cockpit and above all - FACE FORWARD. The ram air pressure cant get into your fuel tank unless the vent faces forward and can in fact suck a vacuum on your tank at high speed and cause fuel starvation if you have the vent facing to the rear.

Never use check valves in gravity feed systems. They rarely work like they're supposed to. (Taking one out of John Thorpe's T-18 solved a problem he'd been fighting for over a year.)

If your tank filler neck is recessed inside of the fuselage you must build a dam and provide a scupper drain. This is so fuel wont run into the cockpit when you overfill the tank, or the cap is left loose by the line boy.

Use heat resistant lines or cover them with rubberized asbestos sheathing from the strainer to the carburetor. This could give you the time you need to shut off the fuel and avoid one hock of a fire in the event of an engine compartment fire.

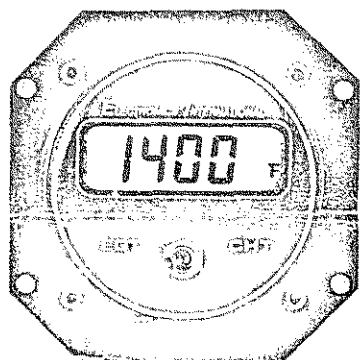
Don't skimp on the components, use aircraft shutoff valves, fittings, strainers and aluminum tubing. No automobile fittings allowed (they're all 45 degree flares and airplane stuff is 37 1/2 degrees) Your fuel system has a great potential for harm, inherently, both from lack of fuel where you need it and the presence of fuel where you don't want it. Put it together right so you'll never have to worry about it.



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OTHER FEATURES INCLUDE: PANEL SAVING 2 1/4 INCH MOUNT BY 2 1/4 INCH DEPTH. VERY LOW POWER DRAIN, 12 OR 24 VOLT OPERATION. UNIT INCLUDES E.G.T. AND C.H.T. PROBES AND EXTENSION WIRE. ONE YEAR WARRANTY. F.A.A. APPROVED.

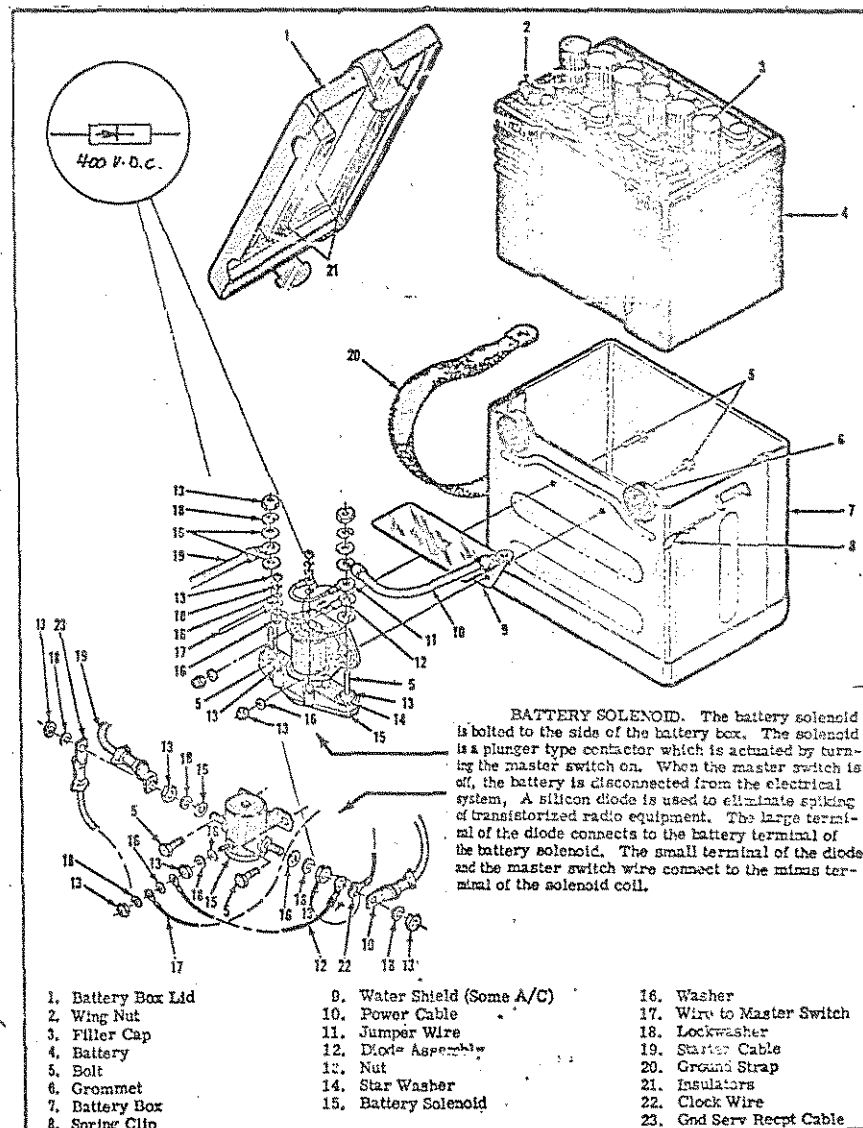
EC-1 — STANDARD MODEL

EC-1A — NON BACKLIT, HEATED MODEL FOR EXTREME COLD CLIMATE OPERATION (CONTINUOUS OPERATION BELOW -15°C)

PAGE 13A & B T-18 NEWSLETTER # 53

From the Designee file, Lyle Trusty, D.I. # 52

A Master Relay wiring diagram filched from a production aircraft service manual shows a couple of important items sometimes overlooked. The diode protects your radio from large D.C. voltage spikes (in the order of a couple of hundred volts) when you turn off the master switch with the radios on... and the wire to the master switch is a ground wire, which makes it 'fall safe'. If it chafes through on a bulkhead it doesn't short out and start smoking... it just keeps on working.



PAGE 14 A & B T-18 NEWSLETTER # 53

## ELECTRONICS INTERNATIONAL

## EC-1 OPERATING INSTRUCTIONS

## E G T

**LEARNING:** As the mixture is gradually leaned from the full rich position, the Exhaust Gas Temperature (EGT), will increase until a peak reading is reached. Any further leaning will result in a decrease in the EGT. Peak EGT with a float-type carbureted engine is frequently a vague point because of the fuel/air distribution problems in these lower horsepower engines. As a result, these engines tend to operate smoothly at 250°F to 300°F on the rich side of peak EGT. The fuel injected engines of 250 horsepower and higher will provide a more precise peak. Most engines normally operate within an EGT range of 1200°F to 1600°F at cruise power. As of this writing (9/30/80), Avco Lycoming allows leaning to peak EGT at 75% power and below on their direct drive normally aspirated engines. For your engine check the engine manufacturer's recommended procedures. It is not recommended to lean for peak EGT above 75% power settings. The richer mixture is needed to cool the combustion temperatures and keep the anti-knock capability of the fuel high enough to prevent detonation from occurring at the higher power settings.

During descents to the traffic pattern, it is recommended maintaining the mixture at the leaned cruise condition with a gradual richening of the mixture, carrying some power and at a sensible airspeed to maintain the most efficient engine temperatures possible. Avoid low power--high speed descents which may cause sudden cooling, severe lead fouling, cracked cylinder heads and warped exhaust valves.

A rich running engine wastes fuel needlessly and tends to run on the rough side thereby creating vibration which cause a deterioration of engine accessories and engine mounts. Proper leaning at cruise and during descent means less spark plug fouling, longer life for the plugs and reduced maintenance costs. Good leaning techniques, likewise, result in cleaner combustion chambers with fewer lead salt deposits on the pistons and exhaust valves. Under certain conditions these deposits invite pre-ignition and higher maintenance costs. Proper leaning at cruise during cool or cold weather aid in raising engine and oil temperatures to desirable minimums in order to evaporate the water and acids out of the oil. Water and acids attack the insides of an engine, causing rust and corrosion.

**THEORY:** A fuel/air mixture is injected in a cylinder, compressed and ignited producing a combustion temperature of approximately 4000°F; this represents an energy level. Some of this energy goes to producing power. Some of it, unfortunately, goes into heating the cylinder heads and the rest is exhausted. As the engine is leaned, the excess fuel in the fuel/air mixture is being reduced, the combustion temperature is increasing and the EGT is increasing. Peak EGT will result from the correct mixture of fuel and air which gives maximum utilization of the mixture.

Since the EGT is directly related to the combustion temperature, it is an indication of the engine's ability to produce power. If the engine is not producing the correct amount of power, the EGT instrument can be a very valuable trouble-shooting tool as well as an early warning system before engine failure occurs.

## C H T

**OPERATION:** The Cylinder Head Temperature (CHT) gage helps the pilot protect his engine against the threat of excessive heat. Most general aviation aircraft take the CHT off the hottest single cylinder determined by extensive flight tests. Minimum inflight CHT should be 150°F, and maximum in most direct drive normally aspirated Avco Lycoming engines is 500°F. Some of the higher powered, more complex engines having a limit of 450°F. Although these are minimum and maximum limits, the pilot should operate the engine at more reasonable temperatures in order to achieve the expected overhaul life of the powerplant. It would be normal during all-year operations in climb and cruise to see head temperatures in the range of 350°F to 450°F.

Sudden cooling of the CHT is a problem that is common with aircraft engines. This is caused by fast descents with little or no power and rich mixture. This may result in heat cracks due to exhaust valves sticking, spark plug fouling, broken piston rings, cracked cylinders at the spark plug and valve ports and warped exhaust valves. To avoid these problems, do not allow the CHT to cool more rapidly than 1°F every 3 seconds during inflight operation.

**THEORY:** The source of heat in an engine is from the combustion of the fuel/air mixture producing temperatures of approximately 4000°F. Some of this heat energy goes into heating the cylinder heads due to radiation and conduction. This heat is sinked away from the engine by the air flow over the cylinder heads. When the heat being generated in the cylinder heads equalizes with the heat being sinked away, the cylinder head temperature will stabilize.

Another factor affecting the CHT is RPM. Lower engine RPM causes slower piston speeds which allows additional time for the combustion temperatures to transmit more heat into the cylinder heads. Therefore, high throttle settings with low RPM causes higher cylinder head temperatures. Controlling the CHT to within operating limits is essential. Some methods to reduce cylinder head temperatures are:

1. Open cowl flaps (increased airflow sinks more heat away from engine)
2. Enrichen mixture (reduces combustion temperature)
3. Increase airspeed without increasing throttle setting (increased airflow sinks more heat away from engine)
4. Increase RPM without increasing throttle setting (reduces heat energy transmitted into cylinder heads)
5. Reduce power (reduces combustion temperature)

## EC-1 INSTALLATION INSTRUCTIONS

**EGT PROBE:** The EGT probe should be installed in the exhaust stack of the leanest cylinder. This information is available from the airframe dealer's service department.

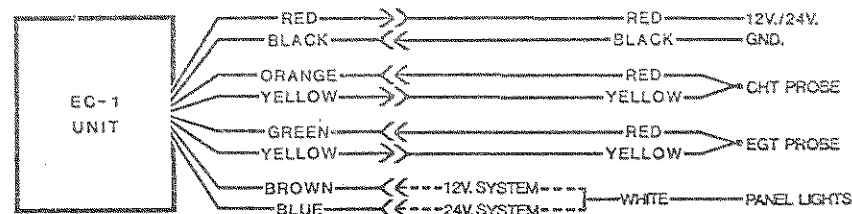
Drill a 3/16 inch diameter hole in the exhaust stack 1 and 1/2 inch from the exhaust port you wish to monitor. Adjust the spring clip on the probe so when it is placed in the stack, it protrudes approximately halfway in. Tighten the clamp around the stack and cut off any excess tail. The spring clip should be between the clamp and the stack. Dress the EGT wire away from the exhaust stacks, cylinder heads and any unshielded spark plug wires. If the EGT wire is too short, order thermal couple extension wire to length needed.

**CHT PROBE:** Remove the spark plug on the hottest running cylinder. This information is available from the airframe dealer's service department. Replace the spark plug ring with the CHT probe and reinstall the spark plug. Dress the CHT wire away from the exhaust stacks, cylinder heads and any unshielded spark plug wires. If the CHT wire is too short, order thermal couple extension wire to length needed.

**INSTRUMENT:** The EC-1 is designed to fit a standard 2 and 1/4 inch mount and be installed and easily removed from an instrument panel. Install the unit from behind the instrument panel using the 6 x 32 screws supplied with the unit. If it is to be installed in a 3 and 1/8 inch hole, an adapter plate is available from ELECTRONICS INTERNATIONAL.

For wire connections see the diagram below.

## WIRING DIAGRAM



**NOTE:** We do not recommend cutting or splicing the thermal couple wires.

A little while before my recent hospital visit my old friend, Pete Gonzalez, of Colorado Springs, CO, flew his T-18 in for a visit and we had a good, old-fashioned gab session on building T-18s. He said he would forward some dope for the newsletter when he got home and sure enough, he did.

On page 17B is his tail wheel tow bar drawing and it is very well done and looks like it would work like a charm. Pete also included a 5 page "scrounge" list, as per his letter below, but space won't permit using it until next NL. He also sent in an index of drawings that I'll need to re-type and update before printing in a later issue. Thanks a mil, Pete. We do appreciate your efforts!

DICK:

Enclosed is the drawing for the tow bar that I built.

It works very satisfactorily, especially on a hard surface.

Hope you can use it.

Pete

P.S. Also, I am enclosing a couple of index that I developed while I was building my plane. The may be slight out dated, but maybe not too much to be of some use to other builders, especially as a start to complete one of their own with the newer plans. I have found it useful for locating a plate for reference even to this date.

In addition I'm enclosing what I called my "scrounge list" when I was building the plane. On occasion, I might find myself in a place that had potentially useful metal, such as a small piece of, to them, scrap .250 2024 plate but by carrying this list with me, I could immediately determine if it was too small for me out was it useful,

If it could be used by me, I would purchase or beg it from them, preferably beg.

As an example-A local window builder had a small piece of .250 2024 alclad that was basically too small for anything he might be manufacturing. I was able to purchase all my .250 2024 alclad from requirements from him for the then junk price.

I thought of sending this to you when I was using the copy of the Newsletter index for the second or third time and realized how this index in Newsletter #51 had helped me.

Hope you can use some or all.

P.S. This scrounge list is incomplete, but I think that the portion I have completed might be useful. Some day I may complete it from my notes.

*Pete*

# P.O. GONZALEZ PIECE TO ADAPT TAIL WHEEL SPRING TO TOW BAR

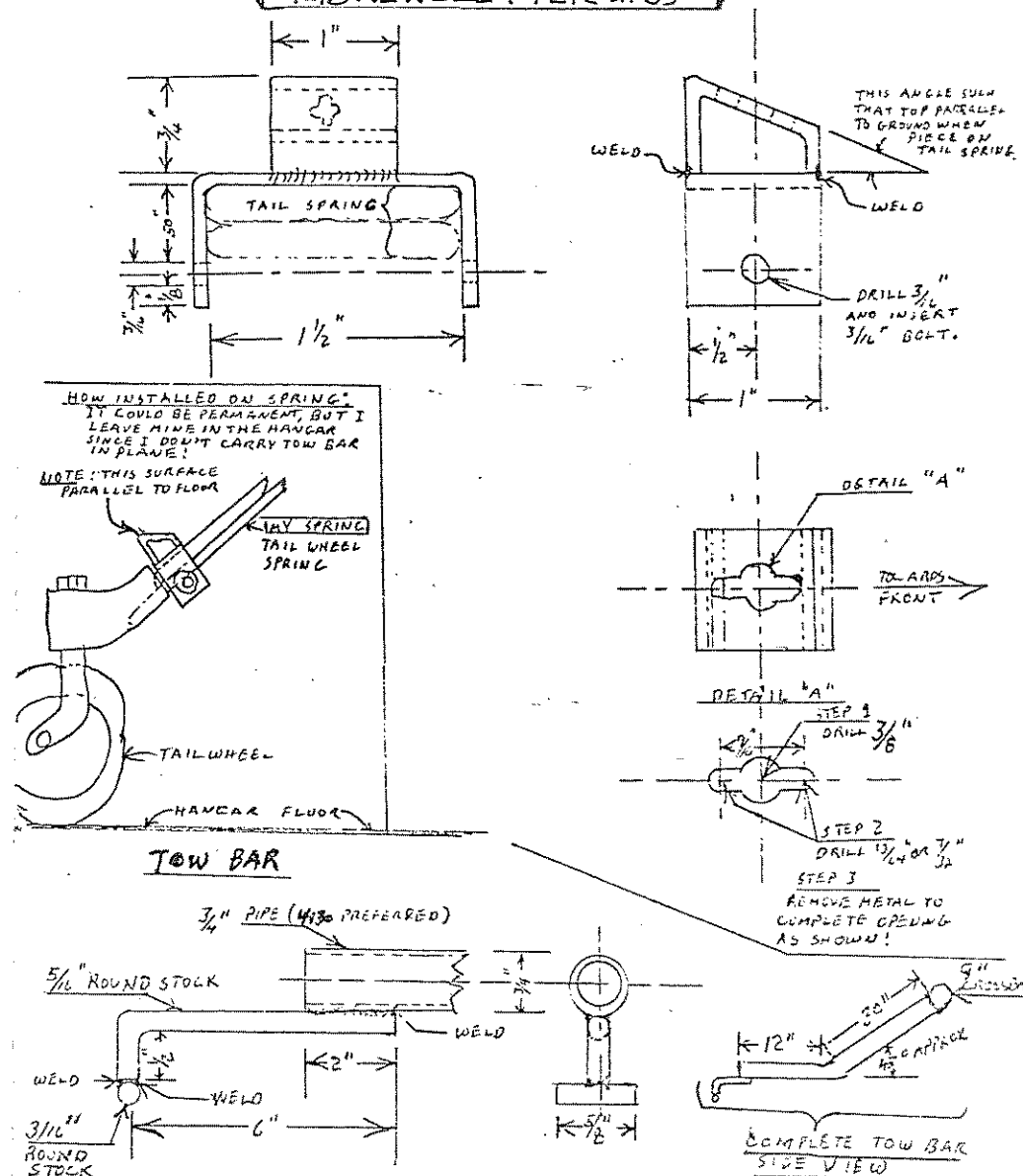
MATERIAL: .090 MIN STEEL

(NONE OF SKETCH TO SCALE...)

"I USED 4130 - MILD STEEL WOULD PROBABLY BE SATISFACTORY."

PAGE 17B

## T-18 NEWSLETTER #53



(From the Davis DA-2A Newsletter, courtesy of Chas. Vogelsong) I have used this method for many years and in my opinion it's the only way to accurately use a brake and it dispenses with having to use a formula!

# HOW TO FORM METAL ACCURATELY, by Charles T. Vogelsong, EAA 10199

For years I have been passing along to other homebuilders, through forums at Fly-ins, class instruction, and chapter lectures, the simple technique of accurately bending metal. I have tried to explain it at a level that anyone can understand by breaking it down into several basic procedures. If you want to understand how simple it is to bend metal accurately, read and understand each step of the following before moving to the next part of the discussion. Remember, understand thoroughly before moving to the next sequence!

**Forming a simple angle.** (Fig. 1) We need ~~two~~ bits of information: the dimension of "A" and the dimension of "B" (Fig. 2). To keep things simple and easy to figure let's have dimension "A" equal one inch and dimension "B" equal one inch on the finished angle.

**Problem # 1: Forming dimension "A", which is a one inch leg on the angle.** (Forget "B" for the time being). First make some form blocks, using wood, metal, plastic or whatever is necessary to support the type of metal you are bending, be it aluminum, steel, or whatever. Two blocks will be necessary, one with the proper radius for the metal you are going to bend, (Radius will be discussed later; we are concentrating on bending accurate dimensions now) and one to use as a back up block. (Fig. 3)

We know we want a finished angle one inch on each leg. We need to know one other bit of information now, the thickness of the metal we are going to form. Again to keep figures simple, we will use 1/8 inch as a dimension of thickness for simplicity of figuring. (Do you understand the above? If not reread until you do!)

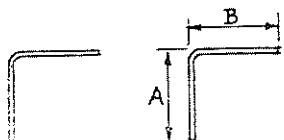


Fig. 1

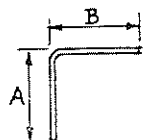


Fig. 2

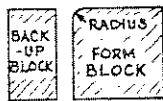


Fig. 3

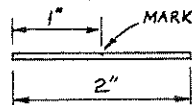
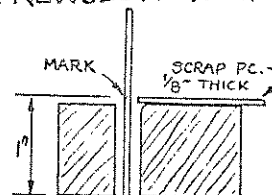


Fig. 4

Next step: Let's take the piece of metal that we have selected to bend which is 1/8 inch thick and cut a piece two inches wide to use as a test piece. (Length is not important here for this part of the problem. Make it two inches long if you want or any other length!) The flat layout of this strip should be as shown in Fig. 4. The one inch is dimension "A". Now we need a "scrap" of the same metal which is 1/8 inch thick. Place it in the forming blocks which are "C" clamped or used in a vise. (Fig. 5) Notice that the scrap piece with 1/8 inch thickness is placed on the form block and the mark lined up with the top of the 1/8 inch piece. Clamp in this position. (Reread and understand!)

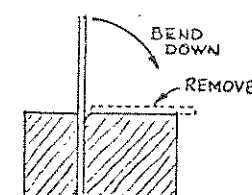
Next step: Remove the 1/8 inch scrap piece and bend metal over form block. (Fig. 6) Since the piece to be formed is 1/8 inch thick, we have moved the bend mark 1/8 inch above the form block by using the scrap of the same material. When the scrap piece is removed and our metal part is bent, the allowance for the material thickness is displaced and the resulting flange is equal to dimension "A", exactly one inch! (Fig. 7) (Do you understand? Reread until you do!)

(18B ON NEXT PAGE)



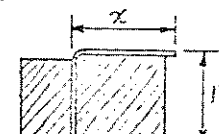
STEP 1

Fig. 5



STEP 2

Fig. 6



STEP 3

Fig. 7

Now at this time we better explain how to measure accurately before going any further. Using a rule that has a sliding clip, we measure as follows: (Fig. 8) Slide the clip down and read on the rule; this will be one inch exactly if previous instructions were followed exactly. This is the simplest and most accurate way to measure.

We now have dimension "A" formed to exactly one inch on our test piece and will now explain how to form dimension "B" to one inch. --- Using the above method of measuring, reverse the test piece so that dimension "A" is on our flat reference surface and measure "X" as shown in Fig. 9. Again to keep figures simple, let's say we find "X" to be 1-1/8 inch. Therefore we gained 1/8 inch due to the radius of the form block. With this information we can now lay out our original angle in the flat pattern which would be as shown in Fig. 10 and form as before to get our perfect dimension of one inch on each leg of the angle, (Fig. 11). We started with a two inch wide test piece and the above method proved we gained 1/8 inch due to bending, therefore by subtracting 1/8 inch from our flat layout, a 1-7/8 inch piece will bend accurately to one inch on each angle leg.

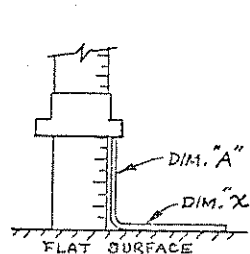


Fig. 8

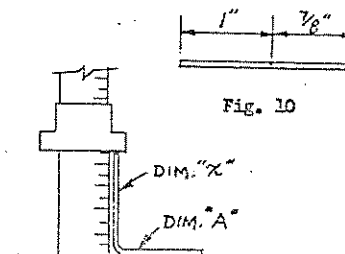


Fig. 9



Fig. 10

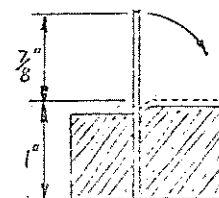


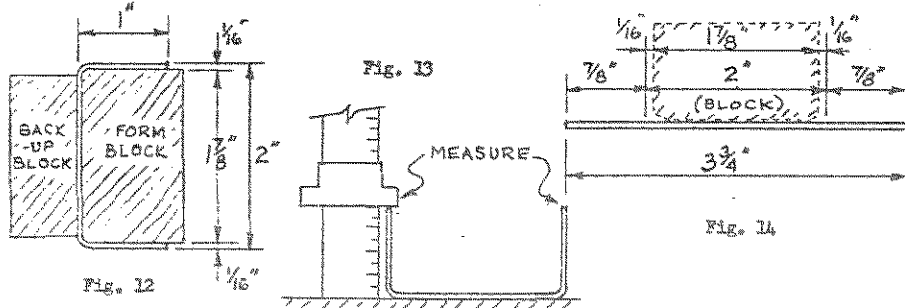
Fig. 11

Forming other shapes using the same technique. --- To form a channel over a block we do this: Let's say we need a channel with these finished dimensions: Two inches on the web with one inch flanges. In this case let's say our metal to be formed is 1/16 inch thick. Our form block would then be 1-7/8 inches wide, (two inches minus two metal thicknesses of 1/16 inch) and a thickness of one inch or more (Fig. 12).

First again we start with a test piece of known dimensions, since we now have a different form block. In each case of a different form block we must "prove" our "bend allowances" with a test piece. In this case our test piece can be four inches long (two inches plus one inch plus one inch). Center this piece over the form block, bend, and accurately measure each flange to find by how much it exceeds the one inch dimension (Fig. 13). If we find this to be 1-1/8



inch it would mean we gained  $1/8$  inch in each bend or  $1/4$  inch overall. Therefore our flat layout would be as shown in Fig. 14.



The above information can be used for any variety of shapes. Just remember to "prove" by bending a test piece over each different form block to determine the exact gain or bend allowance.

The preceding discussion covered the use of form blocks when bending. When using a bending brake, the principle is the same except the "mark line" will be in another relative position. In the discussion of bending brakes, first let's give names to a few of the parts of the brake, (Fig. 15). Note that the "hold down" must be set back a little more than the thickness of the metal being bent to provide clearance.

Now let's use the brake to bend the same two pieces we used as examples previously. First the angle, (Fig. 16). Cut a test piece of material two inches long. Make a flat layout, (Fig. 17). This piece is to "prove" our brake or to find how much gain the nose piece radius will give us. This should be checked with every brake used rather than using some set of given tables.

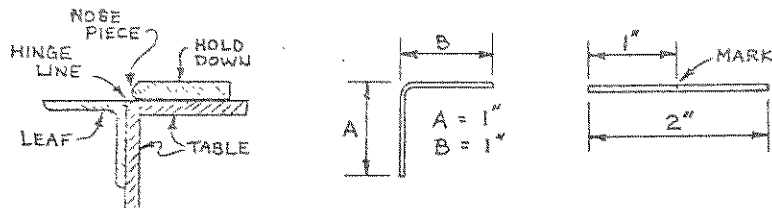


Fig. 15

Fig. 16

Fig. 17

Another term I use is "wanted dimension". This is the one inch section of the test piece (Fig. 17). This "wanted dimension" is always placed under the "hold down", placing the mark on the hingeline (Fig. 18). Now bend the test piece 90 degrees with the leaf and measure the wanted dimension. This should be one inch. If it is less than one inch, make another test piece laid out exactly as before. This time place the mark slightly over the hinge line (toward the hold down) equal to the amount that the first test piece was "shy" of the wanted dimension. Now this will give us our exact dimension for flange "A". Again measure the remaining flange of the test piece, and if this would show  $1-1/8$  inch as in the earlier example, we then know that our "gain" is  $1/8$  inch per bend. Therefore the flat layout would be as shown in Fig. 19. Since the one inch portion

is the "wanted dimension" of our angle, this would be placed under the "hold down". When bent, the gain of  $1/8$  inch over the nose piece will make flange "B" exactly one inch to finish our one inch by one inch angle.

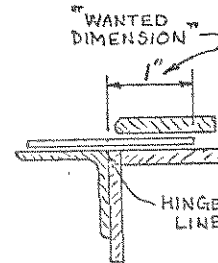


Fig. 18

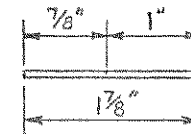
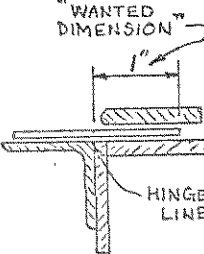


Fig. 19



Now to bend a channel (Fig. 20) in the same brake, using the same nose piece which gives us  $1/8$  inch gain per 90 degree bend, our flat layout would be as shown in Fig. 21. (Two bends,  $1/8$  inch per bend equals  $1/4$  inch). Note that one end with the one inch "wanted dimension" is placed under the hold down and bent. Then remove and reverse the piece and place the other end (H.D. #2) under the hold down and bend. Since each bend gained  $1/8$  inch on our test piece, for each 90 degree bend in our channel,  $1/8$  inch will be added to the center portion being pushed by the leaf. Therefore two 90 degree bends will add  $1/4$  inch to the  $1-3/4$  inch web to make our perfectly planned channel.

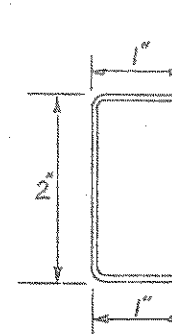
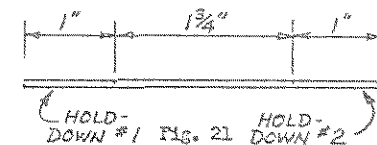


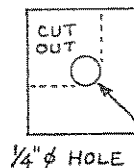
Fig. 20



That is the procedure for bending. Remember each different thickness of metal will give a different bend allowance. With my home made brake and a  $1/8$  inch radius on the nose piece, I have found the following bend allowances for 2024 T3 Alclad sheet aluminum:

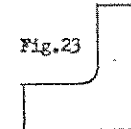
|                               |                         |
|-------------------------------|-------------------------|
| .025 sheet, bend allowance is | .100 per 90 degrees     |
| .032 sheet,                   | .110                    |
| .040 sheet,                   | .120                    |
| .063 sheet,                   | .220 (nose piece added) |

I have found the  $1/8$  inch radius is adequate for all sizes up to and including .050 aluminum. A simple radius gauge for shaping a nose piece on a bending brake or on a form block can be made as follows: Take a scrap of aluminum sheet about one inch square. Drill a  $1/4$  inch hole in the center. Cut out a quarter segment and you have a perfect  $1/8$  inch radius gauge, Fig. 22 & 23.



1/4" HOLE

Fig. 22



FINISHED GAUGE

Fig. 23

Our thanks for the "Info", Charlie.

See Mario McKinty) See his display at OSH '81

Page 20A

BECAUSE EXPLOSAFE HAS NO CONTROL OVER THE PLACEMENT OF ITS PRODUCT IN EXPERIMENTAL AIRCRAFT, EXPLOSAFE ASSUMES NO RESPONSIBILITY OR LIABILITY FOR ANY OCCURRENCE OR CONSEQUENCES THAT MAY ARISE FROM SUCH PLACEMENTS

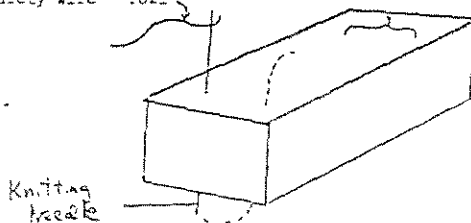
#### INSTALLATION OF EXPLOSAFE

It does require a little thought and planning ahead to adapt to different shaped tanks, float areas, drains, fuel pick ups, etc. In planning beforehand, think of assembling a series of blocks shaped and placed in proper sequence so as to allow, for practical purposes, a complete filling of the tank volume. Don't allow the placement of one batt to keep you from having access to another area. If you have an odd shaped tank, you may wish to make styrofoam mock ups of the shapes prior to actually cutting the Explosafe batts.

The pinning or stitching of the batts with aluminum rods or safety wire before handling or cutting, aids in keeping the batts together, and maintaining their shape. The safety wire or aluminum rods can be left in after installation. The foil can be cut to accurate shapes to avoid stuffing small areas with waste foil.

#### EQUIPMENT NEEDED:

1. Knitting needle - 13" long, with eye drilled in one end, or in some cases, the aluminum rods that come with the batt may be all that is required if the tank shape is simple, and doesn't require odd shaped batts.
2. Safety wire - .021
3. Small needle-nosed pliers for bending aluminum rods into U shaped hooks on the ends to hold compressed batt.
4. Template material: either thin metal sheets or thin stiff cardboard, and scissors for cutting the template.
5. Marking pen (felt Mark-a-lot or equivalent).
6. Electric knife (kitchen variety with bypassing blades).



**DISCLAIMER:** The situation has changed a great deal since last year: the original company was sold and the new manufacturer is having lots of problems. The cost was high before; now it is ridiculous, and it no longer meets F.A.A. specs for fire retardancy in certificated aircraft.

If you really have to have safety and comfort at any cost, it now comes in one inch layers of the soft, medium and hard and you make them up to suit your individual needs. The very firm bottom layer comes only in 16" x 18" x 1". A 3 inch cushion will cost around \$45.00. Hopefully, some other manufacturer will produce a similar product at a more reasonable cost.

PRESENTED IN ANSWER TO MANY REQUESTS FOR INFO

THIS NEWSLETTER IS

#### STEPS:

1. Plan batt sizes, shapes
2. Carefully use knitting needle to thread safety wire through the batt, or carefully thread the aluminum rod through the batt on both sides of the proposed cut. This is to keep batts in desired shapes after cutting.
3. Measure, mark, and cut the batts. If necessary, stop the cut before it is complete and fasten the cut portion together with safety wire or aluminum rods before cutting it off completely, in order to not lose the relationship of the layers to each other.
4. After cutting, shake batt to get out small particles.
5. Templates - Where one batt must slide next to another, cut a template the size of the first batt to act as a divider. After placing second batt, slide template out, of course. A slight compression of the batts is desirable, but do not deform them. Single sheets may be layered, rolled, or fanfolded as necessary.
6. Filler Openings, Quick Drains, Fuel Pick Ups, and Float Areas

It is necessary to isolate the float travel area so that the float at no time can come in contact with the Explosafe. Form a round or square box or tube of .016, aluminum or equivalent and fasten it securely to accomplish this. Several 3/8 or 1/4" holes or slits may be placed top and bottom to allow an ample fuel flow. Allow 1" minimum clearance for all moving parts, drains, and access openings.

While small loose Explosafe particles are not a major problem, a 16 mesh fuel pick up strainer should always be used, as well as a fuel filter in the line.

As long as Explosafe fills at least 90% of the volume of the tank, the safety features are not compromised, but of course it is best to fill the tank as completely as possible.

Prior to fastening your last access panel in place, be sure you have your fuel tank signed off by the FAA inspector.

You now have a tank that will not build up static electricity, (it is wise to be sure all fuel tanks are grounded externally) and one that provides a slosh attenuation by a factor of forty, besides providing a tremendous safety factor in the event of fire.

Explosafe batts are manufactured by Vulcan Industrial Packaging, Explosafe Division, 414 Attwell Drive, Roxdale Ontario, Canada M1W0L1, to homebuilders through Explosafe, 1310 Idylwild Drive, Lincoln, Nebraska 68502

**EXPLOSAFE:** There is an article coming out soon in Wingshield Aircraft that explains the installation fairly well. It is an unbelievable product from the standpoint of rendering your tanks absolutely safe against an internal explosion. You can even put a hole in the tank with a cutting torch that is half full of fuel, without worry of an explosion. It is far superior to the previous foam type of protection in that there is no static electrical build up, and it doesn't break down chemically. It is a .001 expanded aluminum foil product. It is most easily placed when the tank is constructed, of course, but it can be retrofitted. The cost is about \$3.00/gallon based on the square measurements of your tank. There is quite a bit of waste due to the shape of the 29 gallon T-18 tank. It only displaces 1% of the volume, and weighs 2.2 lbs. for 7 gallons.

**SAD NEWS DEPT:** Dr. John Shinn, of Ormond Beach, Fla., was stricken with cancer in early June and passed away July 5th. John was a frequent contributor to the NLS from the very earliest days and one of the most enthusiastic builders. His T-18, was #100 to fly in early 1973. John also wrote an excellent article on aircraft painting in Sport Aviation and has been a regular instructor in the T-8 workshop. He also conducted the T-18 Forum at OSH last year. John also taught both of his sons to fly the T-18. We will all miss John and his friendly, cheery manner and his ever-present willingness to help others with their building problems. We'll also miss seeing his T-18 at OSH. On behalf of all of us that have known John all these years, we'd like to express our sincere condolences to the family.

**FROM TONY SCHNEIDER, 7 RALE ST., BIRMINGHAM, NEW ZEALAND:** I got a letter thisspring from Tony, just prior to his trip to Marietta, GA, in June in a F2 AF C-130, which will be there for two weeks. Tony said his T-18 is about 90% finished, so he hopes to be able to fly in a very few months. He also said that they have two other T-18s flying in NZ. The first flew about 3 years ago (ZK-EDF by Greg Mc - 11-60) and the second just before last Xmas (ZK-ROF by Rod Davis). He says Rod only lives about 1/2 mile away from him and that he flies another P300 designed airplane for a living, the Fletcher FV-24-400 Ag aircraft, and that this must be first to fly, two w/e for work and pleasure, both designed by the same man. Rod's T-18 (ser. 111) was some 3 1/2 years in the building and is absolutely standard apart from the personal touches in the cockpit and a non-standard carb intake. It is an 1800 HP 150 hp and a prop is a Schenck 1661/71. Tony also has the same prop and says they prefer less pitch to get out of small grass fields that they have in NZ. Tony's T-18 is 1500 lbs. It performs almost exactly as per spec. (climb is 130 kts (150 mph) at 2400 rpm, climb is 1200 ft./min, speed is 81 kts (100 mph). Tony planned to buy a radio for his T-18 while here in the US.

**FROM ALAN J. BROWN, A-10:** Just talked to Ken Knowles and he told me Ken Taylor did that review of his biennial flight review a few days previous and they did push over flights and very stalls. The more they flew the new airfoil the more they said they were with the stall characteristics. He said that with power the airplane was still flying with the airspeed down close to 40 mph (indicated, which would not be accurate at that angle of attack). He said the more the high speed the stall stall break comes it is not a violent pitch down, a much gentler stall than before. He said it also acted the same in turning stalls and had practically no tendency to roll. I believe the larger radius leading edge is a great benefit for much of the improvement. I also believe that it can very easily be flown at several degrees higher angle of attack before separation occurs, as he also said it was (too) easy to get the tail wheel on first in the normal landing. This same characteristic was observed in airplanes with the "short" gear, indicating the wing was below the stalling angle in normal 3 point attitude. The longer gear cured this little problem. (Now don't run out and put an extension on your longer gear). In my opinion, the greatest virtue of the new airfoil is the ability to fly it slower(safely) in the pattern, on turns, and a slower final approach...not a slower touchdown speed. It will give the pilot a little more margin of safety in the landing phase and this is good if his attention is distracted, or he is tired, or maybe hasn't had had a chance to fly too much lately and is pretty rusty, etc. If it truly has a larger coefficient of lift, as indicated, its load carrying ability and rate of climb would also be improved.

Ken also told me he a nearly completed airframe for sale. Workmanship by the builder he acquired it from is excellent, he says. It's up on the gear, controls are in, and everything nearly complete from firewall aft, and would be a good chance for someone to get airborne in pretty short order. Call him for price and specific details. Would save the average guy about two years work, at least.

## FROM THE T-18C NEWSLETTER

By Lu Sunderland

**T-18C Rear Beam Fitting Correction:** A dimension on Rear Beam-Cutter Wing Fitting #317 was erroneously changed 26 Feb 76. This change should not have been made. It should read 1.812 rather than 1.712. Also, the center line of the ball-lock should be at W.S. 41.563 on #102R Drawing and the end of the rear beam fitting should be at WS 41.172 on drawing #314, rather than WS 41.253. Make other necessary changes to the #314 drawing where dimensions are referenced to this wing station. If anyone has any questions about these corrections, Sunderland Aircraft will replace the affected drawings.....End.

**JOHN'S BIRTHDAY PARTY '81:** Talked to John the other day and he said his latest fly-in birthday was a very happy occasion. There were 16 T-18s and no this year, the same as last year, and about the same number of people, too. Anyway, John, we wish you a very happy return, even though he couldn't fly at this year.

**JOE'S BUILDING:** Joe's 14th, Alamo, TX, 75016, was an exciting T-18, just about a lot of work a few months back. He had also had a project started in this area at the early '70s. He called us the other day to say that he had finally made his first T-18 landing and he was waiting for first trial. He has the other project moving into the final process, also.

**OSH '81 BIRTHDAY:** Last year we had a "OSH THIS DAY" party that began at noon on Monday and lasted until 7 pm. It set off a veritable torrent of comments, not only from the T-18 builders, but also from many other type fans as well. Several said they hoped to get their groups to do the same. It was such a hit with new builders. T-18ers led the way with the first newsletter and the cowbirds off hit was another first. Let's keep it the best too, by having 100% participation. "Goodies" will again be on Monday, and Tuesday. Also, the annual T-18 Dinner will again be on THURSDAY evening at 6:00 pm. Let's all let our guests know as soon as possible if you can attend, at 10:30, at your party, etc. We will bring the T-18 "Family Album" again and will again have photos of each table. If you have a good color print of your T-18 please bring it so we can put it in the other album of airplanes only. The T-18 table will be held in Room 12 at 10:30 to 11:30. (Don't wait until 11:30 to 12:00 which tent is in Room 12) Lu Sunderland will again be the forum moderator - if he can make it there (somewhat doubtful at this time). If he can't make it, let Dick and I will hold down the fort....Have all, let's remember to fly safely, be more low and slow turns to finish on RFL! Make that turn to finish no lower than 300 ft. and then to land on the last half of the runway. If you're too high or hot-punt-go around and do it right the next time or the next time after that. Keep your head on a swivel all the time...and you can keep your seat intact. Keep everyone to get back safely to their families. Don't gamble on the weather up there. Usually if you'll just be patient a couple of hours it'll change. When weather blocks your direct route it's surprising how many times a detour of a couple of hundred miles will give you clear sailing and actually cost only a few extra minutes enroute. Simulate some of these on a map and then put the computer to it for the time factor. It'll surprise you.

I've got a lot of goodies on tap for #54, which I'll try to get out as soon after OSH as possible. I have a good article on an Angle of Attack indicator system, Pete's 5 page "Scrounge" list, another article on building a landing gear, a good article with drawings for a cabin heat box, some info on turbo-charging with water/alkali injection for T/O, some dope and drawings on seats, more state by state listings of builders, an article on the care and feeding of batteries, (probably) an article on the first flight tests with the "Secret" engine, OSH/T-18 news, and a story about a new T-18 that the builder regularly pulls behind his pickup, to and from the airport, on its own wheels. See you at OSH!

Dick



As per usual I'm apologizing for being so tardy in getting out the newsletter, but it has been more than a little hectic since Oshkosh. My wife's Mother died in early Oct. and everything connected with that just about wiped out a whole month. Anyway, we have a lot of good info for this issue, so here goes.

**BUILDER'S LIST:** In N.L. #52 we listed some of the builders for several of the states. The listing was enthusiastically rec'd, so here's some more:

**DELEWARE:** Norbert Hesterberg, RD4, Box 705A, Dover, Del, 19901

**FLORIDA:** Lamar Turner, RT 1, Box 419, DeFuniak Springs, 32433

Dick Wyngarden, 200 Park Ave., N. Winter Park, 32789

John Starr, 1120 Hallamwood Ct., Lakeland, 33803

Wm. Sanders, 2178 Whitehall, Dr., Winter Park, 32792

P.R. Schmitgen, P.O. Box 1326, Palmetto, 33561

Russ Riter, Rt. 1, Frostproof, 33843

Wm. Rose, 2150 SW 89th, Miami, 33165

Bill Passinos, 940 Lighthouse Dr., West Palm Beach, 33408

Richard Mozina, 3400 SW 100 Ave., Miami, 33165

Al Kasten, 652 NW Sunset Dr., Stuart, 33494

Joe Jingle, 1340 Holt Dr., Merritt Island, 32952

Jake DeHaan, 10521 SW 124th Ave., Miami, 33186

Lawrence Dreyer, 5800 Melville Rd., Ft. Pierce, 33450

Russ Davis, 341 SE 8th St., Pompano Beach, 33060

**GEORGIA:** Raymond Frost, 5407 Iris Dr., Mableton, 30059

Ralph Powell, Box 137A, Keysville, 30816

Paul D. Schmidt, Rt. 1, Falcon Field, Whitesburg, 30185

**Indiana:** Gil Cook, RR #1, Box 353, Lexington, 47138

John Kleber, 213 Sheffield Dr., Danville, 46122

Donald Mize, 805 E. 300 S., Lafayette, 47905

Robert Poehner, 607 Amos Rd., Shelbyville, 46176

Edward Wiggins, 6938 Ironwood Ave., Gary, 46403

Jack Herrli, 2016 W. Indiana, Elkhart, 46514

**Illinois:** Thos. Weinberg, RR#2, Mt. Vernon, 63864

Joe R. Wood, 302 N. Cross St., Robinson, 63454

Rollin Tippet, 298 S. Jackson, Waukegan, 60085

Wm. Teeters, 950 Koshare Trail, Elgin, 60120

Jerry Turner, RR #5, Box 132, Marion, 62959

Richard Secrest, 134 Matte Ave., DeKalb, 60115

Ron Sassaman, 931 16th St., Rochelle, 61068

Anthony Repeta, 4300 N. Marine Dr., Apt. 1704, Chicago, 60613

Kenneth Rhoades, 175 Hickory Lane, Far Hills, E. Peoria, 61611

Allen Lurie, 605 E. Armstrong, Peoria, 61603

Paul Kirik, 2921 26th Ave. A, Moline, 61255

Donald Kames, 3N275 Keil Rd., West Chicago, 60185

Bob Jaeger, 2405 Melrose, Melrose Park, 60164

Wallace Hunt, 1658 Plaza Dr., Rockford, 61108

Robert Hubbard, 437 1/2 First St., LaSalle, 61301

Wm. Gillen, 3228 Brockmead Dr., Rolling Meadows, 60008

Alfred Cousineau, 8332 N. Octavia Niles, 60648

Keith Claypool, 826 W. Broadmoor, Peoria, 61614

to Del. add Donald Byrne, Jr., 1B Anthony Circle, Newark, Del., 19702

Future issues will have more builder listings. I don't have enough up to date info from all builders to be able to indicate what stage the projects are in. Also, all addresses listed may or may not be current. It might be a good idea to give the builders an advance call if you want to visit.

The late Dr. John Shinn was always one of the first to submit building tips for the N.L.s and the following was one of the last he sent in:

# HELPFUL HINT

From Dr. John Shinn

**WHAT:** Quick way to get AN bolt size for any desired bolt grip length.

**HOW:** Remember a simple number sequence (6,7,7,9,9) for thread length adders. Add to your desired grip length, and the AN length is obtained directly. Note bolt length must end up in 1/8 inch increments.

| (Diameter) AN                          | #3 | 4 | 5 | 6 | 7 | 8  | 9  | (1/16" diameter) units |
|--|----|---|---|---|---|----|----|------------------------|
| Thread length adder (1/16" increments) | 6  | 7 | 7 | 9 | 9 | 11 | 12 |                        |

**EXAMPLE:** Need a 5/8 inch grip 5/16" dia. bolt

**SOLUTION:** 5/16 dia. is AN5, therefore ~~add~~ thread adder of 7

Desired grip (with desired washers) 5/8  
+ 7/16  
TOTAL 17/16 = 1-1/16 inch

Round up to full 1/8 inch increment: 1-1/8 inch (use an extra 1/16" washer on assembly).

In the AN numbering system, the digit in the "tens" position is whole number of inches, while the number in the "units" is the additional number of 1/8 inch increments less than a whole inch.

Thus, for 1-1/8 inch length, the AN "dash" number is -11, and the desired bolt is:

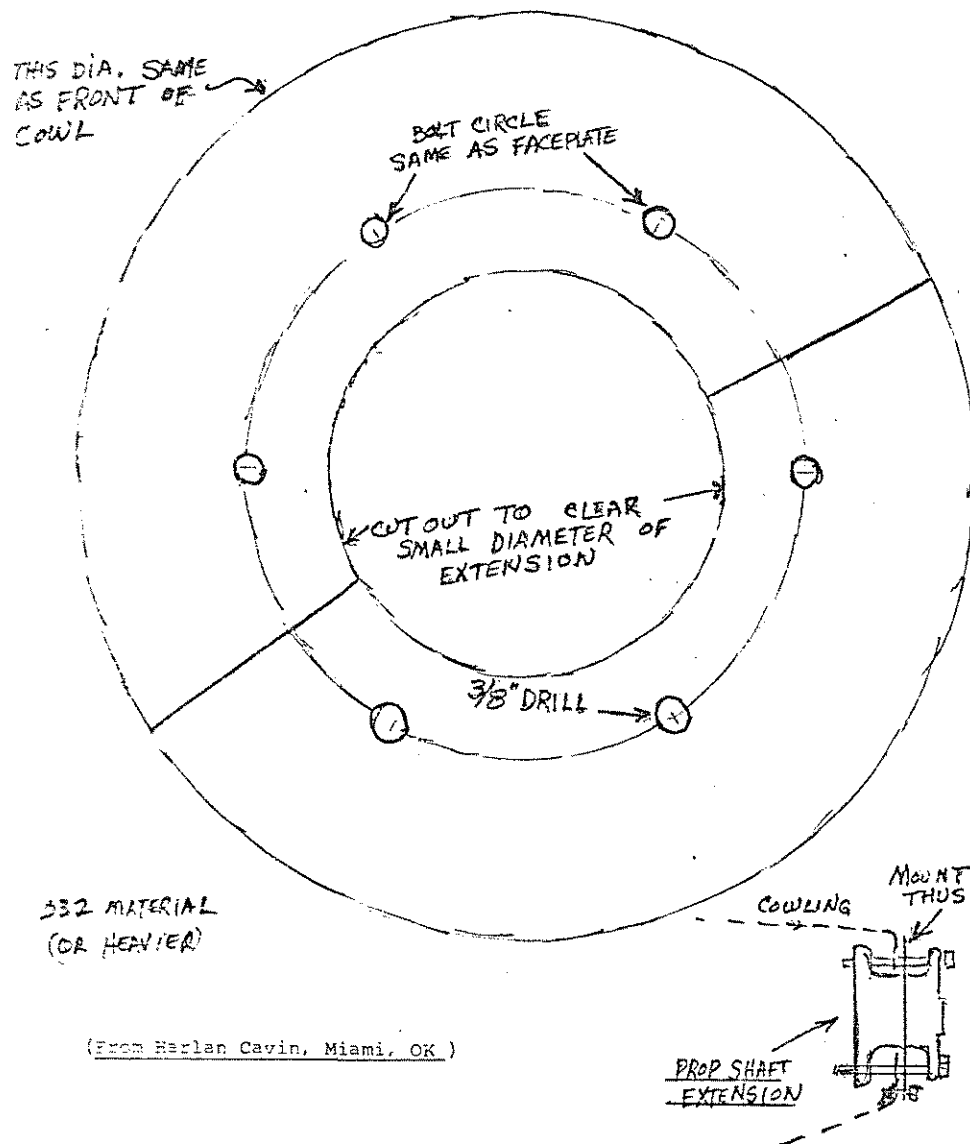
The AN bolt is then obtained:

5/16" dia.  
AN 5 - 11  
1" 1/8"

(Similarly, a 2-1/8" length would be designated AN2-21)

**REMEMBER:** 6, 7, 7, 9, 9 - and you can be AN expert!!

- 640 **COWL INSTALLATION TIP:** When installing the cowl it is essential that the front end be held securely and accurately positioned. Here is one good method to precisely locate the front of the cowl:



- 641 Questions from Grover Rahiser, 517 Van Buren St., Evans City, PA, 16030 re what shorter builders have done to elevate the seat to better see over the cowl and reach rudder and brake pedals easier:
- Don Lankford, Denison, TX, who is about 5 ft. 6", had an extra thick cushion made for the pilot's seat. He also had a cushion of regular thickness made (to match) and when taller people flew it he simply swapped the cushions. I thought that a very good idea. Someday you or your heirs will sell the airplane probably, so it would be wise to keep this in mind when approaching such problems. The odds are that the person that will want to buy the airplane will be the exact physical opposite of you. If you want to move the rudder and brake pedals back to fit your legs, that's easily done with no problem, but before you make such an installation permanent why not first mount the pedals as shown on the plans and then if they need to be moved forward later it would be a simple matter. A flat steel strap would suffice to lengthen the rudder cables to the most forward position. The "standard" seat height is pretty good for most people now, so it would be wise to use a std seat cushion first and just put a cushion on top of it until you have a chance to really see what you need.

- 642 **0-290G News:** Don't count out the 0-290 just yet. I had a recent visit from Jake Sauerwein, who lives in Las Vegas, NV, and he told me he has a highly modified 0-290 in his T-18 and he gets around 200 hp out of it at 3000 rpm, which in turn gives him a top speed of 220 mph!! He has Jan forged pistons in it and a specially ground Collins cam. The compression ratio is raised to 8.5 to 1, and timing is set between 34 to 37 degrees before TDC. Jan pistons are "waified" for strength and stellite valves are installed. Jugs are bored .001 over. Head temp will run about 500° at the cruise rpm of 2700, which gives him 200 mph on a Sensenich prop (66 x 76). I forgot to ask him what carb he had on it and which crank, etc. The guy that put the engine together for him felt that the engine would go 500 hrs. between OHs. He has about 200 hrs on it now. I don't think he told me the fuel consumption at 2700 rpm, but it probably is 10 gph or more. I'd guess. Jake's serial # is 920 and his phone is 878-9492 in case you get out LBS way. Oh, yes, he said his R of C only indicates 2000 fpm, but that his actual R of C averages far above that. That's the kind of performance that makes T-18ers think they are in their own P-51. Wow!!!

Along that same line, I've had a brand new 0-360 for about a year that I'd been rat-holing for the new wide body CW I'm building. I also bought a constant speed Hartzell from Ken Brock and a dynafocal mount and prop governor at the same time. I've decided now to go ahead and put it in my present airplane and fly with that in it for the time being. When all the results are in on the Escort engine I'll make a decision on it at that time. Dave Blanton's development work on the Escort got a late start this fall when he got a rush order from Cessna to make a water tanker out of one of their Citations to use to certify their airplanes for icing capability. (The tanker flies just in front of the other airplane above the freezing level and sprays water to ice up the one in trail). He expects to start flight tests within a month, so we'll have some news on it very soon. He has invited me to come up to ICT and fly it at that time and of course I'm quite anxious to see how it will perform.

- 643 **WEIGHT AND BALANCE CALCULATIONS:** Recently I've talked to a number of builders that were ready to weigh their airplane and do the CG calculation, but were unsure as to how to proceed. If you have the I thru 44 set of T-18

(WE NEED MORE WT & BAL. CALCULATIONS FROM BUILDERS. PLEASE SEND IN YOURS, WHETHER OR NOT IT IS FLYING)

Newsletters, look at N.L. #27, page 7, and you'll see that Lou Sunderland showed a "cock book" type of example of computing CG, using his airplane. With one of the modern hand-held calculators it's duck soup to run thru his examples. He also shows examples of several other T-18s and how their CG calculated out, so practice running thru these examples and you can soon become proficient with it. Note that it really isn't necessary for the airplane to be complete to do a CG on it. As a matter of fact, it is really more desirable to do it before locating your battery. If you are using an O-290 and a wood prop you can probably expect the airplane to be a bit toward the tail heavy side if you have the now-common steel tail spring. If you are installing a big engine and C/S prop you can expect to have to mount the battery behind the luggage compartment and possibly add some lead in the tail, too.

Again referring to a N.L. from the previous series, #18, page 1, which was a report of a forum at RFD. John Thorp answered several questions that were posed. One asked, "What should the CoG limits be, since they aren't called out on the plans?" Thorp: "The theoretical neutral stability point is 34% MAC, N299V (I80 hp & C/S prop) demonstrated a neutral stability point at 31% with 94 lbs. in the baggage compartment. This forward shift in the neutral stability point is apparently due to the high friction in the horizontal tail bearings. The lower this friction, the more AFT will be the neutral stability point. It would be better to use anti-fric tion bearings in this horizontal tail pivot, but it would be advisable to enlarge the fitting slightly if they were used. The forward CG limit is 15%".

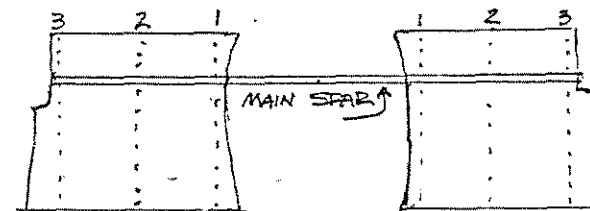
I would again like to emphasize that the accuracy of a CG computation can be severely compromised unless ACCURATE scales are used. Bathroom scales cannot be relied on. Note how much of an error you can get by standing too far forward or backward. If you positively cannot find platform scales in your area, do NOT try to weigh one wheel and then the other. You will need 5 pairs of bathroom scales to do it right. You will need to put 2 pairs of scales under each main wheel with a 2 x 6 bridge between each pair for the wheel to rest on. (Don't forget to subtract the tare weight of such a bridge when recording each wheel weight). You'll also have to make some sort of a fixture to hold the tail wheel up in a level flight position, and of course you'll have to again take the tare wt. of the fixture off.

Be careful that the airplane is leveled very accurately fore n aft. You can use a level taped to the center line of the rivets on W.L. 42.0 to do this. Be sure there is no tendency for the airplane to roll forward on the scales and be in a closed area out of the wind. Also level the ship laterally, too, by adjusting air in the tires. Now drop your plumb bob to the floor from the L.E. of the wing. Make a mark on the floor on ea. side and measure from these marks to the axle center line. Drop another plumb bob at the tail wheel axle C/L and record the distance from there to the first marks dropped from the L.E. (datum). Most standard T-18s will measure from 160 to 163 inches, depending on the make of tail wheel, etc. The longer gear or a wide body fuselage will change this figure. Expect a tail wheel net weight of 13 to 48 lbs. Your empty CG (zero fuel) should fall pretty close to 60-61 inches (fuse. Sta. no.), Aft CG about 70-71 inches, and Forward CG should be pretty close to 62.5 to 62.8 inches. All these figures are ball park numbers only. If your calculations aren't pretty close to these Sta. nos. you'd better re-check everything again, starting with the accuracy of your scale readings. Compare all your weights and measurements to those listed in the table in N.L. #27. Take note of Lou Sunderland's comments about the difference between the readings of platform vs. bathroom scales.

Recently abuilder called me and asked me to do a wt. & bal. for him and gave me a set of numbers to work with that he'd gotten by weighing with bathroom scales. He had a Lyc. 180 in it and a C/S prop and the numbers weren't realistic. He first gave a total empty wt. of 830 lbs, with a 30" tail wt. I asked him to re-weigh with the best scales he could locate and this time his empty wt. was 976# and his tail wt. was 34 lbs! That was quite a significant difference, but such errors are NOT uncommon with those that use bathroom scales. Be aware that a nose heavy airplane could quite likely be a candidate for the first half of an outside loop if the flaps were extended at a bit too much speed and flare capability could also be compromised. Also, a good possibility exists that with such a condition the pitch trim capability would be grossly deficient.

**RIVETING SEQUENCE, CENTER WING, CONVERTIBLE WING:** From JOHN P. KLEBER, 213 Sheffield Drive, Danville, IN, 46122: (letter, quote). "Dear Dick, I am writing this letter I promised you last summer. Now that I have just finished my foldable wing I have a little more time on my hands. I have included herein the riveting sequence for the center wing section on the "C" wing. It allows the builder to fabricate the wing with virtually 100% solid rivets and prevents him from getting backed into a corner and helps to insure absolute squareness of the structure while riveting, so here goes.

(NOTE: It is assumed all pre-riveting work has been completed, sub-assemblies completed. Also NOTE that the ribs have been re-numbered for ease of reference. Please refer to the following diagram.)



- I. Rivet nose rib #2 to the skin.
2. Install pitot-static, nav antenna cable, and other electrical cables thru #2 nose rib.
3. Cleco rear beam in place. Position main beam. Clecos every other hole.
4. Rivet main beam to upper and lower skins full length (except rib holes).
5. Remove rear beam.
6. Bolt on main spar fittings (steel fittings at wing joint).
7. Cleco #3 nose rib in place. Rivet to skin.
8. Loose position #2 and #3 rear ribs.
9. Bolt 226-I support to rear spar.
10. Re-position rear beam w/clecos. Rivet to lower skin only (all holes full length, except at rib positions).
11. Bolt 226-2 & -3 fittings to rear beam.
12. Cleco #2 & #3 rear ribs, plus step plates & support angles in place.
13. Rivet rear rib #2 complete. (Remember main and rear beam rivets).
14. Rivet step plate support angles to skin.
15. Rivet rear beam #3 complete, like #2.
16. Position #1 nose ribs w/doubler strips. Rivet completely.
17. Rivet rear spar to top skin & doubler.
18. Position .032 spacer & rivet the most aft rivet row.

-END-

(John Kleber, cont'd)

Well, Dick, I hope this will help some of the guys out. I have a riveting sequence for the 6 ft. outer wing panels, which I'll mail to you for a subsequent newsletter.

(John, we are in your debt for the above info and you can bet it REALLY will be of a great deal of help to CW wing builders. We'll also be looking forward to the sequence for the outer panels).

Continuing: "On the down side of things my wife has become the victim of a R.I.F. (reduction in force) and therefore I must regrettably sell my T-18. Will you please include the following ad in the Newsletter:

FOR SALE: Thorp T-18, 200hrs. TTA, Lyc. G-320 E2D, Navcom:KXI50; Imron paint. Can be purchased with either the standard or the convertible wing. Price \$17,000 w/"C" wing or \$15,500 w/ standard wing. Also for sale: (1) standard wing, complete with flaps and ailerons \$3250. (2) One convertible "C" wing complete \$4500. All prices firm. Will build other T-18 components on commission basis. Interested parties may write me at the above address or call me a 317/272-3584." Sincerely, John Kleber. John also added a footnote to the effect that he enjoyed building about as much as flying. I think most of us can relate to that, too. Anyway, we're sorry that you are going to have to sell your bird, but the buyer will be getting a good 'un. I looked it over at OSH and not only was the workmanship excellent, but I thought that it had a very sharp paint scheme, too. Thanks again, John.

FOR SALE: (May already be sold) LEO PERLAKE, 6301 Somerset Road, Riverdale, MD, 20840 has all parts for center and outer wings finished plus flaps and some tail parts. Also has optional V-8 engine and Airesearch turbo charger. Also has wingtip, spinner, and nose bowl molds (or pieces) Price was \$1600 w/engine, \$1200 without.

Mark McKinty posed a question: "Should allowance be made for future settling of the engine when one is fitting the cowl and spinner?" Ans: It seems that most T-18s do develop some droop as they pile up hours & certainly the Lord mounts do compress in service, so it seems sensible to make some allowance, but I don't have any numbers. My <sup>has</sup> drooped about 1/4" since new, but I've seen some with a bit more. If you have the big engine and heavy C/S prop, I'd think it well worth considering. I'd like to hear from some of you other builders with a couple hundred or more hours on it.

From Ken Hansen, 1207 Valebrook Pl., Glendora, CA, 91740 (letter, quote) "Dick, Enjoy the newsletters. I figure if I glean one idea from each issue I'm that much farther ahead. Even when I read of something not new to me a great deal of confidence is instilled in me to learn of someone else that's doing the same thing. ....Now for a little description of my project: I started about 8 yrs. ago (plans #819) Picked up an O-320 with only 800 hrs. SMO. I overhauled it anyhow. I took one semester at Mt. San Antonio college power plant maintenance and did most of the work in class. (a great place). Glass head blasted case, honed & balanced everything to within 1/4 gram. Only thing I had to replace was the cam. Got a factory re-grind from Lycoming.

I bought a Rayav turbocharger salvaged from an Aero Commander. Mounting, fitting, & plumbing was a barrel of snakes. Exhaust system tricky, too. Did a lot of cutting and fitting. Ended up with 2 1/2 sets before I got it all (including waste gate) inside the cowl. Have 4" prop extension, Corvair oil cooler, CHT on all 4 cyis., EGT, Sensenich 66-78, and a WATER/ALCOHOL INJECTION OF MY OWN DESIGN. ....I use a polyethylene water tank that is pressurized by a light wt. nitrogen bottle. It's activated by a computer switch on my panel that energizes a miniature solenoid valve in line to the carb. The injector is mounted in a plate between the sump and carb. .... Flow tests came right out to my calculations. Expect to run 30% H2O/Alcohol at 3 psi thru an .031 orifice. This'll drop cyl. head temp 100° and let me boost at altitude. All my plots and graphs fall off at 39,000 ft, so can't wait to find out what the ceiling will be. Expect one hell of a good ground

(Ken Hansen, cont'd)

speed @20,000 ft. with the prop I have....As you've probably guessed by now, I have an oxygen tank all plumbed in.....Am building the folding wing, since I only live 3 miles from the airport, so I've scrapped some of the old wing parts.....I've rounded off my rear deck. Am using fiberglass bucket seats from a dune buggy, with a pair of mini ones in back. Cut down and braced the bulkhead behind the front seats....could go on & on about the massive amount of wiring behind the panel, harnessed here and there. Lighted push button mike switch on sticks, entire panel indirectly lit from under a custom overlay....Have electric trim, electric flaps, courtesy lights, strobes, quartz halogen landing lite, electric fuel pump...I designed my own low fuel sensor. It sounds an electric beeper and flashes an LED @ a pre-set level. The FAA eng'g group has a copy of this now. It's a bit stalemated now, since I don't have the money, backing or time to push it thru type certification. ....Some further details on my turbo system: I'm picking up air thru a 2 1/2" duct, just in front of the cylinders on the left bank. This is routed to the turbo output of the turbine, is ducted to a pressure box. I bought a "deep drawn" aluminum box from Zero Mfg, that is complete with cover....Did some hole cutting and installed two flapper type doors in the box that are linked together with a turnbuckle. The other port is ducted to a "hot rod" air cleaner that I have mounted on the inside of my cowl, so when one door is closed, the other is open. One way is filtered air for ground operation, the other is ram air & turbo pressure. Fuel is fed thru the box thru a bulkhead fitting, as well as my wacky/ water injection & manifold sensor. I have a Holly high performance fuel pump. This is a motor driven type and beats the heck out of the pulsating type. It's capable of 14 psi @ 90 GPH, so the regulator is important! It has a built in regulator and an independent one in line...won't go into detail here, but manifold pressure from my pressure box regulates fuel pressure....The turbo has to have oil pressure fed to it to keep its main bearing floating. The hot rod boys are turning them up to 125,000 rpm... 80,000 is normal...The turbo has to be mounted high enough to get a decent drain back to the sump...above the normal oil level, if possible. The only other alternative is a scavenge pump (something else to go wrong). This whole barrel of snakes started because I didn't want an air scoop sticking out from the bottom of the cowl! Ha! Will tell more of my water/alky injection system in a later letter"....Sincerely, Ken.....This letter got lost in my files somehow, as I rec'd it last year. Sorry, Ken. He enclosed 3 photocopy pictures that are unsuitable for reproduction here, but if we can get some good, sharp b & w pics we'll sure run 'em. All I can say after re-reading Ken's letter is that anyone that says that EAA types are unimaginative and afraid to experiment with advanced techniques and concepts just aren't up to date with things. Anyway, Ken, thanks a bunch for such an informative letter. Just wish more would follow your example in sending in details on their projects.

In recent months I've received several comments on the current cost of the A frame landing gear (\$545) as supplied by Ken Knowles. A careful reading of the following report by Pete Beck should serve to illuminate some of the misunderstanding that has arisen. Prices on everything today are out of sight (been to the grocery lately) and when we buy anything that someone else spends their time and labor to fabricate, invests THEIR money in raw materials, pays the rent and utilities and taxes and insurance on a plant, takes the time and bears the expense to package and deliver for shipping, it certainly seems reasonable for them to expect to make a profit on their endeavors. Remember, too, that when you purchase a fabricated item that you are paying a certain amount to eliminate the gamble of unsatisfactory parts.



## ● "BUILDING YOUR OWN LANDING GEAR" by Pete Beck

Mr. & Mrs. Peter K. Beck  
8712 Queen Elizabeth Blvd.  
Annandale, VA 22003

Dear Dick;

COPY

Just a note on a couple of items we have discussed recently:

LANDING GEAR COSTS

As I recall, Ken Knowles gear is now up to around \$550, and many are probably considering building their own gear. I would like to offer my own thoughts on this, having now travelled the build it and the buy it routes. My T-18, 102ER originally had a standard "boughten" gear, dating from the days when we all thought \$220 was a bunch. Last year I ground looped the T-18 off a highly crowned taxiway and bent my right gear strut, and had to rebuild the whole gear. (Believe it or not, there was no other damage to the airplane, although it got stood up on its nose. I am flying the same prop and spinner even today!) You, Dick, kindly gave me the gear you had bent in a similar way on the theory that I could cut apart and resplice the the two good halves, but that was not possible. (Due to their different lengths.) Instead I wound up remanufacturing two new halves of two gears, or the equivalent of one gear. For reference, here are the costs:

|  |       |
|--|-------|
| Tubing (B&F Aircraft Supply, Oaklawn ID) | \$141 |
| Welding                                  | 175   |
| Heat Treating                            | 126   |
| Shipping (to and from heat treat)        | 33    |
|  | 5475  |

Some further comments are in order.

(CHICAGO)  
● B&F, probably has the most available and best priced tubing for the gear, and it is in inventory, at least as of a year ago. They laid in a bunch back when T-18s were new on the market and Ken Knowles wasn't even in business. Their prices a year ago beat everyone else's, and their per foot costs include cutting and drop charges, averaged over all orders. Beware that you add these charges in when you are pricing this tubing - they can add 30 to 40 percent to the cost of your tubing, and everyone other than B&F adds it onto the per foot prices they quote you. Response from B&F was fantastic. I called them, they checked their stock while I held the line, they shipped via UPS that very day, and I received it three days later. Good businessmen live! And they have my thanks, respect, and future business.

● Welding the gear was not something I wanted to tackle myself - I had neither the skill nor the equipment. A certified aircraft welder did it for me - heliarc'd, cash on the barrel no checks, at a reduced rate, and it still wasn't cheap. It took seven manhours to complete, and I took it in all jigged up, etc. My thanks to Paul Shiflett for the loan of his jig. It turned out beautifully - better beading and penetration than Ken's gears, which are excellent.

## ● "BUILDING YOUR OWN LANDING GEAR" (cont'd) by PETE BECK

● Heat treating is the real impediment to doing your own gear. It is nearly impossible to find someone who:

- has the size oven needed
- can schedule it in with other work requiring the same heat treat times, temperatures, etc.
- will do it for a reasonable price

The only reason I got the price I did was that Lu Sunderland included it in a lot of 6 gears that he was able to get done at cost.

● Other than these trivial matters, actual fabrication took but 12 hours of my own time.

● Having gone both routes, I have learned that there are sound, logical reasons why Ken has to charge what he does. While his prices may seem high, they certainly are not a rip-off as some of the neo-buddies are wont to assert. If faced with the same prospect again, I would call Ken and tell him to ship one of his straightaway.

● SAFETY OF FLIGHT ITEM !

One of the T-18s in this area had a mishap and wiped out his gear a couple of months ago. He purchased a new gear to replace it. In examining the damaged gear, we discovered that 1/2" bolts had been used by the previous owner to attach the axels to the gear strut extensions. Moreover, they may have been loose in oversized holes. Worse, I discovered that in mounting the axles to the new gear, the owner had been forced to use 1/2" bolts on the top two axle mounting holes because the holes in the gear were not a full 5/16". The prints call for 5/16", and the holes in the gear should be opened out if necessary. I called Ken Knowles about this problem. He indicated that on all his gears he provides 5/16" holes for axle mounting. Ken Brock's people indicated that they may use an undersized hole to jig the gear prior to welding, but that they try to be sure that it is opened out later. In any case your ought to check those hole sizes on new gears and make sure they are opened out. My friend wasn't as fortunate as I. When his gear gave way, he skidded down the runway on his nose, bent the crank and has a complete engine rebuild job on his hands for a couple grand and odd chance. While the axle bolts may not have been the primary cause, it certainly appears that they were contributory.

All the best,

Peter

I had given Pete an old gear that had been given me by a local T-18 builder that had let his son fly and had groundlooped it, BUT IT TURNED OUT THAT IT DIDN'T SAVE HIM ANY MONEY.

● ANGLE OF ATTACK INDICATOR: from Glenn Young, 703 Park Ave., Litchfield, Minn. 55355

(AOA)

Enclosed are drawings on the angle of attack indicator that we have installed in our T-13, N10510. I did complete the A.O.A. that worked on the photo cell and light, but before mounting that one, I saw this one on Mr. Pagel's Teenie II. He explained it and sent me a unit that he had for testing. This works on a potentiometer with a vane directly mounted to it. This sends a signal through a circuit and amp. meter. The meter is then marked for the angle of attack. Mr. Pagel is an engineer for the Rosemount Corp. and they make instruments for military planes, airlines, space craft and many other interesting things. His address is: Roy Pagel, 6324 Morgan S. Richfield, MN 55423. (DON'T FORGET A SISA ENV. IF CONTACTING)

We mounted our angle of attack prior to Oshkosh last year. It is quite sensitive to turbulence. You can adjust the needle both at the cruise end and the stall end. Once adjusted, Green, Yellow, and red strips can be put on the gauge. We have our A.O.A. adjusted so with 1 notch of flaps, 2 people aboard, approaching at 95, it is just in the green. Our stall occurs at the low end of the red. We want to do some more adjustments in that area. Another thing that is noticed is that with different weights, the angles will be different. With more weight, it will take a steeper attitude to keep the same angle of attack. The flaps will also change the angle of attack. With the vane mounted on the outer portion of the wing and the flaps on the inboard, when flaps are put on, the nose pitches down and the angle of attack goes down also. I am not sure of what to do with this. One very good thing that it shows is that with increased load, you have increased angle of attack. We have slowed to approach speed and banked sharply and watched the angle of attack go quickly into the red. This is something taught in training, but when you see it here, you remember it better.

Another area it is handy is on climb. We have a spot marked so that with about half fuel and Ethel and I aboard, we climb at 100 MPH indicated. With full fuel and baggage, to maintain the same angle, we had to maintain 110 to 115 MPH.

We feel that we have a lot to learn about this, but it has taught us a lot about the T-13 and what the wing is doing. I wouldn't go so far as to throw out the airspeed, but the A.O.A. is a handy tool also.

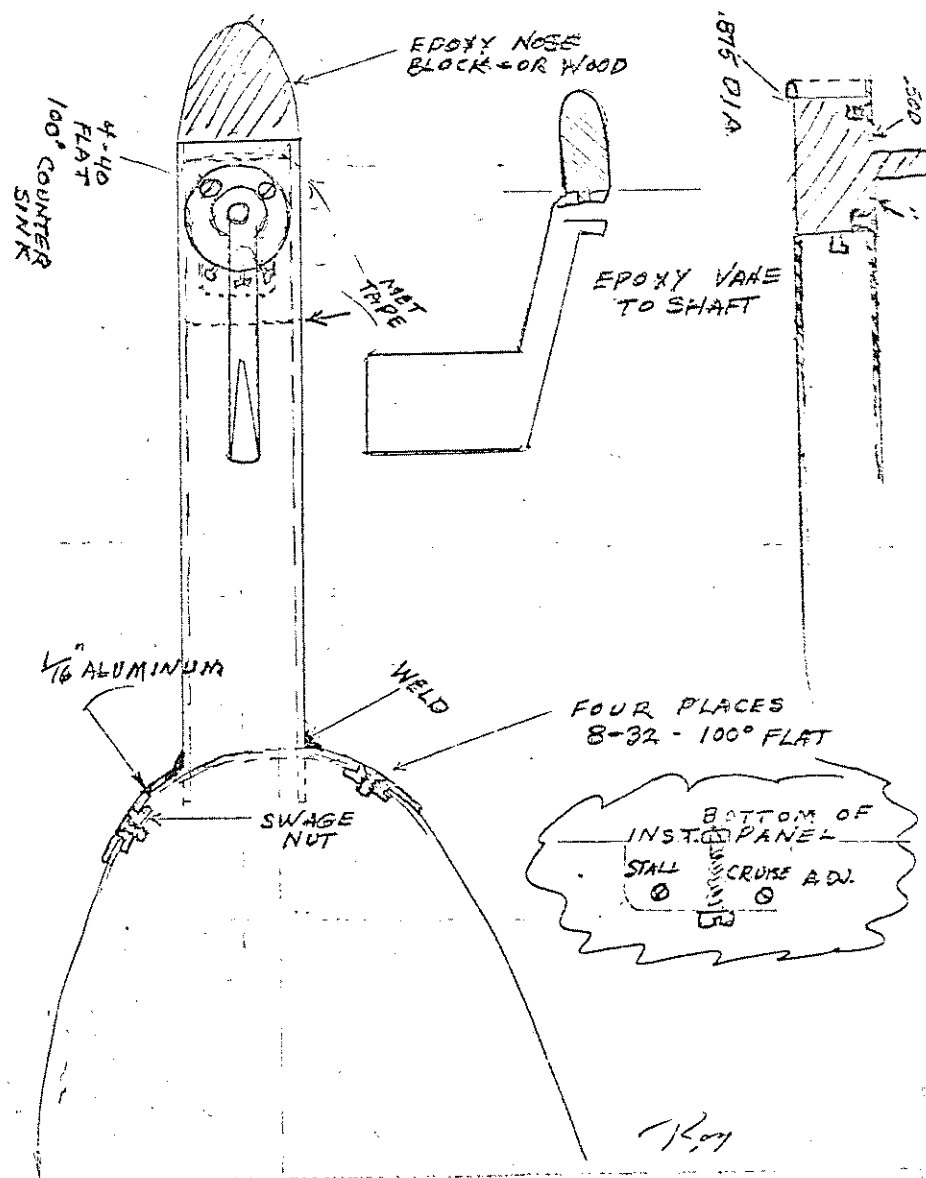
Last year I mentioned that when we have full fuel and just one aboard, that with the airspeed 90-95, we get a buffet on the elevator and a pitch down on the nose. We added 4 pounds to the tail to try to move the C.G. a bit aft. We cut an inspection hole below the elevator 3 1/2" X 5 1/2" and used 2 pieces of 1/4" thick lead plates with a piece of .040 alum on top of it. This is bolted to the lower longerons with 4 #10 bolts. This moved the empty C.G. back .75 inches. This helped but we could still feel the buffet with full fuel and one aboard. Ethel felt that it was more comfortable to her. I don't want to go too far aft as we don't have full fuel that much and with one half fuel, there is no buffet. The main reason that we notice this is that Ethel and I are both quite light. She is about 125 pounds and I am 130 pounds.

As for my health, I just got out of a plasma exchange and am waiting to see what it does for me. They took my plasma out and put some sterile plasma back in. I can't complain and have been doing pretty good. We hope to make Oshkosh this year also, "Lord Willing". (It is multiple sclerosis that I have.)

This report & the four drawings are by Glenn Young  
703 Park Ave, Litchfield, MN, 55355

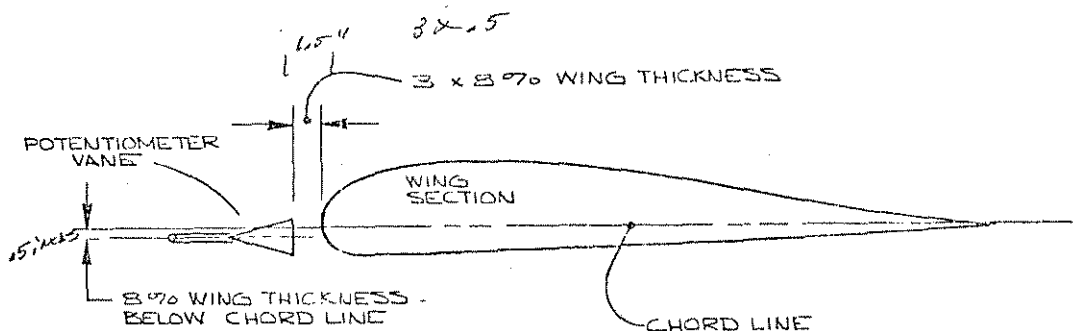
from Glenn Young -

● AOA DIAGRAM



SEE SEPT. '75  
"STORT AVIATION"  
FOR FURTHER DETAILS

T-18 NEWSLETTER #54



INSTALLATION DETAIL  
FOR  
ANGLE OF ATTACK  
TRANSMITTER

2 MAY 78

6

4.8

Page 74

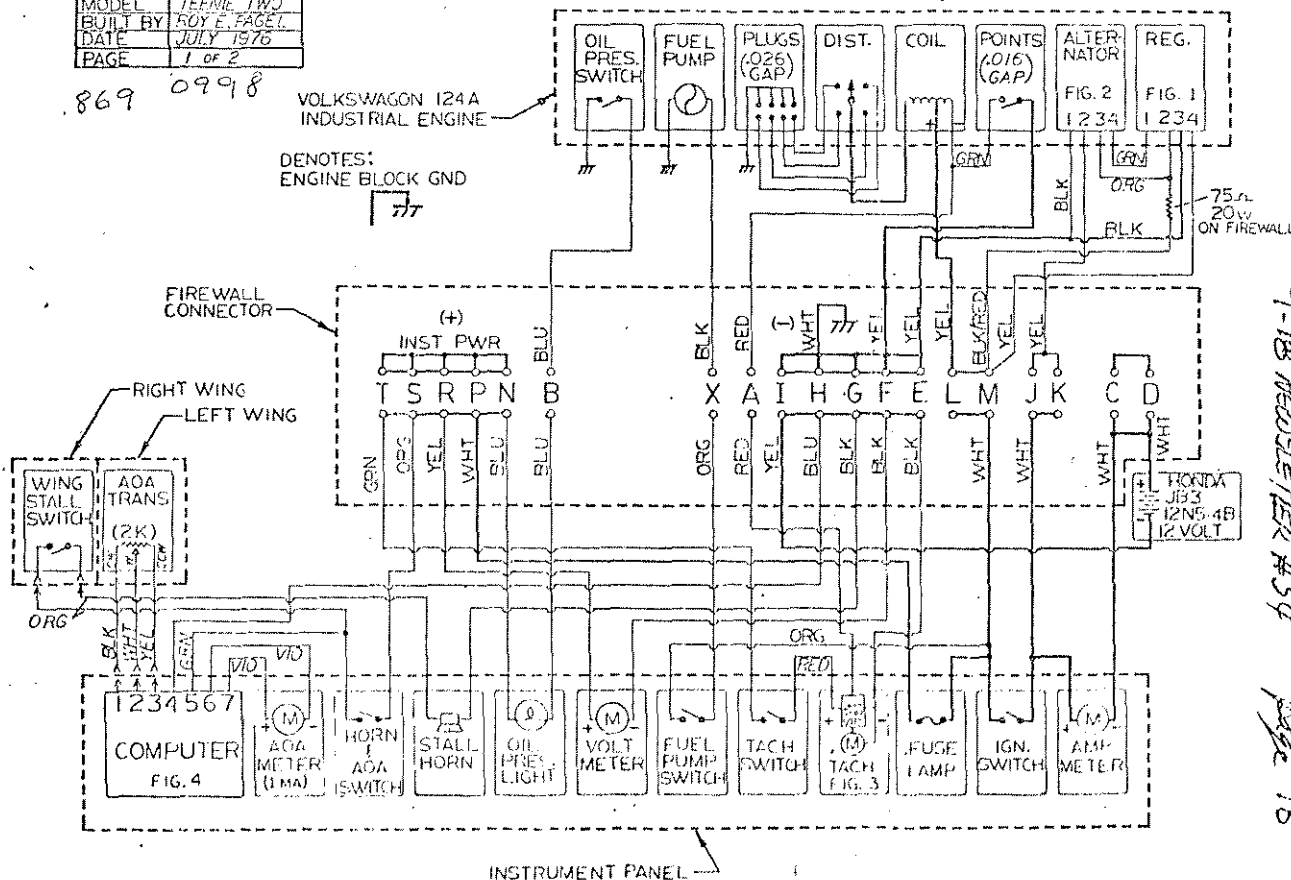
GLENN YOUNG

| WIRING DIAGRAM |              |
|----------------|--------------|
| MODEL          | TEENIE TWO   |
| BUILT BY       | ROY E. FAGEI |
| DATE           | JULY 1976    |
| PAGE           | 1 of 2       |

869 0998

VOLKSWAGON 124A  
INDUSTRIAL ENGINE

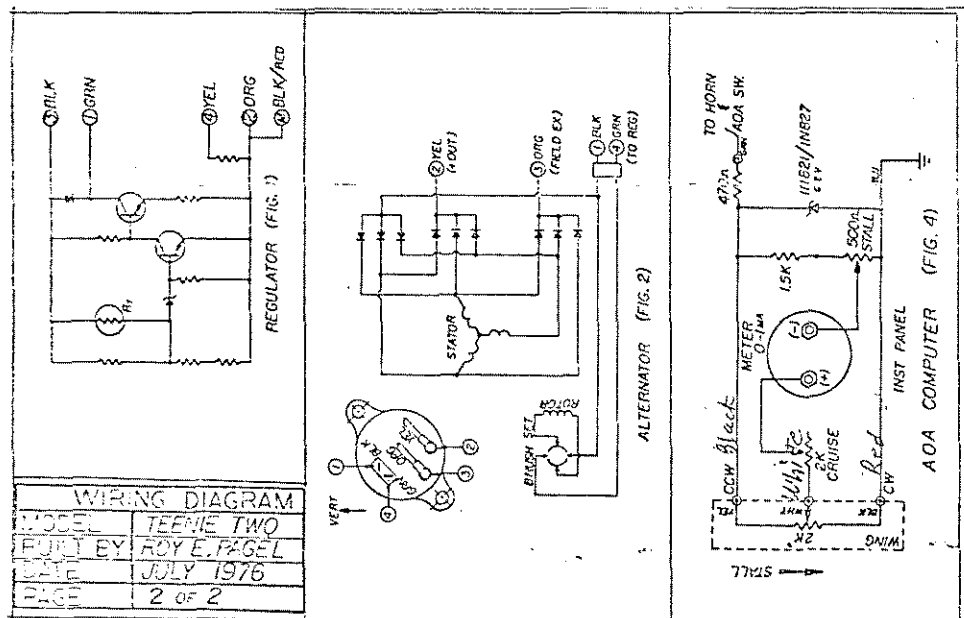
DENOTES:  
ENGINE BLOCK GND



T-18 NEWSLETTER #54

Page 78

(CONT'D)

● ANGLE OF ATTACK INDICATOR: from GLENN YOUNG (WIRING DIAGRAM)

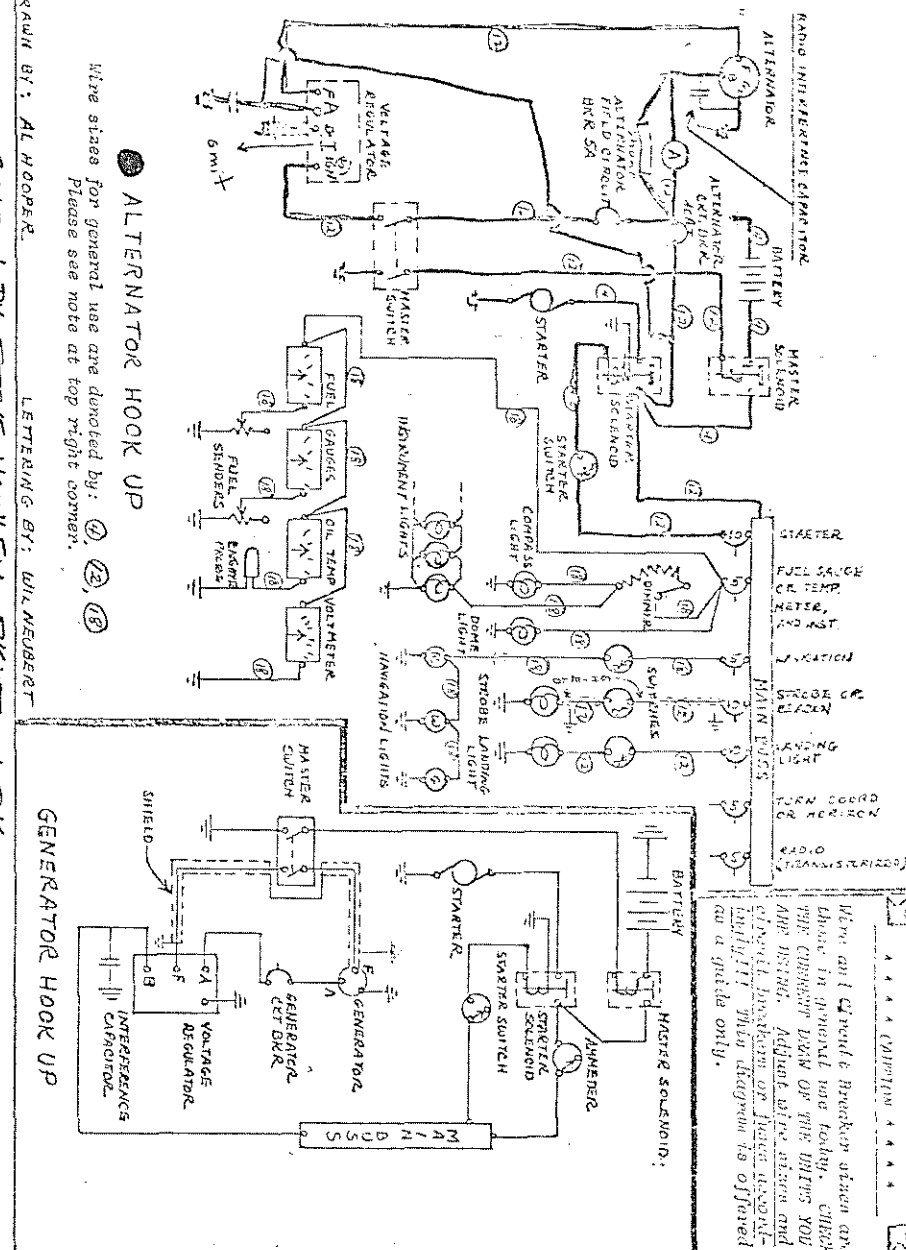
Thanks again Glenn and Ethel for the info. It's greatly appreciated. An Angle of Attack indicator would seem to be a very useful item. There are times when we might want to fly a little slower than  $V_s + 30\%$  on approach, but with the rather poor pre-stall buffet that most T-18s have, most all of us usually pad that figure a little, too. My T-18 indicates 58-60 at stall with two people and I normally approach at 90 until about 200 ft. & then I may work it back to cross the fence at 80 if I am going into a short field. Incidentally, I feel that to go in and out of any field of less than 2000 ft. with two people aboard and an average 10 mph wind is using up most of our normal safety reserve (and that's a field with no obstructions on either end). With 180 hp and a constant speed prop you might safely knock a couple of hundred feet off that figure and the new airfoil might trim another hundred more off. In very hot weather, light or no wind, and a turf field, a 2100 ft. field is my personal minimum, unless it's a case of "have to". I'd be interested in hearing how other T-18 owners feel on the above. I also wonder how many of you make a practice of using a forward slip on approach, with flaps extended? My airplane slips very well with full (30°) flaps. John Thorp doesn't recommend (or approve) of this, but I've done it hundreds of times and some so steep I've had to use full rudder and MY airplane lets me know when I am close to the max control limit. (I'm not advocating it for anyone else. Just curious).

SENT IN BY STEVE HAWLEY, SKIATOOK, OK.

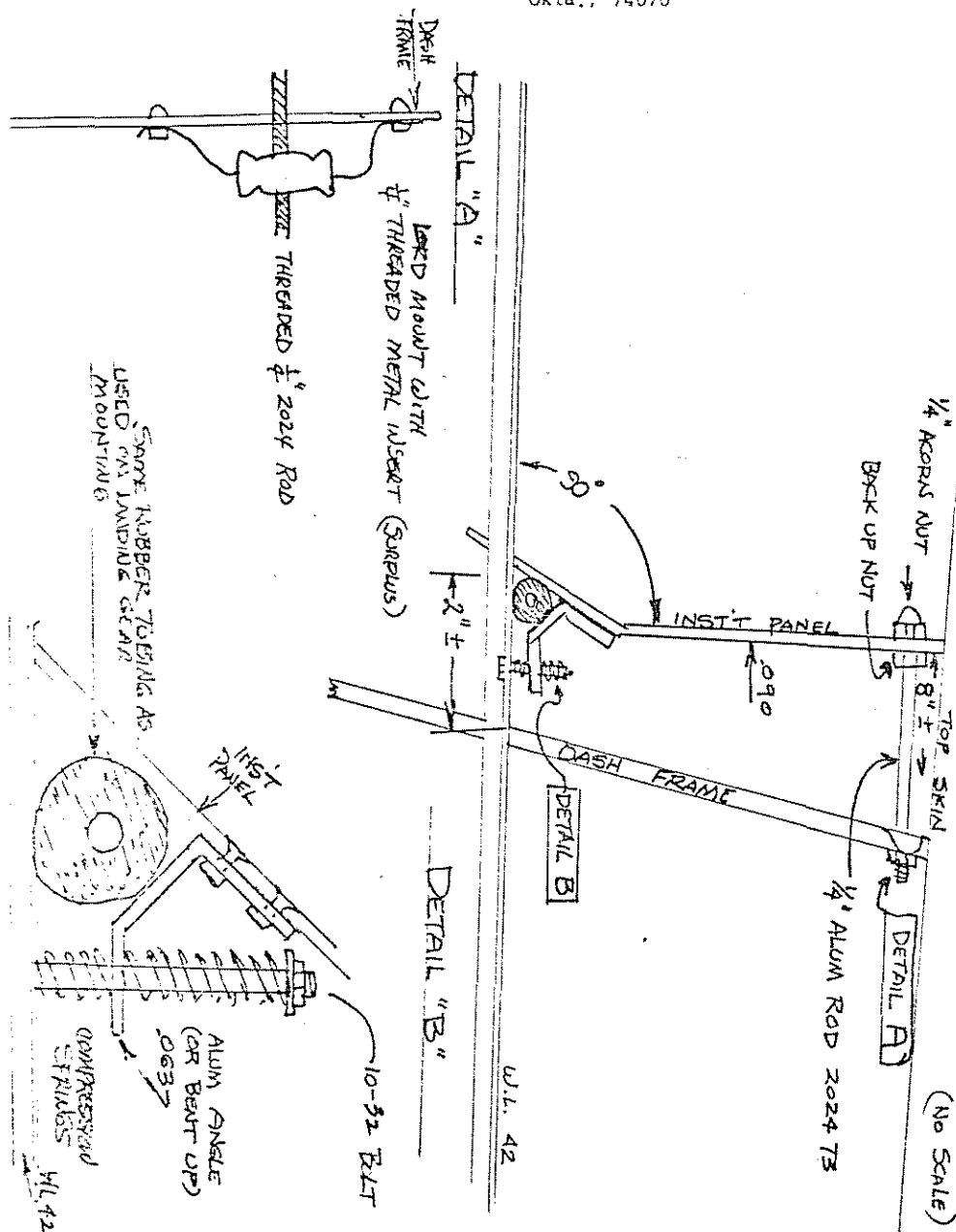
DRAWN BY: AL HOOPER.

LETTERING BY: WILNEUBERT

Wire sizes for general use are denoted by: ① ② ③ ④

● ALTERNATOR HOOK UP  
Please see note at top right corner.

INSTRUMENT PANEL SUSPENSION DETAILS from STEVE HAWLEY, 805 W. 5th, Skiatook, Okla., 74070



- **DIMENSION UPDATE, DRAWING #-485:** From Dick Amsden, I6434 Concord, Fraser, Mich., 98026

He says: "We purchased Cleveland wheels and made our axles and retainers to the prints. The drawing #485 no longer has the correct O. D. dimension, as the seals on both sides of the wheels are the same size now. The 1.654-1.658 dia. should now be 1.750-1.754".

He also refers to an old newsletter about some putting an .040 shoe on the fuel tank cradles to keep the tank from denting and asks if it is still being done.....ANS: "No. It was an isolated instance and was a result of the builder's failure to properly tighten the tank straps." Dick also sent in a little sketch of the top skin "cap", that is an extension of the top skin and sits on the top of #575 & #576 bulkheads (under the base of the fir). He wants to split it down the middle to provide inspection access in that area without removing the fin, but is concerned about re-inforcing the part.....ANS: There are a number of ways that builders have used to make the part easily removable (or openable) and they all seem to work out okay. . . . Some have used a length of piano hinge and some have used two separate pieces, with an overlap taking in the entire top surface. Some type of fastener, screws, camlock, etc. then joins the overlapped pieces. This is a spot that you can use your ingenuity.....

- **INTERCOM**  
Minimum cost ~~intercom~~ for the cockpit: As I also edit and write our local chapter N.L., I thought this article by one of our chapt. members would be of interest to T-18ers:

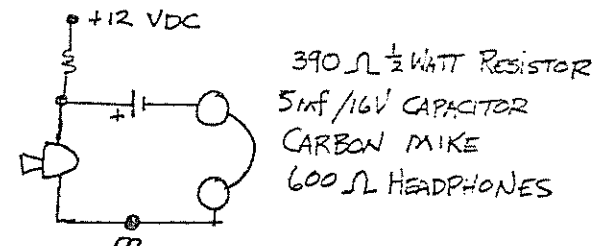
"While preparing for a trip to OSH in a Cessna, it became apparent that we would be more comfortable if we could communicate without shouting, so I started with this basic idea: If I can put audio from my carbon mike into the other 600 ohm headset, and vice versa, I can make a simple intercom.

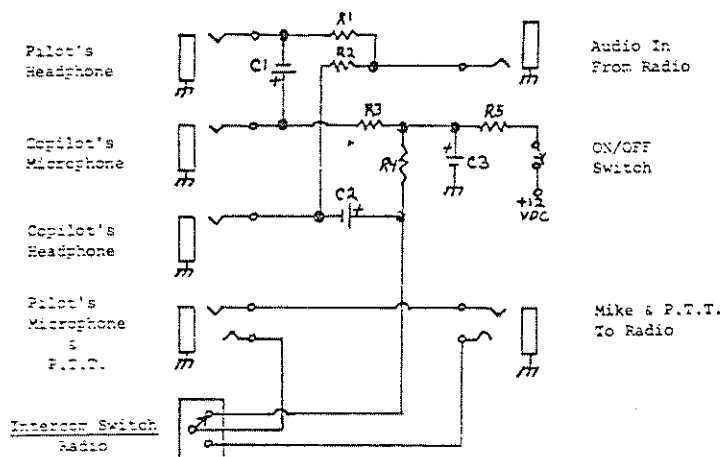
It would be nice to be able to switch the pilot's mike to normal radio function nad have rec'd audio in both headsets. This also allows audio from an AM/FM radio to be piped in, which is nice on a long XC.

Use plugs and jacks to match what your installation already has and you will be able to revert back to normal in case of any difficulty with the intercom in flight. But since there are no transistors, or any other active devices in this intercom, reliability should be very, very good. The sound level into the headset is about all a person with normal hearing can take, but since it is a passive unit, it can't make up for a hearing loss. We had no trouble communicating with this intercom and the price was RIGHT. I did not waste audio power by putting my audio into my own headset, and vice versa, since I felt there was little to spare. This takes a little getting used to, as it makes you think your mike is dead, without the sidetone.

Since this was a temporary installation, I picked up the 12VDC from the cigarette lighter. Don't omit the filter capacitor, or you will hear all the hash on the DC buss.

See page 10a  
for complete  
circuit diagram.





C1 = 5mf/12V

R1 = 820  $\Omega$  1/2 Watt

C2 = 5mf/12V

R2 = 820  $\Omega$  1/2 Watt

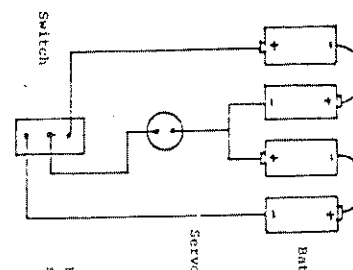
C3 = 2000mf/16V

R3 = 390  $\Omega$  1/2 WattR4 = 390  $\Omega$  1/2 WattR5 = 12  $\Omega$  1/2 Watt

The above was designed by Ed Lawrence, a Chapt. I68 member, and also known as WA5SWD for you combo ham & T-18 buffs.

TONY RUSSELL, who lives in Slidell, LA (New Orleans) tells me that he recently visited BOB MOORE, who recently moved to Slidell from Los Angeles, and said his eyes popped when he saw Bob's highly modified T-18. It has a Franklin and 3 blade C/S prop, a tri-cycle retractable gear, electric flaps & trim on all 3 axis, All-metal cowl and wing tips. The wing has been moved forward 4" to compensate for the extra wt. in the nose and a dorsal fin has also been added. Tony says the workmanship is superb. Bob is a retired Navy aircraft mechanic. Tony says he'll get some more dope on it later and perhaps a picture. Tony's T-18 is also getting pretty close to being ready to fly. After Tony saw Bob's metal wing tips he decided to go that route himself and said they came out to please him. He says they are similar to the ones on a Grumman Tiger in shape. He's sending me a pattern for inspection. More on this later.

An alternate method of ELECTRIC TRIM is presented below.

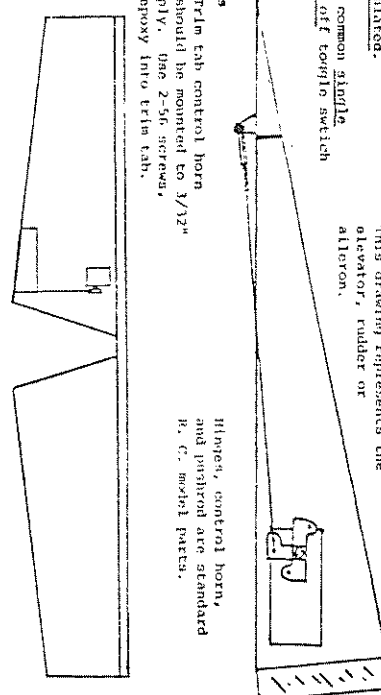


Batteries are 'C' or 'D' size alkaline cells. They will give many flying hours of service before replacement is necessary. Wiring is in aa, double insulated.

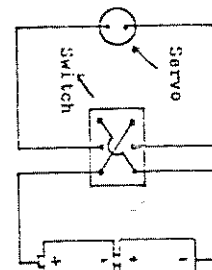
Lower diagram uses the more common single pole, single throw, center off toggle switch found on control sticks.

Elevator trim tab should be at least 2 1/2" x 6".

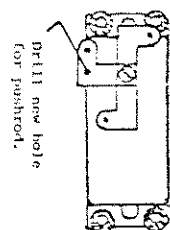
(Thanks to Fred Fisher for much assistance.)



Flanges, control horn, and pulser are standard R. C. model parts.



This diagram utilizes a double-throw double-throw center off, single pole, single throw switch.



Drill new hole for pushrod.

Use the landing gear retract servo manufactured by RAIN, CHANDLER, INC. This servo has heavy duty gears & is self-limiting (155° travel) with built-in limit switches. Mount servo with aluminum angle, attach to 3" x 3" piece of 3/12" plywood. Epoxy entire unit to fuselage skin of control surface.

ANYONE WHO KNOWS THIS?

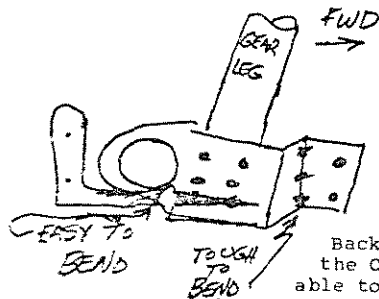
ELECTRIC TRIM FROM YOUR KIT OR COPY OR REPRODUCE ANY PART FROM F&M Chapter 10 ELECTRIC TRIM, WHEELIE TRIM, Flaps, Electric Trim

A letter from JOHN CRAGIN, 34 Smith St., Needham, MA, 02192

"Dear Dick, For once I'm not writing you about needing a missing N.L.! Seriously, you have a thankless job coordinating and publishing the N.L. and we all appreciate it, but seldom thank you for your efforts.

I've enclosed a sketch of the access panel for the FUEL TANK SENDER I've used. Obviously if one plans ahead early enough and moves the sender location slightly the cover plate would end up totally round. I was able to slip the .040 doubler between the skin and the 528 channel and then re-rivet.

Another tip I'd pass along is my method of bending the .090 .4130 steel for my 500 x 5 Goodyear brake and Rattray wheel pant bracket.



The main problem is joggling the steel at the fwd end. I needed a tight down and then up (or an in and then out) bend along the 5" wide stock. I ended up by putting a saw kerf halfway thru the thickness by re-sawing on a band saw. The bends are then very easy. For reinforcement I then skip-welded across the kerf to restore the needed stiffness.

Back when LDS was doing the N.L.s I had a few of the Corvair coolers and filter brackets. I've been able to pick up a few more that I'd like to clear out of my garage.

FOR  
SALE  
ITEMS

I have 2 filter adapters I'll sell for \$10.00 each, and 5 of the 8 plate coolers (3005703/3154153 at \$20.00 ea., and 4 of the finer filigree type 3328822 also at \$20.00 ea. Each item plus a \$2 UPS fee or ppd. All coolers are 2" x 3 1/4" x 6 1/4" standard Corvair parts, cleaned and pressure tested to 100 psi. Some are a little dented, so first come, first served with the best of the lot. I only have one of the larger I2 plate coolers, which I am installing on my T-18.

Speaking of coolers and oil system plumbing I'm a bit confused on the size of oil lines. I guess the recommended scheme is from the fitting above the screen on the rear case thru the filter to the cooler & return via the pump pad on the case. If we close down a 1/8 NPT fitting at the screen to .080-.100 Dia. I assume the rest of the plumbing can be 1/8 NPT with AN hoses of -4 size. Is this the consensus? Some of the older NL's spoke of 1/8 NPT fittings and I can't see why- if we've restricted pressure fitting to approx .7 - .100 dia. The engine is an O-290-G4, by the way. I'd like to have your comments. SEE COMMENTS ON PG.

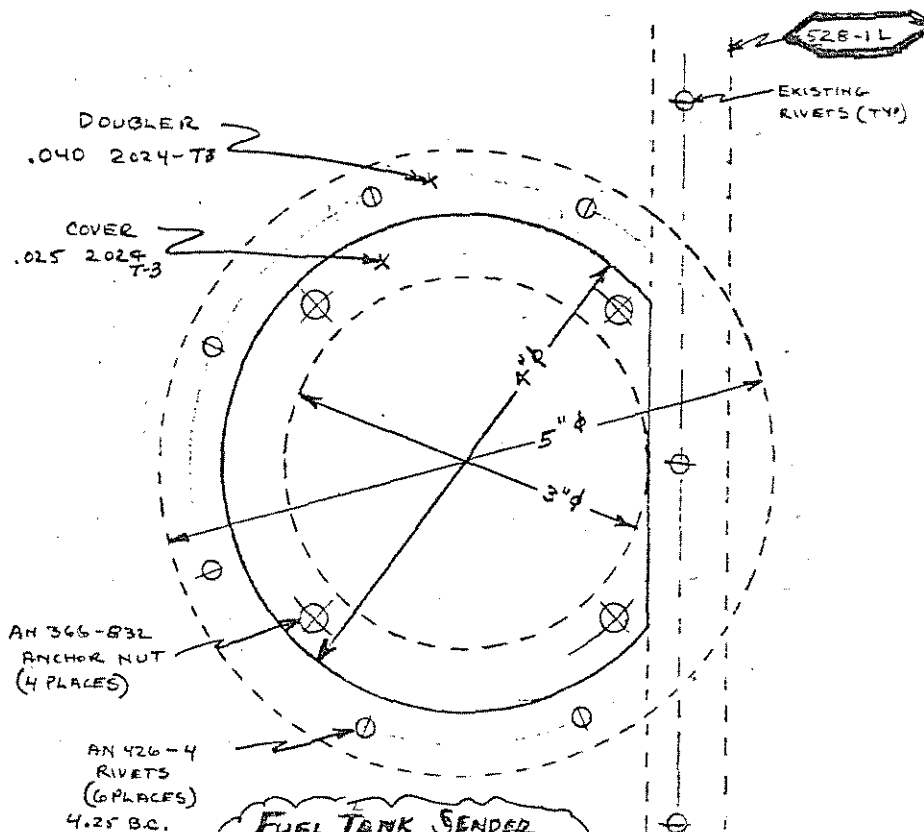
On the induction system: Do you know of anybody making the #75I seal for the carb air box? (Ans. No. Do any of you?) Is the Thorp induction system still the recommended way to go? I assume the carb heat is pulled in from the top of the valve area without a definite plenum or shroud around the carburetor? SEE "COMMENTS" ON PG. 22A

Another comment on AIR VALVE ACCESS PORT on WHEEL PANTS may be in order. I have Rattray "jet flow" wheel pants, which are quite tight around the tire and wheel. To get access to the valve stem with an air hose (to pump up a low tire) I cut a 2" dia. hole forward of the outboard attach bolt and I closed the 2" hole with a plastic cap plug (samples from local supplier). The plugs snap in place and grip the fiberglass. Much simpler than a hinged panel like Cessna and I trust they will stay in place during flight and landing, but no confirmation of this yet.

For actual valve/air input I will screw on valve stem extenders (auto part) that are long enough to penetrate a 2" hole.

That's it for now, Dick. Best wishes for holidays & I look forward to your comments. Sincerely, John"

AGAIN, SEE "COMMENTS" PG. 22A



- FROM -  
J.C. CRAGIN  
12-15-81  
34 SMITH ST.  
NEEDHAM, MA. 02192



## POSA CARE FOR O-290G:

I've had several letters and phone calls the past few months from builders that are planning to use an O-290-G or actually installing one in their project and all seem to be having difficulty locating an MA-3 or MA-4 carb. A few seem to be available, but the price is out of sight. One solution may be the POSA CARE. The price is certainly right. Pete Gonzalez, 1318 Server Dr., Colorado Springs, CO, 80910 has had an O-290G in his T-18 for quite a few years and his comments on the POSA will be of considerable interest:

"Dear Dick, I have been flying the Posa with no large problems. The main one right now being the different mixtures that I get as the fuel level in my tank changes...too rich when the tank is full and only slightly rich when I'm down to my personal fuel minimum (6 gallons). John Monnet says use a 3/4 lb. regulator, but I can't see it working unless a fuel pump is used, since max fuel pressure with tank full is less than 1/2 lb. I can't see the regulator being activated at any time using only gravity feed.

One of the local fellows with an O-290-G had a Lake injector on it and replaced it with a Posa. He feels he is getting better results with the Posa. He also recently installed a Posa in an O-320 in his EAA biplane. There is also another in a Cassutt. He says the O-320 develops more static and performs nicely in the air. (WITH THE POSA)

He has been burning a mixture of Av gas and no-lead auto gas in the Cassutt with no problems. Just the other day he drained all the fuel from the Cassutt and replaced it with straight regular with no apparent change in performance.

After he had placed the Posa on the biplane with the O-320 and adjusted the metering needle to the optimum with Av gas and flying it a few times, including pulling a homebuilt Cherokee glider with it, he tried no-lead auto gas in it with the result that it ran too rich, forcing him to re-adjust the needle to a leaner setting. Could it be that the gas industry is fooling us on the 'better' quality of Av gas? Auto gas running richer with no loss of power...I wonder.

After this experience he placed regular gas in the O-320, adjusted the metering needle only 1/2 turn out and flew it for approximately 45 minutes, landed, cut the engine and pulled the plane off the runway and removed the plugs. They were the proper color and the inside of the stacks were now a nice gray, instead of thick, dark, sooty black as before. Field elev. 6880.

Another fellow from a field near Alamosa (7700' MSL)...his own...has a Pazmany PL-1 that was built in Taiwan during his military duty tour there. He started using no lead in his O-290-G about a year ago. Since he only has tip tanks he uses a fuel pump. Altho' the engine never gave him any problems he told me that his fuel pressure would drop to nearly zero each time he rotated on T/O.

to?) Shortly after he started using the no-lead he decided to use regular from his own tank. Getting the no-lead specifically for the airplane was too much bother, plus the fact that he was worried about what the additives in the fuel might do to any rubber or neoprene items in his engine. He stated that now the engine appears to give him slightly more power and that the fuel pressure no longer fluctuates on T/O. He has been using the regular for slightly less than a year out of this high altitude field. ...Anyway, thought you might be interested in the above info, not only on the Posa, but also on the use of auto gas and the experiences so far."

See you, Pete

MORE ON DRAWING THE 80% SECOND DEGREE CURVE: For those of you that are building your own firewall and dash frame, the following letter from JOHN THORP to DICK WALLACE, 1230 PEAR AVE., MOUNTAIN VIEW, CA, 94043 will be of interest. QUOTE:

"Dear Dick, Drawing # 604 does "ghost" the drawing of the 80% second degree curve.

The Control Point 8.40 inches outboard of B.L. 3.6497 (B.L. 12.2497) and 6.10 inches above the intersection of the firewall plane and W.L. 42.0 is at a point 80% of the length of the diagonal on the diagonal of the control trapezoid.

Since you are given the coordinates locating the control point you can forget about the curve being of the 80% variety and just draw a second degree curve through B.L. 3.8497, the control point and W.L. 42 projected on the firewall plane.

Drawing a second degree curve is covered in Chapter X (pg. 151) of Roy Liming's book, "Practical Analytic Geometry With Application to Aircraft".

The graphical construction of the second degree curve is simple, although it does involve quite a few lines. I had hoped that the Builders could follow the lines I had "ghosted" in. I'll try to give you the steps, although it now comes hard to make my hands do my bidding (Parkinson's Disease):

Draw A-E and locate Control Point D on it. (6.1 up and 8.4 over).

Draw lines B-D and C-D.

Draw a number of 'rays' A-F

Locate intersection of lines A-F and B-D (point b)

Locate intersection of lines A-F and C-D (point a)

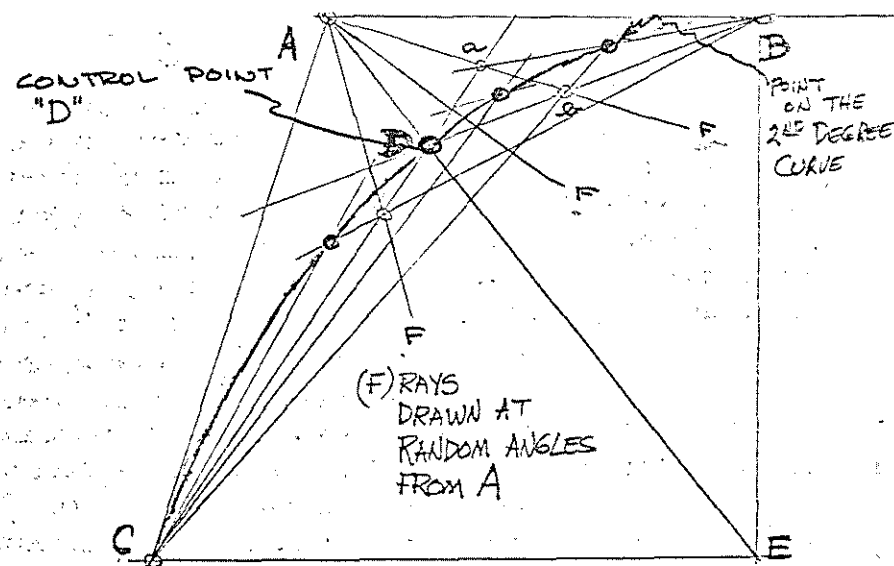
Draw line a-B

Draw line C-b

Where lines a-B and C-b intersect is a point on the second degree curve.

Repeat the exercise for as many points as you feel you need to provide a smooth curve from connected points.

The following drawing example should clarify the procedure:





Thank you John for the letter and drawing and to you, too, Dick for forwarding the info.

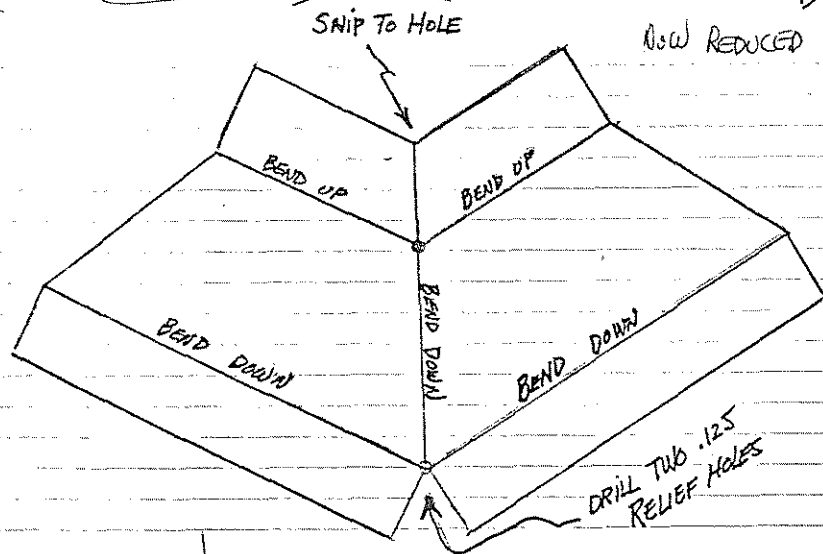
That's been a problem for builders from the very beginning, as most of us had only vaguely heard of a second degree curve.

I well remember what we did when we were trying to lay out our templates on the original airplane. We drew carefully spaced "grid lines" over firewall and dash frame drawings. We then took a close up slide photo of both drawings and then projected the picture on a large piece of artist's posterboard, on which we had previously drawn in the top Water Lines of both parts and also the Butt Lines in the proper location (Full size, of course). We then traced the projected lines on the cardboard and this gave us an accurate full size pattern to make our template from. By moving the projector fore and aft until the projected water lines and butt lines lined up exactly with the ones drawn on the posterboard, we were able to come up with an exact full scale projection of that area. It must have been mighty close, for when we wrapped the skin over the tank it fit perfectly. Some other builders had some problems fitting that skin, as there was a bit of a compound curve there, due to the shape of the WL 42.0 longeron (as viewed from above). About this time several of the builders also began extending the external 1/8" x 1/2" stiffener clear up to the firewall in order to hide any puckering of the skin between rivets on WL 42, due to the compound curve problem. Most everyone seems to go clear to the firewall with it nowadays.

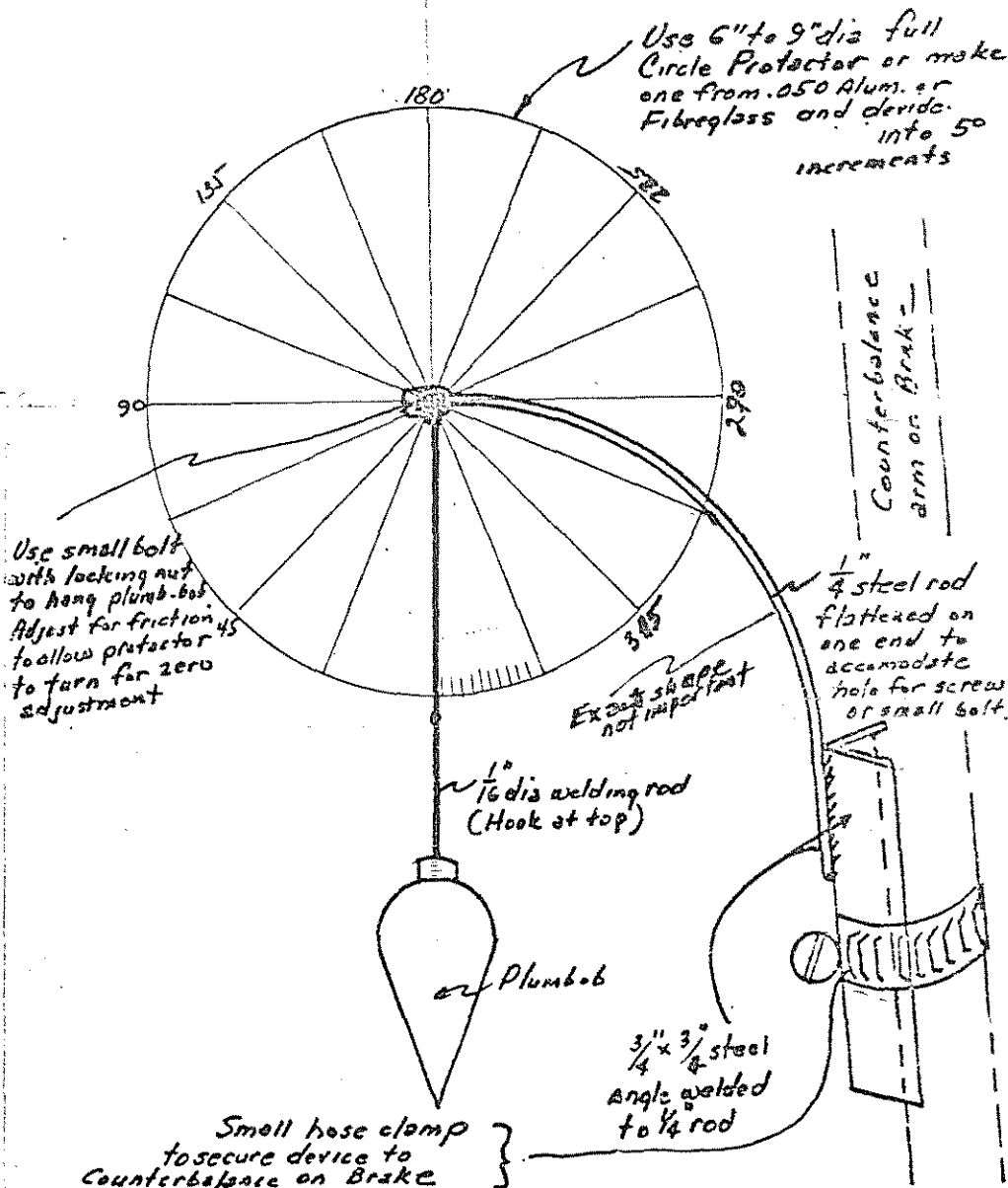
COMMENTS ON RUDDER BUILDING: from Geo. Durkota, 629 Wilcoxson Ave., Stratford, CT, 06497: "A few days ago I was finishing up my rudder and I was having trouble with the #585 rib. I couldn't get inside it to buck it. ... that is I couldn't until I got your newsletter suggesting that I use that rib. It REALLY works!

I don't like the hole in the front of the rudder where the #588 and the #537 beam joined, so I formed up an .025 alum doubler to close it off. In case any of the other builders are so inclined to do the same thing I've enclosed a full sized flat layout template below:"

~~THIS SHEET LEFT FULL SIZE FOR TEMPLATE USE (ED.)~~



## Gauge for Bending Angle on Sheet Metal Brake



(SEE "COMMENTS") Thanks again to Pete Beck for still another excellent submission. In addition to Pete's Short Course in Prop Design he wrote the following: "I wrote the prop article about a year ago to go in the Chapt. 186 N.L. I have decided to rewrite it and submit to Sport Aviation. While I am doing this I will rewrite it using the T-18 as an example and I will send you a revised version suitable for repro in the N.L." Incidentally, Pete sent me a copy of Harry Weishaar's manual to look over and I agree with him that it is excellent and the best book around on props that I have seen. It didn't cover a generalized design procedure, tho', so Pete turned out that part in fine style. Raoul Hoffman's writeups in the EAA publications are really too sketchy, altho' the nomograph is pretty useful for prelim work. Pete further said that he had heard from Dick Hovey, now in Boise, and he is now building props for the Varieze, using Pete's write-up as his design text. He claims the resulting props are more efficient than either Bill Cassidy's props or those built from Harry Weishaar's designs for the Varieze.

Pete's research in the prop field has led him into a study of the possible use of a SCIMITAR PROP for his T-18 and he has talked to quite a few experienced people around the country, including Steve Wittman, Ken Swain, and the St. Croix Prop people in Lake Oswego, OR. This is back burner right now with Pete, due to his job and time available, but he'll be back on it soon he thinks. As most of you may know, a scimitar prop (S shaped) theoretically combines the best of a fixed pitch and a C/S prop, but the ones made of metal tend to break after awhile. In recent years there have been very encouraging results with wood ones, so we'll watch developments with great interest..... This is one of the things that EAA people. Someone in the group is always pushing the envelope something or other back a little... and sharing that experience.

PAWSETTER PROPS IN DENVER called me recently to tell me he had quit making props and had sold all his machinery, stock, and designs to someone in Oregon and that Pacesetter props would again become available after the first of the year (watch Sport Aviation). Bill had to give it up, as he had become so allergic to the wood dust from sanding that he couldn't take it anymore. Too bad. Bill is a very talented person.

I just got a call from DAVE BLANTON and he said the Ford Eng'g Dept. had called him to tell him that Ford is NOW making the TURBOCHARGED ESCORT ENGINE AT THE RATE OF 800 per day. At present they are storing them in a warehouse until the new sport car design is ready. There is a very good possibility that they will market this car by early summer. They are also scoring out with a V-6 that will put out 200-220 hp in the unspirated version. It, too, will be one of the new generation of thin-walled steel blocks like the Escort and is only about 12 lbs. heavier than the Escort and will weigh (complete) less than a Lyc. 0-320 (180 hp), by 10-15 lbs. No info yet on when this one will go into production, but it is even now undergoing extensive testing.... So hang in there, troops, it sure looks like we're gonna have an excellent Ford powerplant for our airplanes before too many moons go by. What's more, we have a choice of horsepower from 125 to 220. Dave promised to call me to come up and fly the Escort powered Cessna 150 just as soon as it's ready to go and the results will be in the N. L. just as soon as possible.

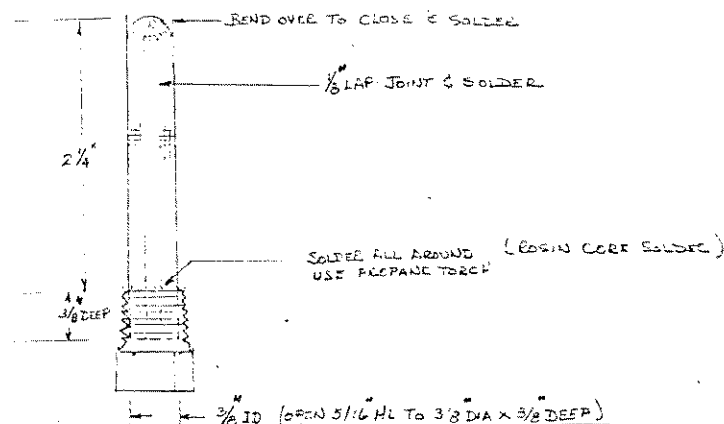
It's always the "little" things that get you into trouble in an airplane and one of those little things that so often is neglected is the use of a finger strainer in the fuel tank. It's a MUST to install one. It doesn't take much to choke off that fuel outlet and FAA's accident files are full of reports about engine stoppage from that one source. John F.

4-9-81

(CONT'D)

Kenton has contributed an excellent how to do it article on making one and we are very grateful for your taking the time and trouble to turn out such a fine piece of work. John also contributed a fine article on canopy installation for a previous N. L., so again, John, we thank you.

### FUEL TANK FINGER STRAINER



USE COPPER .043 THICK, 1/16 GRID OR LARGER

FLAT PATTERN 1 9/16" WIDE X 2 7/8" LG APPROX.

ROLL TO FORM 3/8" TUBE, INSERT INTO SHUT OFF VALVE OR FITTING THAT HAS BEEN DRILLED OR REAMED TO 3/16" DIA & 3/8" DEPTH. WRAP TUBE WITH WIRE TO HOLD SHAPE & SOLDER LAP JOINT. HEAT FITTING & SOLDER SCREEN. REMOVE WRAPPED WIRE & FINISH SOLDERING

NOTE: ALWAYS REAM HOLE LARGER TO ACCEPT SCREEN METAL THICKNESS - EXAMPLE: IF HOLE IS 5/16" & SCREEN IS 1/32" THK (2 X 1/32 = 1/16) REAM HL 1/16 LARGER THAN EXISTING HL

The following is an example of an excellent project report. I'd like to encourage all of you to submit such reports for the N.L., especially detailed as to what you have done in the engine installation area and instrument panel area. Exactly how did you go about fitting your cowl, lay out your instruments & in what location, how did you mount your radio & how did you wire it & install the antennae, what hardware did you use where, etc. Be as specific as possible, with sketches, too.

Dear Dick,

I guess it's high time I take a few minutes and let you know of my progress on T-18 #1093. I am building a T-18C with wing serial #15. My project started in April 1978, concurrently with Fred Swafford's project. We worked closely, sharing templates, ideas, morale, etc. until Fred transferred to Arkansas in January 1979. At that time both projects were on the gear with wings and tail surfaces complete and signed off.

I now have my 0-32052D (with Bendix mags) installed and running. The engine is high time but I intend to fly prior to majoring the engine. I have perhaps the last Sensenich 661M16 wood prop with plastic tipping and a Dix crossover exhaust system. I have installed a converted GMC alternator - by the Aero- and it works like a charm.

I designed and built my own air box for the MA4SPA carb, using a foam and pulling heated air directly from the crossover pipe above the filter.

I have recently installed a cabin heat box per the sketch enclosed. It looks good and fits good. I'll let you know if it works!

I have used an Aircraft Spruce & Specialty nose bowl (split vertically) and their corresponding belly pan. I stretch formed the air scoop from 6061 and attached it to the belly pan. The top cowling and fully opening hinged side doors are formed from 2024-T3 and fastened with camlocks.

The entire airframe structure, wings, and tail surfaces were coated with Dupont's Incon epoxy primer for the maximum in corrosion protection, at the expense of a few pounds.

The panel is from Ken Knowles and is set aft about 4 inches (at ML42) and is fully shock mounted. I have tried to keep the panel quickly removeable and all wiring is routed through quick disconnect type plugs. The panel contains vacuum gyros, electric turn coordinator, 1X145 radio, Westach engine instruments with EGT and CHT switched to all 4 cylinders. The throttle mixture and carb heat controls are mounted in a sub panel attached to the lower edge of the instrument panel so that they can be quickly dropped for panel removal. The push-pull controls are further stabilized and supported by a strut running up to the top center line of the "dash" frame.

The canopy latch is Therp's. I think it looks and works great, at least on the ground! I have added a small piece of 3/4 angle and drilled the

(DEAN ADAMS project report, cont'd.)

outside handle and angle for use of a separate padlock. Very simple; see sketch.

I have added access panels for the fuel gauge sending unit and for the elevator trim mechanism.


The T-18C wings were a bit difficult for me to start on - the first phase of a first time project. There were some errors that have since been corrected. We (Swafford and I) felt a bit like pioneers at the time. We ran the outer wing skin splice span wire, leaving a 1/2" joint, to be either filled or ignored, just under the leading edge. I believe I would run the splice clockwise if I had it to do again.

So far, we've done nearly everything the hard and slow way but it has been a lot of fun and a very satisfying project. I have high hopes of completion this summer.

I have flown T-18's belonging to Bob Daniels in Eugene, Oregon and Lloyd Toll of Hazen, Arkansas.

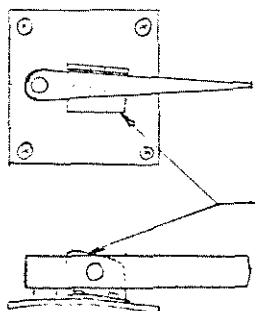
I read and re-read the newsletters every so often. Its amazing how much "new" information I pick up every time through!

Keep up the good work! We builders really appreciate your efforts.

  
Dean L. Adams RM 31184  
16575 S.E. Sager Road  
Portland, Oregon 97236

The following page details Dean's cabin heat box. Cabin or carb heat can be enhanced by wrapping as much screen loor spring around the pipe as the box space allows. This increases the amount of radiating space - exposed inside the box. BE SURE AND FABRICATE CABIN HEAT BOXES SO THAT THEY CAN BE EASILY DISASSEMBLED FOR INSPECTION OF EXHAUST PIPE. CARBON MONOXIDE IN THE CABIN COULD RUIN YOUR DAY IN A HURRY!!! A recent inspection of a T-18 here (newly arrived from FL) disclosed a hole the size of a dime in the (automotive tubing) exhaust. It's a good thing the WX has been mild, or we'd have had one of those messy, hard to explain, accidents. Such as the above doesn't make automotive pipes that much of a bargain in my book, but just because you have S.S. steel pipes, don't neglect frequent inspections.

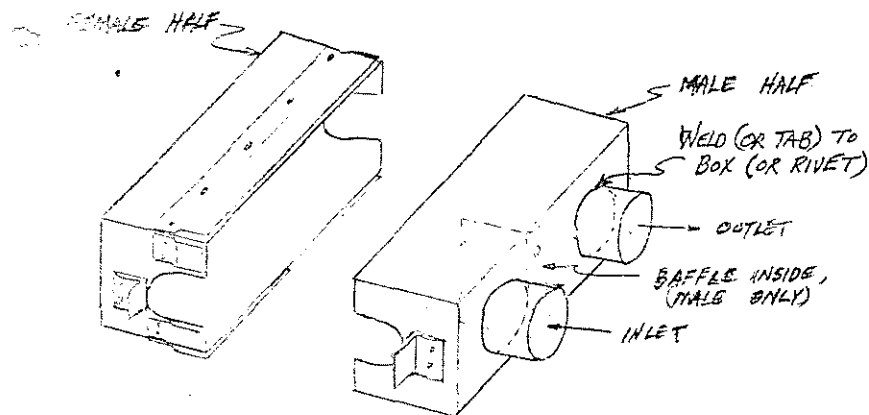
## ● CANOPY LATCH



3/4 x 3/4 angle, shaped & riveted to cover plate of the latch.

Hole drilled through angle & latch provides for padlock

## ● CABIN HEAT BOX



Cabin heat box (about 3 x 3 1/2 x 8" in size). Baffle forces air around and over exhaust pipe. Both halves assemble over pipe and seal on asbestos seals cut from hydraulic hose fire sleeve material. The assembly is held together & secured to pipe by 2 hose clamps over angle clips riveted to each end. (Hope it works) (It will-Ed.)

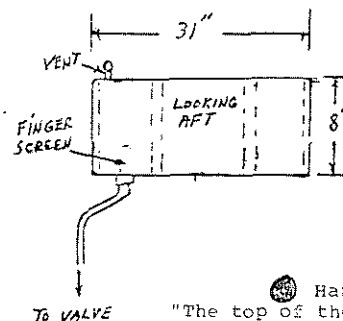
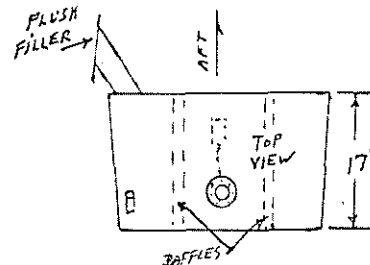
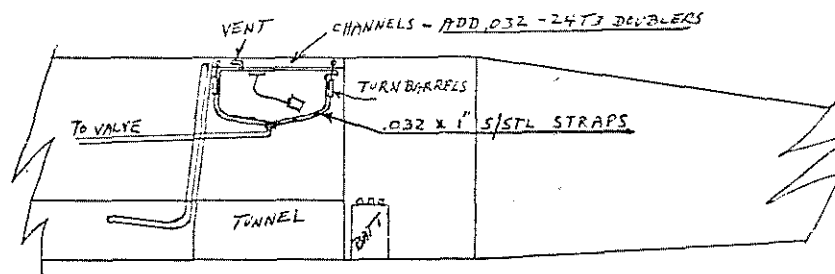
Submitted by DEAN ADAMS, 16575 S.E. Sager Rd., Portland, OR, 97236

Thanks, Dean, for an excellent report. We appreciate it.

## AUX FUEL TANK

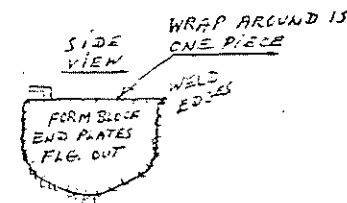
by HANK STEIGINGA, 45526 NEWTREE, LANCASTER, CA 93534

T-18 N 512.S  
UNDER DECK AUX FUEL TANK



MAT'L .C40 5052-H32

DIMENSIONS APPROX.  
 FASHION FOAM SHAPE TO FIT, THEN MFG. TANK.



## AUX TANK TALK

● Hank's descriptive write-up follows:

"The top of the tank is flat and the bottom is round. At the deepest point it is 8". You might think that this would prevent access to the aft end of the fuselage, but not so. At 60 yrs. I can slide my 175 lbs. of blubber belly up past the left side of the tunnel and into the aft fuselage. Now if I can do it I know you young skinny turkeys can do it, too. (But how about us old 65 yr. old buzzards with a protruding awning over our front porch?)

(CONTINUED)



(Aux fuel tank, cont'd)

AUX  
TANK

The tank is held up to the canopy track channels using two .032 x 1" stainless steel straps and turnbuckles. The channels are strengthened by .032 2024 T-3 channels (see sketch). A flush filler cap assembly a la Ken Knowles is mounted in the RH hip skin aft of the ~~exhaust~~ bulkhead at the back of the baggage compartment. The filler neck extends out of the back of the tank and is connected to the filler using a 2 1/2" hose and clamps. A 3/8" fuel line is routed on the right side to a 3 way valve mounted where the trim wheel normally goes. (N512S has electric trim and I love it). You can select 'main' or 'aux' or 'off'. (Doesn't fly too well in the 'off' position, but sure glides nice). The vent is teed into the main tank vent. An aux tank vent is also provided. The tank holds 10 gal plus expansion space. Personally, I think a flatter tank holding about 8 gallons would do most folks anyway, unless they have exceptional bladder capacity, and especially in co-pilots.

I only use the aux tank after I am leveled out in cruise, never for takeoff, climb, or landing, altho" I have tried it out in shallow angle cruise climb and it works well. Both tanks are strictly gravity feed only. No pumps in the system whatever.

A Stewart-Warner sending unit is in the tank. A single pole, double throw switch selects fuel quantity on the tank desired. Tank material is .040 5052-H32, best for fuel tanks. That's about it. See diagram for additional info."

OIL  
COOLERS  
SCUSED

Hank also wrote: "I thought my annual inspection produced no needed corrections, but after the first couple of hours a slight, but persistent oil film aft of the cooler turned out to be a leak in the cooler. It took 80 psi nitrogen before bubbles formed (cold). I have since found that the Corvair Monza coolers are scarce. Fortunately I found two new ones at \$70 each. I talked to John about this and he said most of the guys are now replacing them with Piper PA-28 coolers. The price I was quoted on these was \$131.50...I wanted to get it back together soon as possible, so I used the Corvair cooler. I used 1/4" soft sponge rubber between it and the left forward baffle. Two 3/16" bolts hold the bottom flange. Two stainless steel straps lined with 1/4" sponge rubber attach to the forward lower flange, wrapped up and aft over the cooler and attach to the baffle. I hope this less rigid mounting will prevent future cooler failures.

Has anyone researched the possibility of repairing leaky coolers? At over \$70 it would seem worthwhile to repair them if possible. "Harrison Radiator" manufactured them. If I can find their address I will write to them and ask if they can be repaired. Incidentally, I taped over about 85% of the cogler and only raised the oil temp from 85° C to 90° C. John likes 90° to 95° to cook out moisture( we NEVER have that problem in Texas). It looks like you could almost tape it over completely for winter flying"

I can well relate to Hank's oil cooler problem. When I had my RV-I I had oil cooling problems and so installed a Corvair cooler in the inlet ramp baffle. It started to leak in less than 20 hrs. I tried to get the leak repaired, but the repair station made a mess of it and I had to junk it. I bought a Harrison cooler and made .063 brackets to install it just below the spinner, attaching it solidly to case bolts. I had no further problems with it. I don't know whether I got a bad cooler or if the leak occurred because of the comparatively flimsy mounting in the baffle allowed it to shake around too much.

The subject of where to mount oil coolers, what kind and size, and the various problems or lack of problems, is something we need to poll the troops on, particularly the ones with several hundred hours on their T-18. How about YOU writing a little note about your installation????????

OIL VAPOR RECOVERY SYSTEM

by RUDY ADLER, 73699 Broadmoor,  
Palm Springs, CA, 92276

Rudy writes: Dear Dick, Thank you so much for those kind words in the newsletter. It was good to get the T-18 going again after so many years. I'm sending you an item I submitted to Sport Aviation last November. Chuck Larson's acknowledgement sounded like he was going to stop the presses, but instead he lost it. I have now re-submitted it.

This low cost breather system, oil separator, oil recovery system, or whatever we call it simply draws the oil back into the engine instead of getting on the belly of the airplane, as per usual. I have flown about 22 hours since installing "it" and the breather outlet remains completely dry.

I am still staying on top of this monkey on my back, having been off all medication, etc, for better than two years now, but I'm not getting much energy back. As you can see, I haven't been putting much time in the air.

I have now installed a wood propellor made by the Great America Propellor Co., with between 3 and 4 more inches of pitch than my former metal one. I'm showing the same top speed (with RPM like the book says). I am 4 mph faster in cruise and am sacrificing only 100 fpm in climb, but am doing this with 300 to 375 LESS RPM, not to mention much less noise. It is also much smoother., not to mention that it saved me 204 pounds of weight! Rearward CG now is 29% of chord, which is one half of a percent less than the original weight and balance, without all the additions, like starter, alternator, avionics, etc.

Hope you can get out to Palm Springs one of these days."

I hope I can, too, Rudy. I'm planning to make another trip to Calif. this year and if it works out I certainly will plan to stop in Palm Springs and spend a couple of hours or so catching up on our visiting. This trip I'm not going to hurry to get so meplace at a certain time and will take time to visit with several of my T-18 friends on the West Coast.

Thanks again, Rudy, for the drawing and comments on your bird. That new prop really sounds good. I'm sure you are also appreciating the fuel economy increase, too. Especially so since gas prices went up so much while you were so ill and couldn't fly, eh?

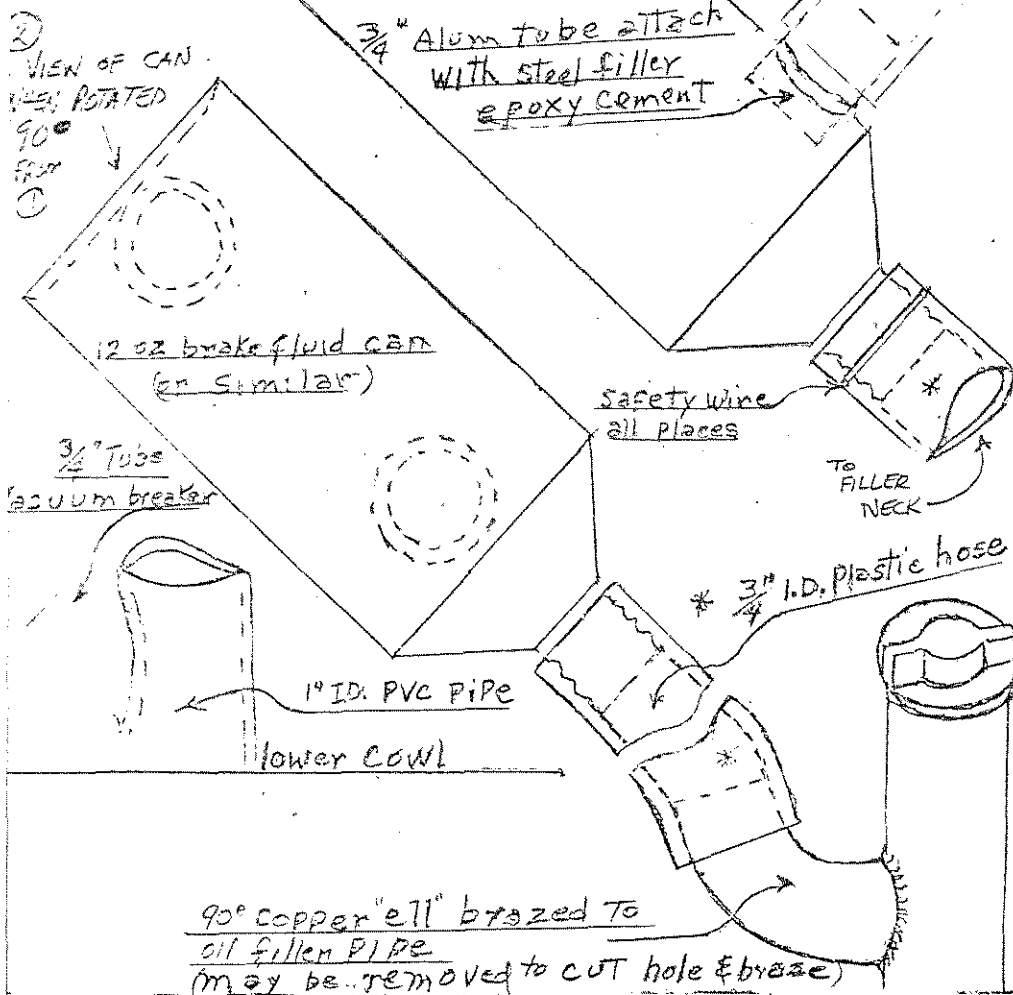
The oil vapor recovery system looks pretty good. It's certainly something needed. I've seen some people run a line from the breather down one of the gear legs, but there are drawbacks to that method, too. Some have even run a line all the way back to the tail wheel, but that's a lot of trouble to go to it would seem. See Rudy's drawing on the next page. Rudy doesn't specify where in the engine compartment he locates it, but obviously it is close to the oil filler tube. A lot of the newer tubes are plastic, so you'd have to rely on epoxy to attach the "ell" to the tube.

One of the little problems I have is that to add oil I have to use a funnel with a one foot long flex tube spout to get at the filler neck opening and that's a pain to have to carry along when I'm on a XC. Have to put it in a plastic sack, etc, store under the seat. I've been trying to come up with some sort of a clip setup inside of the cowl to hold it, but I don't have all that much extra space. I don't have the Thorp cowl, but I've noticed that several of those that do have to notch out the upper piece to enable the dip stick to be pulled straight up. The cowl cheek covers the notch up, so it's no problem. I'm going to install the fiberglass Thorp cowl I got from Ken Knowles "soon", so I'll have that problem to cope with then, too. The trouble is-I have so much fun flying my T-18 that I hate to have it out of service for several weeks.

To 1" I.D. PVC Thin Wall  
Pipe Thru Lower Cowl

FROM  
RUDY Adler, EAA #22476

1-18-80



# '81 OSHKOSH REPORT:

In numbers of T-18s present in '81 we were down a few from the previous year, but we made up for it in quality. We truly had some superbly crafted T-18s there, one of which was judged the Reserve Grand Champion, as you doubtless know by now. Perhaps I'm prejudiced, but I really thought Peter Hodggens T-18 was far better in every way than the Mustang II, which won the Grand Champion award, and that's not taking anything away from the award winner, either, for it truly was a finely built airplane. Personally, I don't like gaudy paint jobs or excessive chrome plate on airplanes or cars. Those things smack too much of teen ager's hot rods, whose mission in life seems to be an all out effort to draw attention, regardless of whether or not it's in good taste. But, as I said, that's only my opinion and I guess I'm an old 'fuddy duddy' in a lot of ways.

One thing that originated within our T-18 group that has become almost a tradition in two years is the Monday Cowlings Off Day. I heard a great deal of very favorable comment about it this year from people that were not T-18 aficionados. Many said it was one of the most educational features of the fly-in. I know most of the T-18 builders feel that way, too. It is of immeasurable help to new builders obviously, but it is just as much so for those that are already flying. Someone always comes up with maybe a little better way to do so many things. You can see such a variety of airscoops, carb air boxes, cabin heat systems, exhaust systems, mufflers, baffles, fuel systems, oil cooler installations, engine control routing, etc. that this one feature is worth the price of the trip there to many of us. Just seeing where other builders put things in the space available is worth a lot, too. I took a lot of pictures again this year and now am accumulating quite a file of engine installation pix to go with my file of cockpits and instrument panels. I would really like to encourage all of you that fly in next year to participate. Even if you can't be right at the airplane at Monday noon you can delegate a T-18 buddy to handle it for you.

I can't begin to list all the T-18s there, but it was interesting to see how many of them this year had folding wings. Perhaps next year we ought to have one day when all the CWs will fold their wings, too. Perhaps you had already noticed, too, that the newly popular fiberglass and foam airplanes don't have a single example of folding wings. Perhaps they will work this out later, but I think the T-18s demonstrate themselves as the answer to a lot of folks need for a very versatile and practical airplane, of long proven ability and integrity.

One other feature that showed in some numbers at OSH was fuel in the wings. I saw fuel in both the outer and the center wings of the standard wing T-18 and I saw the same thing in the convertible wing ones. Since the CW came out, a number of the builders were debating on the feasibility of using the L.E. of the outer wing for fuel and while the debate was going on some of the others quietly went ahead and did it—and did it well, too.

One of these was on an older airplane built by BOB MORRIS, 312 South Olmstead St., Oakwood, IL, 61858. Bob's serial no. is #237 and the airplane is N2377. Bob built a new CW wing for it a year ago and in the process he wet the outer wing LE. In the center of each rib "bay" on the bottom side Bob installed an access panel, so that after riveting was finished he could get in there with the sealant. These access panels are circular in shape and of course have doublers on the inside to attach the access plates to via blind nuts. Bob took photos of the wing under construction and supplied me with 8 pretty good detail shots. If the engraver can get a sharp enough plate to print clearly I'll make up an entire page with them for the next NL. Hopefully, I'll get Bob to do a write up on the technique and sequence, too. I've examined the pix very closely with a powerful magnifying glass and I think I can figure out most of what's involved, but I won't go out on a limb right now. Incidentally, Bob was a

(CONT'D)

## BOB YOUNG WET WING, CONT'D.

Looking at the pix, I note that Bob has two fairly large lightening holes in three of the nose ribs and three smaller ones in another. He has also added bent up angle stiffeners vertically between the lightening holes. I can't quite make out whether he has some small holes near the bottom of the ribs. If so, they might be about 1/4" in dia. He has also added an additional rib in the LE and it is at the root end and it appears to start about where the wing attach fitting ends. It is a full length rib, not just a nose rib. Between that rib and the next nose rib to the tip side he has added a stub spar and this is added about 6 or 7" aft of nose of the wing. Anyway, I can't do anything but guess on things, so stay tuned until next N.L.

Still another fine T-18 there was built by Bill Brackett of 235 Oak Hills, Butler, PA, 16001 and it, too, was an award winner. He had just about everything on it but the kitchen sink. The instrument panel was... well, fabulous. It was full IFR, with everything in the way of avionics and the upholstery was ultra-suede. First cabin all the way! His outer-center wing juncture was different, in that he used piano hinge on both the top and bottom skins (between the spars only) to secure the gap. When the wing was in the "fold" position he didn't have to disconnect the fuel line at all. The line came out just in front of the rear spar and was protected against pinching (when in flight position) by larger diameter PVC pipes, one of which slipped inside the other.

Bill also had a rugged steel tubing rack to hold the wings in their fold position while he pulls the airplane on its own wheels the 4 miles to and from his house to the airport. The tubing is arranged as a 'saddle' that supports the wing weight on the top skins of the fuselage via braced outrigger arms that go out to the wings. Tight fitting dual tubing goes around the entire periphery of the airfoil and are connected to the outrigger arms. I asked Bill if the last part of his N number (N872WB) stood for "Wide Body", but he just grinned and said in some quarters he was known as Wm. Brackett.

I don't mean to slight any of the other fine T-18 builders that were there. It's just that I've misplaced (lost) 2 pages of my OSH notes and I'm looking at pictures and jogging my memory to get this far. I do remember seeing an older airplane that had been completely re-done, with a new Thorp cowl, new wheel pants, new upholstery, new instrument panel, and a new paint job with a very original design in deep orange, with a wide yellow cream strip beginning at the rear edge of the cowl cheeks, with a dark brown wide accent stripe in the middle of the cream one and color accents of brown around on the airplane in other spots. Can't remember whose it was, but I do remember being shocked to find out that it wasn't a brand new one.

I also remember an all-white one, newly completed, that was also very well done and was a standard T-18 and had a wood prop, no airscoop and I think the N number was 69SB.

I kept going back and going back to see Pete Hodgen's "tie-eye-teen". Pete kept telling me with a perfectly straight face that his brother, Lewis, had built an even better T-18 than his. You never know about those Aussies and their sly sense of humor. Anyway, the closer I looked at the detail work he'd done, the more I appreciated the time and work involved. He had a clever little demountable map table that would be a slick addition to any personal airplane. It would even make map reading a piece of cake in an open cockpit type.

When Pete and I got together for a bull session I told him he ought to put out a set of plans for some of the unique things he had done on his airplane (I was thinking about his rear mounted aux tank and his excellent baffling system, in particular). He replied that he DID have several component drawings that he had had to submit to the Australian FAA.

(CONT'D)

## (OSH '81 CON'D)

I asked Pete to send me whatever drawings he had when he got back to Sydney and he agreed. Long about the 1st of September a thick envelope of drawings arrived from Australia and I was very pleased and impressed with both the quality of the drawings and their content. Here is a list of the drawings:

5 drawings (about 9 x 12) on wheel pant attach details, (with full size templates for attach plates) and landing gear leg fairing (also with full size flat layout of the fairing). One of these sheets detailed the attachment of the upper and lower fairings on the gear leg, down to the last screw and rivet.

I (9x12) sheet detailing the Thorp cowl installation, crossover exhaust system, carb and cabin heat muff locations, and cowl flaps.

I (9x12) sheet drawn half scale of the carb heat box and its inst'n.

I (9x12) also half scale drawing of carb and cabin heat muff details.

I (9x12) drawing of all the baffle parts (15) in the flat and the material call-out for each.

I (9x12) drawing of the cowl flap installation and details, including controls to the cockpit.

I (9x12) sheet of engine hook-up and controls. One head-on view of the firewall shows the location of all accessories and where each control comes thru the firewall. Also has side views for further clarification.

I (9x12) sheet of full size drawing and details of oil filler door & top cowl support bracket.

2-2 1/2 ft. X 3 ft. Drawings that are full size flat layouts of the entire engine baffle system, complete to the very last detail. These drawings make baffle fabrication a breeze.

4 (2 ft. X 1.5 ft) drawings of the rear fuel tank and its installation. These drawings are also complete to the last detail, with some of the parts drawn full scale.

I had offered to act as Pete's U.S. agent for these drawings (at no cost to him or the U.S. buyer. I would enthusiastically recommend any T-18 builder purchase these additional plans. They could save you weeks, maybe months of work (and who knows how many rejected or cobbled up parts),

Let me quote from the letter from Pete that accompanied the plans:

"Dear Dick, Please find enclosed copies of rear fuel tank drawings and baffle systems, plus various other drawings carried out to satisfy our D.O.T.

Fuel Tank Drawings are \$35 and Baffle Drawings are \$20.

Don't know when I will get time to make drawings for the trailer (that he uses to transport the T-18) and some of the other parts, but I will see what I can do in the future.

It was great to hear from you on the telephone. It brought back fond memories of Oshkosh. I still can't believe the Great Adventure is over. Cheers for now, Pete.

In case some of you haven't met Pete, he built the 1st homebuilt in AUSTRALIA & HAS BUILT TWO T-18s SINCE THEN ALSO!

(CONT'D)

ADDITIONAL  
T-18  
COMPONENT  
PLANS  
LIST

## (OSH '81, CONT'D)

I haven't had time to check with local blueprint people here to see if Pete's drawings can be reproduced here and what the cost would be. I suspect this type of print cannot be photocopied.

(I just took time out to go over to the b.p. people and sure enough they cannot reproduce from these drawings without taking them back to the original tracing paper and the cost per square foot is \$2.65 and then there would be a cost per sq. ft. for each drawing run off, so for now, at least, we'll have to get the prints from Pete. I'll check with him and see how these costs compare with his and see what he wants to do. I'll advise in the next N.L.).

In the meantime if you want to order drawings from Pete, get a U.S. Postal Money Order (not a check) made out to "Peter Hodgens, 2 Weerona Place, Carinbah, N.S.W., 2229". (The N.S.W. is for New South Wales). You can send it directly to Pete or to me and I'll forward it for you. Correction on the above address: It should be "Caringbah", not Carinbah.

## ALSO ADD AUSTRALIA TO THE ADDRESS

Meanwhile, back at OSH: Our annual T-18 dinner at OSH was again a sell-out and thoroughly enjoyed by all those present. T-18 people are pretty much like a family in so many ways and there have been a lot of what will be lifelong friendships formed from our association with fellow builders at fly-ins and thru our T-18 Mutual Aid Society. The MAS is fast becoming a T-18 Owner's Association, too, inasmuch as there now about 350 T-18s that have flown around the world. (By the way, did you know that Aviation Consumer magazine rated the T-18 as one of the "safest homebuilts in the world" in a recent survey of homebuilt safety by type?)

Billman was another winner as our Master of Ceremonies at the dinner at Butch's Anchor Inn. We also have again reserved the 1st prize there for our '82 dinner, courtesy of John Walton. Don's account of his flight to and from Australia superb. He filled in a lot of between-the-lines details that most of us hadn't heard or read about. Most of us can comprehend the courage such a flight demands, but few can really appreciate what is involved in being in the cockpit of a tiny airplane with only the very minimum of navigational equipment out over the middle of that BIG Pacific and trying to hit a tiny island atoll that might not be much larger than Lake Winnebago. Can you appreciate the continuous concentration this requires for hours on end in very cramped quarters? Picture yourself at night with several hours of darkness ahead and wondering what you'd do if the electrical system dominated and the only back up to see your instruments was a flashlight. How could you maintain a precise compass heading in order to hit your destination? Spooky, huh?

Lo Sunderland again handled the T-18 Forum with expertise. It was SRO as usual. Not too much in the way of new problems or subject matter were dwelt on. Most everything brought up has been touched on in the N.L.s and as always there were a lot of either brand new builders there, or those interested in starting a T-18 project.

SOUTHWEST REGIONAL FLY IN (KERRVILLE '81).....The Kerrville, TX, Fly-in is held the 3rd weekend in Sept. each year and is becoming an institution. This year we had 2 T-18s there from Dallas, one from Ft. Worth, one from McAllen, and one from Midland, TX. While we were down there the inevitable subject of an all-T-18 fly-in came up again. Incurred liability when any sort of formal invitation is issued has stopped us cold in the past. One solution that has been advocated is for everyone to meet at one of the major fly-ins (that is covered by insurance) and then make a mass fly-out to a neighboring city. No invitations would be issued and would be by word of mouth only, thus each one's liability would individually be covered by their own insurance. Some have objected to this for OSH, as they don't want to miss out on anything that goes on there - a valid point.

But just maybe if a bunch of us came into a pretty good sized regional fly-in like Kerrville and one of them happened to mention that his wife had heard about a super-good restaurant over in a city about 40 or 50 miles away and that he believed he might go over and try it and if it turned out

(cont'd)

to be a pretty fair place to eat I might just stay overnight at a certain nearby motel, that he'd also heard was pretty nice. If someone else just "happened" to overhear and decided that that was a pretty good idea, too, and up and did the same thing, why that wouldn't be any different if a bunch at OSH all decided to drive down to MKE and go thru the museum, and of course if they all decided to stay there overnight and go back the next day, would it? Just because they all happened to be drive the same make of car surely wouldn't make them liable as a group would it? Just because a bunch of friends happened to be together in a strange town and ate dinner together doesn't seem to imply anything as a group. Does it? As a matter of fact, any time we as individuals decide to go to any kind of an aviation event (that has their own insurance, of course) and get bored and go somewhere else on our own, just whose business is it anyway? Comments?

As a matter of fact, I have heard of some excellent German-Mexican restaurants about 30 minutes flying time away from Kerrville and since I often get bored just watching someone else do aerobatics I just might decide to do something a little different next year. Don't know what yet but I'm going to see what I can find out about that place in the meantime.

LYCOMING MODEL CODE FOR  
RECIPROCATING ENGINES

Each Avco Lycoming engine has a model designation. The designation is made up of a prefix which is a series of letters, a three-digit number, and a suffix which combines letters and numbers. The letters and numbers in this model code have meaning. Most people who fly or work on general aviation aircraft are curious about the meaning of the code, but only a small number thoroughly understand it. Perhaps the explanation and examples provided here will promote a better understanding of what the engine model designations do mean.

| EXAMPLES:                             | TO               | 360                              | C146D |
|---------------------------------------|------------------|----------------------------------|-------|
|                                       | 10               | 540                              | A41A5 |
|                                       | 10               | 360                              | A386D |
| PREFIX      DISPLACEMENT      SUFFIX  |                  |                                  |       |
| L — Left Hand Rotation Crankshaft     | Cubic Inches*    | A or A4 — Power Section & Rating |       |
| T — Turbocharged (exhaust gas driven) | *Note: (541) - A | 3 — Nose Section                 |       |
| I — Fuel Injected                     | displacement     | B — Accessory Section            |       |
| G — Geared (reduction gear)           | ending in "1"    | 9 — Counterweight Application    |       |
| S — Supercharged (mechanical)         | indicates a      | D — Dual Magneto                 |       |
| V — Vertical Helicopter               | specific engine  | (Subsequent changes to models    |       |
| R — Horizontal Helicopter             | model which      | are reflected in the suffix.)    |       |
| A — Aerobatic                         | incorporates     |                                  |       |
| AE — Aerobatic Engine                 | integral         |                                  |       |
| O — Opposed Cylinders                 | accessory drive. |                                  |       |

With the information above and a few explanatory details, the Lycoming engine code is not difficult to understand. Starting with the prefix section, an O will be found in the engine designation of all flat opposed cylinder engines. In addition to the O, a combination of the other letters may be used to further describe the engine. The O alone indicates a carbureted engine, but an IO will show that the engine is fuel injected. A further example is the TIGO prefix. Broken down, this says that the engine is (T) turbocharged, (I) fuel injected, (G) geared (which means the prop will run at a lower speed than the crankshaft) and, finally, the (O) for opposed cylinders.

The three-digit number always provides an indication of engine size in terms of approximate cubic inches of displacement. Engines currently in production at Lycoming Williamsport have displacement values of 235, 320, 360, 435, 480, 540, and 720 cubic inches. The suffix of the reciprocating engine code is a little more complex and the differences signified by each letter or number are not readily apparent. The first characters of the suffix will always apply to the parts of the engine indicated in the examples; in some cases, such as the IO-540-A41A5, two characters are used to designate one section of the engine. The fourth place in the suffix will usually be a number to indicate a specific counterweight application. Depending upon the need for a counterweight number, a D may be used as either the 1th or 5th character. The D indicates that the engine uses a dual magneto contained in a single housing.

To determine the minor differences in an engine model which are reflected in the model code suffix, it is necessary to consult the engine specification. Most aircraft owners or pilots will have no need for this type of detail. Those who are curious about an engine can get a good idea of its size and character by simply applying the model code information which has been presented in this brief outline.

FROM NOV. '81 AVCO LYCOMING "FLYER"



## FOR SALE PAGE (ALL ITEMS ARE FROM MEMBERS OF THE T-18 MAS ONLY)

From Frank Lanier, P.O. Box 195 Colorado City, Colo.:

Q-191-G engine, OSMOH (\$1600), 67 x 68 metal prop standard fuselage cleco'd (frames, skin, longerons) rudder assembly standard gear, axles, master cyl's, brakes roll bar, 526, 527 fittings, C-150 seats instrument panel, C-150 flap motor, oil cooler, motor mt. ring wing ribsm, fittings, some instruments, primer, master switch gascolator, vacuum pump, vac. regulator, modified spar (horiz'l tail) several .025 sheets, plus set of plans. About \$6000 value, sell for \$4000.

(I made some notes over phone about this project, but made them in my brand of shorthand & I'm not sure of accuracy. Ed Wiggins had started the project in Chicago with Frank, but now must sell, as he is opening business. Call Ed at 312/536-6660 day or nite, or write or call Frank to verify prices and items)

From John Walton, 5726 Boyce Springs Dr., Houston, TX, 77066(713/440-8093):

Sensenich metal prop (M76) 68" dia x 72" pitch. From Santa Monica Prop Shop, and has been vibration tested. \$400

From Vern Peppard, c/o Geomap Co., P.O. Box 30008, Dallas, Tx, 75230 ph. 214/690-9214 office, or 214/369-7934 home.

Has brand new Sensenich metal prop from Santa Monica Prop Shop. Was vibration tested. Still in crate. (Put constant speed prop on his 150 hp. powered T-18 while new prop enroute to him). \$415

From Ron W. Johnson, 8760 Spearhead Way, Reno, NV, 89506(702/ 972-7216)

Has MA4SPA Marvel-Schebler Carb and a pair of st'd outer wing panels (finished, but not skinned) for sale or trade. No price quoted. He is impatient and would like to buy a completed set of wings, standard preferably, from someone that has just finished building a set of folding wings to replace the st'd ones. Give him a call.

COMMENTS: PETER BECK's article on designing your own prop was withdrawn from this issue on his request, in order to update it and make some changes. It will appear in NL#55, so watch for it. It's outstanding.  
Re JOHN CRAGIN's questions on oil coolers and wheel pant access for air case: Time & space limitations too tight this issue. Again, see N.L. #55

T-18 MUTUAL AID SOCIETY FUNDS: As all of you know, postage costs have been recently increased and hits us where it hurts. At our present level of cost per N.L. issue, we have enough funds for only 4 more issues. A lot of you have expressed your appreciation for the NLs and said to let you know when more funds are needed. Quite a few have sent donations of \$10 to \$20 in (and it's strictly because of you that we still have a NL), but there are still quite a lot of you that have never contributed beyond the original \$3, so apparently you don't find the NLs of appreciable value to you, so as of this issue your name will be removed from the mailing list. Your 3 bucks bought you 10 NLs of 20 to 40 pgs. ea, so I believe everyone will agree that's a pretty good value at today's prices. If you don't, I'll be glad to personally refund your 3 bucks. For the benefit of the newcomers to MAS, this is a non-profit operation. Anyway, I hope I hear from all of you that are light on the ante and that we can keep our NL alive and eventually phase it into a T-18 OWNERS ASSOCIATION. In the meantime I'd like to wish all of you and your families the very best of everything for the coming year and hope all your fondest T-18 dreams come true.

\$6 IS THE REQUESTED MINIMUM TOTAL DONATION PER MEMBER.

## T-18 NEWSLETTER #54

PAGE 22A

E. Pershing Larsen

7059 N. Moselle Avenue

Chicago, Illinois 60646

(NO LONGER IN BUSINESS)

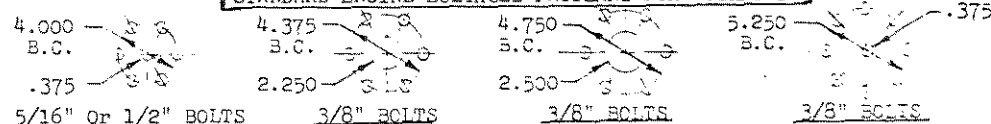
EXPERIMENTAL AIRCRAFT SPINNERS

MATERIALS

ONLY!

BULKHEADS-----6061-T4 bare (not a clad) aluminum sheet spun to shape.  
SPINNER SHELL---6061-S bare (not a clad) aluminum sheet spun to shape, heat treated to age harden to the T4 condition, and re-spun before age hardening to remove the distortion.

## STANDARD ENGINE BOLT HOLE PATTERNS FOR BULKHEADS



Others will be made available if demand warrants.

CHARGE for counterboring rear bulkhead for engine driving lugs----- \$2.00

## SPINNER SIZES AVAILABLE AND PRICE

CASSUTT-----13" long X 12" diameter with a 2" nose radius.

Unpolished----- \$ 39.00  
Polished----- 45.00

Standard propeller hub thicknesses are 2 3/4" and 3 1/2" all others are special with extra charges to be quoted.

T-18-----14 5/8" long X 12 1/2" diameter with a 2" nose radius

Unpolished----- \$ 39.00  
Polished----- 45.00

Standard propeller hub thicknesses are 2 3/4" and 3 1/2" all others are special with extra charges to be quoted.

CONSTANT SPEED is furnished with a single .125 thick rear bulkhead only.

EXTRA ADDER TO ABOVE----- \$ 10.00

T-18 #502-2 spar end cups machined to size old or new tube/pr. 1.75

MUSTANG I & II---18" long X 16" diameter with a 1" nose radius.

Unpolished----- \$ 54.00  
Polished----- 50.00

Standard propeller hub thicknesses are 2 3/4", 3 1/2", 3 7/8" and 4 1/8" all others are special with extra charges to be quoted.

ALL SHIPPING CHARGES ARE F.O.B. CHICAGO, ILLINOIS

ORDER FORM

E. Pershing Larsen  
7059 N. Moselle Avenue  
Chicago, Illinois 60646

MAKE OF AIRCRAFT

ENGINE MODEL DESIGNATION H.P.

PROPELLER HUB THICKNESS (make and model not wanted).

SPINNER TYPE Unpolished[ ] Polished[ ]

COUNTERBORE BULKHEADS FOR DRIVING LUGS[ ] DIAMETER (decimal).

\$10.00 minimum deposit with order, specials must be paid in full before work will be started.

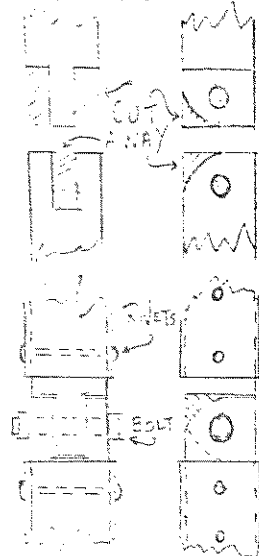
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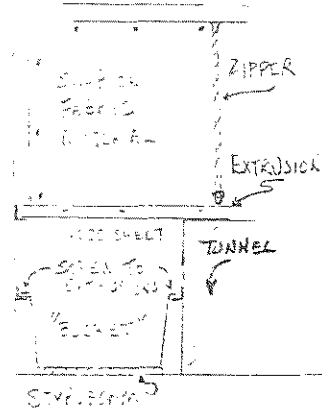
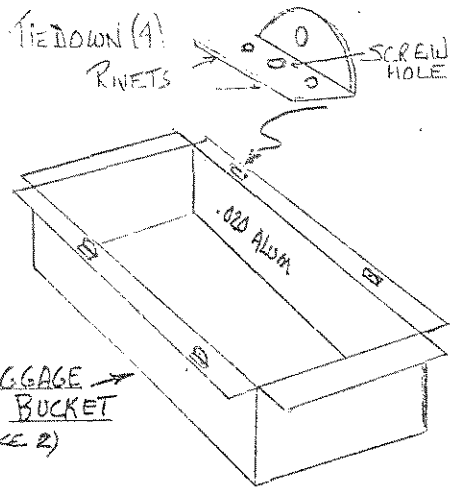
CITY

STATE

ZIP

HARDWARE FOR SEAT  
FRONT CORNERS

## HINGE FOR FOLDING SEAT

BAGGAGE  
BUCKET  
(MAKE 2)

## BAGGAGE COMPARTMENT MODS

*forgive my modern art!*

FROM BUD WIGHT, 7434 GOLFCREST, SAN DIEGO, CA, 92119

## More FOR SALE items:

Ken Morgan, 439 Louella, Hurst, TX, 76053 (817/268-1834) recently called on the Bell Helicopter plant and found out that they were about to dispose of some remnant pieces of the soundproofing that they use in the Bell Jet Ranger cabin and so he bought all that they had left. He has enough for about ten T-18s he thinks and says he'll sell enough for one airplane for \$35. He showed me some of it. It appears to be a black urethane type foam about 1/2" thick and has a thin layer of rubber-like material in the middle (a foam-rubber-foam sandwich in other words). It seems to be reasonably light, too.

John Hardy, Rt. 1, Box 292K, Natchitoches, LA, 71457 (318/352-5705) has his T-18 ready to fly and since he has electric flaps on it now he has no further use for the manual flap handle assembly and says he'll let it go for what he paid for it (\$75), which is about 65% of today's price. He'll also sell an extra pitot/static tube ass'y, which mounts on the fin, for \$20. I tried to get John to say he'd make both items free if you could pronounce Natchitoches the first time you tried, but he said that'd be too easy and besides that they couldn't get the right Cajun inflection on it anyway. "NACK-A-TOOSH"

Jaime Alexandre, who lives in Burlington, Ontario, Canada asks, "Is it possible to put floats on a T-18?" ..... I'm pretty sure the answer would be NO, but you had better check with John on that one. It certainly would require much modification of structure and the added wt. and drag of the floats would degrade performance so much it would be a ho-hum bird.

MASTER PLAN: Carroll (Bud) Wight (see pg. 22B) sent me his "Master Plan" to build his T-18. It's a 2' x 3' blueprint and there's no way I can shrink it down enough to reproduce in the NL, but it would be an excellent aid in building to post on your shop wall, and would save you beaucoup time in looking up drawing numbers, etc. He has the airplane broken down into sub-assemblies, with drawing numbers and part description in bold letters. He also has dotted lines ghosted in to show assembly flow in order. I have not asked Bud if he could have more blueprints made up from his master or if he would want to take the trouble to mail a copy to those interested, but you might drop him a letter & S/SA env. & send him a couple or three bucks for his cost & trouble.

Remember BILL WARWICK's tip about the safety cable, tying the engine to the frame, that was in a previous NL? Harvery Mickelson, 496 Novato, Sunnyvale, CA, writes about his recent trip to the Reno Air Races, where one of racers almost lost his prop/engine in a rage, but the safety cable kept the engine in, altho' it was hanging down 45" and as a result, there was no fatal stall/spin, just a forced landing! "Nuff said!"

MORE ON BUILDING YOUR OWN LANDING GEAR: From BILL AYRES, 761 Simpson St. Independence, OR, 97351: "I bought a partially completed landing gear from a discontinued project, which was set up like the drawing of Dean Cooper's in NL #22, pg. 3, however I split the bushing off center, where the split is inside the wall of the tube. This way the bushing, as well as the bolt is carrying part of the shear load.

I split the cross tube differently than Lu Sunderland shows in NL #28, pg. 3. I cut the short piece of 1.5" tube into two halves and welded one to each leg, with the 1.25" piece between them. This makes the fitting of the 486-6 plate much simpler, as the parts it's welded to are the same dia.

It's been my experience that if you have to pay to have the welding done, you can't make up the welded parts, like rudder pedals, trim mechanism, control fork, etc. as cheaply as you can buy them from Ken Brock or Ken Knowles (and theirs are cadmium plated, too)! However, I've enjoyed the learning that went with each part." Thanks, Bill, for those gems of

(cont'd from Bill Ayres)

wisdom. Perhaps when you have some spare time you could do a sketch of the way you did your gear, just in case some of the boys have a problem de-coding the write up. A good, clean pencil drawing is fine for any of these things. I have a sharp pointed BIC fineline Office Marker that I use to draw over pencil drawings, so they reproduce better on the Eytetek plate I have to make for each NL sheet. (I've become so efficient at operating their plate making machine at the printing plant that they have offered me a job! Last year I made 680 plates for this NL and our local chapter NL)

Al Kasten, 652 NW Sunset Dr., Stuart, FL, 33494, sends in his experiences in building his own gear: "NL#53 was most interesting as to the problems several people have had with the heat treat of their landing gears. I have run into the same thing, except I have been unable to resolve it. Making the gear was no big thing for me and I sent it to REX Heat Treating, in Orlando, FL. They appear to be the only one in this area capable of handling pieces of this length (I made the two piece gear). They finally called & said they could not heat treat it—it would not harden. Must be the material they said. I have certification on all the tube and mil spec on the sheet stock. Macrostructure check at another shop seemed to indicate that the material had been heated, but cooled in air—a quench problem? Since I was going to Long Island, NY, to visit my children, I arranged with Burton Industries in North Babylon (NY) to heat treat it. They, too, were unable to get it above C-23 Rockwell. Since I have no idea how many times it has been heated and quenched, I have decided to scrap it and buy one (ouch!).

There have been several articles about making your own gear, but I believe the first step should be to find a heat treat shop that will be able to handle the size of this part and will work with you to get it right. From the impression I get, once a shop sees one T-I8 gear, they don't ever want to see another one. A T-I8 gear sure makes awfully expensive scrap!"

Thanks, Al, for sharing your sad tale. That little story might save someone a batch of grief.

Well, we've had a pretty good cross section of the pros and cons on making your own gear vs. buying one.

BACK ISSUES OF THE NL: Just as quickly as I get this issue off the ground and in the mail I plan to go back thru my files of letters and assemble back issues for all of you that have been picked on by the P.O. Dept. and if there are enough of them to satisfy their minimum number for mailing I'll make a separate mailing via 3rd class. If not, I'll try to work out a deal with the local EAA chapter to include them in their monthly NL mailing. I wish we could afford the luxury of first class mailing, but if we mailed the next NL first class it would probably wipe out the kitty that's left.

One of the things I have on tap for NL #55 is a detailed check list to use in doing your annual inspection on your T-I8.

We continue to need your input for material for future NLs. Just because we have one or two writeups on a subject, don't let that stop you. That might serve to further verify a procedure or technique. The T-I8 MAS is like a family in many ways and what your NL is all about is the exchange of information on building and flying the T-I8. Each and everyone of us has received some benefit from the NLs, thus incurring a "debt" of sorts, so you now have an obligation to repay that debt, not in currency, but by a letter (or so) recounting one or more of your experiences; good, bad, or indifferent.....and there's no time like the present!

P.S. (I have delayed mailing this NL until the first of the year, in order that mailings won't conflict with the Xmas rush)

*Sick Cavin*

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JOHN THORP: Quite a few of you have recently inquired of the state of Jon's health. I recently had a letter from him in which he said that his condition (Parkinson's disease) had worsened to the point where he could no longer continue builder support and wanted to discourage new starters from buying further sets of plans, etc. He said he had been approached to turn over plan sales to someone else, but at this time he was not inclined in that direction. I know that ever since he was forced to hire a lawyer to defend himself from that ridiculous lawsuit he has been very gunshy on the liability angle, understandably so, too. He once told me that he felt that simply selling the rights to plans would not automatically absolve him from liability. Whether that's true or not, I don't know.

It pains me to learn John's physical state and outlook on life has gone backwards. I'm going to be optimistic and hope that at a later date he will see fit to turn over plan sales to some responsible person that would be in a position to give adequate builder support and advice where needed. The T-18 is simply too fine a design to simply drift off into limbo and fade into obscurity. I'd also hate to see bootlegging of plans get started, as they have on some other designs. The very fact that the design has evolved from a plain Jane, no frills, open cockpit, minimum airplane, powered with a surplus engine of 125 hp, into a sophisticated high speed Mercedes of the sportplanes, with the capability to go anywhere in the world, to fly at 26,000 ft., handle weather encounters as well as bigger airplane counterparts, fold its wings and go home on its own trailer, handle a 200 hp engine and constant speed prop, and fold its wings and go home on its own trailer, is the highest of tributes to the basic T-18 design concept. Statistics published by Aviation Consumer magazine in a recent survey of the relative safety of homebuilt designs put the T-18 at the top of the list. What accidents have happened have shown a very high degree of survivability, certainly due in part to the role the rugged landing gear plays in very high energy absorption and the protection it affords the occupants from engine penetration thru the firewall.

In any case we'll continue to keep the T-18 Newsletter going for some time yet....as long as there is still a need of it. I'm happy to report that since the last N.L. was published (in which I made a request for all members to bring their minimum contribution level up to \$6) that a considerable number of you have responded and several have sent in more than the requested minimum, so we now have enough in the "kitty" to keep going for a few more issues at least. A few contributions are still trickling in, saying "Sorry to be so tardy, etc.".

In case you are wondering why it has been so long since N.L. #54 was sent out until this one is because our chapter offset press that I use to print has been out of service since early Jan. A part for it was accidentally lost and it has taken all this time for the mfr. (A.B. Dick Co.) to get a new part to us. Having the N.L. printed commercially was out of the question for our budget, so there was nothing to do but wait. Sorry it's taken so long, but it was one of those things.

Along with expense money, one of our constantly occurring needs is a constant flow of INFORMATION FROM YOU THE BUILDERS! The following letter on the next page is an excellent example of what we need from those of you with airplanes that are now flying. This letter is from DON THOMSEN, and I have reproduced his complete letter as sent:

April 6, 1982  
112 Station Ave.  
North Hills, PA 19038

Mr. Dick Cavin  
T-18 Mutual Aid Society  
10529 Somerton  
Dallas, Texas 75229

Dear Dick,

This must be the fifth or sixth time I've started a letter to you and never finished. First I wish to thank you for the super job you are doing with the T-18 Newsletter. I have almost 300 hours on my T-18 and still learn something from each newsletter.

In the last issue you said some very kind words about an orange and yellow T-18 at Oshkosh; this was mine, thank you.

I fly from a 2100 foot strip and would like to offer my solution to short field landings. I have found a high, slow approach with full flaps works best for me. A 90 to 95 mph final, decreasing to 80 to 85 mph over the fence, seems about right. The rate of descent is controlled with power. At light weight there is a little float, at heavy weight almost no float. Three point landings are used exclusively. Flaps are retracted at touch down and very little braking is needed.

Most modern aircraft are flown to the flare with power. I am uncomfortable trying to land a T-18 as I was taught in a J-3. This may not be the best approach for everyone but it works for me.

I lost the form you gave me at Oshkosh so here is some data on N-98DT:

|                                   |                          |
|-----------------------------------|--------------------------|
| <u>Standard wing and fuselage</u> |                          |
| Empty Weight                      | 932#                     |
| Engine                            | Lycoming O-290-G         |
| Prop Sensenich                    | 68-70                    |
| Static RPM                        | 2150                     |
| Max RPM                           | 2900                     |
| Cruise RPM                        | 2500                     |
| R.O.C.                            | 1000-1100 FPM            |
| R.O.C.                            | 1500-1600 FPM            |
| Best R.O.C. Speed                 | 100-110 MPH              |
|                                   | 180MPH I.A.S.            |
|                                   | 160MPH I.A.S. 6.4GPH     |
|                                   | Gross Weight             |
|                                   | Avg. Weight (pilot only) |

Equipment:

Full Gyro Panel  
Dual Nav Comm  
Glide Slope  
Marker Beacon  
ADF  
Intercom and Audio Panel  
Wing Leveler

ALL  
UPDATE

HELP  
WANTED

(CONT'D)

Center of Gravity 16.82-30.26 %

The C.G. will stay in range with any loading 2-75# baggage, 3-29 gallons of fuel, passenger to 200#, and I weigh 150#.

The aircraft seems to exhibit neutral stability at all loadings. The wing leveler (Doug Garner's design with my vacuum servos) is a great help on cross countries. I am working on a pitch axis with an electric servo. I am also looking for any information on an in-flight adjustable propeller that would fit my engine. A metal hub with wood or composite blades would be ideal. Here is my idea on exhaust heat exchangers. The difference in area between the O.D. of the pipe and the I.D. of the muff must equal the area of the carburetor intake. A larger area means less heat transfer, a smaller area starves the engine. In order to get maximum heat transfer, the air to be heated must scrub against the exhaust pipe.

Here's an easy way to make a heat exchanger. Cut two pieces of .125" 6061 aluminum with two hole saws. One the size of the pipe and the other the size of the muff. You wind up with two donuts, these are the muff supports. Weld two stainless angles on the pipe (90 degrees apart) at the location of each support. Bolt the muff supports (donuts) to the standing leg of the angle. (Think ahead and position the donuts before you weld.) Wrap a piece of .032" 6061 around the donuts and hold in place with two hose clamps. Locate and weld the inlet and outlet flanges. Make the muff as long as possible. I made one on each side behind the ball joints.

I've gained so much from the newsletters over the years I hope someone can benefit from this idea. Enclosed is a donation to the fund keep the newsletters coming.

Sincerely,

Don Thomsen

As we said before, that was a superb letter, Don, and we really do appreciate your taking the time to gather all that info. I heartily agree with your technique for short field landings. To my way of thinking, that's the only safe way to do it. I've always been opposed to dragging a T-18 (or any other airplane) in in a very flat glide path. First of all, if you have any sort of power loss you're in deep, deep trouble. Most T-18s have minimal stall warning buffet and flying the airplane close to the ground and the stall at the same time is a form of gambling that's in the same category as passing cars on the top of a hill. With a steep approach you can precisely control your airspeed, sink rate, and glide path with a degree of accuracy that's simply not attainable with the other method.

I give a considerable number of BFRs and if there is any one thing that is common in many private pilots is a reluctance, or timidity, to use flaps. If you will pay close attention to the way highly experienced pilots fly an approach, you'll see full flaps extended on all landings & you'll see landings with minimum float. When the pilot knows exactly

where his aircraft will touchdown and he has the airplane centerlined on the runway he then only has two simple problems to solve for a safe and smooth landing: What altitude to start his flare and how rapidly to make it. If we analyze the difference between a no flap landing and a max flap landing it's nothing more than the time factor. Speed will decay more rapidly with flaps extended, hence the flare must be executed in a shorter interval.

## LANDING TIPS

When I check a new pilot out on the T-18 the first thing I show them (before we even start the engine) is where the horizon is in the 3 point position (which is fairly close to the stalling angle of the wing). On most T-18s it will be pretty close to the front and top of the nose cowl. I point out that if they don't quite raise the nose that high on landings that they won't drop it in and 95% of their landings will be good ones, and at the most they might get a little skip. I go on to say that as one feels the mains first roll, to bring the stick all the way back. I also have them record that horizon position in their minds for use as a quick guide for a safe climb angle for takeoffs and waveoffs.

I'll also pass on a little tip I use to use on pilots that seem to have a problem in focusing their eyes the proper distance ahead of the ship (which usually is the primary reason he'll flare too high). On takeoffs I try to get them to notice how far ahead that marks on the runway, or blades of grass, stop blurring from our speed and come into sharp focus and I try to get them to zero in on this at what they think is 2 or 3 ft of altitude. I also usually have them fly 6 or 7 approaches down to 3 feet without landing and then fly most of the way down the runway at that altitude before climbing out. The T-18 should never be flared above that altitude and if you will take care to do these things when you first fly your airplane (including the series of approaches without landing) you shouldn't get into trouble. Until you get very used to the airplane and get a bounce of a couple of feet or more, don't hesitate and try to save it, get full power in and go around and do it again. This time try to improve your airspeed control on final and concentrate on your flare height and rate.

It goes without saying that before you do all this with a new airplane that you should do a series of simulated approaches at altitude to investigate any peculiar characteristics that might be found when the flaps are extended. You are going to be approaching the Forward CG limit on your solo test flight or flights, so remember the pitch down with flaps is a combination of Forward CG and too much airspeed, both of which are not hard to correct. One T-18er I know normally carries a 50lb tool box in his baggage compartment. Other obvious solutions might be to move the battery further aft or add a reserve fuel tank in the baggage compartment.

OTHER FIRST FLIGHT TIPS: At any time you do any fast taxiing be absolute sure THAT BOTH YOU AND THE AIRPLANE ARE READY TO FLY AROUND THE FIELD. I know of three accidents and one hair raising incident that happened when the airplane got airborne when the pilot was not expecting it and when insufficient runway length remained for landing and stopping. In one of these cases the airplane ran out of gas just as it was crossing the field boundary on takeoff, causing major damage to the airplane. The pilot said his throttle stuck open and it rattled him so that he forgot the switch and mixture. A couple of years back a T-18 pilot found himself 10 ft. high, the airspeed indicator not hooked up, the stick only stuck in

the socket and he had drifted off the runway to the side...AND it looked like he didn't have enough runway left to get back on and stopped!!! Guess he had no choice but to try and somehow or other he did get back on and stopped, altho' it ended up in a hair-raising, tire screeching ground loop out in the grass at the end and nothing got bent except his ego.

### TAXI EXERCISES

② I have mixed feelings about the worth of doing high speed taxi runs and most of those feelings are negative. If the pilot is not CURRENTLY a PROFICIENT tail dragger pilot he should make every effort to put in 3 or 4 hours minimum of takeoffs and landings (not touch and go wheel landings). The T-18 is quick on the rudder and that takes a little getting used to. If you have only flown tri-gears, it might take a lot of getting used to. One thing I always advocate ANY new T-18 pilot do is to get on a wide, unused runway or taxi strip and starting out at VERY slow speed (5 mph) make precision taxi turns of say 30° on each side of the center line. Do this upwind, downwind, crosswind for perhaps a half hour...at least until you are truly proficient with stopping the turn EXACTLY the same amount on each side of center. I have noticed that new T-18 pilots doing this with me riding shotgun with them that they inevitably slight the turn to the right, only going about 20°. I found out the reason was that they were using the spinner to sight the turn, not an invisible sighting line parallel to the C/L of the airplane. When I stuck a piece of tape on the nose cowl directly in front of them and had them use that for their front 'gun sight' and that ended that problem. As you become proficient doing this at 5 mph you can gradually increase your taxi speed in 5 mph increments, but as your speed increases to a maximum of 25-30 mph it is advisable to cut down the angular deviations from the center line to perhaps no more than 10° at the high speed end. While this exercise is best done using no brakes, you certainly should have your foot in such a position that you can immediately use brake if the occasion demands it.

T-18 TAKEOFFS: The T-18 has a marked tendency to turn left as the tail comes up on T/O, due to P effect. This usually starts the pilot to overcontrolling the rudder and getting one oscillation out of phase with the nose swinging. Fortunately the airplane is ready to fly at this time before the pilot embarrasses himself too badly. The airplane is accelerating so rapidly and the rudder is becoming so sensitive with full power slipstream that there is a very natural tendency to overcontrol on the rudder and even experienced T-18 pilots will also do it if they haven't flown a T18 for awhile.

The cure for all this is simple: Just let it fly off in the 3 point position unless you are very heavy and on a very short runway. In my airplane flying solo I can't tell the difference in the length of the takeoff roll. On a very hot day and with a load I have found that if I raise the tailwheel no more than an inch or so after I am about 3 seconds into the takeoff roll, that takeoff roll distance and acceleration after lift off is about optimum. In this way I can take full advantage of the available tail wheel steering, which is much less sensitive than the rudder alone.

If you are inclined to be offended by such elementary advice as above it isn't intended to offend. While building one's own airplane is a noteworthy accomplishment, it's wise to be aware that our ability to properly and safely fly our creation is completely UNrelated to the building process and the first flight should be approached with an

attitude of humility. Tempering that attitude with a little bit of knowledge coming from practical experience will help to reduce the number of surprises.

SAD NEWS DEPT.: In addition to Dr. JOHN SHINN's recent passing, another of our regular contributors to the N.L., BILL JOHNSON, of 913 Cherry Hill St., Kent, Wa. recently suffered a sudden and fatal heart attack. Bill was an engineer for Boeing. He had plans serial #272 and his T-18 was one of the earlier ones to fly and made its national fly-in debut at Rockford. Bill was an inveterate and incurable experimenter and his experiments with lowering the stall speed of the T-18 are well documented in past newsletters. Bill also designed and built a retractable landing gear for his T-18, a project that got so involved that he once said it would have been easier to have built a new airplane from scratch. As a matter of fact, he did a complete re-design on the T-18 and called it the Eagle and had intended to sell plans, but as far as I know he never did. Bill did an article for Sport Aviation a few years back on his r.g. T-18 and in it he mentioned that it would cruise right up on the red line. We'll all miss Bill. Sport Aviation can ill afford losing people of Bill's caliber.

BOB GODWIN, of 1209 W. Evans St., Florence, S.C., was another of the early day T-18 builders that passed away a few months back. He also succumbed to a heart attack. Bob had stored his T-18 away for several years, but had gotten it out and flown it quite a lot the past year or so. He wrote me about a year ago, telling me how much fun he was having flying it again. His wife put his T-18 up for sale after he died, but I haven't heard whether or not it sold.

QUESTION ON COWLING SAG: In a previous N.L. HARLO Mc KINTY asked the question as to whether to allow for future engine sag, resulting in a mismatch between the top of the cowl and the spinner. Here is an excerpt from a letter from one of our most dependable sources of authentic information, CHRIS FAST: "Regarding Harlo's question on spinner mismatch, my T-18 had the 0-290G with the 3/4" horseshoe plate for an engine mount (the so-called flat-back engine mount instead of the dyna-focal). I washered the lower legs of the engine mount forward a couple of times the first 200 hours to remove the sag. This was when the rubber mounts were new and this worked out pretty well. It never changed after that and is still going OK today, so I would say to allow about a 3/16th" mismatch between the prop spinner and the cowling when you first set it up. On KEN BROCK's ship that I am just finishing I have left the spinner 1/8" high, as it is an 0-360 (180 hp) with constant speed prop and the dynafocal mount." Thanks, Chris, for the info.

What have some of the rest of you found out on this line? We would all appreciate your comments and opinions.

Another area that we are constantly in need of your input is in the engine hook-up department. I recently got a letter from a new builder and he says: "How about asking some of the builders and A & P's out there to send in some detailed information and sketches on how they rout throttle, mixture carb heat flex cables from the firewall forward and where and how should you clamp them enroute to the carb?" Now here is a chance for some of you that have finished your bird to contribute a goodie or two for the new troops. OK?

The following letter from Gene Sloan is reproduced in its entirety.  
(Further comments on page 4B)

Mr. Dick Cavin  
T-18 Mutual Aid Society  
10529 Somerton  
Dallas, Texas 75229

Dear Dick:

Enclosed is \$15.00 for "renewal" of my T-18 newsletter subscription. I've appreciated very much the information the newsletter has provided over the years and wish to continue to get it. The sketches for the firewall cabin heat box awhile back were a great help--I made one according to the sketch but have it oriented horizontally instead of vertically. My project (Serial #805) continues to make slow progress. All of the structure is now closed, panel details finished (full IFR), canopy fitted etc. Currently fitting fiberglass wingtips. Still have cowl work to do, prop installation, many details in engine compartment (O.320 ~~430~~, paint, trim, etc. I have a Cherokee 140 that keeps me in the air but I'd like to get the T-18 done.

I have also sent to you via UPS a copy of a thesis I wrote a little over a year ago in connection with a masters degree I was working on at the University of Tennessee Space Institute. The professor that was my advisor, Professor Ralph Kimberlin, is an active test pilot and I had several courses under him dealing with aircraft performance, stability and control, etc. His opinion was that a thesis should be a "fun" thing so we did it that way. Incidentally, Mr. Kimberlin has been one of the "lecturers" at Oshkosh and Tullahoma speaking about aircraft performance and flight testing. Anyway--the thesis deals mostly with performance testing of homebuilt aircraft. This part was not a good thesis area but there was method in my madness. What I did was outline a test program to develop "handbook" type performance curves for a homebuilt aircraft using techniques available to the average homebuilder. The example used was a "fictitious" T-18. The real "thesis" part of the thesis dealt with a mathematical way of developing an engine performance chart when only the horsepower vs rpm variation is known. But you don't have to read that part.

A couple of news letters back there was some discussion of airspeed calibration and if I remember correctly I think there was a slight error in technique suggested, having to do with the way two-way speed runs are averaged. This prompted me to send the thesis to you but it has taken me awhile to get around to it.

I feel that the homebuilders could clean up their act some by better documentation of the performance (and maintenance features) of their aircraft. I plan to do this with my T-18 following the outline in the thesis. If you think it might help some other T-18'ers, I would give permission for it to be used.

I myself am employed by Calspan at the Arnold Engineering Development Center, an Air Force R & D center for wind tunnel testing, where I supervise an operations engineering group.

Sincerely  
*Gene Sloan*  
Gene Sloan Jr.  
412 Lillard Road  
Murfreesboro, TN 37130

The copy of the thesis Gene sent me was most impressive and very professional looking. It's more than an inch thick and contains about 200 pages of double spaced copy, charts, and graphs, plus an impressive list of reference material that he used in compiling his data. I wish I could reproduce several portions of his material, but inasmuch as it is copyrighted and I don't yet have his permission to do so I'll have to defer that until I have had a chance to discuss it with him. I will report on that at the earliest possible moment. I will also ask Gene about the possibility of obtaining complete copies of this very scientific treatise. I'm well aware that most people aren't all that interested in doing a truly scientific analysis of the performance capabilities of their newly completed bird, but then again I know that a significant number would find this sort of information fascinating.

*PARTS SUPPLIERS*  
T-18 PARTS SUPPLIERS: I've had a couple of comments that gently took me task for only mentioning Ken Knowles as a supplier of pre-fab parts. I apologize for this oversight, as I had no intention to slight Ken Brock's most excellent quality of T-18 parts. I of course assumed that all of you knew that Merrill Jenkins had retired quite some time back and that left only Ken Knowles as the only major supplier of T-18 parts on an exclusive basis. Ken Brock's Co. supplies a considerable number of assorted parts for several makes of homebuilt airplanes and gyroplanes. Recently two former employees of Merrill Jenkins have resumed T-18 parts fabrication (no widebody or folding wing parts at present) under the firm name of "Leisure Aircraft Products" and their address is 16627 Parkside Avenue, Cerritos, CA, 90701. Their phone no. is 213/926-4545. They also handle various sizes of sheet stock, aluminum plate, extrusion, bar, and tubing, plus various hardware options. The owners (John Adams and Mike Hanich) invite you to write for their catalogue. As far as I know these three firms are the only ones supplying T-18 parts in any quantity. I think it only fair to point out that the mixing of parts from one supplier with those from another might not match in hole register so please be aware of this possibility.

*PLANS*  
SUPPLEMENTARY PLANS STATUS: As you may or may not have noticed in a recent classified ad in Sport Aviation that Pete Hodgins (Australia) is advertising his supplementary plans for various T-18 items, with funds to be sent to him direct. Those of you that sent me funds for plans be advised I have forwarded them to Pete, so no doubt you'll hear from him soon. There is still an area of uncertainty as to what price he wants for the various options, but it will be clarified soon I'm sure.

*A NEW T-18*  
NEW T-18s to look for at OSHKOSH: After 17 long years LEE SKILLMAN, of 7 Worthington Lane, Parkersburg, WV, 26101 (our T-18 dinner MC last yr.) got to see his T-18 fly and fly perfectly it did! Lee has lived all over the country in those 17 years and the project went with him on every move. There were gaps of many months, when things were too hectic to work on it, but he never gave up and kept plodding. There were a lot of things along the way that were bitterly disappointing at the time and required backtracking and sometimes it was two steps forward and one backwards, but the month of May saw #294 with daylight under its wheels.

Lee was fortunate in having Ed Burke, a long time US AIR captain who has his own T-18, to do his initial test flights for him. Ed flew his T-18 over from his home in Pittsburgh, PA, for the occasion and was truly delighted with how perfectly Lee's airplane flew. Since Lee was



was not tailwheel qualified and actually had done very little flying in the past few years he was most agreeable when some of his old friends suggested he approach Ed to do the initial test flights for him (Ed was just one of the old friends making that suggestion). Here's Ed's letter that he sent a few days after the test flight:

"Hi Dick,

Surprise! A real letter! As you know from the phone calls how elated Lee Skillman was when his airplane finally flew. You should also know how proud I was that he asked me to fly it. It was so clean, so truly aligned, it ran and flew so straight! Very few factory aircraft built on super jigs could match it.

It was a simple task to check out his friend and instructor, Charlie Pickering (who really could have flown it the week before), so that Charlie could get Lee checked out when I left.

This machine will be a REAL competitor in many fly-ins and it will certainly be a real credit to the T-18 design, but its real beauty and craftsmanship can only be appreciated in flight. No shims, no trim tabs to keep it straight...absolutely true!

The actual first flight was a TV event, with a big front page story, too. It will take six months for Lee's chest to relax and wear the grin off.

I now owe you my profound thanks for two things: You told me about the Reaagaard T-18 for sale that I bought and then put me in touch with Lee. This is truly the T-18 Mutual Aid Society!

Some time ago I told you that Ken Coleman and I had put the gear extensions on our two airplanes (both with the short gear) and what a GREAT improvement they made. I have since learned to fly the ship into much smaller strips and have also learned to wheel land it. Please extend our sincere thanks to the folks responsible for such a simple device which has made such a great improvement possible.

The airplane now seems to sit up in a very pert, saucy attitude, similar to a Cessna 180 and by presenting more wing and fuselage frontal area in this higher 3 point attitude it definitely will slow down much quicker without the use of brakes. Maybe the best point of all is that I no longer get the tail wheel on first and then bang the mains down as I did before when I did full stall three point landings.

The Sensenich wooden prop you recommended (66dia-72 pitch) has also been a real improvement. With the O-290G turning 2650 rpm wide open at 3000 ft on a warm day, with full fuel and Jody and I in it, we are now indicating 163 mph, without gear or wheel fairings. With the gear and wheel fairings installed we almost certainly will pick up 50 rpm to get full rated power of 2700 rpm and probably another 10 mph, too. Kinda has me thinking about a conical mount 160 in it one of these days."

Ed went on to say how sorry he was to hear about Braniff and how it had really generated shock waves in the airline piloting profession.

Ed's an old, old friend that goes back to the pin feather days of the T-18, when we (five or six of us) built a T-18 fuselage in 4 days at

the '63 or '64 Rockford Convention. Our workbench was a couple of old wooden folding chairs in a tent and we had no electricity. Had to use hand powered breast drills and we used pop rivets to put it together.

I'm most anxious to see Lee's creation at OSH this year. He sent me a couple of color photos of the interior when the ship was unassembled and it looked plain gorgeous even then. Lee called me again a couple of weeks later after the test flight to tell me that he was now flying it solo and getting along very well with it. He also said he planned to make two or three fly-ins with it before OSH and it wouldn't surprise me to find out he had copped an award or two in the process.

Lee has promised a complete story on the airplane very soon, so in the meantime we'll just say, "Congratulations, Lee, not only for a job well done, but also for hanging in there for 17 long years!"

*ANOTHER NEW ONE*

SERIAL #1 PLIES: FRANCIS RICHARDSON, 2608 N. Johnson, Denison, TX, 75020, finally flew in May 1982. #1 has a long history. D. B. Underwood, of Dallas, bought John's first set of plans. I laid out a set of skins for him from my templates and made him a set of bulkheads. D. B's fortunes took a turn for the worst, so he sold the fuselage to another builder, who never got a rivet in it either. I acquired it in a three handed swap a few years back. Francis decided to build his second T-18 shortly after that. He was being discharged from the Air Force after 23 years of service and very soon enrolled in college to finish his degree in Aircraft Maintenance Management and the T-18 went to school with him for after hours work. After graduation he took on a brief stint as a factory rep for Northrop in Iran, but Iran soon wasn't to his liking and he came home and went to work for Texas Instruments looking after their fleet of planes at Dallas. This kind of work was a natural for him, as he had managed large detachments of maintenance people for the AF for all those years. We had run across each other in Bien Hoa when I came in there on a 707 MAC flight and we got caught up on some concentrated visiting in the two hours I was there.

While he was with TI in Dallas he and I got together nearly every night in my shop to build two sets of the folding wings. I also had another fuselage standing by for a set of wings, so we found it just as easy to make two of everything as we went. The big steel wing fittings were the hardest part, as we didn't have access to a metal cutting bandsaw and had to rely on an outside party to cut them (which started a chain of headaches). Francis chose to leave his wings as quickly removable, rather than folding, as hangar rental in the Denison area was still a bargain. Francis moved back to Denison when the wings were finished, as he was was thoroughly sick of big city traffic by then. He had to completely remodel his house and commute the 140 mile round trip to Dallas, so working on the airplane was few and far between. To eliminate the long commute each day he transferred to TI's plant there, but it was back to school 3 nights a week to get his degree in Electrical Eng'g this time.

Little by little, all those hundred little jobs got done and finally he took it to the airport to fly it. Because he took the time to do all these so-called little things so thoroughly the only squawk he had after his first flight was to adjust the idle mixture!

Francis has a unique T-18, inasmuch as he does not have a sliding canopy.

He has an all metal, fixed, super-structure built up in the general shape of the canopy, but he has forward opening doors on each side. He has side and aft windows built in and the effect is quite pleasing to the eye. It reminds me of the Meyers 145 canopy. Forming the door frames of .063 was the toughest part. All of the windows have compound curves in them and this meant making plaster molds for each. (yes, he made a spare set or so of each, "just in case").

His cowl is mostly metal and looks to be very close to the Thorp cowl. I made him up some fiberglass pieces for the front end part of the "cheeks" but the rest of it is metal. The compound lines of the belly cowl are most difficult to do in metal, but he came out with a reasonable facsimile. You may wonder how he did the top piece in metal. It's actually made in two pieces, a top and a front piece. The top piece is made of .040 and was rolled in a sheet metal roller to form the curves to match the corners of the firewall and the circle at the front end.

To form this front piece he made a circular form block and clamp block of 12 1/2" dia. to match the rear of his spinner. Using .040 6061 T-6, he made a circular blank of 14" in dia. and spaced 1/2" dia. holes all the way around on about 1" centers. The outer edge of his form block was exactly even with the center of this ring of holes. He next took a pair of shears and clipped out a strip of metal from the outer edge to the edges of each of the 1/2" holes. This left a series of tabs approximately 3/4" wide all around. It was then a simple matter to bend these tabs down on the form block and then rivet the part to the top piece. Of course this circular piece was cut in two after forming, so that one of the halves could be used for the top piece and the other for the bottom. If you should choose to go this route to form these pieces, don't forget to make an adequate radius on the edge of the form block and use a sufficient number of clamps to hold the form block and clamp block tightly together. Flush rivets should also be used. A solid disk of metal is permanently attached to either the top or bottom cowl. The other part is attached to the disk with camlocks, nutplates, etc., making both the upper and lower halves of the cowl removable.

Francis built up his O-290G engine and overhauled it. He has a Sensenich metal prop on it, (M74DM, 70/68) and gets about the same performance out of it that Ed Burke gets out of his. He is especially impressed with the larger flaps of the CW in shortening the landing roll and steepening the approach path. He also has the longer gear on this one. He also says he can tell no appreciable difference in aileron response with the shorter CW ailerons. The airfoil used is the standard one, not the LDS2. So more congratulations are in order for another well done for Francis' 2nd T-18.

Another one flies!... JOHN HARDY, Rt. 1, Box 292K, Natchitoches, LA, 71457, also flew his T-18 in late May and is most pleased with it. John's fuselage and wings came from this area from one of the original gang of 28 T-18 builders we had in the DAL-FTW area umpteen years ago. John picked up a run out IO-320 (160 hp) from a Twin Comanche shortly after he got the bare airframe and zero timed it. It also had a 6" prop extension on it and the regular constant speed prop, too. (Standard equipment on the Tw. Com.).

John hasn't had a chance to really nail down his performance as yet, as he's having so much fun flying it to really get serious yet. You'll see all three of these gents and their new airplanes at OSH this year and I will corner them there for their promised specs, wts. CG, etc. for

inclusion in N.L.#56, which will come out very shortly after OSH. I would like to get a complete rundown on each and every T-18 at OSH in '82, so if you are planning to fly your T-18 there this year it would save me a lot of time if you would sit down before you leave and record all the vital statistics: Engine, prop, empty wt., IAS at stall, full throttle (alt. & temp), rpm & M.P., cruise at 75% power, battery location, new or old airfoil, type of paint used, type of cowl, exhaust type, carb air box details, avionics, etc. In fact, please include any and all details that would be of interest to the troops. If you have something a little different please do a short description of it. You don't have to write a fancy article. Just scratch it out and I'll be glad to rewrite it if needed... BUT PLEASE DO YOUR PART IN THE SUPPLYING OF MATERIAL FOR THE N.L...... A lot of you have said, "I appreciate the time and trouble you are going to to get the N.L. out, so keep it up, etc.... but the N.L. can't keep going on if you guys don't take the time to write your experiences!" If you are at a loss as to what to write about go back over the newsletters and take note of the subjects that have been covered. Many of those things are only one person's experiences. Even tho' the quoted technique may be the best, it might not be the easiest for everyone. It's also of value to newcomers to learn of more than one way to do something. If you can't think of anything else, sit down and make a detailed sketch of your brake system from top to bottom. Call out the specs for tubing and other hardware, what type of master cyl's used, how mounted with brake pedal, etc.... Another good subject is your fuel system... again with complete call out on all hardware. What type of fuel tank cap used, scupper drain, how vent lines located, fuel tank sender used & how calibrated, how accurate? All of these, plus your personal opinion and recommendations are of great value. There are a LOT of uncompleted T-18s out there and many of them are in desperate need of the very information YOU could supply. Now, of course if YOU never asked John or any other person for advice on some part of your airplane (whether it's completed or not), then the above doesn't apply to YOU, but if you don't fall into that category you might want to take note that you have incurred an obligation to make payment in the same type of "currency" that you "borrowed" in. Now in case you think you might be a little embarrassed if others knew about some of your "goofs" along the way, please remember that each and every T-18 builder has made a bunch of them along the way, so let's put that crutch away for good.

'82 OSH T-18 FORUM: For some reason a T-18 forum was NOT scheduled for OSH in '82. I don't know why. It's hard to believe it was simply an oversight. No doubt the T-18s won't be the most numerous among those present, as they have been in past years, but when over 350 of a type have been built, with another thousand under construction, it doesn't seem very likely that it was simply overlooked. I can't help but get a little hot under the collar at the way Headquarters has seemed to snub the finest design of them all over the years.

We will have our annual T-18 dinner at Butch's Anchor Inn at the regular time on Tuesday evening, with a cocktail hour preceding the dinner.

Also, as per usual on Monday at 1200 noon we will again have our "Cowling Off" display. This is one of the most educational things that take place out there on the flight line and we solicit your cooperation in making it a 100% effort. I know some of you have the Rattray cowl, which is more difficult to remove, but perhaps you could remove the bottom half without too much trouble. It REALLY IS appreciated! If you are taking pictures, you might want to use a flash for better detail.

PLEASE DON'T FORGET! 1200 MONDAY

N.L.  
MATERIAL  
NEEDED

'82  
T-18  
FORUM  
OSH?

"COWLINGS  
OFF"  
MONDAY  
12:00 Noon

METAL  
COWL  
TIPS

STILL  
ANOTHER  
NEW  
ONE

**MORE ON TURBOCHARGING:** Excerpts from a letter from our old buddy, BOB DIAL, 5175 Wing Lake Rd., Bloomfield Hills, Mich, 48013:

"I am motivated to write specifically after reading about Ken Hansen and his turbocharging efforts. It should be CLEARLY and FORCEFULLY pointed out that aerodynamic damping of the flutter regime is a function of TRUE AIRSPEED and not INDICATED AIRSPEED, as you well know. John has pointed this out most emphatically and the T-18 has NOT been tested above the present maximums of speed. Therefore, at altitude he would still be limited as to maximum top speed. (Actually, the maximum speed would be lower than at sea level).

If he would contact TOM BACSANYI, 18815 Blue Skies Dr., Livonia, Mich., 48152, he could obtain much valuable information about turbocharging a T-18. Tom designed and built a "controlled leak" in place of a wastegate. This eliminates all the complications of a mechanical wastegate and simplifies the cockpit controls to the simple, single throttle lever. He installed an intercooler to reduce inlet air temperature at higher altitudes, thus eliminating the very real danger of detonation and increasing the density. He has his "calibrated leak" set to develop 31" at T/O and he can hold 31" clear up to 24,000 ft.! From FL240 on up the MAP decays, but at a slower rate than on an un aspirated engine at the lower altitudes. Service ceiling is 'somewhere above 35,000 ft.' He also designed a scavenging pump for the turbocharger, which works fine. I believe he has never flown the airplane above 25,000 ft, but he routinely flies at 18,000 to 20,000 ft. He abides by John's speed limitations religiously and his biggest advantage in addition to cruise speeds of 220-230 mph is the phenomenal fuel consumption he gets. With 180 hp and a 30 gallon fuel tank he has a range of about 1000 miles! He has several hundred hours on a proven system and since he is an engineer with a wide background in turbochargers I believe his counsel is certainly worth listening to on its merits. He has much technical and engineering on his system and you might be able to get him to write something for the newsletter.

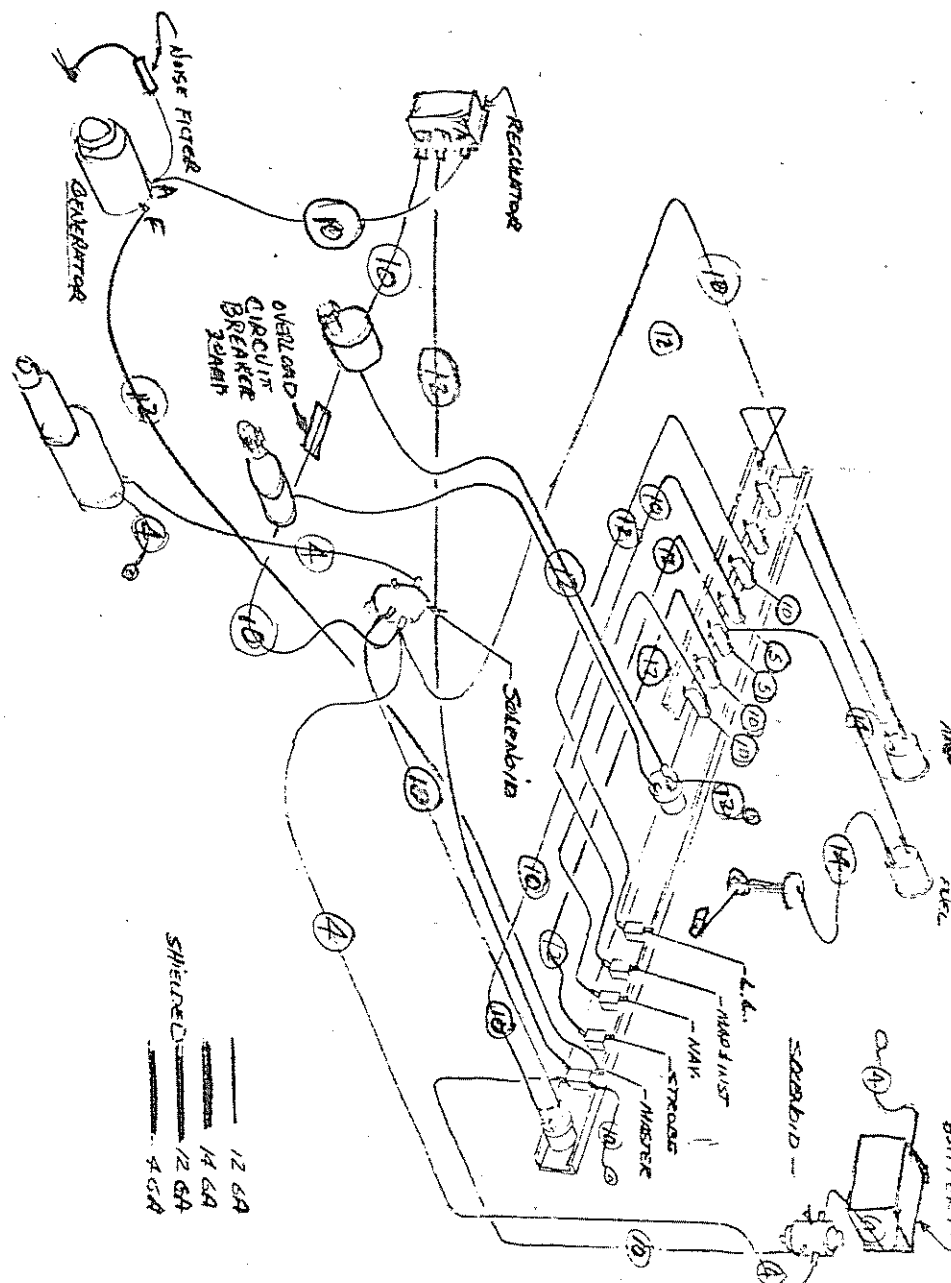
I am sending along a simple schematic of a wiring system for the T-18. It needs the addition of radios, etc., but maybe it will help give someone some ideas to go from. This sketch was by courtesy of Dick Penman. (See page 7B).

I'm also including a couple of pictures of the 450 lbs. of equipment that was installed in my airplane several years ago when we did the prop vibration tests (see older newsletters about the tests that were done to set guidelines for a safe metal prop). My gross weight for these tests was 1981 lbs. At that weight I had to do stalls, 2G pull-ups, vertical turns, dives to 220 mph IAS, and climbs to 15,000 ft. I'd like to get these pix back when you are thru with them.

I'm still working on my #2 airplane and hope to finish it this coming summer sometime. I will sell one of them, but I haven't decided which one as yet. I'll send pictures and info soon.

Keep your airspeed up!

BOB DIAL



Thanks again, Bob, for all your words of wisdom on the flutter speed's fixed relationship to the TRUE airspeed. I sincerely hope one and all clearly understand the inherent danger associated with foolishly pushing the airplane's speed up to or beyond what is known to be safe. The T-18's speed and control response makes it an exhilarating airplane to fly and in some people this also generates an overwhelming surge of "Look at me, Mom-it's"....the show-off urge, to be plain about it. Most of us can resist that urge at low altitude, but be alert about Vne at altitude. Don't ever assume you could react fast enough to stop flutter after it began. You can't. I interviewed two eye witnesses within 15 minutes after they saw the start of the tail flutter until the airplane self destructed in mid-air and they both agreed the total time interval was considerably LESS than 2 seconds!

If you don't have an OAT gauge in your airplane perhaps you ought to sit down and figure how much less your airspeed indicator will read for each thousand feet of altitude you go up and make a little chart to keep in the airplane and refer to. You can use standard temp dropoff figures and be pretty close. Right now you should also be asking yourself "I wonder how accurate MY indicated airspeed is?????" That's a pretty good argument for finding out just how accurate your airspeed is. Right?

Here's a letter (in part) from T.J. McCormick, Box 105, Rowland, NC, 28383 in which he says: "I have been working on the horizontal tail. The left and right sides are made and I used matched hole procedures as you suggested and it worked out OK. The biggest mistake I made was to lay out the #613 beam template for the holes real accurately. I was sort of scared of making a mistake somewhere and spent extra time with dividers etc. to get it just right. I then had a hard time identifying the position where it should go. Everything was marked, but still this thing gets touchy when the two sheets are drilled at one time and one has to be turned over to get one right and one left elevator. Anyway the elevators are cleced together now and now I'm up to installing both to the tube spar, etc."

I am learning though. I built a Baby Ace back in 1958 and I still have it. I also built a Pitts Special and have it licensed and it has 12 hrs. of test time on it as flown by a crop sprayer friend a year ago. I haven't flown it myself yet. It needed a few things to finish and now I have all of them done. Now I can concentrate on the T-18.

One problem I had with the MATCHED HOLE TOOLING was with the transfer punch (the #30 punch with the nib). The nib, or center punch part of mine is too rounded and it leaves a mark that is too sloppy to center a drill or punch in. I made a punch out of a 1/8" punch and made a good sharp little in the center that works very well. The taper on the punch matches with the #30 template hole and no tight fit has to be made like with the Whitney punch. I find this more accurate. (I'd like to go over this with you at OSE this year, T.J. and make a sketch for the NL).

The subject of SHEET METAL GRIND DRILL BITS has been mentioned several times in the NLs, but there seems to be a great vacuum of information when it comes to someone telling in detail exactly how to do it. I get mine thru another builder, who in turn has a machinist friend make them in his spare time. In case you are just starting and have just discovered

that an ordinary drill bit is prone to drift out of that tiny punch mark that you needed to hit accurately...especially after it began to get a little bit dull. With such bits you simply cannot perfectly reproduced the hole layout that you have center punched. The Sheet Metal Grind bit makes it possible not only to hit the exact center of the punch mark with the center of the pilot drill part, but also the bit will drill straight and true and won't "walk". It actually works like a miniature hole cutter, as the outer flutes cut out a perfect disk.

**HOW TO GRIND A SHEET METAL GRIND BIT:** T. J. continues: "I found out how to grind sheet metal grind drills, also. I played with grinding them various ways and found out that if you support a Dremel hand grinder so way (I put mine in a vise) and use a mounted grinding wheel (Mine was about 3/4" dia. and 1/8" wide). Mount a magnifying glass over the wheel so you can see and dress the wheel so that it will run true. Grind the drill bit so that it has a center pilot, which is sharp and about .020 to .030 long. Then very carefully grind the lips at a good biting angle and you will have something that will drill a very accurate round hole. Look at it this way: with the sheet metal grind drill you have a center pilot to guide the bit and with an ordinary drill bit the only pilot you have is the tapered point and it was ground to drill steel, not aluminum. Consult any shop manual and it will say to grind the drill with a much sharper point and give it a lot of rake angle. This sheet metal grind bit does not wander and does not have to have a punched or drilled undersize pilot hole to start accurately, but we all know you really need a pricked point dimple to be very accurate. Take a look at some of the PLAT type wood bits that are used for larger hole sizes in wood and you've got the idea."

I also found out that a high speed air drill works much better than an electric drill, is lighter, and you have a wide speed range by controlling the air pressure.

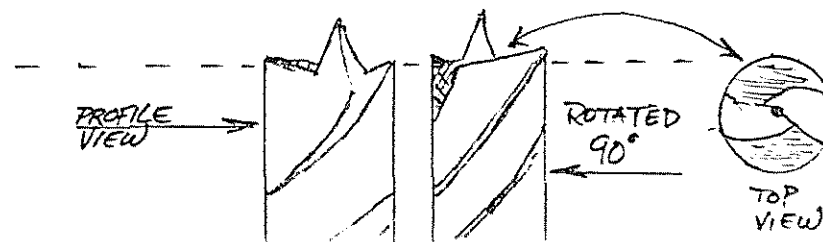
Well now that I have my hole drilling problems worked out, I'm ready to get at the riveting and I hope people won't be laughing at my riveting sometime in the future.

One more thing on the drill subject: The drill bits are much easier to grind than the regular ones.

Sincerely, T.J.

T.J. that was GREAT! If it wasn't for those like you that take the bull by the horns and go ahead and do these things....and then pass on what they've learned, the homebuilding movement would have died on the vine years ago. Anyway, thanks a million, T.J.

Just below this I'm making a crude sketch of a Sheet metal grind drill bit, just in case the writeup still isn't clear.



GRINDING  
A  
SHEET  
METAL  
GRIND  
DRILL  
BIT

HORIZONTAL  
TAIL

TRANSFER  
PUNCH

SHEET  
METAL  
GRIND  
BITS

ABOUT READY TO FLY: Paul Carabelli, Address unknown, Los Angeles area; Tony Russell, 406 Cardinal Drive, Slidell, LA, 70458; Lou Falconi, 1917 W. Freeway, Apt. 5, Grand Prairie, TX, 75051; Tom Kerns, 4218 Ticino Dr., Arlington, TX, 76016; Ken Brock, 11852 Western Ave., Stanton, CA, 90680; Bob Dial (#2), 5175 Wing Foot Rd, Bloomfield Hills, MI, 48013; Cecil Hendricks, P.O.Box 68097, Seattle, WA, 98188; plus about a dozen more in the "maybe soon department", that I haven't had any info on recently. If any of you know of an advanced T-18 project near you or have heard of someone who recently bought a flying T-18 (or an advanced project) I'd appreciate a card from you with the details.

BUILDERS LISTS (continued): Repeating, if I know that one of those that are listed as T-18 MAS members has an airplane now flying I will underline his name. I'll also do the same for any that might be flying in the very near future. Address changes from previous listings will be updated as they come in. State by state listings began in NL #52.

OREGON:

Wm. Ayres, 761 Stinson St., Independence, OR, 97351  
Dean Adams, 16575 SE Sager Rd., Portland, OR, 97236  
Ron Arnoldson, 1539 Roberts Ck. Rd., Roseburg, OR, 97470  
T.V. Anderson, 2235 NW 16th St. Corvallis, OR, 97330  
Larry Eversmeyer, 4725 SW 207th Ct., Beaverton, OR, 97007  
Robert Furrer M.D., 427 Oakway Mall, Eugene, OR, 97401  
Ronald Gerrard, 85 T St., Sprigfield, OR, 97477  
Wayne Heigel, Rt. 3 Box 140-E, Sherwood, OR, 97140  
Howard Martin, 10270 SW 80th, Portland, OR, 97223  
Amos Ranck, 3536 Poinsetta St. NE, Salem, OR, 97303  
Denell Zander, 13700 SW Hall, Tigard, OR, 97223

MICHIGAN

Richard Amsden, 16434 Concord, Fraser, MI, 48026  
Wm. Beswick, 7144 Heatherwood Dr., Jenison, MI, 49428  
Al Bosonetto, 32625 Benson Dr., Westland, MI, 48145  
Douglas Boyer, P.O.Box 236, Eastport, MI, 49627  
Bob Dial, 5175 Wing Lake Rd. Bloomfield Hills, MI, 48013  
Anthony Dakrowski, Jr, 3104 Temple St., Muskegon Hts., MI, 49444  
Orville Green, 34 W. Dale Ave., Muskegon, MI, 49441  
Bob Hudgins, 2502 Leroy, Flint, MI, 48502  
Don Hackney, 6647 Hatchery, Pontiac, MI, 48054  
Mark Lamos, 25687 Kilreigh Dr., Farmington Hills, MI, 48014  
Merlin Miller, Rt. David Dr. Springport, MI, 49284  
Roy Oberg, 8040 Shadybrook, SE, Ada, MI, 49301  
Dick Penman, 5918 Borden Rd., Dryden, MI, 48428  
Vincent Reno, 11483 Kennebec, Detroit, MI, 48205

OHIO

Larry Baker, 4330 Chippewa Falls, Jamestown, OH, 45335  
Francis Boehlein, 6206 Timberlane Dr., Independence, OH, 44131  
Craig Cihlar, 3407 Revere Rd., Richfield, OH, 44286  
Carl Cole, 7927 Heatherglen Dr., Cincinnati, OH, 45230  
Walter Giffin, 4277 Kenmont Pl., Columbus, OH, 43220  
Paul S. Jones, 302 E. Main, Oak Hill, OH, 45656  
Jas. Mach, 7274 Butternut Ln., Mentor, OH, 44060  
Robert Neitman, 4017 Glenheath Dr., Dayton, OH, 45440  
Jas. Paine, 4240 Wagner Rd., Dayton, OH, 45440  
Kenneth Patsch, 2102 Jeanetter Dr., Sandusky, OH, 44870

Clifton, Redden, Rt. 1, 609 Wise Rd., Lynchburg, OH, 45142

OHIO (cont'd)

H.L. Starcher, 10588 Norwalk Rd., Litchfield, OH, 44253  
Ted Williams, 640 St., Rt 314, RD12, Mansfield, OH, 44903

ILLINOIS

Kurt Ayres, 5951 Guilford Rd., Rockford, IL, 61107  
Alfred Cousineau, 8332 N. Octavia, Niles, IL, 60648  
Keith Claypool, 826 W. Broadmoor Dr., Peoria, IL, 61614  
Lewis Corbett, 8202 Grand Oaks Ct., Gurnee, IL, 60031  
Wm. Gillen, 3228 Brookmead Dr., Rolling Meadows, IL, 60008  
Robert T. H. Hubbard, 437 1/2 1st St, La Salle, IL, 61301  
Wallace Hunt, 1658 Plaza Dr., Rockford, IL, 61108  
Bob Jaeger, 2405 Melrose, Melrose Park, IL, 60164  
Donald Kames, 3N375 Keil Rd., West Chicago, IL, 60185  
Paul Kirik, 2921 28th Ave. A., Moline, IL, 61265  
Allen Lurie, 605 E. Armstrong, Peoria, IL, 61603  
Tom Morley, 5721 W. 55th St., Chicago, IL, 60636  
Gaylen LeCount, 301 E. West St., Georgetown, IL, 61846  
Kenneth Rhoads, 175 Hickory Lane, Far Hills, Peoria, IL, 61611  
Joe Robinson, 602 N. Cross, Robinson, IL, 62454  
A.A. Repeta, 4300 N. Marine Dr., Apt. 1704, Chicago, IL, 60613  
Ron Sassaman, 931 16th St., Rochelle, IL, 61068  
Gary Smith, 512 S. Waterman St., Arlington Heights, IL, 60004  
Warren Spencer, 1512 North Ave., Crystal Lake, IL, 60014  
Richard Secrest, 134 Mattek Ave., De Kalb, IL, 60115  
Bernard D. Scolia, 1823 Palm Dr., Mt. Prospect, IL, 60056  
Jerry Turner, RR#5, Box 132, Marion, IL, 62957  
Rollin Tippet, 208 S. Jackson St., Waukegan, IL, 60085  
Thos. Weinberg, RR #2, Mt. Vernon, IL, 62864  
Joe R. Wood, 602 N. Cross St. Robinson, IL, 62454  
Bob Young, 512 S. Olmstead St. Oakwood, IL, 61858

(Other states listings will follow in future N.L.s)

UPDATE ON BACK ISSUES OF NEWSLETTERS #45 thru #54:

As I mentioned in N.L.#54, I am in the process of making a complete new set of printing plates for ALL of the above N.L.s and right after OSH I will run off about 100 copies of each of these issues. I have kept each and every letter and postcard that any T-18 member has sent me, so I do have a record of the ones that have not received one or more of the N.L.s as a result of the Post Office Dept. carelessness, etc. It's going to be a time consuming and wearisome job to print, staple, collate, address, and mail all these back issues and since I have to do all this myself I would appreciate it if you'd give me a little help and immediately after OSH if you would (again) mail me a simple postcard saying, "I need N.L.s #....&....etc. That would save me a good many hours of precious time if you would take a couple of minutes to do this. All back copies will come in the large mailing envelopes like we now are using. We have found that the P.O. Dept. is much less likely to "lose" them, as compared to those that are just folded and stapled and the extra cost of the envelop is worth it.

One more thing: I inadvertently sent out my "Master Copy" for N.L. #50 to someone. I would appreciate it if you would check your #50 N.L. and if it is TYPED instead of printed that is it. If you happen to have it, please send it to me PDQ. If I have to re-type #50 from one of the printed copies to make the new plates for it and re-draw the sketches

in it it'll use up a week of time best spent otherwise.

THANKS

UPDATE '82 OSH T-18 FORUM: I talked to Wes Schmidt today (who schedules the forums for the convention) and asked him for an explanation as to why there had been no T-18 forum scheduled. I never really got a satisfactory answer. Wes said that NASA had come in with a lot of forums, some of them to run twice. What it boiled down to was they said WE hadn't contacted them. He finally offered a spot at 9:00 to 10:00 AM on Friday, August 6th. I very reluctantly accepted, as I feel most of the people will have gone home by then. I've had quite a few of you call me (some pretty hot under the collar about it) and when one looks at the forum line-up and sees forums on Pietenpol, Pixie, CPR, flapping wings, Flying Fleas, The Flying Companion, etc....well, why don't YOU look it over and draw your own conclusions. You might look at that list and ask yourself how many of those programs called EAA and asked THEM to put them in a forum slot. You might check the forum line up when you get there. We just might want to make some arrangements on our own....perhaps something like an open-air auditorium meeting on say, Tues. morning (the one just south of the antique area in the woods if not in use).

FITTING THE FIREWALL AND #603 DASH FRAME TO THE SKIN OVER THE TANK:

Getting a perfectly airtight fit of these two to the skin above isn't very easy in most cases, whether you use matched hole tooling and pre-purchased parts or not. Sometimes you will have a series of little "flats" between the rivet holes or sometimes you will have a series of gaps that let you see daylight around the firewall or dash frame. You obviously don't want openings where fumes, heat, fire, or noise can penetrate the cabin area. Some people have made thin shims to fit the gaps, others have caulked, etc.

Ken Hamilton, 1357 Camfield Way, Frisco, TX, 75034, came up with a pretty good way of getting a first class fit all the way. He is using Ken Knowles parts and all holes matched pretty well. He first drilled everything with a #40 drill, checked the fit, and found he had a series of these small gaps. Part of the problem is that the angle on the flange of the firewall and the #603 must continuously change ( a small amount) as it makes the curves at the upper corners of these two. He then drilled all the Holes out to #30 size and rechecked to see if this would relieve the problem. It didn't. He had ciecos in EVERY hole, too. He made a hardwood "chisel" out of an old hammer handle, sanding down an edge on the end of the "chisel" that had about the same radius of the radius of bend of the flange of the firewall and dash. Getting inside, he tapped the other end of the chisel while the "sharp" end was held just barely on the FLANGE side of the bend radius. In effect, this makes the firewall and dash frame flanges a small amount narrower and the vertical part of them a little taller. The galvanized steel of the firewall is actually quite malleable and relatively soft, so it is quickly responsive to the chisel strokes. The dash frame is somewhat less responsive, but it, too, will accept the light reforming with no trouble. At the same time this is taking place, the flanges are re-shaped to the exact angle needed to match the skin. Using the same ball pein hammer he had used to tap the other end of the chisel, Ken used the small end of it to drag it around the radius of the flange, using heavy hand pressure. This further softened and blended the new bend radius area. Ken says the final result of all this is such a tight fit between the bulkheads and skin that you could hardly pour water between them.

I had previously warned Ken that around the firewall where you have 3 separate layers of metal to tightly pull together just before the

SQUEEZING  
SHEETS  
TOGETHER

rivets are inserted for driving that you should use 1/8 in. (fully threaded) machine screws to pull the pieces together as tightly as possible. The firewall flange has much more noticeable stretching from the forming process than aluminum flanges and when squeezed between the skin and the vertical .063 doubler it looks very wary. I believe Ken's use of the wood "chisel" could well be used to advantage in this area also, to minimize some of the effects of this over-stretching. Of course if you use this method here, it would be best to do it before you match drill the doubler with the skin and firewall, to avoid a possible hole mismatch after the re-forming takes place. I also believe it would be wise to tightly "bolt" the entire perimeter of the firewall with the little machine bolts, so there will be no shifting of hole positions. I think you also should use washers on each end of the machine bolts to squeeze as large an area as possible. If you are new at riveting you should be aware that a rivet will try to swell up between two sheets in the upsetting process if the sheets are separated and of course that's a no-no. If that happens, drill it out and do it right. That's why you should be diligent about deburring before riveting.

DEBURRING TOOL: I ran across a good little deburring tool recently in a Tru-Value Hardware store. It is made by GENERAL HARDWARE MFG. CO. of NYC, NY, 10013 and is called a "Swivel head deburring tool" (#430) and the retail price was \$4.79. It can be used in holes by rotating it or on sheet edges by a straight pull. It's about the length of a pencil and has a little joggle at the business end.

You can make a very good tool for deburring the wire edge from sheet stock by taking an old screw driver and making a 90° bend in the shank about an inch from the end and grinding a sharp Vee in the end. By dragging the Vee toward you down the edge of the sheet you can peel the standing wire edge off neatly. One used to see knife sharpeners made like this that worked on the same principle.

JOHN's '82 BIRTHDAY PARTY : I talked to John a day or so after his last birthday party (around June 20th) and he said about 60 people showed up for the now annual event. Bad wx in the LAX area kept quite a few from that area from coming, but I think he said 19 airplanes came up and 2 of them were Scooters. Several were from Northern CA, too. John was delighted with the day and to be with so many old friends again. I believe this one was his 70th birthday. At my current age of 65 that doesn't seem at all old.

FROM CHRIS PAST's LAST LETTER ALSO: Chris said he has the tooling for the #751 air box seal, that he has made many from, and he has offered it to John first for \$50 (since he doesn't plan to make more). If John doesn't want it someone of you might. The hot air intake is picked up via a shroud from the crossover exhaust just above. Chris also said to remind the troops that the access cover over #575 & #576 bulkheads was stressed and not to go too far afield in this respect.

As a final note for this issue, please be aware that as always our newsletter is presented as a clearing house for ideas and opinions only and anyone using these ideas or opinions does so at their own risk and discretion and no responsibility or liability is expressed or implied and is without recourse against anyone.

AVISO-  
NOTICE

AVISO-  
NOTICE

I plan to fly my T-18 up to OSH again in company with several other T-18s from this area, so hope to see all of you there.

Dick

#54 WILL HAVE SEVERAL PHOTO PAGES.







OSHKOSH '82 is now history and a pleasant memory to the T-18ers that made it there. We had one of the best turnouts of T-18s that we have had in recent years. We had 41 registered by Wednesday and I believe that no more came in after that. Here is a list of those that were registered:

| TAIL # | NAME OF OWNER    | CITY AND STATE          |
|--------|------------------|-------------------------|
| N78DF  | DONALD FRAZIER   | NORWALK, CA             |
| N8818  | JOE FORBES       | FRANKLIN PARK, IL       |
| N45381 | JACK HAGLE       | ROSWELL, GA             |
| N600HH | HOWARD HENDERSON | KIRKWOOD, MO            |
| N9008Z | STEVE HAWLEY     | VALENCIA, CA            |
| N679JB | ANGUS McDONALD   | SEFFNER, FLA            |
| N55P   | JACK HULL        | BLUEGRASS, IA           |
| CF-YEI | BOB AFFLECK      | HARROW, ONT., CANADA    |
| N18Z   | MICHAEL CHARLES  | NESBIT, MS              |
| N199MP | HANK BEAMER      | LOCKPORT, NY            |
| N57JH  | JOHN HARDY       | NATCHITOCHES, LA        |
| N4PV   | BUD VANDERBOS    | ROLLING MEADOWS, IL     |
| N139G  | ROBERT GRIFFITH  | HAMPSHIRE, IL           |
| N370G  | CHARLES SHUSTER  | PARK RIDGE, IL          |
| N8952  | EARL ODY         | SAN PEDRO, CA           |
| N3764C | GARY COPELAND    | WILLIAMSBURG, MI        |
| N2287C | HILLS JOHNSON    | AUBURN, IL              |
| N109K  | OLIVER SMITH     | DOWNEY, CA              |
| N49PW  | ROBERT HUDGINS   | FLUSHING, MI            |
| N2111  | ERNIE BACSANYI   | NORTHVILLE, MI          |
| N51863 | JOHN WALTON      | HOUSTON, TX             |
| N18GR  | GAR ROOT         | CARMICHAEL, CA          |
| NLLG3  | GARY GREEN       | SAN ANTONIO, TX         |
| N9379  | GEORGE LEIDER    | LAKEWOOD, CA            |
| N2NE   | NATE EASTMAN     | KIMBALL, NB             |
| N13P   | KEN POST         | RAPID CITY, SD          |
| N27DW  | DICK CAVIN       | DALLAS, TX              |
| N99KK  | KEN KNOWLES      | NORCO, CA               |
| N46806 | GLENN LAWLER     | AUBURN, AL              |
| N715C  | JACK BIGHAM      | ANDERSON, CA            |
| N5GL   | GAYLE LECOUNT    | GEORGETOWN, IL          |
| N2377  | ROBERT YOUNG     | OAKWOOD, IL             |
| N895B  | BAUER-STREATOR   | WINONA, MN              |
| N44LS  | LEE SKILLMAN     | PARKERSBURG, WV         |
| N8812  | DON THOMSEN      | NORTH HILLS, PA         |
| N18VP  | VERNON PEPPARD   | DALLAS, TX              |
| N12055 | ED BURKE         | PITTSBURGH, PA          |
| N3020  | CECIL WILLIAMS   | COOPER CITY, FL         |
| N49101 | GREG MCBRIDE     | RICHMOND, VA            |
| C-GRAF | ROBERT FROEBEL   | WEST HILL, ONT., CANADA |

We also had an excellent turnout for our annual dinner at Butch's Anchor Inn on Tuesday night, which was again emceed by Lee Skillman. That was at the same time that the terrific thunderstorm and downpour hit Wittman Field and when we came out after the dinner we were more than a little surprised to see all the water standing, etc. Several transient airplanes were blown over by what may have been a small twister, but none of the display airplanes were damaged.

I LEFT OFF TOM BROWN, SUMMERVILLE, S.C., N-2 FROM ABOVE LIST. I ALSO BELIEVE DEAN COCHRAN, BROOMFIELD, COLO, N11DC, WAS AGAIN THERE WITH HIS T-18. (OR WAS IT LAST YEAR?)

'82 T-18 FORUM: For some reason EAA HQ failed to designate a slot on the Forum schedule for T-18s, which upset quite a few people. When we complained about it we were given a Friday time in the U.L. area. At our Tuesday night dinner we announced that it would be held Wednesday afternoon at the open air auditorium in Ollie's Woods (just south of the antique area). This was a last minute makeshift arrangement and the attendance was a little poor, as might be expected, since we had very little time to pass the word. Hopefully next year we will have a Monday or Tuesday slot.

**BAD NEWS DEPARTMENT:** FRANCIS RICHARDSON, one of my long time very good friends and a very enthusiastic T-18er from its pin feather days in '62, died in a stall/spin accident in his T-18 on the first leg of his trip to Oshkosh. His oldest son, Danny, also died in the accident. He is survived by his wife and another son.

Circumstances of the accident, as related by an eye witness (a pilot and the son of the airport manager) at the Neosho, MO, airport: Francis had called in on Unicom and advised his intention of landing there for fuel. Weather was no factor, nor was fuel or engine stoppage. He entered a close left hand downwind at fairly high speed, but somewhat lower than normal pattern altitude (estimated 500' AGL). On his base leg turn he overshot the runway centerline (extended). To correct back to the proper approach line he made a very steep bank (in excess of 60°) at an altitude of not more than 200-300 ft. The airplane stalled in the turn and spun over the top, making two complete turns. Spin rotation was stopped just a few feet before it impacted in an almost vertical attitude. There was no fire. There was no fuselage damage aft of the cockpit.

His airplane (plan serial #1) had a standard fuselage, except for a modified canopy, with forward opening doors. The wing had the standard airfoil, but was the folding wing configuration. He had about 75 hours on the airplane and the engine and had had no engine or flight problems. This was Francis' 2nd T-18 and he had flown the first one over 300 hrs. when he lost it in what was either a departure stall or a violent little dust devil. Francis went with me when I flew my T-18 out to Calif. a couple of years back and I had him fly every other leg. On each one of his approaches and landings he had a pattern of overshooting final approach, at too low an altitude, with incorrect rudder and aileron inputs. I talked the matter over with him on the ground after each landing, pointing out the potential lethal results of even a slightly accelerated stall in the turn from base to final, as verified by hundreds of such fatal accidents in nearly every type of airplane ever made. His main problem was that he couldn't accurately project ahead in computing the angle of bank that was required and when to start turning base to final, to accommodate to the conditions of wind, altitude, drift, and speed. I suspect this was very probably the reason that he made this final turn so low, that possibly he felt he could better judge the situation at a lower altitude and closer in. This is a judgement decision that all of us have to learn by experience and really cannot be taught by an instructor. I always used to teach a new student to start the turn when the landing target spot was midway between the nose and wing tip (an angle of about 45°, more or less) and to start with a steeper bank angle, shallowing it out as required. This was a very mechanical method and in the beginning I even suggested a pre-selected bank angle to correspond to surface wind velocity. Most people rapidly learned to visualize the invisible track of the airplane ahead and their "computer" soon stored the necessary information for future

but with full deflection the down aileron will cause more drag than it increases lift. The increased effective camber will trigger flow separation and the aileron drag will tend to slow that wing up and speed up the high wing. Result? Left wing stalls and it will autorotate to the left. As that wing (1) moved backward the ball bank would show you the same thing as if you were holding left rudder. It would be on the far right side of the cage. In other words a skid, which in itself is a speed losing maneuver.

Now ask yourself what else might have happened as the airplane began to unbank? Remember when you were practicing steep turns and as you rolled out what happened to the nose? Unless you applied forward stick the nose would pitch up sharply as the wings shed their G load. If the airplane was already close to the stall angle of attack that little extra pitch up could do it. Right?

Now suppose a pilot is making a perfectly coordinated turn and the skid ball is in the center, but his entry airspeed for the turn was too low for his weight, the degree of bank, and the number of G's he has pulled for the particular angle of bank. In order to pull X no. of G's he has had to pull back on the stick and increase the angle of attack. If he exceeds the critical angle of attack the airplane will enter an accelerated stall (trying to force the wing to carry more load than it is capable of at that moment). Now...which way will the airplane spin?.. Clue: Go out and stall your airplane with one wing say 10° higher than the other and see which wing will fall at the moment of stall. If there no yaw at that moment it will fall off toward the high wing. Try it with 20°, then 30°, then 40° bank and see how much more rapidly it will roll as the bank increases. The answer to the above question is that, yes, the airplane will spin over the top in the direction of the high wing. Of course if you experiment with any of the above (which you probably did during your test period) common sense would dictate you be well above 3000 ft. AGL, be prepared to spin and recover promptly with throttle closed. Don't let your speed get out of hand on recovery, but be very gentle and don't horse out of the spin recovery into a high speed stall or bend the wings, etc. Also avoid the tendency to pick up the low wing with aileron.

One other thought on the subject: The SPAN loading of the T-18 is on the high side. This isn't too worthy of consideration until you increase the angle of attack, such as in a climb, a glide, or a turn, and then it hurts. As this angle of attack increases more and more lifting energy is siphoned off by the wing tip vortex. More of the high pressure air on the underside of the wing escapes towards the wing tips and the result is the same as if some giant had taken a pair of scissors and clipped off the outer few feet of each wing, and it loses a large amount of its potential lift. To compensate for the suddenly increased sink rate from this loss of lift the pilot either has to increase his speed (thus generating more new lift) or increase his angle of attack. Well, you know what also happens when you increase the angle of attack to get more lift. The drag also increases, so you are in an ever increasing condition where the airplane loses speed at a rapid rate.

I've heard new T-18 pilots comment on how puzzled they were that the T-18 would lose speed so rapidly in a steep\* mentally comparing it to other airplanes they had flown....particularly those with a much lower span loading. The subject of span loading doesn't often come up in the average bull session, so many pilots aren't really too well versed on the ifs and ands I guess. At any rate, be aware of the limitations as you start to enter a steep turn. If you don't have the airspeed you need

\* TURN

decision making and most of them soon learned what adjustments to the bank angle were necessary to fit the real time situation....But I also found that perhaps 10% of these people took much, much longer to really project ahead and a few of them were extremely deficient. I also noticed that these same sub-standard ones badly mis-handled rudder, aileron, and speed coordination in this final turn, even tho' their coordination was acceptable in level flight turns. To me this indicated they had one too many "balls to be juggled" at that time, thus overloading their computer. What has really surprised me over the years is that many experienced pilots carry those same bad habits right on. I've had experienced co-pilot on the airline that show a sub-standard ability to project ahead on entering the final approach course from base or downwind (in the airline business it's REALLY a no-no to overshoot final and have to make a bank in excess of 20°). In such cases I've often wondered whether the fault lies with incompetent or sloppy primary instructors or whether a certain per cent of pilots are genetically unable to handle multiple judgement calls in that segment of flight.

#### ANALYSIS - CONCLUSION

In any case the purpose of this discussion is not to be critical of Francis or anyone else, but to call attention to a potentially lethal situation for new pilots on the T-18 (and also for those that might tend to get a little careless, too). This can and does happen in any other type of airplane, but high performance airplanes like the T-18 have different characteristics than the run of the mill factory built. First of all the pre-stall buffet is either minimal or practically minimal in most of the T-18s I've flown and that's why John Thorp has recommended the installation of stall strips on the wing leading edge....to induce a more complete stall at the wing root before it spreads out towards the tips, thus sending more rough air back to hit the stabilator and warn the pilot. I've talked to builders that have tried them with widely varying results. Admittedly it takes trial and error to get them located perfectly, but don't get discouraged. Let's be aware that there is only one thing that ever stalls an airplane....excessive angle of attack...pulling the stick back too much for the conditions of the moment. Very rarely will we ever stall an airplane straight ahead on the final approach (unless it is flared too high). It's the accidental stall in a turn...the accelerated stall.... that's the killer. If the rudder or aileron control is being misused when the airplane is stalled in a turn the airplane will spin. The direction of the spin will depend on which wing stalls first. To avoid a spin it follows that we should not stall the airplane, but in order to have a trained reaction to avoid a spin out of the stall it follows that we should really know what causes one wing to stall first and trigger the auto-rotation. Give yourself an honest little quiz and see if you really know - or are you just guessing?

Let's take a hypothetical case: The airplane is in a steep left bank, turning from base to final. The pilot has let his speed decay in the turn and now he attempts to unbank, using aileron alone (or mostly aileron alone) and he has applied the opposite aileron control rapidly and very strongly. Since the airplane is now very close to the critical (stalling) angle of attack, which wing will now stall and which way will the airplane spin? What will his ball/bank indicator be telling him when he has applied full opposite aileron? I'm sure that 99% of you know the correct answers, but how many of you had to stop and think about it a few moments? Any one of us can get rusty, but that's one situation we should stay super-sharp on. In the case of the T-18 you remembered that there is a differential throw built in that causes the up aileron to move more than the down one

for a comfortable safety margin, don't be timid about getting the power in firmly. If you've waited a little too long to start your base/final turn and it's apparent you'll have to do something drastic to get back in the approach slot, why that's an excellent time to roll out and go around the pattern and do it right the next time. Besides, that's good PR if you give the ground bound troops a good low level fly-by in the process!

UPDATE ON BACK ISSUES OF THE NEWSLETTER: Those of you that have missed part or all of some back issues of newsletters #45 through #55 will be happy to know that there is no longer a problem. It has taken quite a lot of work to get all master copies updated and offset printing plates made, but now the job is done and in a few days I will have a complete set of 500 of each one of these back issues.

The actual printing and collating of these 10,000 sheets appeared to be an immediate impossibility up until a couple of weeks ago, when one of our local T-18ers, Vern Peppard, came to the rescue. I had counted on using our chapter offset press to print them, but it has been down for repair and parts replacement, so I turned to bids from a local printery for the job. The bill would have wiped out our treasury, so I began to think I'd simply have to pull the plug on the project and say, "I'm sorry fellows, but-----", when Vern came to the rescue. One of his businesses has an in house printing facility that serves all his various business interests and needless to say it's very busy at all times, but they are going to squeeze us in sometime in the next few days. The plant also has an automatic collator and this, too, will solve a major labor problem we've had in the past. Past issues have taken myself, my wife, and two granddaughters the better part of a day to collate, staple, put in the envelope, apply address labels, zip code bundle, etc., so you can see that doing ten newsletters would just about eat up two weeks (even if I could corral my granddaughters for that long, which I can't, as they now live in another town). All I can say is, "Vern, you're a lifesaver and I know I speak for all of you when I say we're deeply grateful for your offer".

If time permits I'll go back thru the stack of requests for back issues that I've filed and I'll mail them with this issue. I've always got a half dozen irons in the fire, so I may run out of time between now and then. If your requested back issues don't arrive with this issue I would appreciate it if you would send me a postcard requesting back issues X & X, etc (not a letter, please) and on Jan. 25th I'll put all back issues in the mail. That same day I'll mail you a postcard that will advise that X & X have been mailed, so if you don't receive them in 14 days go to your post office and make some waves. About 10% of our mailings are not delivered by the PO and this gets to be a BIG problem. Putting the NLs in the envelopes has helped some, but this is extra expense and work and adds up to a lot of unnecessary correspondence and telephone calls. With all the other activities I'm up to my eyeballs in, I simply can't keep up. Half the time I can't even answer the stamped & self addressed requests and for this I apologize, but I have to put first things first. Hopefully the situation will be easier now.

MORE ON BUILDING THE CONVERTIBLE WING: Recently I was talking to John Walton in Houston and we were discussing his progress on the CW he was building to replace the standard wing he's now flying with. He brought up a problem he'd encountered in aligning the 213 and 311 bell crank brackets for match drilling. I was on the way to California when I talked to John and when I got to Los Angeles I visited both Ken Knowles and Chris Fast and talked the problem over with them. Back home I had occasion to talk to John Kleber and he, too, had run up against this problem. The next few pages will identify the problem and present different ways to solve it.

## EXCERPTS FROM JOHN WALTON'S LETTER RE THE ALIGNMENT PROBLEM:

Dear Dick,

Enclosed are a few assembly pictures of the inner wing. This is a pretty obvious operation, so I didn't know what to take except a midway shot of the assembly. There is one operation, tho', which I think is important and I have a few pictures of it enclosed. Call it, for want of a better label, "AILERON CONTROL SYSTEM BELLCRANK ALIGNMENT".

The plans locate the aileron control bellcranks precisely. The bellcrank brackets have detailed hole locations and centers for the 1/4" (AN4) bell crank pivot bolt. Before proceeding with the final riveting of the inner wing and any assembly of the outer wing I feel it is wise to mock up the interface arrangement. The purpose of this is to assure oneself that the INNER and the OUTER bellcranks are located in such a way with respect to each other that they interface properly.

I found that when I clecoed my parts together that I did NOT quite have a concentric alignment at the pivots. After making a 1/8" x 1/4" bushing for each bellcrank pivot I could install the bellcranks and actually see the effects of this slightly misaligned condition. What did happen was that the bellcranks interfaced fairly well in the approximately middle 1/3rd of their arc, but at each extreme 1/3 they were either loose (play) or binding in such a manner that even with beefed up reinforcement of the rib that it could be sprung. Such a condition in a finished aircraft would set it up for a metal fatigue occurrence I would think.

Let me describe how I set up this bench test (so to speak): The inner wing was partially riveted, but with the top skin still clecoed. The outer wing spar and a dummy (or the real thing) rear spar fitting were bolted (pinned) in place. The inner rib of the outer wing was also clecoed in place and 2 triangles of .032" (measuring about 8 or 9 in. in each direction) were clecoed in place on both top and bottom (to act as the skins for this operation). Obviously these triangles were transfer punched from the actual wing skins, so that they would pick up around 8 rivet holes in each direction.

A 1/2" hole was made in the overhang of the top skin of the INNER wing (where the skin continues outboard of the outermost rib of the inner wing). This hole was just eyeball located to be about in line with expected projected center of the bellcrank pivots. The 1/2" size hole gives plenty of room for a drill bit down thru it.

I found that my outer wing centers were displaced about .050" from the inner. In addition, the two sets of fittings were too close together. There was virtually no clearance between the heads of the two bolts, and without correction (.110) the arms pushed each other in an AXIAL direction (I may have made a slight error in locating the fittings on the ribs ....working from (knowles) pre-formed ribs as I did, all of the reference dimensions have to be "backed" (?) in). In any event, I displaced my fittings slightly (.110) and replaced the 3/4 X 3/4" reinforcements which already had 1/8" holes. Unfortunately they were in the wrong locations. This was a simple correction to make, tho'....

The result of all this hassling was that, I finally got done with the right side (10 hrs.), my bellcranks interfaced snugly and smoothly thru-out their entire travel. Having "gone to school" on the right side, I was able to take my acquired knowledge and complete the left side in 2 hrs.

The most important thing is that when I put the outer wing together I will know exactly what is the relationship and behavior of these bellcranks. This would be very difficult to do with the outer wing also together. However, because I am a belt & suspenders type, I will very probably check it all out again before riveting down that upper skin on the outer panel...just to be sure.....(End of comment on his CW).

SEE JOHN KLEBER'S METHOD ON PG. 4A

Notes on T-18's 1550's at V.D.

FILED IN CW/AGE SYSTEM ALIGNMENT

JOHN WALTON'S SOLUTION TO BELLCRANK ALIGNMENT ON CW

Now here is JOHN KLEBER's approach to the same problem:

# CONVERTIBLE WING: DRILLING THE 213 and 311 BELLCRANK BRACKETS IN-LINE.

Several builders have expressed difficulty in drilling the 213 and 311 bellcrank brackets. In order to prevent binding of the bellcranks, these holes must be located very accurately and drilled perfectly in line.

One method of drilling these holes in-line is to drill through the top wing skin, and both sets of brackets, all in one operation. This method, however, leaves a  $\frac{1}{4}$ " (or  $\frac{1}{2}$ ") hole in the wing skins. There is another way of accurately drilling these brackets which eliminates the hole in the wing skin. It takes a little longer to do this process, but the end result is worth it.

The following process is accomplished AFTER the center wings and outer wings have been completely assembled (riveted) with the exception of the 310 and 210 ribs. These ribs must not be riveted in place yet!

1. Assemble rib 210 complete with 213-1 & -2 brackets.
2. Drill (on drill press) 213-1 & -2 bellcrank holes. To prevent brackets from flexing during drilling, fit a piece of wood snugly between brackets.
3. River 210 ribs in place to complete the center wing assembly..
4. Cleco 310 rib assembly in place in outer wing panel.
5. Now you need a  $\frac{1}{2}$ " dia. rod with a sharp point machined on the end. Total length  $2\frac{1}{2}$ ".
6. Place this  $\frac{1}{2}$ " rod in 210 bellcrank bracket holes, point facing up. Make sure rod can turn and move up and down freely in bracket holes.
7. Wrap about 6 feet of heavy thread around rod. Leave some extra thread extending forward.
8. Attach outer wing panel to center wing. PIN securely in place at ALL THREE POINTS.
9. Now you're ready to mark the hole center on the 311-2 bracket. Slide a table knife under the  $\frac{1}{2}$ " rod. Lift till point of rod touches 311-2 bracket. Now pull the string to spin the rod.
10. Detach outer wing panel. Remove 310 rib.
11. Center-punch 311-2 bracket where marked. Using a snug-fitting piece of wood between 311-1 & -2 brackets, drill (on drill press) bellcrank holes.
12. Install bellcranks. Pivots should now be perfectly aligned.
13. GOOD LUCK. ANY QUESTIONS CALL JOHN KLEBER 405-728-1650.  
(Pretty slick little idea for a rotating center punch, John)

**MORE ON THE 213 and 311 BELLCRANK ALIGNMENT PROBLEM:** I recently made a trip to California and while I was out there I visited with both Ken and Gerri Knowles and also with Chris and Wanda Fast. We went by Chino Airport, where Ken keeps his wide body, convertible wing T-18 and Ken showed me how he had handled the alignment problem. He had basically done the same thing as John Walton had, drilling the  $1\frac{1}{2}$ " holes in the skin overhang of the center wing, on both the top and the bottom skin. He recommends the procedure because of its simplicity and its contribution to accuracy.

When I went by Chris' house I got to inspect another CW he was in the process of building and sure enough, he, too, had done the same thing that Ken and John had done.

I think Lou Sunderland has now completed his folding wing, but I have not had a chance to check with him on how he handled this operation. How about the rest of you out there that have built the CW? How did YOU do it? Even if you also did the same thing, we'd appreciate it if you would drop us a note about it. In fact, it would be most interesting to know just how many of you have already built the folding wing or are in the process. The CW is a whole new ball game in several areas and we all need to know what problems have cropped up and how they have been taken care of.....so if you'd take pen in hand and run off some notes on your experiences, a lot of fellow builders out there will be very, very grateful. I have literally hundreds of letters on file that say in essence, "I couldn't have built the T-18 if I hadn't had the newsletters to refer to", so your experience, in combination with all the others, has become a very valuable thing. Please do your part. Remember there are a lot of people out there that have never had an occasion to learn some of the simplest things that you take for granted.

A majority of the T-18 builders and owners have told me that they do appreciate that putting out the newsletter is a big job and they have thanked both Lou and I for our efforts and both of us appreciate your thoughts in this respect, but the very best way to thank us is to show us your individual support by sending in a how-to-do article. If we don't continue to have a running flow of information the T-18 Newsletter will cease to function...at least as an advisory for builders. Probably we will eventually transition to a T-18 Owners Society, as we already have quite a few owners that were not the original builder and certainly the present percentage of these will increase in the future. Again, I ask that you make an effort to contribute SOMETHING soon (like now, before it slips your mind)!

**WING GAP COVER ON CW:** Chris Fast is using a different method of closing the gap between inner and outer wing skins on the new CW he is building. Plans call for a riveted assembly, consisting of two nose ribs and a narrow section of skin attached to them, with the skin overlapping both inner and outer wing skins, with the unit held on by a single screw thru the leading edge. Chris' method is the same as many have previously used on the standard wing, in which a strip of skin is wrapped from the trailing edge around the leading edge back to the trailing edge and is secured and tightened with a bolt/turnbuckle sort of set up. This strip also overlaps the inner and outer wing skins. Chris feels that while this method requires you get down underneath the wing to remove or install the gap cover and also takes a few seconds longer to remove or install it that it eliminates the somewhat tricky fitting of the skin overlap aft of the main spar (as per plans). Here is another one of those cases that you take your choice on how to do something. There are merits to both points of view. About all I can add would be the thought that while on a cross country and to share a buddie's hangar for the night dictated that you fold a wing or wings that the plans method would be a little less hassle.



TO NEW T-18 OWNERS: Even tho' you have bought your T-18 and didn't build it yourself, we'd like to hear from you, too. Here's why: There are always a number of people that buy their plans, build their airplane and fly it for a little while and sell it for one reason or another, but no one has ever heard from them since they first bought their plans. Even tho' the airplane has been inspected, annualled, and flown for years and a lot of hours, it may or may not contain modifications or construction errors that could potentially be expensive to correct..or perhaps even dangerous. Since FAA people and A & Ps that have looked at the airplane aren't REALLY knowledgeable about the T-18 design, it's essential that YOU should have a complete set of plans and newsletters and become very familiar with their contents. One of the most important things should know is whether the stabilator has been modified in accordance with Mr. Thorp's very strong recommendations. (A homebuilt designer cannot issue a mandatory directive to modify or inspect and repair some part that has any legal "teeth" to require conformance. He can only advise, request, recommend, or even plead with owners or builders to comply with his advice...nor can the FAA require such compliance). Mr. Thorp has emphatically stated that ALL T-18 stabilators should have the complete modification for safety, regardless of the power plant or cruising speed. Do you know how to inspect yours for pre-flight? What about systems? Have you a wiring diagram of your electrical system? Have you ever traced each and every wire in it or gone over it in detail with a competent A & P? What about the fuel system? And the exhaust system, including carb and cabin heat muffs? How about the engine control system? And flight control systems? Or the induction system? Has your pitot/static system been checked out...and have you verified your indicated airspeed by accurate check over a measured course? What about your seat belts and shoulder harnesses, canopy fit and condition? Don't forget your engine baffles either. What prop do you have? Has it been resonance tested and documented? Some models are VERY dangerous. Have you REALLY examined your brake system in detail? Are they adequate for hard, emergency braking? Have you had the wheels and brakes off to dye check them for cracks, clean and re-grease wheel bearings, etc? How does it fly? Have you checked flap and aileron rigging? Have your engine instruments been bench checked and calibrated?

As you can see, that's quite a list, but be aware that serious incidents and accidents have been documented for each and every one of the items listed above. All these and many other items have been discussed in past newsletters.

Some of the new owners have taken older "plain Jane" T-18s and have refurbished them with new paint and upholstery, making them objects of real beauty. Some have done extensive modification or replacement of components and systems, changed power plants, etc. Some of these things are needed improvements, but some could be ill-advised, too. In any case it would be of value if you'd sit down and list all the specs and performance figures on your airplane, the changes you've made, your experiences and impressions of how it flies, how it's equipped, etc., who you bought it from, when it was built, etc. Some of the new owners have made some significant performance gains by cleaning up a series of little things and certainly these items and the performance gains from each would be of general interest...so you see, you can be a contributor, too. Just don't put it off, tho', for if you're like I am you'll forget it if u do.

So, PLEASE....LET'S HEAR FROM YOU SOON

The following report from STEVE HAWLEY is very well done and we fully appreciate the time and effort he made to present such a fine example of the sort of thing we need more of. Steve has always been exceptionally generous in passing on his building experiences, etc.

Dick Cavin  
10529 Somerton  
Dallas, Texas 75229

Dear Dick,

As I promised at Oshkosh, here is some information on the induction system on N9008Z.

During a visit to John Thorps shop in early 1972, I saw several all metal cowelings hanging from the rafters. I asked John if any were for sale, they were and I bought one. I built a plywood box for it and stored it away. Later a Lycoming O-360-A3A was purchased and installed. The MA-4-5 carburetor was installed and I was dismayed at the thought of cutting up my beautiful coweling. In desperation I called Marvel-Schebler and asked if there were any alternatives to the MA-4-5. They said not for that particular engine but they had produced a horizontal carburetor for another 180 HP engine. It was called an HA-6 and used on various Grumman American and Beechcraft airplanes. An aircraft salvage company was contacted and a horizontal carburetor ordered. I suppose the time spent fitting the thing and making it work added several months to the project but what is two months in seven years!? Enclosed are some drawings with notes that will probably answer some questions.

The elbow was purchased from an oilwell supply company and is a 1/2" wall short radius 90°, 2 1/2" ID mild steel gas pipe elbow. The two bosses welded on each end are .125, 4130 plate. They are arc welded, continuous on the inside and between the attachment holes on the outside. The short adapter between the carb. and the air box is a piece of mild steel exhaust pipe with .90 x 4130 plate gas welded. The air box itself is fabricated from .090 x 6061T3 plate and connected at the corners with 3/4 x 3/4 x 1/16 2024T4 angle. This method provides a nearly perfectly square box with sharp 90° internal corners. Ball bearing assemblies are rivited to the sides and carry the split shaft with the butterfly plate rivited solid. A connected box was bent up out of .025 2024T3 and rivited on to provide an inlet at the bottom for the hot air. An assembly to hold the dry air filter was fabricated out of mild steel and installed on the top. An aluminum "can" of .025 2024T3 was rolled and the edges rivited to provide an air cleaner plenum. The top two pieces were layed up with fiber glass using blocks of styrofoam for a mold. The path of the air is very smooth and I doubt very much if there is any significant efficiency loss due to the induction system. The entire system has been 100% trouble free to date (325 hrs.). I am turning a fixed pitch metal prop. (68" x 86"). This system precludes the use of a constant speed because the air cleaner is mounted directly in the way of where the prop governor should mount in the accessory case. The system is very good for checking and changing air filter elements. Four 1/2" cap screws removed between the carb. and the adapter tube allows the entire air box and filter assembly to drop out. It is about a 30 minute job to change the filter which I do every 100 hrs.

SPECIALIZED INDUCTION SYSTEM ON O-360-A3A  
BY STEVE HAWLEY

TO NEW T-18 OWNERS, NON-BUILDERS

## STEVE HAWLEY (CONT'D)

An interesting point is that the HA-6 carb is a float type carb, but still has to have about 2.5 psi to run above 1000 rpm. Therefore a mechanical fuel pump with an electric boost pump as backup is installed. Sure am glad I installed the electric backup pump. The mechanical pump failed on the return trip from Oshkosh. A new one was installed in Albuquerque with no further problems. (It sure does get quiet when she quits.)

Some information you might find interesting. The airplane was started in Nov. 1972 in Crescent City California. During the next 7 years I and my family (The T-18 was considered part of the family) moved 6 times in 4 states. They are from Crescent City to:

1. San Jose CA
2. Lompoc CA
3. Valencia CA
4. Buena Vista CO
5. Aberdeen Mississippi
6. Skiatook, Oklahoma

The airplane was finally flown in Skiatook, OK. on Sept. 1, 1979. I flew it myself and had to hold about 10 - 12 lb forward pressure on the stick even with full down trim rolled in. After about 30 minutes both arms were tired so I landed and figured out the problem. The angle on the 3/8" trim arm was changed and it has flown hands off ever since.

On long cross country trips I cruise at 2250 rpm, 175 mph (true) and burn 8.0 gal/hr. With that kind of performance and economy, I don't figure a constant speed prop would help much.

My wife and I really enjoy the "long legs" the T-18" gives us.

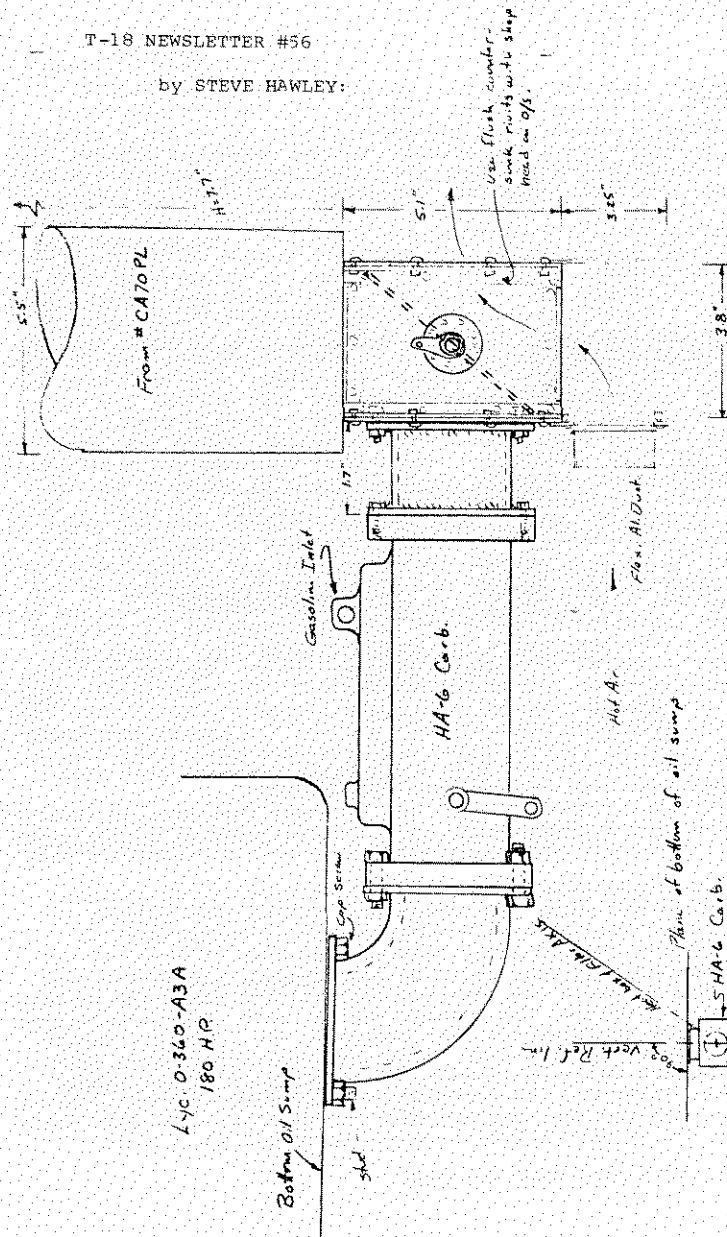
Very Truly Yours,

*Steve Hawley*  
Steve Hawley  
2515B Ave. Ignacio  
Valencia, CA 91355

Thanks again, Steve, for the above. We really appreciate it!

(See drawing of Steve's system on page 6B)

by STEVE HAWLEY:



Induction System  
T-18 N90082  
Scale 1" = 3" ±  
S. Hawley

Lay Out Reference

Here's still another excellent report from TOM KERNS, who is an engineer for Bell Helicopter here and now has another excellent T-18:

Tom Kerns

October 28, 1982  
4218 Ticino Valley Dr.  
Arlington, Texas 76016

Dick Gavin  
10529 Somerton  
Dallas Texas

Dear Dick;

Thank you for your support and advice on my first flight Sept. 3. It was a great comfort to have had the opportunity to fly your airplane before testing mine, and to discuss the T-18's flying characteristics.

I will not send a performance summary yet as I have only begun measuring and calibrating. My airplane is a "stock" T-18 with standard wing, canopy, gear length, and fuselage. My cowl is fiberglass from Ken Knowles, the engine is an O-290 D-2, and I swing a Cassidy Pacesetter 200 68 X 63. Empty weight without Paint or upholstery is 845 pounds. I made numerous detail changes in the airplane with an eye on cruise performance, and I am pleased!

Enclosed are write ups of some of my construction details that would be of use to other builders, with the understanding that it is the builders responsibility to determine the impact on safety for his particular airplane if these construction details are incorporated.

Wing Alignment I have seen some beautifully built T-18's with awful roll trim problems. Two airplanes in particular had wings that were aligned and drilled in beautiful steel jigs, yet they do not fly straight. I believe the distortion is due to inadequate support during the riveting process.

To eliminate wing twist in my airplane I built a jig table that held the wings in alignment during both the drilling and riveting phases. The jig table was built from a 4' by 4' piece of 3/4" particle board braced diagonally underneath with well seasoned 2X6 fir. The braces were carefully planed true to assure a flat table surface. The wing panels rest on the table with C-clamps securing the outer edges of the lower skin to the table. A 4 foot spanwise spacer block of appropriate height and taper supports the wing below the main spar, and a taller spanwise spacer supports the leading edge about 5 inches aft of the nose.

The key to this table is drilling 1.5" diameter holes in the table top at positions corresponding to every second or third rivet in the lower wing surface. The holes allow clearance for clecos during the initial alignment, and during the riveting process the holes allow driving of every second or third rivet in each bay with the wing clamped down flat. After driving every third rivet in a bay, the wing may be lifted off the table and remaining rivets for that bay are driven without fear of a shift in alignment. Clamp the wing back on the jig and rivet the next bay, remove to drive remaining rivets, etc.

WING ALIGNMENT METHOD

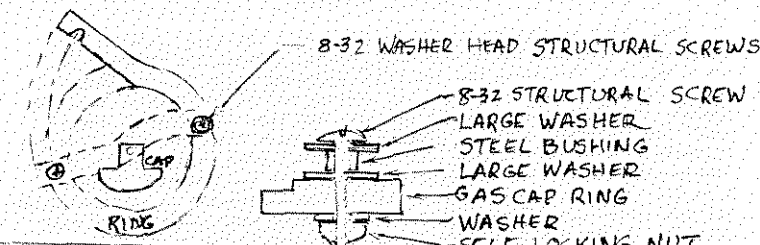
## TOM KERNS (CONT'D)

If the table and spacers are built true, a wing panel clamped to them is sure to be straight.

I built my wings with matched hole tooling except that I did not drill the holes from the upper wing skins into the main and rear spars. This left the wings free to twist after being clecoed together. The wings were clecoed, clamped to the table for alignment, and the spar holes were drilled thru.

Gas Cap Retention The expanding rubber gas caps most of us use can be blown out by overpressure in a relatively minor impact. Positive mechanical retention is required and the lightweight gas cap doors on most airplanes are not adequate load bearing structures.

My solution was to install a swinging arm of 0.10" X 5/8" 2024 t-3 supported by 8-32 structural screws tapped into the gas cap outer ring. The arm pivots on one screw and slides under the head of the opposite screw, locking the cap in place. A block attached to the inner face of the gas cap door drops down behind the arm to prevent the arm from swinging open in flight. The block also insures that the swinging arm must be latched before the gas cap door can be closed.



GAS CAP RETENTION

OIL PRESSURE WARNING

Oil Pressure Warning I added an oil pressure warning light to get my attention if the oil pressure should sag, and realized the added benefit that if I leave the airplane without turning my master switch off, the oil pressure light glows as a reminder. Standard automotive oil pressure switches are 1/8" pipe thread and trigger at about 10 PSI. I installed one at the forward top end of my engine case by removing the 1/8" pipe thread plug which closes an oil capillary access hole used in the manufacture of the engine. I ran 12 volts from a circuit breaker to the warning light, and from the light to the sensor.

COWL MOD  
BRAKE LINES

Cowl removal Removal of the standard T-18 lower cowl can be difficult because of the need to slide forward to clear the landing gear cuffs before dropping downward. I solved this problem by sawing off the aft 6" of my lower cowl and inserting a 6" metal extension on the lower fuselage with 6-32 screws. The cowl attaches to this extension with camlocks.

Brake Lines When I priced the Aeroquip lines and fittings to plumb my brake system, I felt a strong temptation to sell my airplane as it sat. There is an alternative! Followers of Burt Rutan have been using 3/16" Nylaflo plastic tubing with the associated brass fittings to plumb their brakes. I installed it in my airplane and have not had any trouble in 16 hours of taxi and flight testing with OAT as high as 105 degrees.

## TOM KORNIS (CONT'D)

TO hook up my brakes with a remote reservoir, I used 8 90 deg. elbows, 6 straight connectors, an AN917-1D tee to split the reservoir supply to two systems, two AN916-1D elbows for thru-firewall fittings, and about 15 feet of 3/16" Nylaflo tubing. My 1982 Aircraft Spruce & Specialty catalog lists this at \$33.00.

I made thru-firewall fittings by riveting a .090" aluminum plate 1.0" in diameter to the firewall. A hole is drilled in the center of the plate, threaded with a 1/8" pipe thread tap, and a 90 degree Nylaflo elbow is screwed into the tapped hole. Enough threads extend through the firewall to pick up an AN916 elbow or an AN917 tee.

**Fuel Lines** I spent several hours trying to find a satisfactory layout for my fuel system, so here is a description to save someone else the trouble. I used Aeroquip 601-6 lines and 816-6D fittings for my system. Both lines forward of the firewall are covered with Aeroquip AE102-12 fire sleeves using Tinnerman A3122-10-1J (NAS 397-10) clamp at each end. I use a standard metal bowl gascolator. My tank outlet is a welded AN816 flange with a 3" brass finger filter screwed into it. A AN822-90 degree elbow hooks to a line approximately 11.5" long which runs forward and to the right, arcing back to the left and joining a 90 degree elbow which screws into the top of the fuel valve. The arc gives some extra length so that a shifting of structure in a crash will not strain the fuel line fittings.

The fuel valve is mounted on the firewall with the inlet pointed up, valve shaft aft, and the outlet face pressed against the firewall (W.L. 27.7, BL -1.5). The valve has two 3/16" mounting holes in its flange. I bolted the valve to the firewall by passing AN3 bolts forward thru the flange, thru appropriate length spacers, and thru the firewall and a .010" reinforcement plate. A AN822 elbow threads into the valve from the forward side of the firewall and a 15" fuel line runs from the elbow toward the right of the airplane, doubling back and downward to mate a AN-816 nipple at the gascolator inlet. The gascolator is centered below the fuel valve axis and strapped to the landing gear cross member with two Adell clamps and an appropriate steel bracket. The gascolator outlet has a AN-822 90 degree elbow with a line about 11.3" long connecting to a 90 degree elbow at the carburetor. All lines and fittings drain downward to the gascolator.

How do you reach the fuel valve? Extend it 2 feet and mount below the instrument panel center. A Sears Craftsman 1/4" drive universal socket will slip nicely onto the 1/4" square shaft of the fuel valve. Drill a 1/8" hole thru the universal and valve shaft for a roll pin or cotter key to keep it from slipping off. Slip the socket end of the universal inside a piece of 1/2" X .032" wall tube left over from building the aileron controls. Drill thru the tube and universal for two 1/8" roll pins to hold the socket and tube together. I ran the tube to a bracket on the bottom of my instrument panel and installed a handle cut from 1/4" plate stock. The handle is horizontal and unobtrusive with the fuel on, and hangs down vertically for the "off" position.

BRAKE SYSTEM

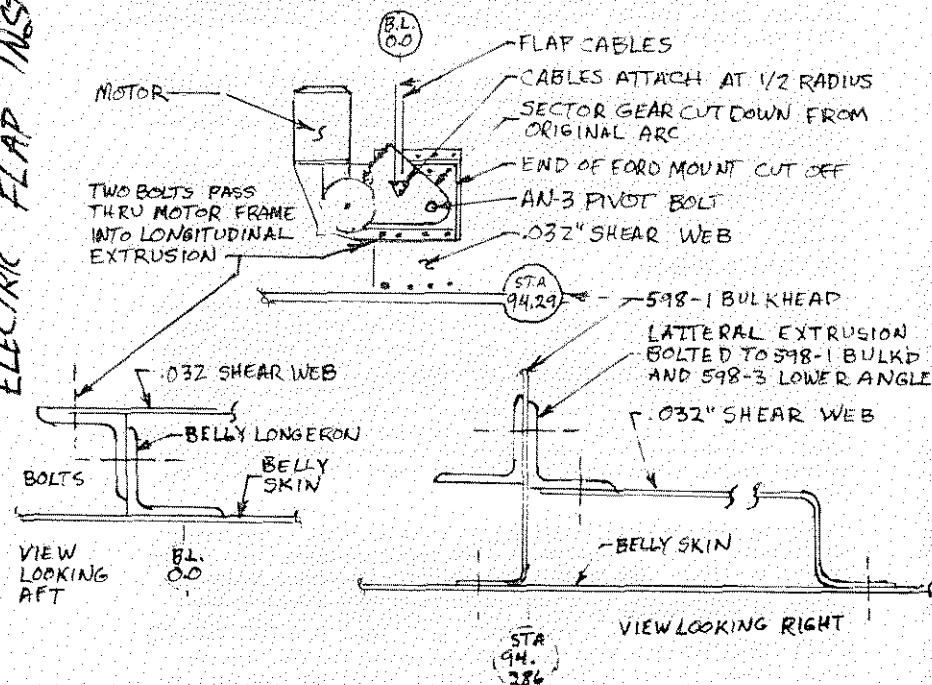
FUEL LINES

FUEL VALVE

FUEL VALVE EXTENSION

**Electric flaps** My airplane has electric flaps powered by a Ford window operating mechanism (similar to Bob Dial's). My mechanism is from a 1976 full size Ford, newer motors are probably similar. Flap travel from 0 degrees to 30 degrees takes 2 seconds at 110 MPH. The attached sketch shows actuator geometry. Attaching the flap cables at 1/2 of the sector gear radius provides the motor with a 2 to 1 mechanical advantage and causes the sector gear pivot to share 1/2 of the flight loads. My sector gear retains 19 teeth (20 notches) to provide 30 degrees flap travel. No limit switches are required, I let the motor stall when it runs out of sector gear teeth just as in the automotive installation. I replaced the self tapping screws with aircraft bolts, and I modified the peened sector gear pivot by drilling it for a 3/16" AN bolt. What remained of the original pivot was retained as a bushing. The motor lies aft of frame 598 on a horizontal .032" shear web which is supported by two 3/4 X 3/4 X .062" extrusions. One extrusion runs fore and aft, bolted to the center belly longeron and the other bolts to the aft face of the bulkhead which holds the wing aft attach fittings (bolted thru to the existing lateral extrusion). The center aft pulley brackets are mounted at a shallower angle to line up with the flap motor.

ELECTRIC FLAP INSTALLATION



Thanks for your very thorough and excellent descriptions.

THANKS A MILLION, TOM, THESE FLAPS MAKE IT EASIER FOR THE NEXT GUY



TRIM SYSTEM CHECK BEFORE FIRST FLIGHT

By Lu Sunderland

Rigging checks should be made on every T-18 before its first test flight.

Today I made the first test flight on Jim Hockenbrock's O290-D powered T-18 at Lewistown, PA., my childhood hometown. Before the first flight I did some taxi tests and short lift-offs. Everything felt quite good including the trim stick forces so I took it up to 3000 feet and checked it out under cruise and high speed conditions. Everything was quite satisfactory, the engine ran well and the aileron trim had sufficient range to trim it in roll. The pitch trim however, ran out of travel and it took considerable forward stick pressure at full throttle.

After landing we put a bubble protractor on the horizontal tail and discovered that with the pitch trim at neutral and with the horizontal tail tab perfectly aligned with the horizontal tail chord line, it had an angle of incidence with WL42 of 10 degrees, trailing edge up. According to the drawing, this angle should be only five degrees trailing edge up. We removed the horizontal tail tab arms, heated them with a torch and removed some of the bend to make the system agree with the drawing. Then on the next flight the pitch trim had adequate travel.

Here is the procedure for checking the rigging of the T-18 trim system:

1. Turn the pitch trim wheel in a nose down direction until it hits the stop. Then put a mark on the trim wheel and turn it in the opposite direction, counting the number of revolutions until it hits the opposite stop. According to the print, the travel should be five revolutions if there is a 1:1 gear ratio between the wheel and the jack screw.
2. Divide the total turns by 2 and reverse the wheel this amount, thus setting the system at neutral.
3. Align the horizontal tail tab with the trailing edge of the tail tip.
4. With the tail wheel elevated to make the WL42 level, using a bubble protractor, measure the angle the horizontal tail chord line makes with the horizontal. This angle should be five degrees trailing edge up. If it is not possible to determine the chord line of the horizontal tail from the mold line on the tail tip, cut out a template from hard cardboard or plywood which will fit over the tail and establish a reference line.

The rigging of ailerons and flaps should also be checked before a first flight although their positioning mainly affects drag performance.

TRIM SYSTEM CHECK PROCEDURE

TRIM SYSTEM CHECK BEFORE FIRST FLIGHT (cont'd)

-2-

Have someone hold the trailing edge of one aileron in alignment with the wing tip while you check the opposite aileron for alignment. Adjust push rods until all trailing edges are in alignment and check that the stick is in the verticle position in roll. Use a carpenter's level or a bubble protractor for this check. Make certain that the fuselage is in a level position before any adjustments are made.

The bottom surface of the flaps should make a straight line with the bottom surface of the aft portion of the wing. It is quite common for builders to have a problem with flap alignment because of flap leading edge interference with the wing rear spar. This is due to the difficulty in forming the flap skin leading edge radius exactly according to the drawing. That is why I recommended in past newsletters that the final drilling of flap pivot holes in the horns be done after flap and wing assembly. If the flap trailing edge needs to be raised for proper alignment after the pivot holes have been drilled, a small amount can be gained by massaging the flap leading edge with a mallet, especially where it might interfere with rivet heads.

The main disadvantage of flying with drooped flaps is that it adds drag.

TRIM SYSTEM CHECK

OIL COOLING

(By Lu Sunderland)

Jim Hockenbrock's T-18 is equipped with a large size Corvair oil cooler in the nose bowl under the left front cylinder. Today was rather warm with the temperature about 80 degrees. On a climb to 3000 feet, the oil temperature would rapidly climb to red line of 250 degrees F. Flow through the cooler was regulated by a .090 inch orifice in the oil line. When I first flew my T-18 with the same oil cooler arrangement, I also had a cooling problem until I drilled the orifice out to a .125 inch diameter. Now I have no cooling problems. The oil temperature rarely goes over 200 degrees F. The oil pressure on my GPU engine never falls below safe operating limits with the full flow cooling.

OIL COOLING

We all owe Lou a huge debt of gratitude for his years of outstanding work on the T-18 newsletter and tech articles in Sport Aviation. Thanks again, Lou, and also thanks for your efforts in the Christian education field, too. We DO appreciate ALL the things you have done for your fellow man!

The following pages are from a letter from John Kleber and with this and his previous N.L. contributions it's obvious we owe John our most sincere thanks and praise for his time and effort expended in our behalf. As you might suspect, his workmanship is as meticulous as his reports.

September 9, 1981

Dear Dick,

Enclosed please find two of the three articles I said I would send you. The third article, the one on forming the 2 inch radius on the flaps, is not yet completed. Ken Knowles is sending me some flap test strips so I can provide builders with procedures specifying exact figures and dimensions. I will complete the article as soon as I receive the test strips---hopefully soon enough to make the next newsletter. (Not in time for #56, but we'll really be looking forward to it in #57. That's a tough subject. Ed.)

Please include the following add in the newsletter:

T-18C Convertible Wing FOR SALE. New airfoil. All parts and interior chromated. Removeable Shabel wing tips. Unpainted. \$3,950. Call John Kleber, Days: 1-405-686-2428 or Nights: 1-405-728-1650.

(fits standard fuselage)

Reference our phone conversation on the price of building a folding wing---checking the latest Ken Knowles catalog it takes about \$3,400 to complete the T-18C wing including tips, hardware, and aileron control system. This would make my wing a good deal for someone wanting to speed up their project---and being just \$500 over cost, might save a builder some money in the long run.

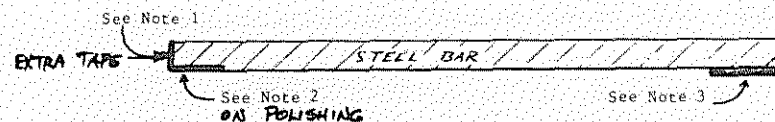
Looking forward to seeing you October 2. Will call you closer to that time to make final arrangements.

Sincerely,

John Kleber

A K.I.S.S. IDEA: by John Kleber

SIMPLE BUCKING BAR: Here's how to turn your wife (if she's willing) or a friend into an expert rivet bucker in just 5 minutes. The secret is in the bar, made from 3/4" X 2" cold rolled steel. Mine is 15 1/2" long and here's how it looks:



- Note: 1. Tape the entire bar with duct tape to prevent scratching your aluminum parts. Put extra tape on the front end of the bar where most contact will occur.
2. Remove the first 3/4" of tape from bottom of bar. Polish a smooth face, 3/4" X 2" on bottom front of bar to set rivets. The smoother the better.
3. Corrugated cardboard (about 3/16" total thickness) is taped to bottom aft end of bar.

Now here's how it works: Workpiece is supported horizontally on work table. Holes to be riveted extend off the edge of the table. Bucking bar is positioned perpendicular to the rib or beam to be riveted. The polished face is positioned over a rivet hole with the padded end of the bar resting on the skin. Since the bar supports itself squarely over the rivet, the bucker's job consists merely of applying slight downward pressure and holding the bar from sliding sideways or backwards. The rivet is then inserted up into the hole and driven. Thus, the riveter has his rivet gun and PSI's working for him, and the bucker has gravity helping him. This results in nicely formed rivet shop heads, less skin deforming from the rivet set, rapid progress, less risk of riveting accidents (bar slipping off rivet, or bar being dropped on skin), and a bucker who will not get a sore arm.

I use this bar to buck the following items: all interior ribs and beams to wings, rudder, flaps, ailerons, horizontal tail, and fin. Try it and see how easy riveting can be even in those tight spots.

This looks like a real gem of a shop tip, gents. Take particular note that it makes a pretty good rivet bucker out of an unskilled one. Also note that the one driving the rivets is sitting down on the floor, with his rivet gun pointed straight up. (That's the reason for extending the workpiece out over the edge of the work bench). The bucking bar size isn't cast in stone. The idea is to have enough weight operating on the end of an arm to give enough hammering action to upset the rivet head.

COMMENTS SOLICITED FROM USERS

ON WING FOR SALE

BUCKING BAR (SUPER TIP)

(WING NOW FLYING)

Please note the following: For some of you that can't find the time to build on your T-18, John is offering his services building a most difficult part at a modest price for his labor.

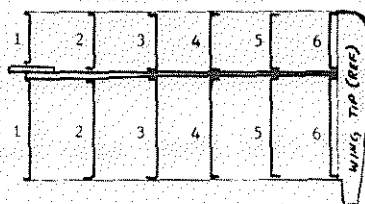
T-18 Rudder Assemblies. Complete and ready to install. All interior parts chromated. High quality workmanship. \$210.00. Order yours today and save time on your project. Write or call: John Kleber, 11209 St. Charles Ave., Oklahoma City, OK 73132. 405-728-1650.

● Suggested Riveting Sequence: T-18C Outer Wing Panels: by John Kleber

1. Cleco the following items in place: inner & outer skins, nose ribs 1, 3, 4, & 6, main beam (314-1), and rear beam (314-2).
2. Check for zero twist.
3. Rivet main beam full length, top and bottom, less rib attach holes.
4. Uncleco and remove rear beam.
5. Insert rear ribs 3 & 4 and cleco to bottom skin only.
6. Reinsert rear beam. Cleco in place to bottom skin only. Rivet full length bottom only, less rib attach holes.
7. Cleco rear ribs 3 & 4 and rear beam to top skin.
8. Check for zero twist.
9. Rivet rear ribs 3 & 4 to top and bottom skins and rear beam.
10. Remove nose ribs 1 & 6.
11. Rivet nose ribs 3 & 4 complete. Don't forget rivets through main beam to rear ribs.
12. Cleco in place nose and rear ribs 2 & 5. Rivet completely.
13. Cleco in place nose and rear ribs 1 & 6. Rivet completely.
14. Rivet top skin to rear beam.

NOTES: 1. Rib numbering system used in above sequence correlates only to below drawing.  
 2. All rib and beam sub-assemblies must be completed before beginning this riveting sequence.  
 3. Installation of any electrical cables and/or pitot/static lines must be incorporated into the above sequence.

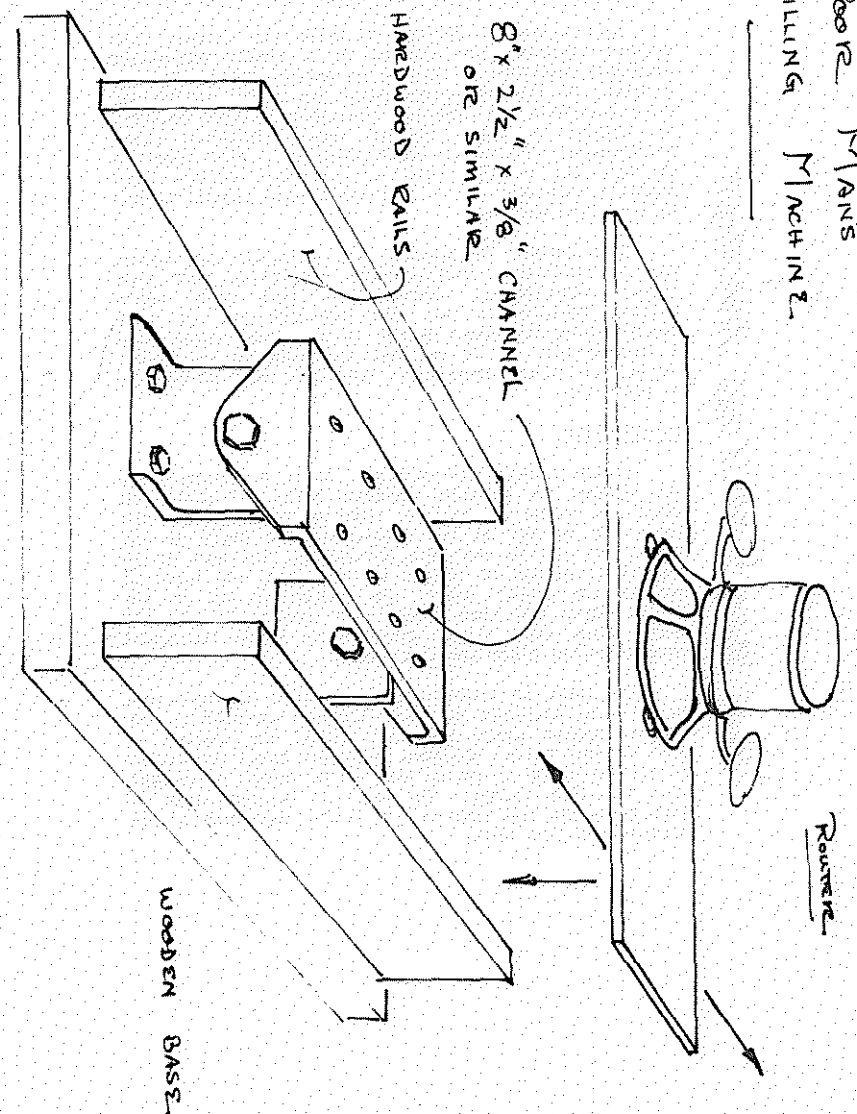
RIGHT WING PANEL



END-

FROM PETE BECK

(SEE WRITEUP PAGES 12A & 12B)



DOOR PLANS  
MILLING MACHINE

ROUTING

The following is from Pete Beck, 8717 Queen Elizabeth Blvd., Annadale, VA.  
22003, who has N102PB back in the air again after extensive mods:

#### THE POOR MAN'S MILLING MACHINE

Last winter I decided to build the Cricket from scratch. Because the Cricket is a finely engineered airplane, designed in France to metric specifications, a number of aluminum plate parts are either called out at a thickness not commonly available in this country, or require a flat, shallow taper. Reducing plate thicknesses, cutting an angle shim, or a flat taper is no task for a file, even if you have triceps like Popeye's, and most of us just can't gain regular access to a milling machine.

Jack Barbour of Hampton, VA, a friend long famous for his precision craftsmanship supporting NASA wind tunnel experiments, demonstrated this poor man's milling machine to me. The business end of this build-it-in-a-few-hours device is a common router with a carbide bit. It is suitable for aluminum and brass, as well as other machineable materials such as micarta or phenolics.

#### CONSTRUCTION

Figure 1 shows the machine. It is a tilting table set between two parallel hardwood rails. A board, to which the router is mounted, rides on these rails. The table can be set at any angle, and the depth of the router bit can be set very accurately. The work to be tapered or planed is clamped to the table, the table is set to the proper angle, the router is set to the proper depth and then passed back and forth over the work, using only finger pressure to guide the board mounted router along the side rails.

The table is constructed of a piece of eight inch or so wide aluminum or steel channel, mounted to two support angles using two 3/8" bolts. The channel is 3/8" or more thick. Threaded holes are bored and tapped in the table top to permit work to be dogged or clamped with bolt-down clamps. The table is mounted about an inch below the top edge of the rails, depending on the thickness of your work.

#### USE

The table is set with a protractor or other means to the angle required by the work.

The carbide router bit should be used. It should be set deeper and deeper with successive cuts until the piece is the proper thickness. Single cuts should not exceed .030". Simply guide the router assembly resting on the parallel rails with your fingers, making successive passes over the work, like an end mill, until the desired area has been planed. This does not require extreme pressure or force, since the carbide bit does all the work. As long as the cuts are shallow, the bit will not grab.

Jack maintains that any aluminum can be milled in this way. He claims that he has even shaved the heads of steel hold-down screws occasionally, and the bit seems to take it in stride. He doesn't feel though, that he would want to mill whole pieces of steel in this way. 2024 and 7075 aluminum alloys mill beautifully and draw-file to a nice finish. If you are cutting 6061 aluminum, use tallow on the bit to avoid overheating and spalling the metal.

If you have a router, this is truly an inexpensive and highly effective way to shape some of those odd-ball plate pieces.

-end-

Thanks, Pete, for the info and the drawing. Looks like a very simple and efficient tool that would be very useful.

Incidentally, Jack Barbour, that Pete mentioned has built three T-18 airframes that are essentially complete (hullwise), but lack engines, instruments, etc. Pete says his workmanship is of the highest quality, too. Jack has two of the airframes for sale and they are priced very modestly. This might be just what one of you guys in the DC area might want. I don't have further details or Jack's address, but if you are interested you could write to Jack ~~aka Pete~~ and he will forward to him, or you could call Pete at (703) 578-0484 for Jack's no. (I believe both airframes are "standard", as per plans).

JACK BARBOUR'S ADDRESS: 1659 OLD BUCKROE RD, HAMPTON, VA. 23664

Pete also is preparing a most excellent article on props that will soon be available.

Like Pete, I, too, succumbed to the lure of the little Cri-Cri and have one of them going together. Like the T-18, it's a finely engineered bird and the plans (in metric) are superb. M. Colombar, the designer, is an engineer for Aerospatiale and worked on the Concorde. (He doesn't use the xyz system, tho').

I THINK THE AIRFRAMES ABOVE PRICED ABOUT \$7000-\$8000 RANGE

POOR MAN'S MILLING MACHINE

T-18s  
FOR  
SALE

FUEL PUMP PROBLEMS ON INJECTED ENGINE: The following letter is from  
EARL ODY, 28903 Gunter Rd., San Pedro, CA, 90732

Dear Dick, I remember that you were particularly interested in the fuel problems in my T-18 that led to my engine out landing at Gary, Ind. airport. Since several people have expressed an interest, I have written a commentary on the incident, had it duplicated, and am mailing a copy to you.

I really do appreciate your interest and concern, Dick- not only the incident in which I was involved in, but over all T-18s and all pilots.

I am enclosing a contribution to the T-18 Newsletter fund. Keep up the good work, Dick! Best wishes, Earl Ody. Commentary follows:

Thorp T-18, N8952 has been flying for 11 years and 1500 hours and is equipped with TWO Weldon Electric Fuel Pumps in parallel with each other and both in series with the engine driven fuel pump. The engine is an IO-320, which requires 16-26 lbs./in. sq. fuel pressure. Ideally it should be 21-25 lbs./sq. in. (the engine will stall at 13 lbs./sq. in.). I have always flown the airplane with one of the electric pumps on AT ALL TIMES, since the engine driven pump would NOT maintain sufficient fuel pressure.

It should be noted that the Weldon Electric fuel pumps are approved for continuous duty and whether or not they are free flow bypass pumps is optional. BOTH of my pumps were of the by-pass type.

During our trip East in July, August, 1982, both electric pumps gave out at different times. On Sunday, July 25, we replaced the two pumps with a rebuilt Weldon electric pump in Cedar Rapids, IA. This electric pump was placed in series with the engine driven pump. Five days later we suffered a loss of fuel pressure over Lake Michigan, the engine stopped, and we glided to a landing at Gary, IN, airport. (Whew ! ) While in Gary we had a new engine driven fuel pump installed and a rebuilt Weldon electric fuel pump installed. At this point we installed the single electric pump in PARALLEL with the engine pump and found that the engine driven pump would maintain sufficient pressure for flight and the electric pump would be needed only for starting, take-off, and landing.

We departed Gary on Thurs., Aug. 12, for Bartlesville, OK, with a fuel stop in St. Louis, MO. Upon arrival in Bartlesville, we found that our electric pump was pulling 15-17 amps and popping fuses as fast as replaced.

Between Friday, Aug. 13, and Mon., Aug. 16, numerous corrections were discussed, but the decision was made NOT to fly until a satisfactory electric fuel pump was functioning. Since I had a collection of electric fuel pumps by this time, I matched a functional pump with a functional motor and had a system that worked. I flew to Calif. on Tues., Aug. 10, using only the engine driven pump in flight and the electric pump for starting, take-off, and landing.

An analysis and some conclusions:

I believe I could have flown for the first eleven years with only the engine driven pump IF the fuel was not passing through one of the elect. pumps, although both electric pumps were the by-pass type. I believe enough resistance was offered to the flow of fuel that it affected the the supply to the engine driven pump.

On our trip East both electric pumps simply wore out. Upon returning home I found the motor on one pump was good (That is the motor that brought me home from Okla.), but the pump section failed. The mechanic in Cedar Rapids took my other pump as a core. I am trying to get the pump back, as well as the \$290 that I spent for a rebuilt pump that lasted only five days).

(cont'd, EARL ODY)

I believe our engine failure over Lake Michigan was caused by the motor quitting on the electric pump installed at Cedar Rapids, that it was NOT a bypass pump, so the fuel supply to the engine pump and to the engine was terminated. We put 12 volts to this pump in Gary and it did not work. I learned several things about the Cedar Rapids pump while in Gary. Weldon has not made this ztype pump for 11 years, parts are no longer available, and that particular pump was rebuilt on 7/2/75. I did not disassemble this pump to determine why it failed, as I have since returned it to Cedar Rapids.

I disassembled the rebuilt electric pump installed in Gary upon my return home and found that the motor had a frozen bearing; hence the high current draw and popped fuses.

Altho' it's probably too early to tell, I believe that I now have a workable system with the engine driven pump and the electric pump in parallel with each other I believe that the solution to the problem is one where there MUST be an adequate supply of fuel flowing freely to the engine driven pump. At this point I do not know why Lycoming IO-320 engines (that were supplied to Wing Aircraft where Earl got his) have customarily had these problems.

EARL ODY

P.S. Since writing this commentary I have received a check for \$290 from the FBO in Cedar Rapids, the electric fuel pump which they kept, and an apology for their contributions to subsequent problems.

-end report-

That was a superb and well written report, Earl, and one that could certainly save someone from grief. I well remember your telling me of the dead stick landing when you got to OSH and how close you came to not making it back to the field. I meant to ask you at the time what airspeed you used and what your sink rate was at that speed, but it slipped my mind at the time, I guess. I can't remember whether or not your airplane has a constant speed prop or not, but I think it does. It would be interesting to know what the comparative sink rates would be for one with a constant speed prop vs. one with a fixed pitch prop with the engine completely dead. I seem to remember a fatal accident that followed an engine failure (Burbank, I think), in which the airplane went into the approach lights and it was equipped with a constant speed prop. I remember discussing this with John and speculating on the possibility of using a prop that could be feathered for minimum drag. Do any of you with constant speed props have any figures on sink rates with the engine at idle? Or better yet, have any of you switched from a fixed pitch to a constant speed and had a chance to record the two different sink rates? It's a pretty good idea to know how far your airplane will glide, what airspeed is optimum, etc. Have you ever given serious thought to whether you would choose a road vs. a field for a forced landing? One of our local T-18ers says he will opt for a road, every thing else being equal. With the 21 ft. span you could fit in most roads in pretty good shape and probably would have a better chance of staying right side up with the small wheels we have. I've flown coast to coast via T-18 and I find one of those big interstate highways to stay above when I can, even if it is a few miles farther. Giving yourself an extra break now and then makes the trip more enjoyable and just might pay off someday.

EARL ODY STORY ON FUEL

FUEL PUMPS

VIA #584 FITTING  
INSTALLATION — BY RON BOSTICK

In order to assure proper level of the #584 fitting, a center line, B.L.O has to be determined on the #575 Bulkhead.

Using the template center punch at the upper flange (A) and lower flange (B), drawing #1, draw a line between point (A) and point (B) to set a B.L.O Reference Line.

If you can not determine the B.L.O center punch marks at point (A) and point (B) location of the Bulkhead. Place a board on each side of the Bulkhead, measure it with a caliper, divide it by 2, and measure that distance from the outside in. It's best to do this in three areas to assure proper B.L.O when you draw your line.

Select any reference point on the B.L.O line between W.L. 44 and W.L. 48 (C) also between W.L. 31 and W.L. 33 (D) drawing #2.

Using a compass, locate one of the center punch marks on W.L. 44.625 (E), drawing #3, as determined by the template panel mark for the double extrusion. On one side of the B.L.O only. Measure the distance very accurately, from W.L. 44.625 (E) to compass to the opposite side (F), drawing #4, leaving one tip on point (C), match the distance from point (D) up to point (F) so that this distance is the same as from point (D) to point (E). Mark this point labeled point (F). Now draw a line from point (E) to point (F). This is your level line, W.L. 44.625. At the intersection of the vertical and horizontal line, (A&B crossing E&F), place one point of the compass in the center and measure out .312" on each side of this point on the horizontal line G&H, drawing #5, these are two of eight (8) points on this line for the double extrusion and the #584 fitting. Drill these two points with a #40 drill.

Mount a 2"x6"x8" in a vise vertically, place two finish nails in the top of the 2"x6"x8", 1.875" apart, .937" from B.L.O. (make sure the nail's head will fit through the two #40 drilled holes). Drawing #6

Place a small hand level on top of the nails, move the 2"x6"x8" as needed to assure perfect level across the nails. Place the #575 Bulkhead on the two nails, through the two predrilled #40 holes. Now a second line must be determined in order to line the 1/4" pivot holes in the fittings with each other. Drawing #7, cut a block of wood any thickness, "A", .750" wide, and place it up against the bottom of the 2nd. nail, now draw a line under the block of wood, "B". On the line B, drill 2 #40 holes, (one on each side of B.L.O). Place 2 nails in these holes and place a hand level on the 2 nails to assure once again, proper level. Nails must extend at least 1" from the surface of the #575 Bulkhead. Place a 1/4" rod across the two nails (check the rod for straightness) double check for proper level by placing the level on the rod. Make any adjustments to assure level by bending the nails, "slowly". Take the #574 fitting and slide one on each end of the rod until they are bucked up against the side of the #575 Bulkhead, clamp the fittings down in place and punch mark all 9 holes in each fitting, remove and drill out with #40 first, place the fitting back on and drill out with #30.

**MORE FIRST FLIGHTERS:** PAUL CARABELLI, 9243 Whitaker, Sepulveda, CA. 91343, a retired exec pilot recently flew his T-18, according to Dan Dudash....KEN BROCK's bird flew for the first time in Oct., according to Chris Fast, who did most of the work for Ken....TONY RUSSELL, 406 Cardinal Drive, Slidell, LA, 70458, flew his for the first time in Nov....TOM KERNS (see page 7A this issue) also joins the T-18 test pilot ranks....JOHN KENTON, 16611 126th Place, SE, Renton, WA, 98055, also flew his for the first time about Sept. '82....JIM HOCKENBROCK, Box 361-A, RD #1, Reedsville PA, 17084, also got his in the air this past month or so (see page 9A this issue).

**BAFFLE PATTERNS:** We've sent out an SOS for builders to make baffle patterns that would be available to other builders, but until JIM HOCKENBROCK sent some in the other day the result was a big zero. Jim sent a taped together folder of posterboard, with a complete set of full size patterns for an O-290-G, that were also made of the same posterboard. Each part was labeled, with appropriate note or sketch on it that identified it, where it went, how it was bent, etc. A very excellent way to do it, Jim, and we offer our most sincere thanks to you for an excellent gesture.

I would like to encourage any of you that are making up baffles to please make some poster board patterns at the same time when it is easy. Or if you are pulling your engine down, that's also a good time. This is an item we need desperately for new builders. Baffles vary from engine to engine, so if you can send in patterns for any of the O-320 series we can really use them. If one of you Calif. builders wants to do a good turn, John Thorp has a complete set of patterns that can be used to make up a set of the cardboard patterns, but his physical condition won't permit him to make up a set. If one of you could stop in at Lodi for an hour or so and trace around his templates it would be a most valuable thing for anyone that is installing an O-360 engine and using the Thorp cowl (fiberglass or metal) John spent a lot of time engineering this set of baffles for maximum efficiency. If one of you can do this, please contact John first to check on his availability and also drop me a line to keep me posted to announce in the NL. Whatever costs are involved doing this should be amortized of course and I know many would be happy to do their part in this area.

On the O-290 patterns here, I'll be glad to send you a set. If you will give me a little lead time before you actually need them I'd appreciate it. I'm going to check on having them put on a blue print full size, but if that's too expensive we'll hand trace them. Whatever costs are involved I'll make a note of it and you can reimburse when you receive them.

Again, Jim, we DO appreciate it!

**INSTALLING THE #584 FITTINGS ON THE #575 BULKHEAD:** One of the problems that worries many builders is installing the #584 fittings with accuracy, as any misalignment (vertically) from one side to the other would be greatly magnified at the tips of the stabilator. There are various ways of doing this and here is one way that RON BOSTICK, 7334 Vallejo, Dallas, TX, 75227, did it on the next two pages. Ron is a new builder and has his fuselage just about finished and is getting things done. He is building the wide body, with the folding wing and new airfoil.

This is a good example of some of the things we need get in the NL. As we have repeatedly said, even tho' someone has previously written up how they made a certain item and another has written up another way to do the same thing....still ANOTHER WAY TO DO IT IS VALUABLE FOR A NEW BUILDER. For one thing, it increases his understanding of the problem and presents solutions, one of which might better suit his ability & equip't. So, again, please sound off on how you solved problem X, etc. PLEASE!

"HANKS", RON

1ST  
FLITES

O-290 Baffle Patterns

INSTALLING  
THE  
#584  
FITTING



#1

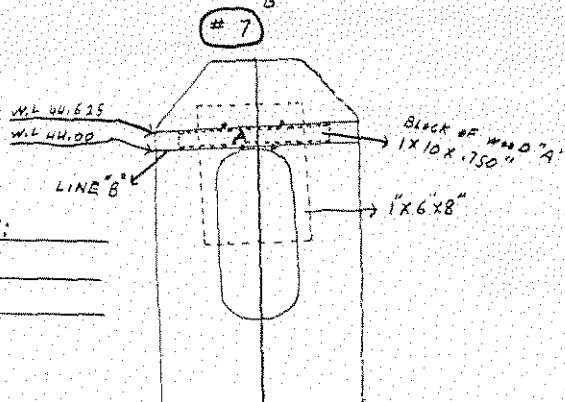
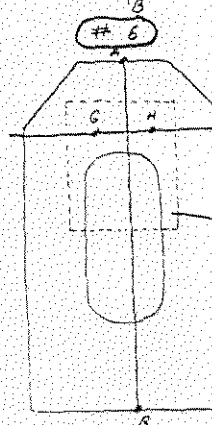
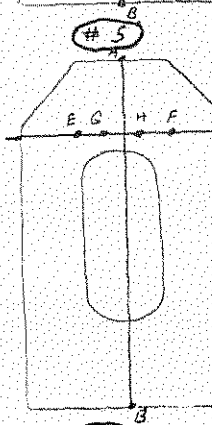
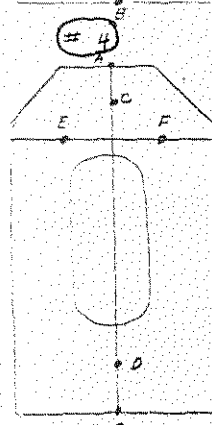
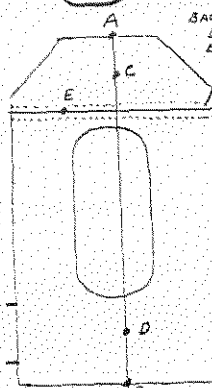
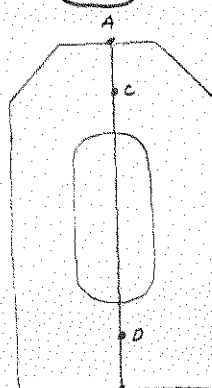
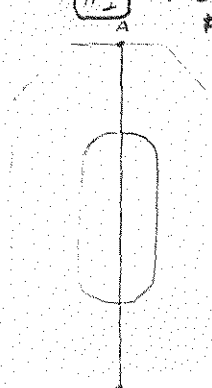
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#56

#2

#3 PAGE 15A

T-18 NEWSLETTER #56

page 15B



CONTRIBUTED BY:

RON BOSTICK

DALLAS, TX

B.L. O

**FRESH AIR DUCTING:** The following letter from HARRY WHEELER, 2 Marion Rd., Salem, MA 01970, and sketches on following page are solutions to one of the persistent problems that occur repeatedly on the T-18 and similar airplanes...that of getting an adequate amount of fresh air into the cockpit for ventilation and cooling. Here is Harry's complete letter:

Dear Dick, As per our phone conversation the other day I'm enclosing a sketch of my **FRESH AIR SYSTEM** and my **ELECTRIC TRIM SYSTEM**. Many thanks for your efforts on behalf of us owners and builders. Enclosed also, is a contribution for the fund.

**FRESH AIR:** The 4" NASA duct and the (2) 1 1/2" eyeball vents (ceiling vents from large airplanes) work very well. A 2nd TEE was put in just above the right rudder pedal with a 1 1/2" hole and a shutoff to direct air over the feet. This did not seem to take away any air from the vents (eyeball), so I'm not sure just how large you could make that vent. The 2" dia. feed thru the firewall is just below the fuel tank and to the outside of the gear leg. The two Tees are made from fiberglass pieces laid up on the right size plastic bottle or cardboard tube. I used polyester resin and glass cloth from the auto repair kits and used wax paper for a parting agent. (Polyester resin shrinks about 6% on cure and this sometimes is a problem to get parts off the mold. A collapsible or two part breakaway mold usually solves this problem...Ed.)

FRESH  
AIR  
DUCT

**THE ELECTRIC TRIM** shown in the sketch is ideal. The speed is the same as would be found in a production airplane and the unit only weighs a pound or so. The gear box is about 3 x 3 1/2" and it's approximately 4" long plus shaft. There is plenty of torque to turn the trim. The limit switch system shown was used, so as not to have to run wires and switches down to the tail. I called the warehouse that I bought the motor from and they said they had 13 more in stock and they could re-order more.

ELECT.  
TRIM

**CANOPY LATCH:** When I opened the latch on my canopy (Thorp type) I found it took a second effort to reposition the latch for closing. I added a small right angle piece of aluminum to the forward right hand corner of the body for the hook to hit against when the latch is undone. This way the hook is repositioned for latching.

CANOPY  
LATCH  
MOD

**AILERON TRIM:** The system described in the NL using the model airplane servo and a 1/4 x 6" tab of balsa and fiberglass construction is one of the best improvements I've made to my airplane. THANKS!

AILERON  
TRIM  
OK

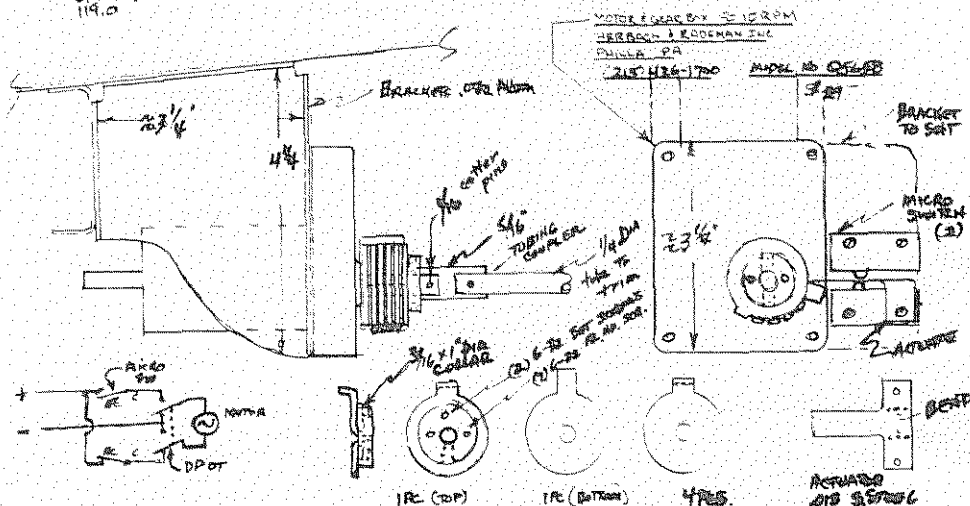
I hope these ideas will be of help to someone else. (You'd better believe they are, Harry) Please use whatever you think is of value. N394AC flies well and often and is always available for rides to prospective builders in this area. Hope we'll soon have a T-18 Air Force in this area of New England.

Sincerely, HARRY WHEELER

ELECTRIC TRIM MOTOR & LIMIT SWITCH

BY HARRY WHEELER

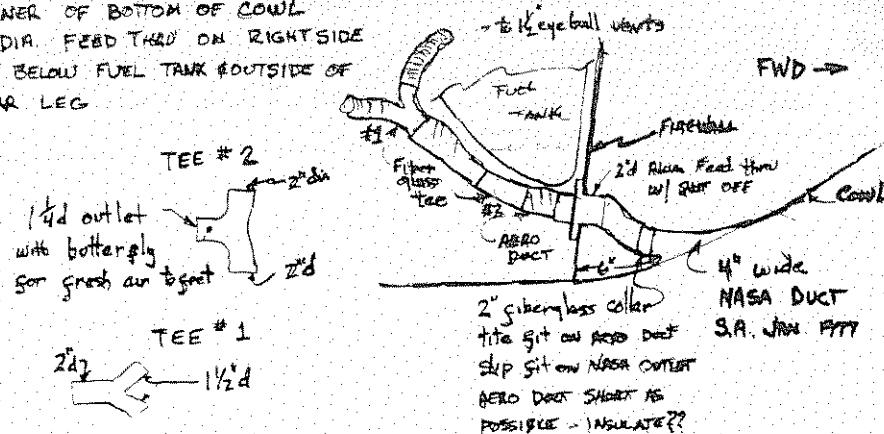
5A  
119.0



DRUMS - .050 POLY T3 TANG IS BENT DOWN AND HITS AGAINST TANG  
ON DISK BELOW 5.4 TURNS OF SHAFT WILL ACTIVATE SWITCH

FRESH AIR DUCT

4" NASA DUCT IN RIGHT HAND  
CORNER OF BOTTOM OF COWL  
2" DIA. FEED THRU ON RIGHT SIDE  
JUST BELOW FUEL TANK (OUTSIDE OF  
GEAR LEG



DICK CAVIN  
10529 SOMERTON  
DALLAS, TEXAS 75229

AUGUST 7, 1982

RE: PLANS #551

DEAR DICK,

LAST MARCH I SENT A LETTER REQUESTING TO BE PUT ON THE LIST TO RECEIVE THE T-18 NEWSLETTERS. ON REVIEWING OLD NEWS LETTERS THIS WEEK-END I REALIZED I FAILED TO LIST MY FLANS NUMBER SO THAT A PROPER "LINK-UP" COULD BE MADE. SORRY, I FELL ASLEEP UNDER MY AIRPLANE.

FOR AN "I DID IT THIS WAY" I WOULD LIKE TO OFFER MY SOLUTION TO THE PROBLEM OF GETTING TWO STRAIGHT, DIAMETRICALLY OPPOSED RIVET LINES DOWN THE LENGTH OF THE HORIZONTAL TAIL TUBE BEAM (502-3). I CAN'T READ SPIRIT BUBBLES VERY ACCURATELY SO I LET MOTHER NATURE HELP ME IN ANOTHER WAY. THE ATTACHED SKETCH ILLUSTRATES THE PROCEDURE. I'M NOT MUCH OF AN ARTIST SO I HOPE I GOT THE IDEA ACROSS. OTHERS IN THE AREA HAVE USED MY "RIG" AND HAVE FOUND IT EASY TO OBTAIN GOOD RESULTS.

IN THE OPINION DEPARTMENT - IN REVIEWING OLD NEWS LETTERS I FOUND SEVERAL REFERENCES TO REPLACING HIGH SHEAR NUTS WITH AN-BOLTS, BUT I HAVE NEVER SEEN A CAUTION THAT THE AN-BOLTS SHOULD BE PROPERLY TORQUED WITH A TORQUE WRENCH. I'M A FIRM BELIEVER THAT ALL BOLTS SHOULD BE TORQUED WITH A TORQUE WRENCH AS FEW OF US ARE EXPERIENCED ENOUGH TO GUESS. IN THE WING ATTACHMENT FITTINGS IT IS VERY IMPORTANT THAT ALL BOLTS BE TIGHTENED EVENLY SO THAT ALL BOLTS CARRY AN EVEN SHARE OF THE LOAD. IF ONE BOLT IS SIGNIFICANTLY TIGHTER THAN THE REST IT IS CONCEIVABLE THAT THAT BOLT COULD BE CARRIED TO FAILURE SETTING THE STAGE FOR PROGRESSIVE FAILURE IN THE FITTING OR AT LEAST LOOSENING OF THE FITTING. ALL THIS MAY BE A LITTLE IN THE OVER-KILL CATEGORY BUT TORQUING IS AN EASY WAY TO MINIMIZE ONE MORE UNKNOWN AND PLAY THE SAFE SIDE. WHAT'S MORE IT DOESN'T ADD ANY ADDITIONAL WEIGHT. PAGE 8-15 OF THE EAA MANUAL "SHEET METAL", VOL 2, LISTS THE PROPER TORQUE VALUES. FOR THOSE WHO DON'T HAVE THE MANUAL, 10-32 NUTS SHOULD BE TORQUED TO 25 INCH-POUNDS (BETCHA MOST NUTS TIGHTENED WITHOUT A TORQUE WRENCH ARE HALF AGAIN THAT TIGHT.)

THANK YOU FOR YOUR DEDICATION AND HARD WORK IN GETTING THE NEWSLETTERS OUT. IT IS A VERY IMPORTANT LINK IN THE HOMEBUILT MOVEMENT.

*Denell B. Zander*  
DENELL B. ZANDER #551  
13700 S. W. HALL  
TIGARD, OR 97223

TORQUEING  
BOLTS  
IMPORTANT



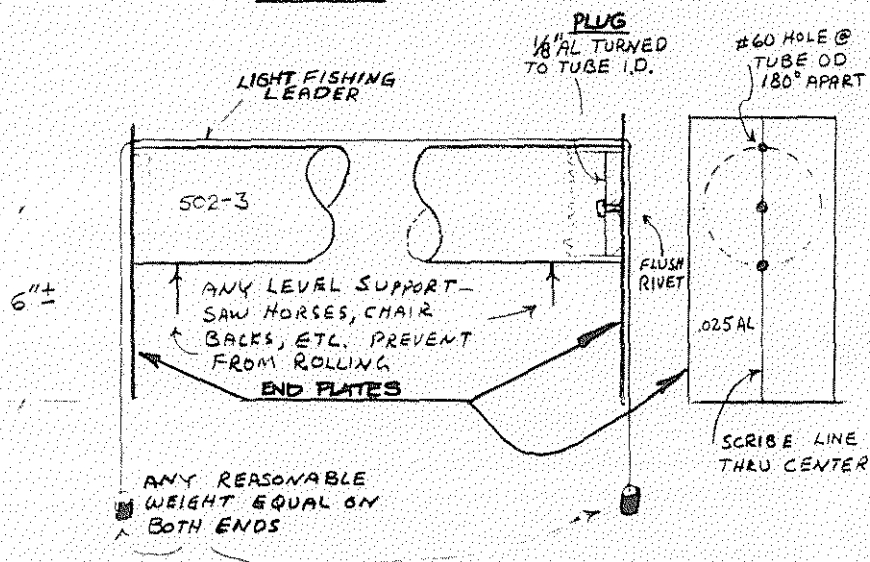
T-18 NEWSLETTER #56  
P 17B

T-18 PLANS #569

W.G. AYRES  
761 STINSON ST.  
INDEPENDENCE, I.R.  
97351BY  
DENELL  
ZANDER

SCRIBING RIVET LINES ON THE 502-3 TUBE

NO SCALE



ROLL TUBE ON A FLAT SURFACE TO DETECT ANY TUBE BEND (MINE HAD ABOUT .032 IN THE CENTER). I ORIENTED MY TUBE FOR POSITIVE DIHEDRAL. TWIST THE END PLATES UNTIL THE FISH LINE MATCHES THE SCRIBE LINE ON BOTH ENDS. SPRAY THE FISH LINE DOWN ON THE TUBE WITH ZINC CHROMATE OR ANY SUITABLE PAINT (DARKER COLORS SHOW UP THE LINE BETTER). SPRAYING FROM THE ENDS WORKING TOWARD THE CENTER WILL PULL THE FISH LINE DOWN IF IT IS HIGH BECAUSE OF TUBE BEND. AFTER THE PAINT SETS PULL OUT THE FISH LINE, ROTATE THE TUBE 180 DEGREES USING THE BOTTOM HOLE TO ALIGN, CHECK PLUMB LINES WITH SCRIBE LINES AND REPEAT THE SPRAY DOWN.

YOU SHOULD NOW HAVE TWO STRAIGHT LINES AS CLOSE TO THE TUBE DIAMETER AS CAN BE OBTAINED WITHOUT VERY EXPENSIVE EQUIPMENT.

This is another example of a very excellent report (the kind we need more and more of) and we all thank you sincerely, Denell. His solution to this problem forcefully illustrates that there are usually several solutions to each "standard" problem that comes up. Pick out one of the problems you encountered and send in your solution.

Dear Duck,

While going through my plans & files recently I found the bills for heat treating my (3 piece) landing gear. Copies enclosed. Also the report of the magna flux inspection after welding. Note that the date is 1979

Maybe you will find the addresses and phone numbers of interest for the newsletter.

3 piece gear?

Best regards,  
Bill Ayres

P.S. My pal, Mike Barte, whose name is on the bill, took my L.G. parts in with some other work, so there might be a minimum charge in effect that's not reflected in the price shown.

W.A.

THANKS, BILL, DIDN'T HAVE TIME TO RE-TYPE, BUT  
60 WRITE PRETTY CLEARLY

SOLD TO SHIP TO L31864

\*MIKE PARTI  
\*8048 LAUREL GROVE

\*NO. HOLLYWOOD, CALIFORNIA

TESTED & CERTIFIED TO  
MAG. MIL-I-6868 E AND. 1

| TAXABLE             |        | CUSTOMER ORDER NUMBER |  | CUSTOMER SHIPPER NUMBER |  | INVOICE DATE |  |
|---------------------|--------|-----------------------|--|-------------------------|--|--------------|--|
| DATE RECEIVED       | 1-2-79 |                       |  |                         |  | 1-8-79       |  |
| QUANTITY            | 3      | WEIGHT                |  | DESCRIPTION             | AIR PLANE LANDING STRUTS<br>(2) 1 1/2" X 1/2" X 58 1/2" (1) 1 1/2" X 24 1/2" |              |  |
|                     |        |                       |  |                         | Lot 35.00<br>tax 2.10<br>37.10   |              |  |
| PAID CHECK #810 1-8 |        | C O D                 |  |                         |  |              |  |

| 4130        |               | HARDEN & TEMPER |           |
|-------------|---------------|-----------------|-----------|
| OPERATION   | SPECIFICATION | MED. AM         | TEMP. °F  |
| DEGREASE    |               | V APOR          |           |
| AUSTENITIZE |               | BDO             | 1575±25   |
| QUENCH      |               | OIL             |           |
| TEMPER      |               | AIR             | 775±10    |
| TEST        |               |                 | 2 HRS. 1A |

T-18 landing gear legs

WE CERTIFY THAT THE ABOVE LISTED PARTS HAVE BEEN HEAT TREATED IN ACCORDANCE WITH THE ABOVE SPECIFICATIONS.

Final Hardness: C36-39

Rockwell: 100%

Grain: 1

Part Tested: 1

Authorized Signature: Robert H. H. H.

**PERFORMANCE:** A short note from RIK KELLER, 5446 Connecticut Ave., La Mesa, CA in which he writes that he's still enjoying his T-18, especially on relatively short trips when he compares flying times to driving times. However he says his bird is still going too slow for one with an o-360, and he says he plans to tuft test soon and see if they can track down the problem(s). He submits the following performance figures and we couldn't help but agree that the speeds recorded are indeed much below average. When one goes to track down the speed sapping items it should be a stem to stern examination. The first area to put under the magnifying glass would be to eagle eye each and every item forward of the firewall...the prop, the cowl, the baffles, the exhaust, the intake system, the spinner, and the oil cooler. Of course the engine itself should also be suspect. Airframe-wise I would take a look at the trim system, the CG, canopy fit, cabin air intake and exit, possible air leaks around flaps and ailerons, wing root flow that might require fairing, etc. All gear fairings and alignment of them should also be checked. Rik is aware of the possibilities of all these items, of course, and we will be interested in seeing what he uncovers. Here's his table:

| MP   | RPM  | IAS | OAT   | ALT.     | TAS         | HP  |
|------|------|-----|-------|----------|-------------|-----|
| 26.5 | 2700 | 157 | 70° F | 3000 MSL | 166 mph (?) | 166 |
| 24.5 | 2300 | 145 | 62° F | 4400 MSL | 158         | 135 |
| 22.7 | 2200 | 140 | "     | "        | 152         | 117 |
| 20.3 | 2200 | 127 | "     | "        | 138         | 99  |

Rik's table didn't specify whether A/S was mph or kts. He also didn't say how his IAS had checked out on measured course or whether engine instruments had been verified for accuracy. It probably will be that several items will turn out to be the culprits. Oh, yes, Rik has a metal prop for sale and will accept any reasonable offer. It is a 67-68, metal, and outside of that I don't know which engine it's for. His home phone is 714/ 466-4762.

**ANOTHER PROJECT FOR SALE:** Richard Taylor, RRI, Box 160, Defiance, MO, 63341 (314) 828-5346 has an airframe 80% complete, on the gear, with a 150 hp Lyc engine, 297 SMOH...Sheet metal comp., flush riveted, all fiberglass parts, cowl, tips, wheel pants, tinted canopy & windshield, some instruments, prop ext'n, fuel tank, misc. parts & hardware, comp. set drawings, most parts to complete....\$7500 ..Says he hates to give up, but doesn't have the money to complete.

**ELECTRIC TRIM MOTORS...AND ROCKER SWITCHES:** Frome PAUL LEHMAN, 517 N. Clark St., Mayville, WI, 53050 (Home phone 414/387-2285) (after 6pm) Dear Dick, Just a few lines to let you know I'm still alive. My project is going very good, but slower than I would like it to. I have my fuselage clecoed together, but not riveted together and it's not on the gear yet. I am sending you some switched to look at and keep if you want them. If any T-18 builder needs some the price is .75¢ ea. in lots of 10 or more. To install these you need a rectangular cut out in the panel .55" X 1.125" (vertical). You can remove and remount again, too. I also have some 12 or 24V electric motors such as I gave you at OSH several years ago. The price is \$25 ea....Keep your airspeed up, Paul. Thanks again Paul. The switches look very neat and nice and seem to work very well. They are made by Carling, have an Und. Lab rating of 10 A @ 125 V.A.C....As to the elec. motors, I'm sure Paul would be glad to fill in details if you'd give him a call some weekend.

PERFORMANCE NUMBERS

PROP FOR SALE

FOR SALE

SWITCHES, AND TRIM MOTORS

# THOUGHTS ABOUT WING TANKS

**ALTERNATE TANKS (cont'd)**  
 Perhaps some of you can think of a simpler or better method than what I pitched out. I keep thinking about Lu Sunderland's method of making a main fiberglass tank he detailed in an early newsletter (one thin layer of glass was laid out on a sheet of alum (waxed) and when cured it was flexible enough to wrap around in the tank shape in one piece. Pre-cast tank ends were cleced in place and bonded. Then more glass was wrapped around the entire tank and ends until desired strength and sealing was assured). This is a good method and perhaps a variation of that method would be better than what I suggested. As for Klegcel and Hysol 9410, Dick Schreder (Schreder Aircraft, Bryan, OH) has been using both products for ribs with a metal skin on his HP series sailplanes for several years now, with no problems. He does use a METAL rib at each end of such a structure to close the box and I believe it should be done on a T-18 LE tank, but that would be no problem. You could simply leave a 4" "dry bay" area at each end, so that the metal ribs would not require sealant application. Total fuel capacity would be reduced insignificantly. I'd be interested in hearing your comments or suggestions. If you don't want me to run them in the NL, please specify. I'd like to experiment on slipper tanks the next time I have occasion to build a wing.

Before you go to all this trouble it might be good to weigh all the negative factors, too. Would it be safe to make a complete full fuel overweight landing at the higher stall speed and higher gross wt.? Since the T-18 gear is practically rigid for taxiing purposes, would taxiing over rough surface cause loosening of rivets at the wing attach area? Is the additional cost worth it? How often would you have occasion to use that much extra fuel? Would a baggage area tank be a simpler and cheaper solution? Remember, too, that wing fuel requires the use of electric pumps, with attendant costs and possible reliability factors to consider. Also, be aware that proper fuel management procedures would be necessary to negate the possibility with having to land with one wing tank full and the other empty. How would you indicate fuel quantity from a wing tank? Also, please be very aware that wing tank fuel could radically affect spin recovery characteristics. A recent NASA study showed that the so-called "flywheel effect" was JUST as important to spin recovery as CG location...even more so in some cases! Like anything else, there are pros and cons and YOU will have to make the decision in the end.

**T-18 for sale:** I have practically no details on this one. A new builder, George Copland, Rt. 2, Box 12, Duncan, OK, (405/ 253-8349, evenings) told me that he knew of an older T-18, 0-290 powered he thinks, and unpainted, that was at OSH (but apparently unregistered), and was owned by a local ex pilot there in Duncan, who recently passed away. His wife either has it for sale or will soon have it for sale and Geo. says he's quite sure it can be bought on the low side of the market worth. He'll let me know further details when he talks to Mrs. Doolin, the widow. I called Geo. the builder, but actually it's his daughter, Dr. Ann Copland, who is a radiologist, an accomplished pilot, and quite a beautiful young woman. She is building a wide body with the folding wing. Geo. is gathering up parts for her and having a ball studying the plans. He's an engineer in charge of a research division for Halliburton, built a Starduster Too, and flies his own Cessna 180 from their farm air strip near Duncan.

**ALSO FOR SALE:** Harlo McKinty, 1310 Idylwild Dr., Lincoln, NB, 68503 (402/ 464-0570) has a pair of .025 outboard wing skins for the folding wing that he will sell for \$50 for both. They are the INBOARD skins of the outer wing and are for the new airfoil, are formed to shape and are pre-drilled.

**More for sale items:** From Jon Walton's letter (pg. 3B) he made note that he has a spare prop for sale, a 76M, 69" x 72", vibration tested by Santa Monica, has "paper". Wasn't enough pitch for his 0-320, but enough for an 0-290. Will sell for \$400. He also has his present wing (standard) that has 135 hrs. on it at present, no scratches or dings, painted white, VOR antennae in left tip, nav lites and strobes, Cessna heated pitot, wing tip tie downs, complete with flaps, ailerons, controls...that will be coming off the airplane (also standard width) in January or in Feb. of '83 and it will be for sale at that time when his new folding wing is installed. He hasn't set a price as yet, until he has a fix on what his total cost will be on the CW, but it will be reasonable. John's address is 5726 Boyce Springs Dr., Houston, TX, 77066 (713/440-8093 eve.).

This sort of deal is good for all concerned. There are still a goodly number of people that have trouble finding time to build and a lot of them have nearly completed fuselages, so this is a natural for helping those people get in the air much sooner. In John's case, I can attest to its excellent flying qualities. It trims out perfectly level and has a very well behaved stall, and if you saw it at OSH this year you know his workmanship is impeccable. So if one of you gents want to get your T-18 airborne before you tangle your whiskers in the stick, here's your chance. You can still build a wing at your leisure and then sell this one later if you want a CW later.

**COMMENTS ON OUTER WING FUEL TANKAGE ON THE CW:** Recently John told me that he did not use the inner bay of his outer wing for fuel in the L.E., as this would have given him more fuel and range than he ever would have any reasonable occasion to use. He also saved himself a considerable amount of work, as each of the circular access panels on the bottom side of the leading edge has 88 parts! This includes rivets, nut plates, etc., but it involves considerable time and effort per each. I agree with his thoughts on the extra fuel. Personally, I feel an extra 10 to 15 gals. would give me all the range I could use (and stand). I believe 3-3 1/2 hrs. is about the max I could sit in a T-18...even with seats of Harlo McKinty's "Temperfoam". Let's face it...the T-18 IS cramped in both first class and tourists section and when you spend an 8 hr. day in one you're ready to quit. I'm always ready to get out and stretch my legs after a couple of hours if I have a passenger, but then I don't have the Temperfoam seats like John does (yet). John really sings the praises of the Temperfoam cushions. It took us 4 days to get back from OSH this year, due to wx, and every time we'd tie up for the nite he'd tell me how rested he was...and wouldn't even trade airplanes with a tired ole broken down airline pilot with an aching butt!

**THOUGHTSON ALTERNATE METHOD FOR FUEL IN WING L.E.:** In view of the extra work involved in the integral tank method, I keep coming back to the idea of a shaped leading edge "slipper tank". This would be shaped to fit the interior of the leading edge of the wing and could be made of alum and welded, with an appropriate interior baffling...or what might be much easier; to use the already bent skin as a female mold, laying up fiberglass in the "mold" and after cure Klegcel (closed cell, structural foam, that's impervious to hydrocarbons) nose ribs would be inserted at about 4" spacing for baffling and bonded with Hysol 9410, which is also impervious to hydrocarbons or colloidal water. After cure a flat strip of Klegcel would be laid on the back end of the Klegcel ribs (pre-shortened on the back side to allow for the foam thickness) and bonded to the ribs. It, too, would be glassed and the glass applied would have to overlap the glass on the front part a sufficient amount to make a leak proof final closure seam. In any case the tank would have to be enough smaller than the LE interior in order to allow tank removal and installation.

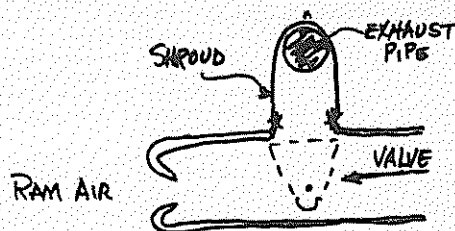
(Harlo McKinty, cont'd)

to match the rib holes from Ken Knowles on the new airfoil. Harlo is putting fuel in the outer wings, so decided to use .032 skins for the inboard sections of the outer wings. Skins have been clecoed to the ribs. He will keep his present outer sections of .025, but here's a real buy for someone.

**SPINNER/COWLING MISMATCH:** CHRIS FAST letter excerpts... "Regarding Harlo McKinty's question on pg. 4B, #54 NL, regarding engine mount sag causing mismatch of spinner/cowling, my T-18 had the 0-290G with the 3/4" mounting plate and I washered the lower legs forward to remove the sag a couple of times during the first 200 hrs. while the rubber mounts were new. It never changed after that and is still OK today... so I would say to allow about a 3/16" mismatch between the spinner and cowling when you first set it up. On Ken Brock's ship that I just finished I have left the spinner 1/8" high (it's a 180, with a dynafocal mount)."

Any of the rest of you have any comments?

**CARB AIR BOX SEAL:** Also from Chris... "On the #751 air box seal, I have the tooling for this and have made many. I don't plan to make any more and I have offered the tooling to John Thorp for \$50. However, if he should not take it you are welcome to it. Regarding the hot air intake, it is picked up from the crossover exhaust thusly: See sketch below....



Pretty crude sketch, but you get the idea. It worked fine on mine" Thanks again, Chris. You have contributed so much sage advice and all of us are greatly in your debt...but, please... DON'T STOP THERE! There are still many things that have not been covered (or done a different way), so if you come across anything that needs to be covered or covered again we'll appreciate it. How about some of you guys out there that come across a problem on how to do something, how about you writing in and say "I'd like to know how to do xxxxx", and I'll pitch the question up to Chris and some of the others that have contributed? Zero in on a SPECIFIC PROBLEM, don't just say, "I had a hard time rigging my ailerons," (or some such). Chris also advised for the troops not to go too far afield on the access cover under the fin, between #575 and #576 bulkheads, as John had warned him this area was stressed, too.

**PARKER MILLER**, 15535 Edenvale, Friendswood, TX, 77546 (713/483/1732) writes: "My T-18 had 900 hrs. on it when I took it apart and I was unable to find any damage anywhere except the doublers which connect the center section closure to the wing skin (?). All the rivets there were dangling! I have talked to Bob Dial and he found the same thing on his." Thanks for the info, Parker, as this seems it might be important to pursue this, but I'm not quite sure of the exact area you spoke of. Could you send a sketch and perhaps take a guess what caused the loose rivets? Aerobatics, rough ground taxi, etc.?

Parker also has some for sale items, as follows (may be gone by now): Good performing prop that was clipped and pitched by Santa Monica Prop Services. It is a 76M, 69" x 72", and is polished. It has one nick, \$375. I also have a used Genave Alpha 300, working good when removed, for \$375. I also have a new Genave Alpha 500 (never installed) for \$700 and a remote compass for \$100....

**NOTICE:** I hate to take up NL space to say this, but again, please be aware that our newsletter is presented as a clearing house for ideas, and experiences only, and anyone using the expressed ideas, suggestions, opinions, or experiences, does so at their own risk and discretion and no responsibility or liability is expressed or implied and is without recourse against anyone. This disclaimer not only applies to this issue but also to all past and future newsletter issues.

**MAIN BEAM EXTRUSION:** It's been pointed out in the newsletter that the main beam channel extrusion for the center wing has a 1° angle on it so that the shape will more closely conform to the slope of the upper surface of the airfoil. The previous channels didn't have this and it was necessary for the builder to file off this 1°, else it would leave a flat spot on top that would degrade air flow. We had cautioned builders to use a try square on the channel with a light behind it to identify which side had the angle, but recently a builder called me to re-check what he had done. He had mis-interpreted the drawings as saying the "low" side of the channel would be on the rear side. He had already trimmed it and drilled his shear web in and I hated to tell him he had done it wrong, but there was no other way. If the drawings shouldn't be quite clear on the subject, think of it this way: The upper surface of the airfoil is still climbing when it crosses the front side of the spar, so the front side of the spar cap should be lower at the front edge. Well, old ... has a new upper channel from Ken Knowles now, so maybe someone can use the old one on some other kind of airplane someday.

**T-18 BUILDERS LISTED BY STATE** (cont'd from NLS #52, 54, & 55):

**MASSACHUSETTS:**

John Cragin, 34 Smith St., Needham, MA, 02192  
Harold Wheeler, 2 Marion Road, Salem, MA, 01970

**NEVADA:**

Donald Derby, 300 E. Tropicana Ave., #10, Las Vegas, NV, 89109  
Ron Johnson, 8760 Spearhead Way, Reno, NV, 89506  
Oats Tokle, 3483 Skyline Blvd., Reno, 89509  
Ferris Williams, 4884 Nettie Ave., Las Vegas, NV, 89110

**TENNESSEE:**

Virgilee Walker, 3324 Homewood, Memphis, TN, 38128  
Edward Waldo, 4755 Gwynne Rd., Memphis, TN, 38117  
Les Seago, 2773 McCully St., Bartlett, TN, 38134  
Gene Sloan, 412 Lillard Rd., Murfreesboro, TN, 37130  
John W. Mills, Rt. 1, Box 500, Church Hill, TN, 37642

**IDAHO:**

Harvey Schumacher, P.O. Box 38, Lewiston, ID, 83501  
Clyde Grafe, Rt. 2, Box 40, Weiser, ID, 83672

**UTAH:**

Howard Andrews, Box 195, Hunting, UT, 84528  
Robert Clayton, 1783 Harvard Ave., Salt Lake City, UT, 84108  
Frank Ellis, 2632 Foothill Dr., Ogden, UT, 84403  
Wm. Nicholson, 1096 Eastridge, Sandy, UT, 84070

UNDERLINED = FLYING T-18

SPINNER,  
COWLING  
MISMATCH

NOTICE

MAIN  
BEAM  
EXTRUSION

LOOSE  
RIVETS

BUILDERS LIST BY STATES

## BUILDERS LISTS BY STATES (cont'd)

## MINNESOTA:

James Borg, 2451 115th Ave. NW, Coon Rapids, MN, 55433  
 John Holm, 7017 35th Ave., North, Crystal, MN, 55427  
 Curtis Kreps, 504 Charlotte, Willmar, MN, 56201  
 Gaylen Lerchl, Rt. 2, Box 29, Sacred Heart, MN, 56285  
 O. C. Moen, RR 1, Box 221, Ortonville, MN, 56278  
 James Renneker, 8150 Nicollet Ave., Minneapolis, MN, 55420  
 D.T. Sherden, 819 15th St. NW, Rochester, MN, 55901  
 Harold Streater, 68 E. 4th St., Winona, MN, 55987  
 Glenn Young, 703 Park Ave., Litchfield, MN, 55355  
 Tom Sandeen, Hector, MN, 55342

## NEBRASKA:

Tom Baarsch, 2332 So. 35th Ave., Omaha, NB, 68105  
 Nate Eastman, 416 W. 2nd St., Kimball, NB, 69145  
 Harlo McKinty, 1310 Idylwild Ave, Lincoln, NB, 68503  
 David Petro, Box 1, Benedict, NB, 68316

## MISSOURI:

Richard Edgar, 4968 Brockton Way, St. Louis, MO, 63128  
 Randle Woolaway, Timberline Airpark, Cassville, MO, 65625  
 Stan Bilotte, Rt. 2, Box 879, Excelsior Springs, MO, 64024  
 Howard Henderson, 444 Bryan Ave., Kirkwood MO, 63122  
 Michael Hammock, RR 1, Box 237, St. Charles, MO, 63301  
 E. J. Lanev, 3361 Van Owen, Springfield, MO, 65807  
 Karl Lipscomb, 100 Grand Ave., Lamar, MO, 64759  
 Fred Marschel, 211 Juniper, Lees Summit, MO, 64063  
 Kim Nack, 5152 Auriesville Lane, Hazelwood, MO, 63042

## WISCONSIN:

Bob Zimmerman, Rt. 1, Bloomer, WI, 54724  
 Bob Pernic, 85 Dartmouth, Williams Bay, WI, 53191  
 Clayton Iverson, 11530 Parkview Lane, Hales Corners, WI, 53130  
 Lyle McCullough, 1525 Beech Dr., East Troy, WI, 53120  
 Dwayne Mood, 11208 W. National, #108, West Allis, WI, 53227  
 Paul Lehman, 317 N. Clark St., Mayville, WI, 53050  
 Paul Krogh, 27118 Sherwood Forest Dr., Waterford, WI, 53185  
 Allen Koch, Rt. 2, Campbellsport, WI, 53010

## OKLAHOMA:

Lee Reilly, Rt. 3, Box 198A, Wagoner, OK, 74467  
 John Kleber, 11209 St. Charles Ave., Okla. City, OK, 73132  
 Harlap Cavin, 2001 E. Steve Owens Blvd., Miami, OK, 74354  
 Gerald Kinman, 848 N. Robinson, Moore, OK, 73170  
 Leroy Holt, Box 238 Savanna, OK, 74565  
 George Copland, Rt. 2, Box 12, Duncan, OK, 73533

## CONNECTICUT: (update)

H. E. Combs, Jennings Rd., So. Kent, CT, 06785  
 Donald Warner, 7 Gaylord Dr., Wilton, CT, 06897

In the next issue we'll start in on the California listings. As you might expect, Calif. builders are the most numerous, by far. We'll also have Texas and some other states as space permits. I'm a super-slow typist and the lists are really time consuming and I get cross eyed after a page or two of them. Will also try to update the lists as new ones come in or some of the others drop out.

I just got a call from Richard Oribe, Rt. 1, Box 30, Bishop, CA, 93514 and he told me he had just recently bought RUDY ADLER's T-18 and that he was delighted with the way it flew and performed. I was very sad to hear of my old friend's deteriorating health, tho'. He said Rudy had suffered three strokes the past year after making a great comeback from his cancer affliction. Our prayers are with Rudy.

NEWSLETTER #56 INDEX: In order to help you locate reference articles more readily I've decided to add an index at the end of each issue. I have also made bold lettering notes in the left margin on the past couple of issues for the same reason.

- |  |                       |
|--|-----------------------|
| 1. T-18s at OSH in '82   | page 1A               |
| 2. Francis Richardson accident and analysis                        | page 1B               |
| 3. Inadvert nt stalls and spins                                    | page 2A               |
| 4. Stalls in turns, span loading                                   | page 2B               |
| 5. Notes on back issues of NLs                                     | page 3A               |
| 6. Aileron Control System Bellcrank Alignment, CW                  | page 3B               |
| 7. Same as above (John Kleber)                                     | page 4A               |
| 8. CW wing gap cover   | page 4B               |
| 9. Notes to new T-18 owners, non-builders                          | page 5A               |
| 10. Specialized induction system (Hawley)                          | page 5B, 6A, & 6B     |
| 11. Wing alignment method (Kerns)                                  | page 7A               |
| 12. Gas cap retainer   | page 7B               |
| 13. Cowl Mod   | page 7B               |
| 14. Brake system   | page 7B, 8A           |
| 15. Fuel lines   | page 8A               |
| 16. Fuel valve extension   | page 8A               |
| 17. Electric flap inst'n   | page 8B               |
| 18. Trim system check 1st flite                                    | page 9A               |
| 19. Oil Cooling  | page 9B               |
| 20. Bucking Bar  | page 10B              |
| 21. Riveting sequence CW outer wing                                | page 11A              |
| 22. Poor man's milling machine                                     | pages 11B, 12A, 12B   |
| 23. Earl Ody story re Fuel Pumps                                   | pages 12B, 13A, 13B   |
| 24. O-290 Baffles  | page 14A              |
| 25. Installing #584 fittings                                       | pages 14A, Bpage 15A  |
| 26. Fresh air duct, Electric trim, canopy latch mod. pgs. 15B, 16A | page 17A              |
| 27. Torqueing bolts  | page 16B              |
| 28. Scribing center line on 502-3 tube spar                        | page 17A              |
| 29. Gear heat treat comments                                       | pages 17B, & page 18A |
| 30. Performance figures (Keller)                                   | page 18B              |
| 31. Switches, & trim motors  | page 19B              |
| 32. Comments on outer wing fuel & methods                          | pages 19A & page 19B  |
| 33. Spinner/ Cowling mismatch                                      | page 20A              |
| 34. Carb air box seal  | page 20A              |
| 35. Loose rivets   | page 20A              |
| 36. Main beam fabrication note                                     | page 20B              |
| 37. T-18 Builders lists  | pages 20B 7 21A       |
| 38. For sale items on pages 20B, 19B, 19A, 18B, 12B, 10A.          |                       |
| (some pages have more than one For Sale items)                     |                       |
| End NL # 56  |                       |

Hope your past days with your families have been most happy.

Dick Cavin

BUILDERS LISTS BY STATES

NAME UNDERLINED = FLYING T-18





'83 OSHKOSH ISSUE

Osh '83 is now history and, as always, it really defies description in 10,000 words or less. Each individual can only savor a microcosm of the total, so the spectacle as he sees it may well be far different from the complete picture.

I arrived early Friday morning in my T-18. They had just activated the special arrival procedures, but traffic was still on the light side. While on right downwind for R27, they surprised me with a command to "turn right immediately and land R18. Clear to land, but maintain altitude over R27." Apparently, this was done quite often on Friday, as there was negligible traffic in the fly-by pattern using R18 and this eliminated some of the congestion on R27 and permitted looser spacing.

Our original plan was to get in Thursday afternoon, but OSH WX was IFR, so we tied up at Janesville, WI, for the night. VERN PEPPARD came in IFR, but the approach sequence had him 57 miles out (over Lake Michigan) on the VOR approach, which gave him a gulp or two when his engine ran rough a time or so. WALT GIFFIN was the first in, with Vern next and I was #3 the next day.

Aircraft attendance was definitely down in all categories from '82 numbers, but I heard it picked up about mid-week. The first Saturday and Sunday crowds were also considerably lower out on the flight line. Apparently, the economy was a factor this year.

I don't know the exact number of T-18s that were registered this year, but when I left on Wednesday morning, there were no more than about 25 and some of them had come and gone on the same day.

We had the T-18 Forum on Monday afternoon and it was almost SRO. In response to requests from several builders, we kept the agenda relatively nontechnical. The main thrust was introducing various individual builders and having them do short thumbnail talks on their T-18 experiences in building and flying.

One of these was VERN PEPPARD who has volunteered to put out a T-18 operations manual. In the main, he will use excerpts from back issues of the newsletter that pertain to safety or flying. Vern is the founder and owner of several large companies and one of his businesses that serves the oil industry has a complete printing plant in-house. He has most generously offered to underwrite the printing and distribution of this manual to all members in good standing.

At present, Vern is in Red China at the invitation of the Peking government along with a number of other U.S. geologists and petroleum production experts. But the manual will be issued shortly after his return. The first copy will go to JOHN THORP for proofreading for accuracy.

I know you all will join me in extending our appreciation to Vern for his generosity. I was at the point of giving up on the newsletters, as they had become a real problem - they were simply too much for one rapidly aging old codger to handle all by himself. The Post Office was to blame for a lot of this by "losing" newsletters which in turn caused a flood of requests for back issues.

We are now sending all newsletters first class mail, which should end most of the nondelivery problem. We have had to increase the newsletter donation fee to \$10.00 to cover our costs for the rest of 1983 and through 1984. If you aren't up to the \$10.00 level, it would be appreciated if you would feed the kitty. Back issue postage and envelop costs (for a full set) are over \$3.00, so you can see it does not take long to add up.

Also at the Forum, we asked for a vote on a name change to the "T-18 BUILDERS AND OWNERS SOCIETY" and it was unanimous in favor. So, in December 1983, we will make the name change on the bank account and letterheads. Eventually, most T-18 owners will not be the original builders, so it will be essential to keep owners up to date on service dictated mods, inspection procedures, operating techniques, accident analyses, etc.

RIK KELLER (San Diego) was one of the proud T-18ers with his bird out on the flight line and he fascinated the forum audience with his account of how four too-long bolts in the axle put him over on his back at a wilderness airstrip in Utah and how he managed to wriggle out between the canopy and turtledeck. Some of the subsequent events were almost hilarious, in spite of the obvious miseries and dejection of a T-18 owner having to disassemble his slightly bent bird and truck it home for repairs!

BOB DIAL gave an excellent discourse on the dangers of T-18 builders or owners exceeding the operating limitations on the aircraft. (More on that later in this newsletter.)

PETE BECK (Washington, D.C.) also reported on a news wood prop being made up to specs of an Australian designer, who has achieved some significant performance gains with his prop designs.

We originally had JOHN WALTON (Houston) on tap for the forum to tell all about the building of the new folding wing with integral fuel in the ouboard sections. But John got stuck with weather in Boston and didn't get in until Tuesday evening and, even then, had to leave the bird in Green Bay. John was the T-18 rep at the Dayton Air Fair this year. LEE SKILLMAN was the T-18 rep last year, with HANK STEIGINGA (Lancaster, CA) the year before that. Lee told of the fabulous treatment accorded to those attending as designated representatives by the designers of the most popular aircraft.

John also made a side trip to Boston to see his mother after the Dayton Air Fair. He really got to evaluate the worth of all that extra fuel being available and he found out he had more available than was practical to use in most situations. Whereas his previous fuel stops were 2 to 2½ hours apart, he now can add 1 to 1½ hours to that and still not use full wing tank capacity.

Before he made a trip to the West Coast a few months back, he installed TEMPERFOAM seat cushions and he sings the praises of it now.



I heartily concur. JOHN HARAST, a local builder, flew up with me in my bird. My seat cushions are 2" thick polyfoam on ½" wide aluminum strips riveted together on about 3" spacing. When I spend a day of 6 to 8 hours of flying, my right hip aches for a day afterward and 2½ hours in the seat is all I can take. We weren't out 15 minutes when John started squirming. He is about 6'2" and 190 lbs. and not as well padded as I am. By the time we tied up for the night at Janesville, his one aim in life was to buy some extra cushions at OSH for the return trip home.

HARLO MCKINTY happened to have some remnant demonstrator TEMPERFOAM cushions at his booth in OSH, so we bought a couple, even though they were a bit too large. What a difference! No longer did the tunnel and seat frames gouge us and we arrived home after some 6 hours of flying with happy fannies. I'm sold on it, as is John.

After my last trip to California, I often said, "I don't know how DON TAYLOR can sit there that long." I still don't. Of course, Don was to be the star attraction for the T-18 forum and the T-18 dinner, too. But, on Monday, he was still in Resolute, Canada (which is about 65° N near Frobisher Bay and near the Arctic Circle) and had been snowed in for 2 days. By our Tuesday night dinner time, we had word that he had made it to the North Pole and was back on the ground at his first refueling stop. He finally got back to OSH on Saturday, wearing a Santa Claus suit.

To say, "Congratulations, Don, for still another fabulous flight" doesn't begin to say it. Besides the careful planning, the meticulous preparation, it is also a tribute to his determination and courage to press on and accomplish his goals. All of us have only the greatest admiration for Don and his amazing and truly fabulous flights. Not only twice around the world, an Australian round trip, and to the North Pole and back, but also several other intercity records in the U.S.

In case you wonder how he navigated to the North Pole so accurately, he used a borrowed OMEGA set, which roughly operates somewhat like Loran, but is even more accurate. You'll read Don's first-hand account in the magazines soon, so I won't go into further detail. Perhaps we can get Don's story in the newsletter soon, too.

You may also know his T-18 went into the new museum at OSH, where it will take its rightful place in aviation history. Will Don be satisfied now to rest on his laurels? Maybe. However, he and his son, who is an aero engineer, are building still another T-18 . . . . .

As usual, our annual T-18 dinner was a whopping success. LEE SKILLMAN again did a superb job as the MC. And, again, we thank JOHN WALTON for making the arrangements. ED BURKE (PIT) presented a giant tail hook replica (a garden fork with a 4' handle properly striped) to LOIS TAYLOR, who was standing in for husband, Don. GARY GREEN's (San Antonio) slick yellow T-18 got the most votes for the best T-18 there and awards were given to each T-18 owner making it to OSH for the first time.

We are printing a few pictures of our dinner meeting in this issue. However, if any of you would like prints of all 23 pictures in the pack, mail a check for \$54.00 to JOHN HARAST, 3018 Merrell Road, Dallas, TX 75229 and he'll send you a set. (if you only want a print of the table where you sat, only the cost is 2.35 ea. ppd. Check the listing of those at various table numbers on pg. 6. Tables were numbered clockwise, beginning with the speaker stand)

One nice announcement at the dinner was RON MILLER's decision to move to the U.S. and make it his permanent home. In so doing, his T-18 project will have the unique distinction of flying nonstop from the U.S. to London and back before it's ever finished! Ron says he'll probably settle in California, where he can inhale a bit of fog now and then and cure any homesickness. Welcome to the U.S. rat race, Ron!

T-18 LIMIT SPEEDS: There apparently is still some confusion about terminology concerning the maximum safe operating speed of the T-18. The  $V_{NE}$  (NEVER EXCEED SPEED) for the T-18 is 210 mph. Do NOT confuse it with the  $V_D$  of 233 mph.  $V_D$  is the demonstrated dive speed and, for all practical purposes, FORGET IT!  $V_{NE}$  means what it says - NEVER EXCEED. We've said it before, but let's say it again. The speeds are TRUE airspeed in mph, not indicated. Also remember these airspeeds are based on calibrated pitot/static systems, so if you have not verified and calibrated your airspeed system over measured ground courses, you have an unknown quantity and you are gambling. So now if you are thinking about installing a 210 hp turbo-charged engine and getting a 230 mph cruise speed at 20,000 feet, let's be realistic. There's no such thing as a free lunch. If something like that is your goal, maybe you should consider selling your T-18 project and putting that money on something like a Brokaw Bullet.

While we're at it, let's take a long look at doing aerobatics in a T-18. The record over the years shows that aerobatics in any type of airplane is more hazardous than normal flying. Most of the accidents occurring were by trained aerobatic pilots flying airplanes specifically designed for aerobatics. So, if they buy the farm occasionally, ask yourself how the odds are for an untrained amateur in a super clean airplane that will go far past its  $V_{NE}$  in a flick of an eye out of a busted maneuver. Even if you wear a chute, there's no way you can get a T-18 canopy open in flight.

Sure, we see "pros" doing aerobatics in a Bonanza or a Viking, etc., but are you one of those that are qualified? It's a lot smarter to go out and rent a Pitts or trade your T-18 for one, if right-side-up flying is too tame or boring for you. Right?

FOR SALE: LARRY EVERSMEYER, 4725 S.W. 207th Court, Beaverton, OR 97007 just called me to tell me he's going to a C/S prop on his O-360 T-18 and, as a result, has a brand new SENSENICH W68LY80 (68"x80") prop, the flange adapter, 4" prop extension, and spinner for sale at a bargain price. His home phone is 503/642-3753. (That's for 180 hp.)

PITOT DRAINS: Talking to T-18ers, I find that I do not have a low-point moisture drain somewhere between the pitot head and the A/S indicator. How have you solved this problem? Please send a brief report and simple sketch ASAP. We need several solutions, so please help.

TOWBAR: At OSH this year, WALT GIFFIN came up with a slick way to make a towbar to attach to the tail wheel spring and wheel. It is carried in the airplane and makes pulling the T-18 around a cinch. Newsletter #58 will feature a picture, drawing, and comment by Walt. You'll like it. (We've got some sharp people in this T-18 bunch, I tell you!)

This is the end of our OSH '83 report. The following pages are pictures of our '83 dinner and a listing of names at the various tables. Since this newsletter is oriented toward the social side, our next newsletter (#58) will be full of some very excellent tech articles that I promise you'll find of interest to all of you. It will be mailed no later than November 15.

#### FOR SALE ITEMS

MIKE DEANER, P. O. Box 2472, Capistrano, CA, 92624, phone 714/661-8170 has gone c/s, so has a Sensenich 66 x 76 wood prop, with spinner and bolts for sale for \$300 (This is for the O-320 engine)

MAC BOOTH, Box 580, Daleville, AL, 36322 needs a "straight back" engine mount for an IO-360 Lyc (not the dyna-focal type). He also has a few T-18 parts left over at 1/3 off the list price. No phone was listed, but you can get it easily by calling the 555-1212 long distance info no.

TED WEISS, 7288 Bridle Vale Blvd. NW, Bremerton, WA, 98310 (206/692-1565) Has his T-18 project for sale for \$7500 (but would negotiate, he says) Engine is a Lyc. O-320-D2a, with prop and spinner. Fuselage is complete and on the gear. Wing, tail, and all tail surfaces are complete and flush riveted. Many extras including wheel pants, canopy, and more. He says his work and current house projects allow no time for T-18 completion in foreseeable future. Too bad, Ted, as it sounds like you were in sight of the magic moment. This ought to be a good opportunity for some of you boys in that part of the country. Ted also said he would consider selling the engine separately. (no info on engine time, etc. or engine mount).

RON JOHNSON, 8760 Spearhead Way, Reno, NV, 89506 (702/ 972-7216) has the following items for sale or trade. Says he would trade for most anything he could use on his project. Items are as follows: (1) Marvel-Sc hebler MA4SPA carb. (1) Rattray cowling (2) standard outer wing panels. Excellent work, with ribs undrilled. (1) flap completed and material to finish the second one (Ken Knowles parts). I think Ron changed over to a folding wing in midstream.

DAVE EBY, 3206 Martin Blvd., Wichita Falls, TX, 76308 (817/766-2523) has not one, but TWO T-18 projects for sale. Dave has about burned himself out on flying since he retired from the Air Force about 6 years ago. He has put in about 100 hrs. a month spraying, instruction, and charter flying and sees no end to it and no spare time. He has one fuselage complete, with canopy, controls, tail group, instrument panel, and tank in, up on the long gear, with a 160 Lyc. partially plumbed and wired. The wing (std) was bought from John Kleber, when John built a folding wing. Wing has 100 hrs. on it & painted white & is complete with tips, lights, flaps, ailerons. Airframe price is \$8000. He will sell the new engine & Cassidy prop separately. The other airframe (also std.) is partially riveted. It was his personal project when he bought the other airframe components. He also has cowlings, wheel pants, and a variety of other parts. Workmanship is excellent on all. Price is his cost in '80 dollars.

JACK WEIGLER, 827 Greenhaven, Richardson, TX, 75080 (214/238-0934) has a partially riveted fuselage (a round back, easily changed to a std.) up on gear, with canopy. \$1800.

TABLE #1 (L to R)

Ken Knowles  
Geri Knowles  
Lois Taylor  
Judy Skillman  
Shawn Skillman  
Lee Skillman  
Terry Hagle  
Hal Aavang  
Lee Walton  
John Walton

Table # 2 (L to R)

Paul Krogh  
Mike Deaner  
Peter Beck  
Mazie Lipscomb  
Karl Lipscomb  
Sue Beamer  
Hank Beamer  
Bob Pernic

Table #3 (L to R)

Jim Ruckman, Sr.  
Jim Ruckman, Jr.  
Ron Chapwick  
Bob Dial  
B. C. Roemer  
Steve Giffin  
Walt Giffin  
Bev Giffin  
Larry Whetzel  
Shirley Whetzel

Table #4 (L to R)

Ron Johnson  
Mike Rothermel  
Bob Hovey  
Fern Hovey  
Marie Brock  
Gray Harmon  
Bob Tannehill  
Gene Sloan  
Thelma Sloan  
Harry Paine

Table #5 (L to R)

Don Hackney  
Ione Shallbetter  
Howard Warren  
Fred Gindl  
Ralph Powell  
Malcolm Mobley, Jr.  
Howard Nixon  
Rose Nixon  
Helen Hudgins  
Bob Hudgins

Table #6 (L to R)

Ted Horlick  
Jim Renneker  
Wallace Hunt  
Vincent George  
Loren Huston  
Alfred Cousineau  
Janice Derby  
Bob Derby  
Bob Furrer

Table #7 (L to R)

Jim Jarchow  
Harold Kelsey  
Paul Kelsey  
Harlo McKinty  
Dick Wallace  
Wray Cloyd

Table #8 (L to R)

Orville Green  
Luci Neunteufel  
Bob Jaeger  
Nick Seraphinoff  
Barney Boukamp  
Linde Fleming  
Ray Fleming  
Lyle Fleming  
Pauline Fleming  
Mark Green

Table #9 (L to R)

Ron Miller (UK)  
Zarin  
Ed Burke  
Jody Burke  
Andrew Dudash  
Dan Dudash  
Holly Robinson  
Dorothy LaBreche  
Rex LaBreche

Table #10 (L to R)

Russell Ross  
Terri Ross  
Glenn Lawler  
Ingrid Lawler  
John Starr  
Amy Starr  
Bill Cox  
Bonnie Cox  
Rik Keller

Table #11 (L to R)

Paul Shifflett  
Helen Shifflett  
Linda Shifflett  
Mary Warner  
Don Warner

Table # 11 (cont'd)

Roger Dengler  
Helen Dengler  
J. Brayshaw

Table # 12

Paul Rendel  
Gary Cotner  
Gary Green  
Jerry Kinman  
Peter Leffe  
Emily Bloom  
Leroy Holt  
Mary Holt  
Bob Slagle  
Helen Slagle

Table #13

Jim Cozad  
Roz Cozad  
John Kenton  
Cecil Hendricks  
Fanny Hendricks  
Jim Evans  
Ford Hendricks  
Jack O'Keefe  
Juanita O'Keefe

Table #14

Bob Sanderson  
Jeff Sanderson  
Ed McLaughlin  
Ken Rhoads  
Greg Rhoads  
Chuck Meyer  
Mike Gould

Table #15

Joe Forbes  
Paul E. Levesque  
Donald Kames  
Bob Vanderbos

NOTE:

When ordering pictures, specify the table # and print your name & address & zip. Prints are B & W enlargements.





LEE SKILLMAN M.C.



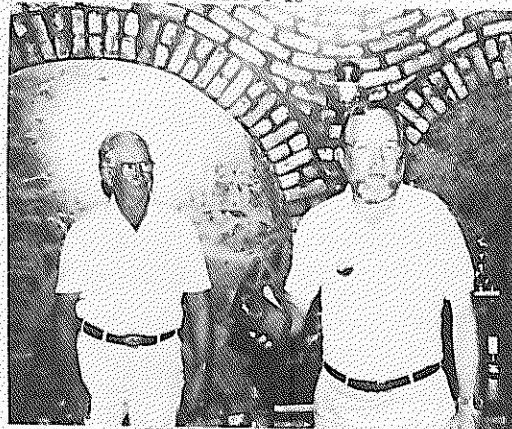
GARY GREEN  
BEST T-18



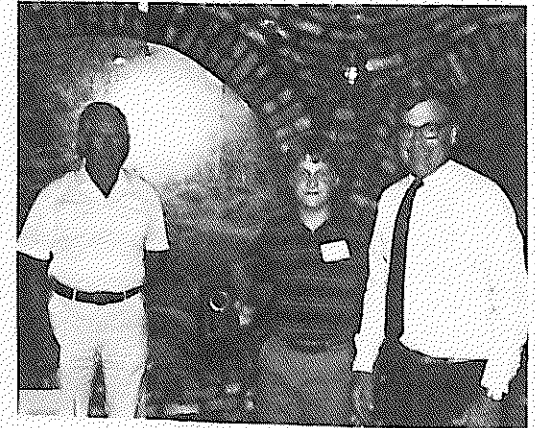
ED BURKE PRESENTS THE '83  
TAILHOOK AWARD TO DON TAYLOR'S  
WIFE, LOIS.



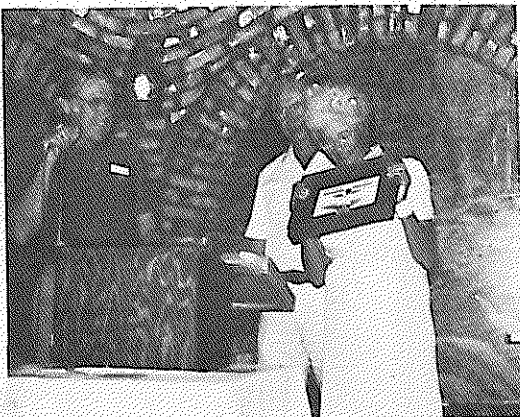
FIRST OSH TRIP WITH T-18



FIRST OSH TRIP WITH T-18



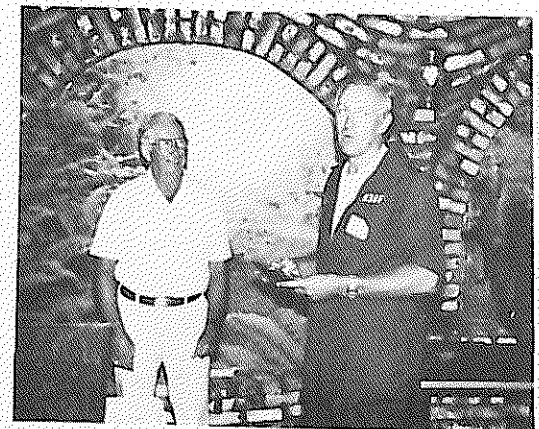
BEST FOLDING WING T-18  
JOHN & LEE WALTON



OUTSTANDING ACHIEVEMENT AWARD  
TO DON TAYLOR



FIRST OSH TRIP WITH T-18



1st OSH TRIP FOR T-18



TABLE #1



TABLE #4

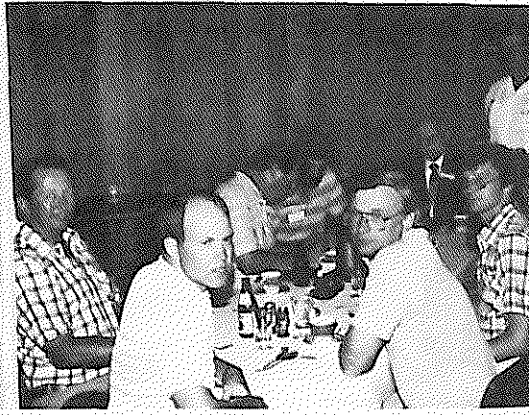


TABLE # 2



TABLE #3

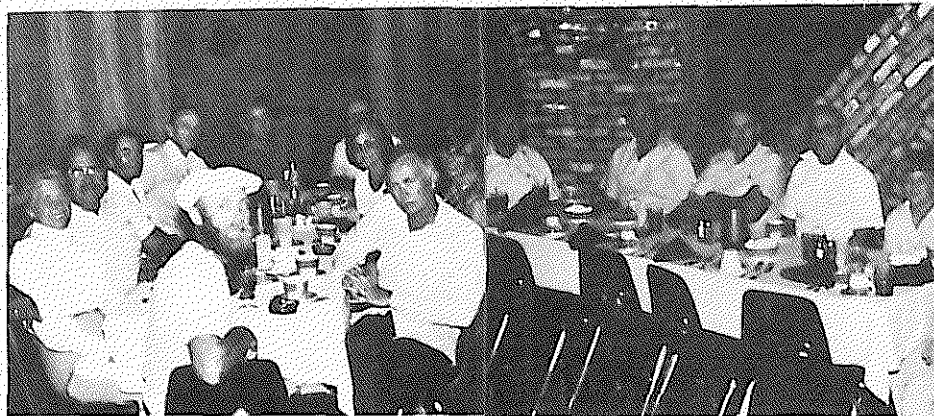


TABLE #5



TABLE #7

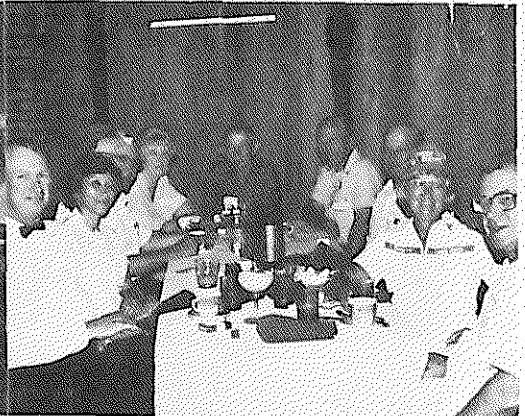


TABLE #8

TABLE #9



TABLE # 10

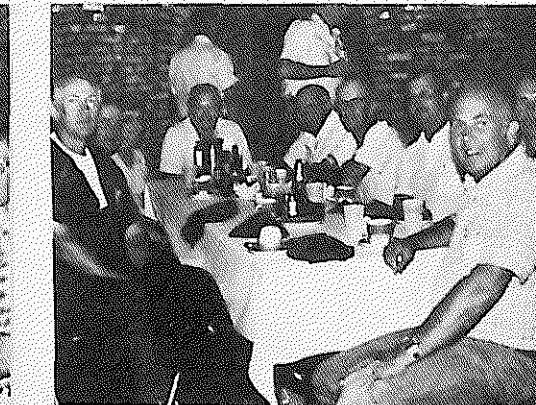


TABLE #11



TABLE #13

TABLE #12



As part of this newsletter you will note an enclosed letter from Mr. VERN PEPPARD, in which he details the plan for a most important addition to T-18 Newsletter, a "Safety Manual", for want of a better term at the moment. This will be similar to the Owner's and Operators manual that factory built aircraft have and will be a very valuable and necessary guide to safe operation of the T-18.....Please note, tho', that this is something that YOU and YOU and YOU must be a part of. It's not something that you can let George do. Most of you are properly motivated when it comes to helping your fellow T-18ers, but some of you are a little on the shy side...or maybe you are a little like I am most of the time, in the finding of time to pass on some of these gems of wisdom. Some experience you've had, some small bit of knowledge you've uncovered, might just be the means of saving someone's skin...and airplane. Just remember...the safer ALL T-18s are-the more your T-18 is worth and the more it will be held in high regard in the market place.....and now on to other things:

TEMPLE, TEXAS, OCT. 15-16: Back before the OSH fly-in began, the EAA national convention was held at Rockford, IL, and those were indeed the fun days for EAA people. Many of us look back on those days with great fondness, that's perhaps tinged with a certain wistful sadness.

As the fly-in became too big for RFD and moved to OSH it lost most of the warm camaraderie and close friendships that were part and parcel of RFD. While most of us really enjoy OSH and marvel at the international spectacle it has become, we still long for the perhaps indefinable missing ingredients that stamped RFD so indelibly on our hearts and memories.

I've tried to analyze what made RFD so much more enjoyable and it all comes out PEOPLE. We got to know EVERYONE that brought in an airplane, and a considerable number of those that just brought a dream of owning their own airplane someday. While we jawed on the pros and cons of our favorite airplanes, our wives met their wives, we ate together, and really got to know each other to a degree that it became almost like a family relationship. Each year it became almost like a family reunion.

Another big plus for RFD was the simple fact that most of us were able to stay in the same motels or hotels, where we could gather in large groups for after-hour informal functions, an utter impossibility at OSH today. Unless one brings in a warbird, or are an aerobatic performer, or a VIP, one doesn't "qualify" to rent a decent motel room there anymore....and this has angered a lot of people for several years.

Still another BIG factor in the RFD success was that the airplanes flew, and flew, and flew after they got there. There were buddy rides for just about everyone. We flew when we wanted to and the fly-by pattern was always in full swing. As it all mushroomed in size, safety considerations greatly restricted such activities.

Boil it all down and we can see that it was a fly-in for US and by US. It was for OUR enjoyment-and not a 6 ring circus to attract thousands of ground-pounder type spectators.

Anyway, the essence of all the above was what made our 1st annual "conclave" and social weekend at Temple such an overwhelming success. We couldn't call it a fly-in, as an invitation to such an event with the fly-in label could possibly incur liability. Ours was a simple invitation to join us for dinner, like inviting someone to your home for dinner. How you

get there and what you do with your vehicle after you get there is your own business.

Our weather on the Oct. 15 weekend was typical fall Texas WX. There was early morning stratus, but by mid-morning it burned off and by noon it was beautiful. Our winds were southerly, 15 to 20, which made the 85 afternoon high seem quite pleasant (or was it the euphoria from just being around the T-18s?).

Numbers-wise, we did pretty good for our very first annual event. By 2pm we had 12 pretty T-18s lined up along the edge of the closed runway 12-30. The Houston area fielded 4 T-18s: BILL COX and guest: PARKER MILLER; STEVE HOLBERT and guest; and JOHN and LEE WALTON.... The Dallas contingent was VERN PEPPARD, with T-18 builder, RON BOSTIC, as his co-pilot; DAVID MANN and son; and myself, with T-18 builder JOHN HARAST, riding shotgun with me. LEE REILLY and wife came in from Wagner, OK; TONY RUSSELL came charging in from New Orleans; and ol' JOHN HARDY made it over from Natchitoches, LA. JOHN PHILLIPS zoomed in from McAllen, TX (which was about as far away as New Orleans and Wagner) with guest RICHARD STAKES, GARY and MAXINE GREEN of San Antonio had the shortest distance to fly.

We had hoped that Houston's WORTHY WARNACK, BILL MCKISSACK, and PAUL STANLEY would join us with their T-18s, but other things interfered it seems. We also looked for JERRY STALLINGS, of Ferriday, LA, to be there, along with HOWARD HENDERSON (St. Louis); SYLVAN KEEBLER (Jackson, MS); LOYD TOLL (Hazen, AR); RANDLE WOOLAWAY (Cassville, MO); NATE EASTMAN (Kimbal NE); DON LANKFORD (Sherman, TX); BRYANT ROWLAND (Midland, TX); BOB MILLER (Ft. Worth, TX); PETE GONZALES (Colorado Springs, CO); DEAN COCHRAN and GALE ABLES (Denver, CO area); DOUG FRANTZ (Okla. City, OK); LOU FALCONI (Roswell, NM); and TOM KERNS (Arlington, TX); and JIM LANEY (Springfield, MO). If all those had made it we would have had about 30 T-18s there, which would have been pretty close to the number that were at OSH! Maybe next year, huh, amigos???

BOB SLAGLE and wife (Clute, TX) had to make it to Temple this year via the family Cherokee, as did Robert and Dean Sanderson (Graham, TX). STEVE RIFFE (Amarillo, TX) came to Dallas via airline, then rode with ROBERT CLARK (Dallas, TX). Others that arrived by auto were BILL GARDNER and wife (Alice, TX) and LEROY and MARY HOLT (McAlester, OK). JOHN AUSTIN and wife, MARY, (Dallas, TX) had to also come by car, as John has been having oil temp problems on his T-18. NORM BUEHLER and wife (Scott City, KS) would have like to have brought their T-18, but they were in the middle of a long planned auto trip and would have to drive back home some 500 miles to get the T-18, so they came via car.

GEORGE COPLAND (Duncan, OK) and daughter, DR. ANN COPLAND (Wichita Falls, TX) had to settle for the family Cessna 180 this time, but Ann hopes her T-18 project will be there next year. She'll have no trouble flying it either, as she's a pretty sharp 180 pilot and has flown it to Alaska a time or so to visit her sister in Fairbanks.

Our little clambake so fired up ROBERT CLARK that he went all the way up to Ames, IA, a couple of weeks later and bought an almost-ready to fly T-18 and trailered it home. He also has a wide body fuselage up on the gear in his garage, so now he can feast his eyes each evening on one of each kind. I can think of another half dozen T-18s in this area that might possibly fly before this time next year.

NEW  
MANUAL

1ST ME  
T-18  
CONCLAVE  
FOR  
S.W.  
REGION

*Santa Paula Buzz-in*

SANTA PAULA BUZZ-IN: Last March I flew out to Long Beach to do a mag story on events and activities preceding the opening ceremonies for the public debut of the HFB-1 (Spruce Goose) and I had called STEVE HAWLEY a few days earlier to tell him I would drive up to Santa Paula and visit him on Saturday after wrapping up the HFB story on Friday. Southern Cal wx had been miserable for several days with very rare thunderstorms and even a couple of waterspouts that moved ashore and turned into twisters. Saturday was only a little better, with light rainshowers and low scud hanging over the basin for most of the day, but SouthernCal T-18ers are not easily deterred when the call goes out for assembling the troops on the filmsiest of pretexts. The occasion was a cover dish luncheon in Steve's hangar. The wx around Torrance kept that T-18 squadron on the ground, or we would have probably had 25 T-18s there. As it was, we had 10 of the little beauties there. (With the world's largest concentration of the world's best sport plane, it's no trick at all to get a group of 25 of 'em together on mighty short notice, it seems).

I got to see KEN BROCK's new "Sweet Marie" for the first time and it's a beauty, as you might suspect. (Did you see the cover photo of it & the feature story about it in the Dec. '83 issue of HOMEBUILT AIRCRAFT mag?) One of the first to greet me was DAN DUDASH, an old, old friend we called "Tex" when he lived in Dallas. Also saw PAUL CARABELLI's almost new T-18 for the first time and it's a beauty, too. I always admire the sharp job of flying that ELAINE GINN does with the family T-18. Husband HOWARD says it's no secret, since she has flown it some 450 hrs. to his 150. (There's a great human interest story in that family...if I could just get 'em to put the stats, etc. down in writing). Also on deck were DON FRAZIER, LYLE FLEMING, LYLE TRUSTY, AL CHIVERS, H. \*CULB'T'Nten really first class examples of sportplanes to delight the most jaundiced eye. \*HOWARD CULBERTSON

Back in Palos Verdes that night I heard about a pilot doing low level aerobatics under a low ceiling that augered into a schoolyard in what was probably a T-18. He had just bought the airplane, was around 20 yrs. old. Probably was teaching himself aerobatics, too. PLEASE, gents, let's do everything we can to make personal flying safer and specifically T-18 flying as safe as possible. Talk like a Dutch uncle to the new ones that come along and buy T-18s. There's simply no excuse for accidents such as this one. I feel we should strongly discourage aerobatics in a T-18, unless the pilot is ex-military, with a LOT of experience doing aerobatics in clean, fast airplanes. With a Vne (NEVER EXCEED SPEED) of 210 mph IAS and a spar that is good for +6Gs...IF...the gross weight doesn't exceed 1250 lbs. what kind of sense does it make to get into a position to exceed one or both of these limits in the flick of an eye???? Have you ever considered that differential aileron throw ACCENTUATES adverse yaw inverted? Airplanes may have docile stall characteristics normally, but that does NOT mean they won't be really nasty inverted, especially if the stall is accelerated. Let's again note that you CANNOT open a T-18 canopy in flight! Also, again, why not go rent a Pitts if you're wormy to do aerobatics?

All of the above is to say that T-18 fly-ins are real fun for all and I just wish we will have more and bigger ones. Thanks again to Steve and the rest of the So Cal guys for all the hospitality! I'm beginning to feel that So Cal is my second home. Just wish I could take my T-18 out there more often and join the fun.

This ends the "social" side of this newsletter. Many of you have encouraged me to make social news a regular part of the newsletters. I hope you agree.

*KOPS*

NOTE FROM LU SUNDERLAND ABOUT SENSENICH PROPS: "Sensenich corporation has appointed a distributor for all their experimental propellers. He is JOHN W. BENJAMIN, 973 NISSLEY ROAD, LANCASTER, PA, 17601. He not only handles all W66LM (125 hp thru 160 hp Lyc.) and W68 LY (180 hp) props, but also wood models for the Varieze, Longeze, Tailwind, Sidewinder, RV-4, and Mustang II.

Sensenich is in the process of applying for type certification for the T-18 props, so this may help to reduce the required flight test period for the T-18 in the U.S. and shorten the landing gear legs on Australian T-18s, which must now use standard length certificated propellers.

Also, Sensenich just confirmed my contention that the brass leading edge took about 5 mph off top speed. On a Cassutt racer with test runs the same day, they got an 8% increase in power and the same % decrease in fuel consumption with a PLASTIC leading edge prop, in comparison with an identical prop with the brass leading edge! They now offer an improved plastic material, which is less prone to rain erosion."

Sincerely,

Lu

Thanks, Lu, for the info. I assume they now have the type certificate on the props, since several months have now elapsed in the interim. I know the reduced flight test time will be appreciated by new builders. It not only is quite tiresome to spend so many hours just boring holes in the sky to fly the time off, but nowadays it's also pretty expensive. After a certain point it's unproductive, too. In most cases one knows what they need to know about a new airplane (of a proven type) in ten to fifteen hours. I'm sure the Australians will also appreciate the removal of one more bit of red tape, too. I rather doubt that many will opt for the shorter gear, as it is now well established that the longer gear greatly improves the actual landing speed, as well as ground handling on the takeoff and roll-out, primarily due to the increased angle of attack in the normal 3 point position. It also puts more pressure on the tail wheel and helps to stabilize the airplane directionally.

*NO LEADING EDGES*

An improved plastic leading edge will indeed be a step forward. LEE REILLY (Wagner, OK) flew a few minutes in what he called light rain a year ago and he nearly had a heart attack after he saw what it did to his Cassidy prop. It not only ate up the fiberglass on the tips, but also ate into the leading edge wood. This was in spite of reducing airspeed and rpm! Since then I've flown a lot of extra miles to stay out of even the lightest of precip. I suppose this isn't all bad, as it's probably kept me from pushing weather, and I've done the old 180 for an overnite of comfort at the motel, where we spent the time congratulating ourselves for such a sensible decision (as we forced down a bit of prime steak). I've found that in circumstance such as this, that it's nice to have such decisions automatically made for you.

*A NEW WING!*

LYLE TRUSTY's NEW WING: I don't know how many of you subscribe to Jack Cox' SPORTSMAN PILOT magazine, but you're missing out on some excellent flying stories if you don't. The current issue (Fall 1983) has a two page article on Lyle's new wing. (If you send \$2 and ask for Vol. 3, No. 3 you can get one of these issues if you hurry.) Jack tape recorded Lyle's account of the exciting performance gain that has been documented with the new wing.

Lyle's wing retains the standard, non-folding planform, with integral aux



tanks in the leading edge of the center wing. This gives him an extra 13.7 gals. of fuel, the total usable fuel now about 42 gals. he formerly had a 10 gal. aux tank behind the seat, which he has now removed. He now has a 650 mile reserve, (an increase of 100 mi.) with a 45 minute reserve with the 3.7 gal. increase in fuel. There's much more than the increase in fuel capacity and range tho':

A big plus is the effect it had on both the CG and baggage capacity. The old baggage capacity limit was 35 lbs. Now it's 195 lbs! He says he very likely won't go beyond 100%, tho', as he now has doubts about the tail wheel's ability to take the extra weight. The wing tank moment arm is just about an inch aft of the Forward CG limit, so if you have an aft CG and put fuel in the wing aux tanks it moves the CG forward. If you have a forward CG and add aux fuel you move the CG aft, so this location ensures that you do the right thing no matter what the original CG position is. Fuel in the wings reduces the bending load on the spar, whereas any added weight in the fuselage increases spar bending load. Of course a landing with full wing fuel would increase negative spar bending, but that's one of those improbable things. He is also aerobatic at 1500 lbs. (which is unimportant to him, but it's there anyway).

You might think all the above was enough to justify all the time and trouble to build a new wing, but not so. That's really just the icing on the cake. The real bottom line is what it does to performance and flight characteristics. Read on: His new stall speed was 6 mph less, he gained 10 to 12 mph in CRUISE (depending on altitude), and he picked up 130 rpm, so now he's needing to raise his prop pitch to 85 or 86 inches. His present prop is a 68" x 84" metal prop. What's more, his head temp dropped about 40°, with a corresponding drop in oil temp. In other words he can get the equivalent speed with less power, less fuel, less heat, if you think of it that way...or he can use the 25 hp he has gained from the 130 rpm increase to go faster, etc. Or you can also say that the decrease in drag was the equivalent of gaining 25 hp. (using the formula that says horsepower is the cube root of the difference in rpm the gain in hp was 25 hp).

Why would "just" a new wing do all that for you. Lyle's explanation goes like this: "People sometimes lose sight of the fact that the T-18 was originally designed around a 125 hp Lyc, as an open cockpit, non-cowled and unfaired airplane, whose max speed would be under 150 mph. For these conditions a 63,-412 airfoil was chosen, with a 1° angle of incidence. (The last three numbers in the airfoil are the key. The 4 means the design lift coefficient is .4, which is what the airplane and its gross weight required at 160 mph and 1° of incidence, meaning the wing would be flying at a plus 1° angle of attack at some chosen altitude. The 12 designation refers to the airfoil thickness in percent of chord, 12%).

When one puts 180 hp in it and are going 195 mph there's quite a change. Long ago John Thorp announced such T-18s didn't need that 1° of incidence, that the fuselage was flying at quite a negative angle at those speeds, where you only need a 1.7 C<sub>L</sub> instead of .4...All adding up to the fact that you are generating a lot of induced drag by pushing the wing through the air at half a degree of negative incidence.

In addition, the tail is up another degree than it needs to be, perhaps 3.5° on the end of a long moment arm of 214", so you are now 2.5° off the optimum cruise angle for the fuselage, plus 1.5° off on the wing. The sum of all this is a lot of useless drag, which requires hp and fuel.

(CONT'D)

My wing has a 63<sub>1</sub>-212 airfoil tha's modified forward of the spar. It also has a 50% increase in the leading edge radius, which greatly gentles the stall. I also built in a strake by increasing the chord of the inboard rib by 5 inches and the aux tanks went into the bay this triangle made. I also inverted the inboard ribs and if you'll notice a 727 or L-1011 has the same thing. The reason is that this points the inboard portion of the wing up into the induced downflow around the cowl, which reduces induced drag. The oil streaks on the cowling definitely show that they all come down where the air comes around the side of the cowl. This shows that on a stock T-18 the wing root area is sitting there in a negative angle of attack in that downflow. Also the additional 5" in the root rib strake increases the Reynolds number significantly, so you get more lift out of the center section. The change in the stall characteristics is tremendous. The old wing stalls from 12 to 14 degrees angle of attack, whereas the new airfoil will get up in the 18 to 20 degree range before flow separates.

The max lift coefficient with flaps down is about 2, and with no flap it is about 1.6 and that's a change of about .4 from the old one. With the increased leading edge radius the new one doesn't have the secondary break characteristics, either. Coming down the back side of a loop with the old airfoil and you pull it tighter until you get the first buzz of an accelerated stall and back off a little. Just barely touch it again and you'll get a secondary stall pronto, but the new one doesn't do that. It also has a nice stall buffet, but the downwash doesn't stall the tail, too. It doesn't tuck or suddenly bunt and it's a totally new feeling to fly the airplane.

I also believe the wing is much more stable in roll and is a much better IFR platform as a result. The harmony between pitch and roll is an even better match with the new wing (?). With the new wing you can take your hands off the stick for a longer time. Some might not find it quite as delightful to fly with the heavier ailerons, but after a few hours you get used to it and soon forget the other. You just know it has greater stability. These changes are due to the change in the wing camber, including the reflex in the trailing edge, in addition to the higher speed.

All in all, I'm tickled to death with the result and if someone else wants to go this way I'll help. I don't have the time, or the desire, to publish plans and sell them. I haven't talked to John Thorp about my wing yet, but I'm sure I will soon. Of course I want to acknowledge the work of Bill Johnston, Lu Sunderland, and Kenny Knowles, as they have designed or built different wings for the T-18 and I borrowed heavily from them. (Bill was the first to design a wing with the inverted rib strake and a new airfoil, which he outlined in N.L. #50-Ed.) I'm having Pete Beck back in VA design a new prop for me that promises fantastic performance, so if that also works out I can do something about that 130 rpm."

Thanks a million, Lyle, for that great wealth of info. We truly appreciate it. The late Bill Johnston was another that generously gave us a lot of information on his experiments and you might want to go back and review his work, too. Bill was an engineer for Boeing-Seattle and he would use his computer to design a new airfoil and then go out and modify the wing of his T-18 with microballoons and resin and go fly it. Of course you well know the story of how Lu and his friend at NASA developed the LDS-2 airfoil that Ken Knowles has on his airplane.

Lyle carefully flew baseline tests with the old wing at 3, 6, and 9 thousand

BETTER  
STALLCONTROL  
FEELNo  
PLANSG.  
FEET-AMANCE  
-MINS

feet with max power to determine airspeed, rpm, and manifold pressure, stall speeds, clean and dirty and all the other items of importance on baseline testing. After he installed the new wing he left the old pitot system intact, using the same prop, too, so he could accurately compare the results, which really startled him (and us, too, I might add!).

Okay now gents, before you drive Lyle up the wall crying for more info, hang loose until next N.L. issue please and we'll get more of the details that you may want to start such a wing on your own. Before you make such a decision, tho', be sure you will wind up with a 180 hp airplane. If you will be in the 125-150 hp range the results might be less spectacular on the high end.

*ENGINE NEWS*

NEWS FROM JAVELIN AIRCRAFT: I just got an advance copy of Dave Blanton's latest newsletter for the Ford-Javelin aircraft engine conversions and there is GOOD NEWS from him for T-18 builders. The 1.9 liter engine that Javelin called the 110T put out 100 hp un aspirated, but it turned out to be 70 lbs heavier than an O-200 Cont., but they flew 20 hrs. in their old Cessna 130 test bed, but the noise from the four tuned stacks was unbearable, he said. The bottom line is that this engine CAN be pumped up to put out 180 hp in the TURBO version, but now Ford has quit making it. Dave says okay to use it in other airplanes from Pietyenpols up to Longezes, but for T-18 class airplanes he does NOT recommend it. The limitations of the engine surfaced in the test flite program, so he accelerated development of the conversion of the V-6 engine (known as the Windsor engine, as it is built in the Ford Windsor, Ont. plant) which is now used extensively in cars and trucks. They got an engine out of a Ranger for \$900, which had 22,000 miles on it.

I've added on some of the excerpts from Dave's newsletter, for your info and I think you will find them interesting. It appears that this greatly de-rated engine turning out 200 hp for T/O will come out even in wt. with a LYO 180 hp O-360 and constant speed prop. Take note that this is NOT an aspirated engine and can use automotive regular. At a 100 hp cruise it only turns 6.2 GPH (.37 SFC). The only engine changes required in the conversion is another camshaft and the gear on it. This raises the max torque rpm from 2200 to 3600 (cruise rpm). If we can live with no more weight than an O-360 plus C/S prop it certainly appears we may truly be on the threshold of a cheap, high powered engine for the T-18 at last. Javelin currently is preparing price lists for four conversion kits, which will range from raw material only to a complete, assembled conversion.

Right now, while I was just in the middle of writing this about Javelin, I got a call from Dave to further bring me up to date. He said Ford had quit building the 1.9 liter engine and they had no intermediate engine between it and the 230 V-6 (which could put out as much as 370 hp!) They have the 230 running on the dynamometer and are very pleased with it. The reduction system turns the prop at only 1800 rpm, which will really make it quiet. He also is working on a ground adjustable prop with Kevlar-reinforced blades and are now testing their 4th model, which may be the final product. He also said there will be a turbo model of the 230 out in a very few months. I asked him about the size of the 230 and he said it's a 24" cube. That means it should fit in the present cowl, too. The present cowl could easily be modified to close off the cheeks and take what little air is needed via a small opening below or around the spinner, possibly like the Doerr cowl.

The 230 engine will be flying in a short time, using an old Cessna 175 for a test bed, so we'll report on developments very soon.

EXCERPTS FROM THE JAVELIN FORD NEWSLETTER #7, DATED DECEMBER 1983  
JAVELIN AIRCRAFT CO., 1982 EASY ST., WICHITA, KS, 67230. (316/733-1011)

JAVELIN FORD MODEL 230 V6 (231 cubic inch, 3.8 liter). With starter, alternator, carburetor, oil filter, fuel pump, 6 1/4 pound flywheel and 2 to 1 reduction drive, no oil, 387 pounds. Reduction drive alone is 59 pounds, bare engine 328 pounds. This engine is 50 pounds lighter than the Javelin Ford 140T (four cylinder Mustang engine 2.3 liter), and is 90 cubic inches more displacement. Only 62 pounds more than the 98T but 2.35 times the displacement, only 14 pounds heavier than the O-360 Lycoming of 180 to 200 h.p. which weighs 373 pounds. 101 pounds lighter than the O-470 Continental which weighs 488 pounds. The weights we give on air cooled engines are with exhaust system, carburetor air box and baffles. An air cooled engine can not be operated without these components. With the 2 to 1 reduction drive the swept volume per propeller rotation is 462 cubic inches. The compression ratio is 8.6 to 1 and due to liquid cooling, automotive regular can be used. The cylinder heads and accessories covers are aluminum. The thin wall steel block is lighter than an aluminum block. The steel block is 3/16 thick as compared to 5/8 thickness of an aluminum block. This engine is known as a Windsor engine, since it is manufactured in the Ford plant at Windsor, Ontario, Canada. The production rate is 2500 per day and they are used in many models of Ford cars and trucks. Low mileage engines are available from wrecked cars and trucks.

HORSE POWER: If you turn up a liquid cooled engine to around 5000 r.p.m. with high compression pistons and the correct camshaft you can get 1.3 h.p. per cubic inch. With this engine that would be 300 h.p. The specific fuel consumption (S.F.C.) would be .54. An air cooled engine at rated power requires .7 for cooling and .78 with a turbocharger. With a small amount of supercharging and the right camshaft, the liquid cooled engine will produce 1.6 h.p. per cubic inch. For this engine that will be 370 h.p. but at a S.F.C. of .7 in order to cool the dome of the pistons. To get minimum fuel consumption we will operate the model 230 at low power and unsupercharged. We have arbitrarily picked 200 h.p. for rated, this is .86 h.p. per cubic inch. At 75% maximum continuous cruise this is 150 h.p. and at an S.F.C. of .37 this is 9.25 G.P.H. with the right prop, a T-18, Mustang II or similar airplane will cruise very well on 100 h.p. and if we can do this at 6.2 gallons per hour on automotive gasoline we have accomplished something.

We encounter people that think F.A.A. requires two spark plugs per cylinders, there is no such requirement on a homebuilt, but even a certificated engine can now be approved with a single spark plug. We are going to use the stock ignition system on the Model 98T and the 230 V6 but with two modules which we will call, left and right. Spark plugs and the distributor never fail but the ignition module can fail. All it takes is a 4 pole-double throw switch. We do want a stand-by battery for the second module. We use a little motorcycle battery and keep it charged with a diode from the main battery.

All of our flight testing with the 98T engine has been with the flywheel ignition system and it has worked perfect. But the cost of the system is \$480 and we think the homebuilders will have better success with the stock ignition system. With the stock system you can get parts and service. We will add the second module and selector switch. The distributor on the Escort is on the end where our prop shaft goes, we will provide a drawing to show how to install it on the other end of the camshaft.

- END -

Dick Cavin  
T-18 Mutual Aid Society  
10529 Somerton  
Dallas, Texas 75229

Dear Dick,

You asked for it so here's from a buyer, rather than a builder. I bought Serial No. 279 w/ 0-360 Lyc. and fixed pitch prop. From back issues of the newsletter and extremely limited information from the guy I bought N3WB from I deduce that I am her fourth owner. Number three owner had installed a placard listing himself as the builder and the logs for the engine and airframe reflected same. In fact it appears that my Thorp was built by Bill Hart and first flown in 1971.

It is a basically well built aircraft but had been messed up with tons of Bondo, foam and fiberglass. My wife, Kathy, and I spent nearly 500 (inexperienced) hours replacing wheels, brakes, windshield, gear and wheel fairings, etc. and on fiberglass cowling, wing tips, etc. Then to the paint shop and upholstery shop for professional finishing touches. We had upgraded 3WB from a flying pile of junk to a third place custom trophy winner at the Northwest EAA fly in at Arlington, Washington last fall.

During the restoration period (with the exception of the painting and upholstering periods) we had to have everything reassembled by Monday mornings as I used the plane daily to commute to and from work. I now have over 400 hours in my T-18 and each flight has been more fun than the last. It is a fantastic plane and I am indebted for life to Jonh Thorp, to everyone involved with the newsletter, to Ken Knowles, Merrill Jenkins and many others for making possible an airplane beyond the dreams of a Cessna jockey.

Some observations: (keeping in mind that I haven't the foggiest idea how many hours total my Thorp has spent in the air). My throttle and mixture controls are routed under the fuel tank. They had worn half way through the tank wall and I corrected this with felt pads cemented to the tank.

My canopy had two latches, one on either side. In flight the canopy lifted 3/4" or more and directed an unbelievable amount of rain into the cockpit. A new seal and a Ken Knowles latch top dead center was the cure.

The forward canopy frame wheel tangs were worn over half way through from contact with the rail. I made stainless shims and attached them to top and bottom wheel bolts. This restored the structural integrity and provides a buffer between the steel rail and the aluminum canopy frame.

As I continue to pile up the hours and as other items come up I will send them along.

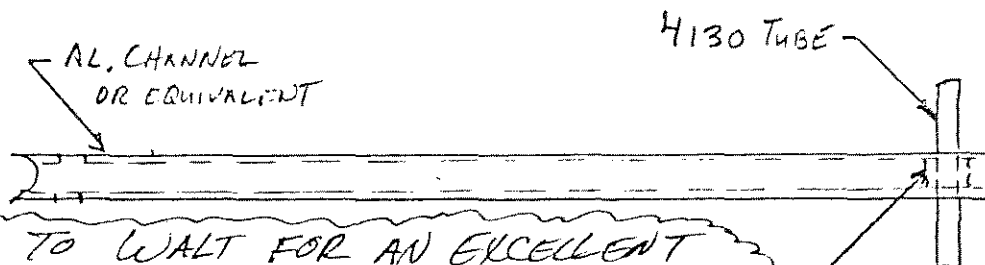
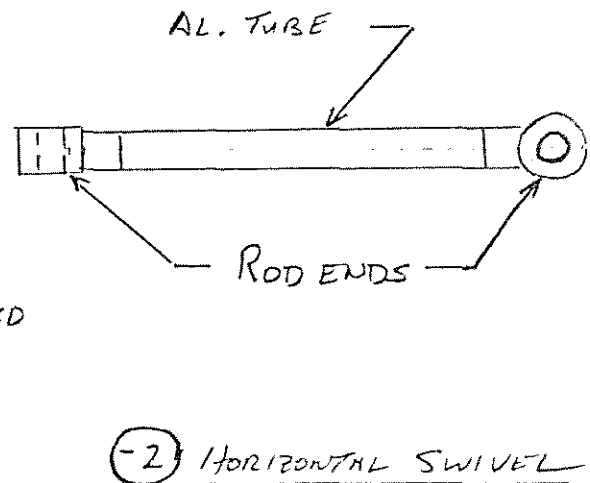
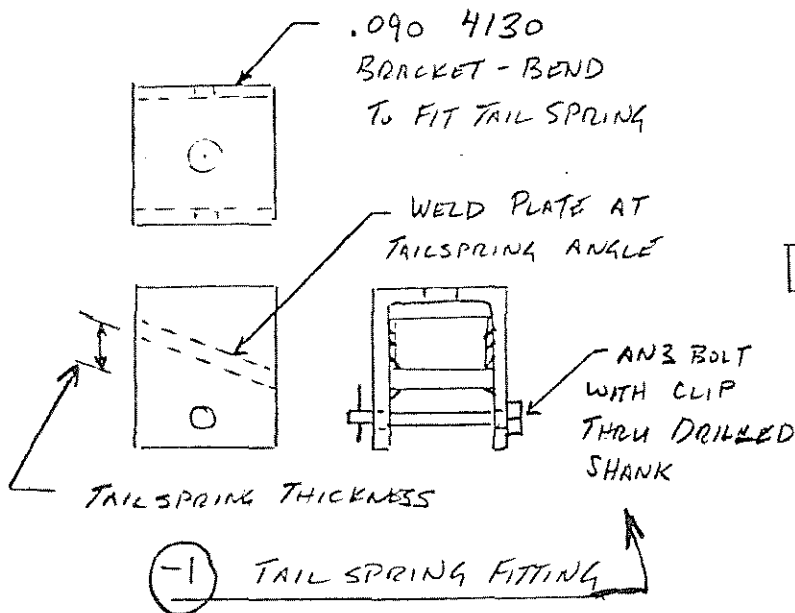
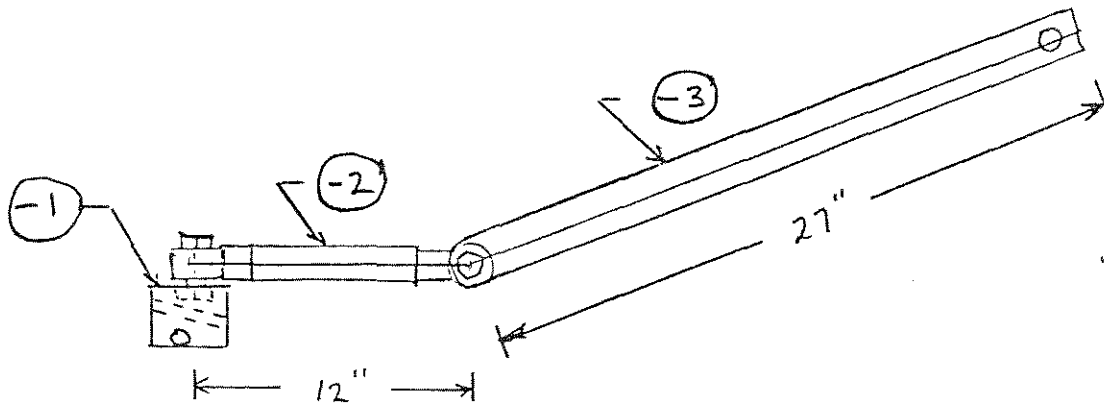
Arch Maxwell  
1845 Mesa St.  
Redding, Ca. 96001

*Arch*

LETTER  
FROM A  
T-18  
OWNER

THANKS, ARCH, FOR AN EXCELLENT LETTER & A COUPLE OF GOOD TIPS

FROM — WALT GIFFIN - NT8WG



"THANKS TO WALT FOR AN EXCELLENT  
DRAWING. THIS IS SOMETHING ALL T-18 OWNERS  
NEED."

DICK

(ALSO SEE PHOTO PAGE)

## T-18 NEWSLETTER #58

PAGE 11

Nothing quite gets your attention like a sputtering engine just after lift off on your first flight or on go-around the first time you've stretched it and your'e down to two gallons remaining..... Yes, that's happened many times to an unsuspecting homebuilder because he neglected a fuel flow check prior to first flight, I consider it an afternoon well spent for the peace of mind you get.

First, some light exercises on your calculator using the following conversion factors:

|                  |                                  |
|------------------|----------------------------------|
| Fuel weight..... | 5.87 pounds per gallon.          |
| " volume.....    | 128 Liquid oz. per gallon.       |
| " " .....        | 3.785 Liter per gallon           |
| " " .....        | 3,785 cubic centimeters per gal. |

Fuel flow requirements for a couple of popular engines will be used as examples.

The 100 H.P. Continental will burn slightly more than eleven gallons per hour at takeoff power setting at sea level. (Because of an enriched fuel schedule which is to cool the valves in this growth version of the old 65 horse Cub engine) 125 % of that fuel flow, as a safety measure, amounts to 13 1/2 gallons per hour. This figures out to .23 gallons per minute or 29 oz., or 867 cc's per minute.

The 150 horsepower Lycoming burns a little more than 14 gallons per hour under the same conditions. 125 % of that is 17.5 gallons per hour. That equals .29 gallons per minute or 37 oz. or 1,100 cc's per minute.

These figures are far above the normal ones your'e used to seeing at cruise. Like 5.6 G.P.H. for the Continental and 9.4 G.P.H. for the Lycoming and illustrate how the trap gets set and why you need to do the flow check under worst case conditions.

So....set your tail in a ditch, hoist your nose in the air or do whatever you have to in order to get the aircraft setting at the stall angle of attack. Now drain all the fuel out, put two gallons back in (to simulate that go-around with only 2 gallons remaining we mentioned earlier) shut off the fuel valve and disconnect the fuel line at the carburettor inlet. Using any convenient measuring container, like a 32 oz fruit jar or a cc beaker time your flow rate. Normalize the time to fit the container if you like:

$$\frac{29 \text{ oz.}}{60 \text{ sec.}} \text{ as } \frac{32 \text{ oz.}}{T} \text{ , } T = \frac{(60 \times 29)}{29} \text{ , } T = 66.2 \text{ seconds}$$

32 oz should take 66.2 seconds then.

If you have installed 3/8 inch fuel lines, as you should have, and have number 6 fittings all the way from the fuel tank to the carburettor, and you have a high wing airplane .....fuel will squirt all over and your jar will runneth over. However, a low wing airplane is another matter since it doesn't have the static head pressure the high wing had. This amounts to about 1 psi for each 35 inches of fuel tank elevation above the carburettor. Now couple this with the Marvel-Schebler float type carburettor specification of 0.5 psi minimum fuel pressure required and you've got a fuel flow problem.

(CONT'D)

The Designee File: by Lyle Trusty, Designee #52 (cont)

The reason most low wingers have two fuel pumps, one electric and the other engine driven becomes obvious. Either one will provide takeoff fuel flow.

You can give up here and put on two fuel pumps or do a little more work and have a more reliable system at lower cost.

Pressurize your fuel tank through the vent line, which should be about 3/8 inch diameter and be facing forward, to about 120 % of stall speed on an airspeed indicator tee'd into the line your'e blowing in and again measure your fuel flow. If it squirts the required amount into the container you know it would do that in flight too and you've got a good system. This is how the Thorps get by without fuel pumps, even with 180 horse engines installed.

Put a screen on your vent line though or a mud dauber can ruin your whole day! (It's happened)

A word of caution about gravity feed systems.. put in check valves, cut down the tubing size, use smaller than #6 fittings or install a super dooper fuel filter and you lose fuel flow. A gravity feed system has to be simple and tested for flow after it's all together the last time.

It's worth the extra effort because something that's not there can't fail and the reliability of a piece of tubing is fantastic compared to two fuel pumps. So, keep it simple and reliable by the check we've described and eliminate one more first flight worry.

This is another excellent report by Lyle and we really appreciate this sort of article. It's hard for the builder to dig out this sort of info, yet it's something each and every one needs. So again, Lyle, our heartfelt thanks from all of us for two very timely and excellent technical articles.

Here's a short note from Walt Giffin about the T-18 towbar that I didn't have room to put on page 10 with his drawing:

## T-18 Towbar

My T-18 towbar was fabricated from assorted scrap material laying around my shop. The basic idea stems from a design by Pete Gonzalez which appeared in Newsletter #53 p. 17A. I modified his design by constructing a simpler tail spring fitting and providing two swivel joints for easy maneuvering and easy storage in my baggage compartment. The towbar works beautifully and makes it a cinch to pull the T-18 into the hangar or a tie-down space without stressing the tail surfaces.

The next two pages also contain some pertinent words of wisdom from our good friend, John Walton, of Houston, TX. I would like to encourage all of you to submit this sort of article for our upcoming Safety Manual. What pre-flight items should we especially watch for, etc.

REMAINING  
JEL  
LOW  
2'TS

FUEL FLOW INFO

April 22, 1983

## WATCH THAT PREFLIGHT / by JOHN WALTON

The experience described herein occurred recently on T-18 N51863 and points out once again the importance of a thorough preflight, including inside the cowling.

On a recent flight a faint fuel odor was noted on initial climb out. Later, when landing, slightly rough and irregular engine operation threatened peace of mind. At the time, a mental note was made that maybe we better check the plugs and engine timing.

Before the next flight that mental note escalated into a special thorough preflight. Both of the Thorp cowl checks were pulled. Before pulling the plugs and checking timing, a meticulous preflight was made of the engine and accessories. The Marvel-Schebler carburetor was fully inspected and everything appeared normal. But when the carburetor bowl was taken in a hand and twisted, it was found that the whole assembly, along with the induction system was sloppy loose. (see diagram)

The fuel trace noted on the previous flight's climb-out was the result of fuel spilling out of the bowl at its gasket and sloshing over into the engine compartment. The entire carburetor and induction system, along with their respective control cables, were suspended below the throttle body assembly by four precarious 12-24 machine screws.

The carburetor in question is an MA-4SPA installed on a Lyc 0-320. It had 150 hours on it since being overhauled and yellow tagged by a certified shop. The 12-24 screws bowl attach screws had tab locks installed and the screws apparently were locked against turning.

The entire carburetor and induction system was removed from the engine for inspection. Upon disassembly, it was found that the gasket was intact and that the screw locks were behaving properly. Parenthetically, it was also noted that these four attach screws, when shouldered on their lock tabs and extending through their holes in the throttle body assembly, extend only  $\frac{1}{4}$ " into their bowl tapping. (5 to 6 threads).

The looseness of the screws seems to have occurred due to a shrinking of the gasket under attach screws which (possibly) were lightly torqued to begin with. The resultant loosening caused some thread marks to occur in the attach screw holes in the throttle body, but appeared to have done no permanent damage to the parts.

It was noted above that the subject 12-24 attach screws extended only  $\frac{1}{4}$ " into the  $\frac{9}{16}$ " deep tappings in the bowl. Disassembly of two other carburetors, and a check with the overhaul shop confirmed that the short screw is "standard".

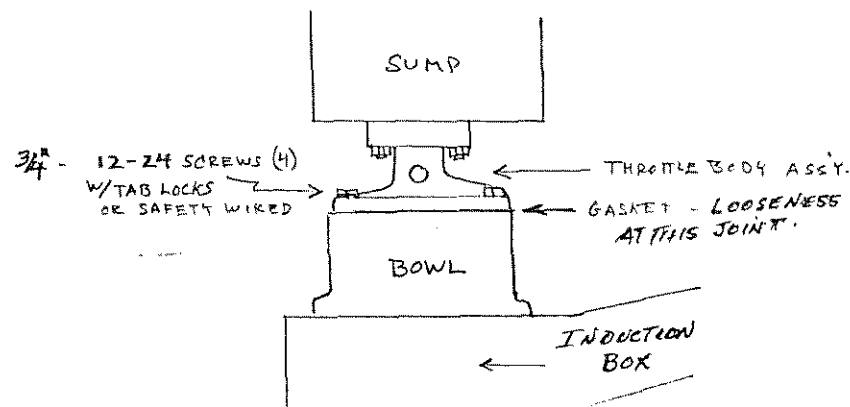
Pre-flight article by JOHN WALTON (cont'd)

(page 2)

Although the carburetor was reassembled tight with these  $\frac{3}{4}$ " screws; 1" screws have since been located to replace them, and utilize another  $\frac{1}{4}$ " of the available thread (due to some possible wear in the first  $\frac{1}{4}$ " of thread length, this seemed to be a reasonable precaution).

The aircraft has flown 3 hours on its retightened screws without any apparent signs of loosening. All signs of fuel odor and roughness are gone.

The hazards coincident with a continued wearing or possible detachment of the carburetor bowl need not be recited, and it is suggested that all owners check for this looseness on their next pre-flight.



Here's another excellent article that certainly deserves our thanks to John. Again, I would encourage ALL of you to contribute ANY sort of article, but especially ones of such general interest. Such sage words could well contribute to one's well being and prevent sudden stoppage, with resultant bent or broken body parts.

*John Walton*  
T-18 N51863

## -NOTICE-

AVISO -  
NOTICE

As always, in past, present, and future newsletters, we would like for you to be aware that this newsletter is presented as a clearing house for ideas and opinions only and anyone using these ideas or opinions does so at their own risk and discretion. No responsibility or liability is expressed or implied and is without recourse against anyone.

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NEWSLETTER #59: I plan to publish #59 very shortly after the first of the year and I have quite a number of letters and articles from T-18 builders AND owners to pass on to you, but it won't take too many issues for my well of articles and letters to run dry. We need more articles on any and all aspects and areas of building. With so many of you building the wide body and folding wing, we especially need your report on wing build'g, canopy fitting, control rigging, etc. As for owners, we need to know who owns what airplane, who built it, any problems, improvements, experiences flying it, etc. Our roster in #59 will have several letters from overseas builders, more Designee articles, a 1st flite report, ultra-sophisticated propellor balancing, a pitot drain tip, an article on auto vs A/C alternators, cutting and drilling your canopy, checking the A/S indicator on the ground, a Canadian accident from their DOT, a rivet gun tip, and more.

Please remember that your contributions of articles..and money..are the lifeblood of the newsletter. Most of you have sent in your \$10 dues which covers increased costs of first class mailings, but some of you are a bit forgetful, as most of us are, at least part of the time .

We continue to publish For Sale items for our current members at no cost, as long as we have space available. This issue contains for sale notices from several builders for complete standard wings, as they now have, or will have, changed over to the folding wing.

JOHN WALTON, 5726 Boyce Springs Dr. Houston, TX, 77066. 713/440-8093, is asking \$3300 for wing. Is complete, painted white, perfect shape.  
Peter Beck, 8712 Queen Elizabeth Blvd, Annadale, VA, 22003. 703/323-7132, is asking \$2500 for the wing now on his airplane, but will be available as soon as his other wing has been completed.

There will be others available next year, no doubt. This is an excellent way to get airborne many months sooner. At today's prices both are really "steals". If you want a CW you could fly one of these awhile while you are building and then resell it.

Frank Seats, 111 Chapel Hills Dr., Fredricksburg, VA, 22401, has an M-76 Sensenich metal prop, prop extension, and matching spinner for sale and is asking \$800 for all. Prop is vibration tested by Santa Monica and is polished. He also would like to hire an experienced builder to update his airplane with a new canopy, add flaps, cut down the deck, etc., or he would consider buying or trading for a later model T-18 (Has no time to do work himself). PROP IS 68" X 76" FOR 160 HP LYC.

Parker Miller, 15535 Edendale, Friendswood, TX, 77546. 713/482-1732 is starting a new business, so must sell his prized T-18 to help finance. He is asking \$23,000. Call after 7 in evening.

Ted Jarosak, 2501 Sand St., Portage, IN, 46368. 219/762-7038 says: "Have a Dynafocal type II Mount, large rings, for Lyc 160 B1A 0-320 \$300, set 2 1/2" Westach Fuel, Quantity, Fuel press. Ammeter, dual oil press./temp sender & lites. \$225 for complete set. (CONTACT HIM FOR FURTHER SPECIFICS)

UNTIL #59 - ENJOY.

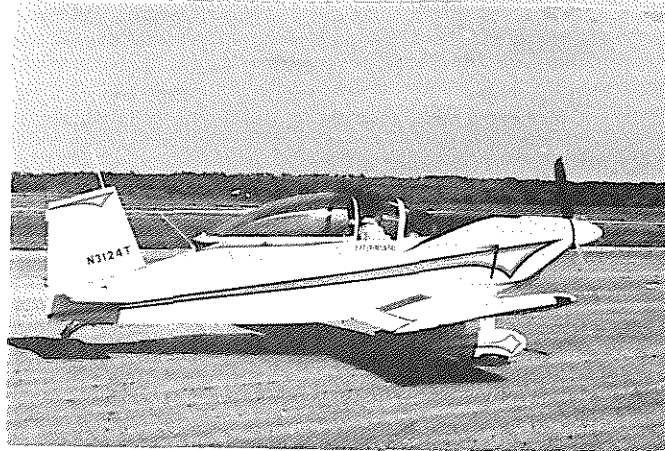
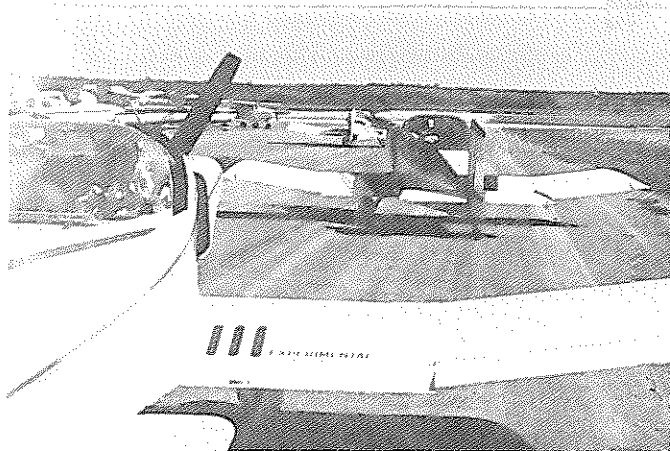
Dick Carwin

N.L.  
#59  
Soon

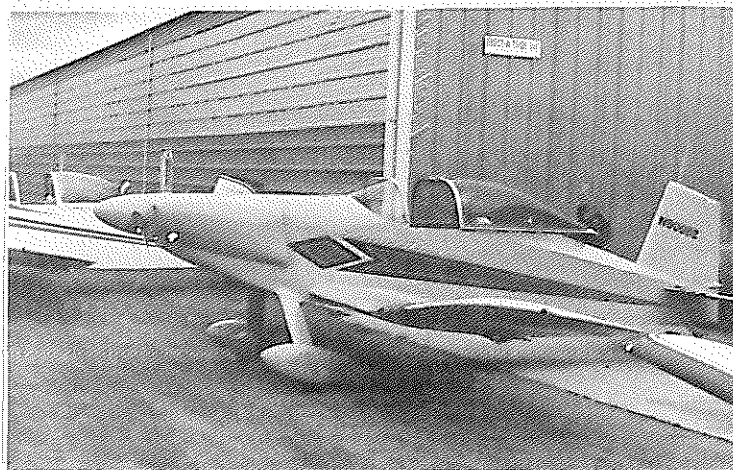




SCENES FROM THE OCTOBER 15th T-18 CLAMBAKE AND CONCLAVE AT TEMPLE, TEXAS

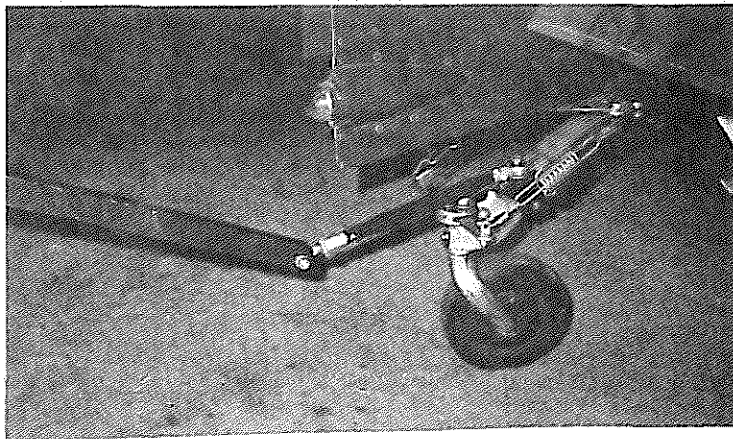
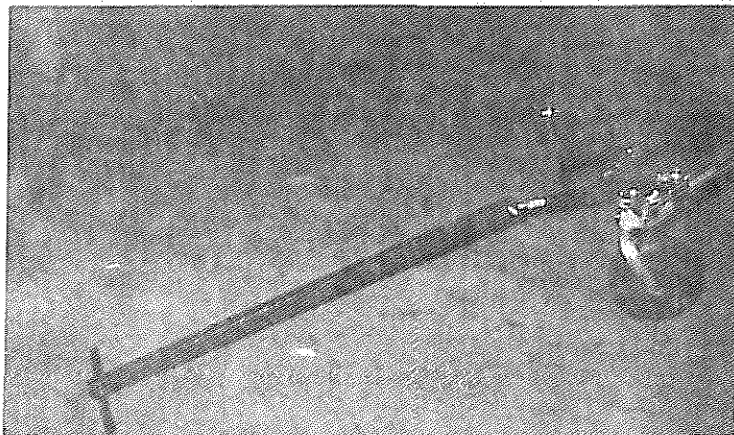
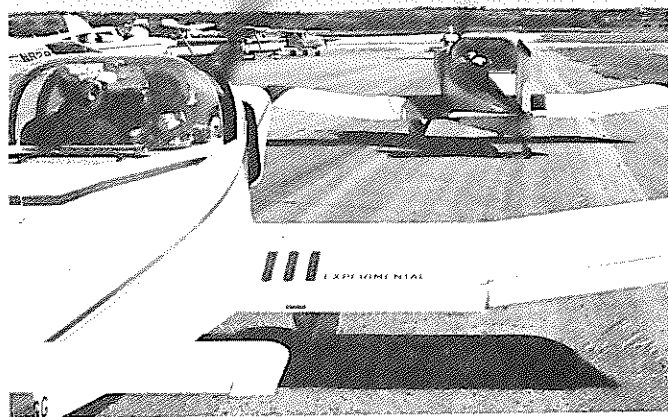
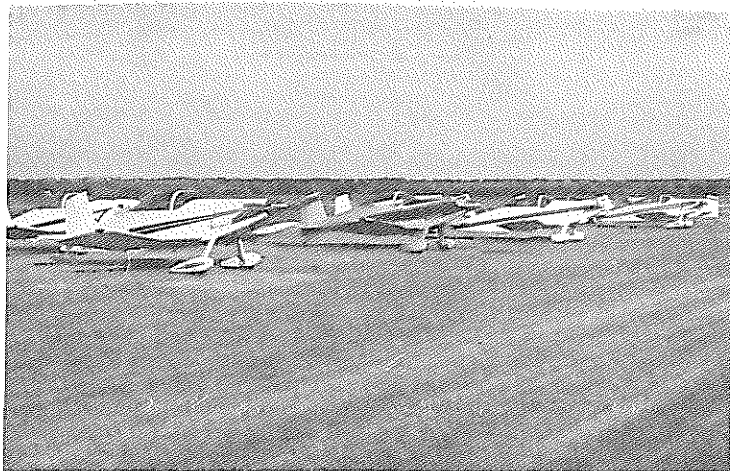
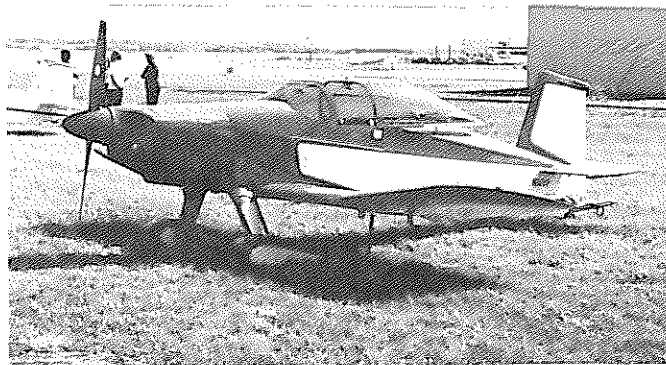
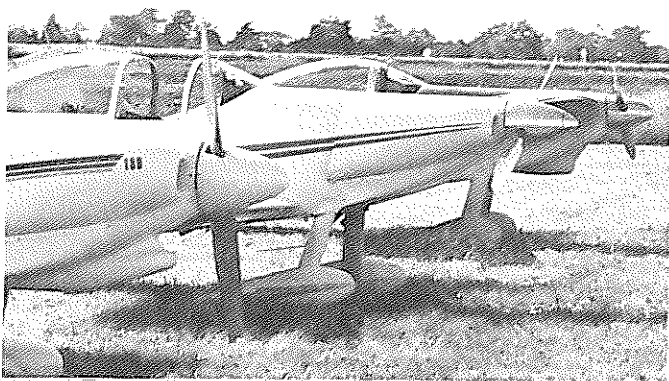


SCENES FROM EARLY SPRING T-18 "BUZZ-IN" AT SANTA PAULA, CA, AIRPORT





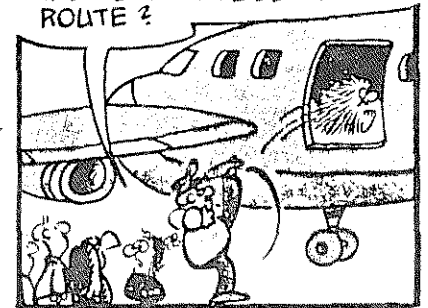
SCENES FROM THE TEMPLE TEXAS T-18 FLIGHT LINE AND WALT GIFFIN's TOWBAR



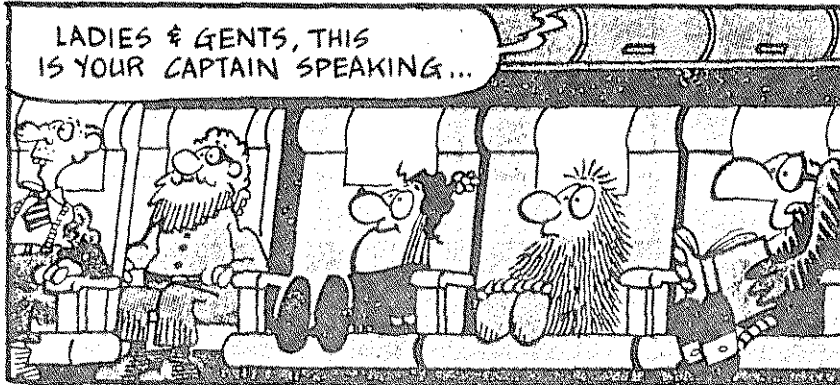
# BROOM HILDA

by  
RUSSELL MYERS

ISN'T THERE ANY OTHER  
AIRLINE THAT FLIES THIS  
ROUTE ?



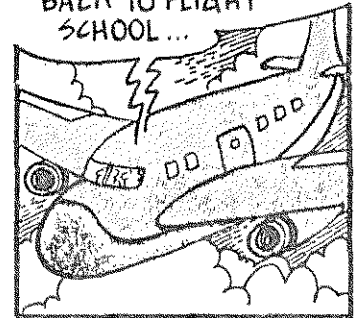
LADIES & GENTS, THIS  
IS YOUR CAPTAIN SPEAKING...



HERE AT WINGWOBBLE  
AIRLINES WE'RE ALWAYS  
LOOKING FOR WAYS TO MAKE  
YOUR FLIGHT MORE INTERESTING!



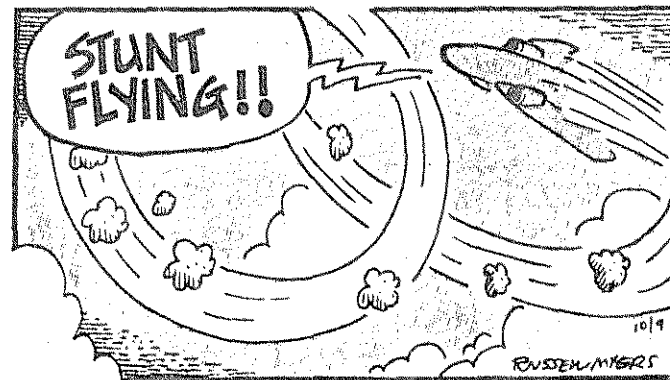
SO THIS YEAR I WENT  
BACK TO FLIGHT  
SCHOOL ...



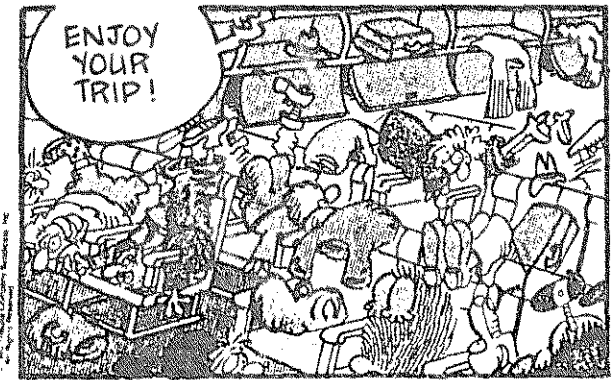
AND LEARNED SOMETHING  
NEW FOR A COMMERCIAL  
PILOT...



STUNT  
FLYING!!



ENJOY  
YOUR  
TRIP!



**To All T-18 Owners and Builders:**

**October 18, 1983**

I am enclosing for you the rough draft of what we hope will someday become a safety manual for people who own and fly the T-18. This first draft is nothing more than an extraction and rearrangement of data just as it has appeared in the newsletters. For anyone reading this information for the first time, let me reemphasize that you must rely on it at your own risk. All of it is well meaning but **you must not accept it as authoritative. You, the pilot, are the only authority when you fly your T-18.**

The material was arranged into eight groups: (1) **Accidents and incidents**; (2) **C.G.**; (3) **Check List for the Annual** (nothing appears here yet); (4) **Danger Directives**; (5) **Flying the T-18**; (6) **Maintenance**; (7) **Miscellaneous**; and (8) **Propellers**. We hope the final product will have as many sections relating to safety as each of you want. The enclosed draft is only the starting point.

Now let me discuss my role in doing this manual. Typists, word processors, typesetting equipment, as well as all paper and printing, will be furnished at my expense, so that each owner and builder will receive a copy of the final product free of any cost. Dick Cavin and I have said in jest that those who make no contribution whatsoever to the booklet should be charged between \$500 and \$1,000 for their copy.

What would we like for you to do?

- (1) **Read this data immediately** and write out any contribution in the form of information which will be useful. For example: a description of any accident or incident in a T-18 is valuable information and can potentially save someone's life. You do not have to type it, just make it legible. Rack your brain for anything meaningful you can add to any section and send it in now!
- (2) **Volunteer to be a coordinator** for one section of the booklet. Each coordinator will be sent the typed information which has been contributed concerning their section. For instance, if you are the C.G. section coordinator, this is the only section you will receive. You will not have to type anything!! Legible handwriting for a typist is all that is required. If there are no volunteers, this is the last you will hear from me, because I do not have the time to do it all myself.
- (3) If you think such a project is worthwhile, **let me have your contribution** immediately. If there is no substantial response in a relatively short period of time, the project will be abandoned.
- (4) If you will serve as the coordinator of a section, **let us hear from you**. The responsibility of the section coordinators will be to review the rough draft of the entire booklet before it is printed, as well as be responsible for their sections.
- (5) Once we have some coordinators, **you may send suggestions** on how the material should be arranged or what information should be added directly to them. We will let you know their names and addresses in the newsletter.
- (6) **Mail any information** you wish to contribute to:

Vern Peppard  
Attention: T-18  
1100 Geomap Lane  
Plano, TX 75074

Please realize that I will not be able to read all of the letters should there be a large number of them. I will have them opened, typed and mailed to the section coordinators.

The data I have enclosed was done on the word processor and has been reduced in size for economy in printing. The final copy will be professionally typeset and printed in the same type style as this letter. Although it will be expensive, I assure you that it will be a first class job. **It cannot be done unless a lot of you contribute to the text or volunteer as a section coordinator now.** If the response from you is not great enough and we decide to abandon the project, you will be notified in the next newsletter.

Sincerely,



Vern Peppard



# Goodbye Homebuilt, Hello, Your Honor

by Ralph Seeley

The legal travails of the Hiperbipe  
builders after an insistent buyer crashed and sued.

Remember those "You Be The Judge" features in the old *Saturday Evening Post*? Try this one: You build an airplane, fly it to Oshkosh, and win Outstanding New Design. A few months later, you sell it to someone who seeks you out; you don't advertise it for sale. A month after that, the man you sold it to has an engine failure; he's on downwind pattern leg, not yet opposite the numbers. This is considered by most pilots to be the ideal place for an engine failure, but our pilot "panics" (in his own words), and the airplane comes to rest amid a jumble of boulders on a river's edge, only 30 feet from the point of impact, facing back toward the flight path. It is a quarter of a mile, maybe a half-mile from the runway. But it is a strong airplane, designed for aerobatics; the pilot lives. He sues you, the builder, for a million dollars. Can he collect?

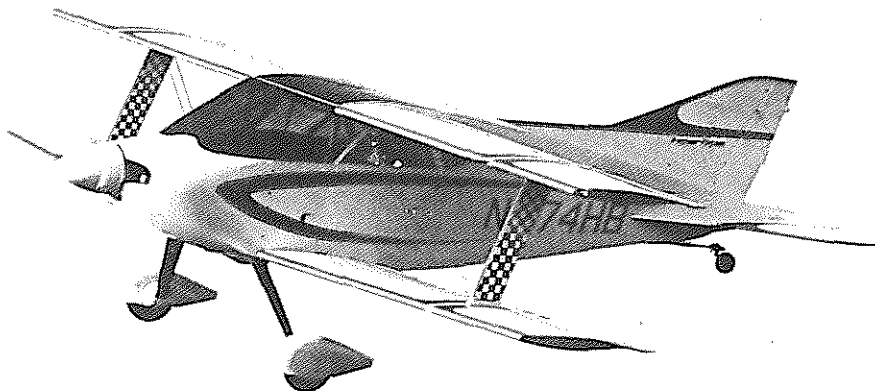
It's almost a moot point. If our hypothetical case runs the same course as *Saulie vs. Sorrell*, you, the builder, will live under that million-dollar cloud for five years, and you'll spend thousands of dollars defending yourself, which can also be defined as constantly educating legal officials on the fundamental laws of aerodynamics, such as the fact that airplanes have been known to glide when engines quit.

## Cost of Characters

Meet, then, our cast of characters in a bizarre story which affects anyone who ever built, modified, or even maintained an airplane, then sold it:

- **The Airplane:** The Sorrell SNS-6 Hiperbipe (for High Performance biplane); a two-place, negative-stagger cabin biplane begun in the late 'sixties by brothers John, Mark, and Tim Sorrell, with advice and assistance from father Hobie; finished in late 1972. It won Outstanding New Design at the EAA's Oshkosh, '73.

- **The Defendants:** John, Mark, and Tim Sorrell (pronounced sor-rel') who, by the time the lawsuit was brought against them—two years after the crash—had all quit various higher-



Sorrell Hiperbipe seats along at a 160-mph cruise behind a 180-hp engine. Though the cabin looks big, it seats only two. The aircraft is fully aerobatic.

paying jobs to form Sorrell Aviation. The original purpose of the company was antique restorations, but the followup to the SNS-6, also called the Hiperbipe (SNS-7) was an even better machine than the -6, so they decided to market a kit. It is important to note that the plane that crashed was built by three brothers, *not* by a company.

Though none of the brothers had a college degree or any real business experience, each brought something special to the effort: John the woodworker, Tim the draftsman, Mark the welder. Each was—and is—a perfectionist. Hobie, father of the brothers and Guru to the entire Pacific Northwest home-building movement, acted as both mentor and laborer for the fledgling company.

- **The Plaintiff:** Grant Saulie (pronounced solly), Attorney at Law. In September of 1973, after repeated refusals by the Sorrell brothers to sell the Hiperbipe, Mr. Saulie walked into their shop and commenced laying hundred-dollar bills on the desk. When 180 of them—that's \$18,000 in 1973 currency, lying there in front of three high-school graduates, all recently out of work, so to speak—were lying there, damn near *pulsating*, the brothers gave in and sold Saulie the airplane . . . to their eternal regret.

Saulie took delivery of the airplane and flew it for a month. From here, the only undisputed facts seem to be

that the engine quit on close-in downwind pattern leg, Saulie flew away from the runway while hitting the starter (with a windmilling prop) and the primer (on a hot engine), the airplane crashed, and Saulie was injured seriously. After that, there are only allegations.

When you waded into the two-foot-high stack of papers which comprise the legal history of this case, one thing becomes clear in a big hurry: a lot of people changed their stories over the years. Thus, I am unable to determine whether Saulie's accusations include one that the fuel gauges were defective (perhaps meaning he took off with less fuel than he thought, and ran out?) or that the fuel system was defective (meaning fuel was present, as indicated, but it was "unusable"). But that is the nature of this entire case; like so many adventures in our legal system, it is a very expensive and time-consuming way of using polysyllables to say "Did!" "Did not!" "Did so!" And like so many arguments, it soon degenerated into an argument about who said what at the beginning of the argument.

## Moral of the Story

It is not my purpose to try the case on these pages; indeed, I purposely waited until it became legal history. My purpose is this: to point out that, through a series of legal maneuvers, someone



might convince a judge that you should be in court defending yourself (with the assistance of an expensive lawyer) if you so much as polished the windshield of the airplane you sold him.

It all hinges around a legal doctrine called *res pisa loquitur* ("The Thing speaks for Itself") which can be illustrated this way: You're walking down a sidewalk and a bale of hay falls out of an upper-story window, injuring you. To collect damages from the owner/operator of the building, you *don't* have to prove that the window was defectively designed, the bales were negligently stacked, and so forth. To invoke *res ipsa loquitur*, the event must be "one which does not ordinarily occur unless someone is negligent." Being struck by a flying hay bale on a public sidewalk is such an event. So, Grant Saulie alleges, is an engine failure in an experimental airplane.

### Design Error?

So Mr. Saulie's argument about the fuel system went something like this: I can't point to anything specific, but the engine quit, so there must have been something wrong with the design.

A similar argument attaches itself to Saulie's argument concerning the "defectively designed" shoulder harness: I was injured, therefore the shoulder harness must have been defective. That a shoulder harness wasn't even legally required to be installed has no bearing, evidently. (Eventually, at the trial, Saulie's own witness testified that the shoulder harness installation resulted in less injury to Saulie than if none had been installed.)

To any unschooled in the workings of The Law, Saulie's accusations may seem a bit far-fetched, but the point is that they were *not* seen as such by various judges, and the Sorrells could not get the case dismissed. The years dragged by as the case inched its way toward a courtroom showdown. Meanwhile, there were multiplying briefs, motions, "interrogatories," depositions, "authorities," and statements, all swearing, moving, stating, iterating, reiterating, setting forth and making manifest various disputed facts, accusations, and allegations. The stack of papers grew at a rate of about a half-inch per month for *five years*, at a cost (to the Sorrells) of around \$500 per inch.

More than a cost in dollars, the Sorrell brothers paid a cost in what we might call "stress" or "mental anguish." These are religious men, perhaps more

concerned with morality than with legal technicalities. (John Sorrell recently quit the company for a full-time Christian ministry.) Not only were they upset and confused about Grant Saulie, whom they had considered to be a friend, but they were confronted with the ethical dilemma of selling plans and kits for the Hiperbiplane, knowing that if a million-dollar judgment went against them, they would be bankrupt. They decided on a no-credit, cash-on-the-barrelhead policy with suppliers, and a token-deposit policy with customers. Thus, if bankruptcy were to ensue, neither creditors nor customers would be affected.

### The Trial

Almost six years from the crash, the case came to trial. Present in the courtroom were Grant Saulie, Attorney at Law, represented by his lawyer. Then, there were the Sorrell brothers, who were represented by their attorney. Hearing the case was a judge—another attorney. The Sorrells felt—shall we say—outnumbered.

For days, the trial dragged on, in the manner of trials everywhere. Witnesses gave sworn testimony which contradicted their sworn depositions. Some gave testimony that contradicted their statements of a few minutes previous. Some were concise, informative, and helpful. One "expert witness" became so confused that he withdrew into a nearly-incoherent monolog for several minutes, reminiscent of Captain Queeg in *The Caine Mutiny*.

### The Winners

Eventually, justice was done. The judge ruled in favor of the Sorrells on all counts.

How can we protect ourselves against this sort of situation? The sad fact is, if you so much as alter the upholstery of your airplane, then sell it, you might face the same kind of lawsuit.

One way is to carry lots of insurance, and let your insurance company worry about it when it happens. Another is to get a signed and notarized waiver from your buyer. (One of the Sorrell brothers suggested still another way: never sell *anything* to a lawyer.)

The law presumes that we all have the duty to treat each other "reasonably," and we can't waive that duty. Thus, if I knowingly sell you a car with a leaking gas tank, and the car burns up, the fact that you signed a waiver accepting the car "as is" is not going to do me much good in avoiding your

lawsuit. But a properly worded waiver—assuming you are acting in good faith, meaning not covering up any known defects—might help get a case thrown out of court without the wasted years and dollars involved in Saulie versus Sorrell.

### Suggested Waiver

A waiver might read like this:

"Buyer realizes that this is an isolated sale of seller's personal airplane, and that the seller is not a manufacturer or dealer engaged in the business of selling aircraft to the public. Buyer accepts the aircraft as is, and recognizes that there are no expressed or implied warranties as to merchantability or fitness for any particular purpose, in particular, no warranties expressed or implied with regard to airworthiness, materials, design, performance specifications, or intended use. Purchaser acknowledges he has made full inspection prior to purchase, and waives any claim against seller as a result of any defect in design, materials, or workmanship."

If you think a potential buyer might balk after reading such a waiver, I have a suggestion: Save this article. Show it to your buyer. If he won't sign it after reading this, you don't want to sell him the airplane anyway.

Your other hope is that when the engine quits on close-in downwind pattern leg, your buyer has enough sense to land the airplane on the runway. □

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*Postscript: This article is written from the point of view of the Sorrells, obviously, and their lesson could apply to any homebuilder who ends up selling his aircraft. But a lot of attorneys reading this story might be moved to cry, "Foul!" and point to their role on the other side of the courtroom in helping innocent aircraft buyers get satisfaction from manufacturers who build a defective product that ends up causing them grief.*

*In the case of the Sorrells, part of the court's decision relating to product liability hinged around the decision that a manufacturer owes a higher degree of care to the purchaser than someone who built an aircraft for himself, basically. And the Sorrells were not at that time considered manufacturers.*

*Also, no one should assume that a signed waiver is going to offer protection against negligence by the builder, since that can't be contracted away.*

—Ed.



Newsletter #22 - 6/67

OOPS - WATCH THAT LINE BOY - Herman Rassler, 98 Constitution, Henderson, NV.

I don't know just how to start this letter, but May 21st, I added another chapter to T-18 history. Returning from a trip to Lake Tahoe, I stopped at Bishop to refuel and the attendant left the oil plug off after checking the oil supply without my notice. I made an emergency landing at Lone Pine, CA, and overshot on the rather short runway. I applied power to make a go around and got no response from the throttle. As there was a new ditch across the end of the runway, I tried to save as much speed as possible to jump the ditch. The gear hit the top of the far bank and this started the disintegration of #24. About twenty feet beyond, the right wing hit a mound of earth and she started cart-wheeling and tumbling from tip to tip. After the dust settled, my wife and I crawled out of the wreckage with only minor scratches and bruises (for the damage done). The engine, gear, fuel tank, instrument panel, and floor boards were laying inverted about twenty feet beyond the mound and the tail cone, with the wing attached by one rear spar bolt, was another twenty feet away, inverted and reversed. The roll bar with one attached channel still on it and the canopy were between the main parts. Both the shoulder belts and the high back on the tail cone share the credit for the minor injuries in this case. None of the panels survived with no damage, but most of the tail cone and one horizontal tail panel are repairable. On any other bird it would be declared a total loss, but to a homebuilder I can see plenty of fitting which can be salvaged by carefully removing rivets. The engine appears OK, except for the crank and the engine mounts. Not a fin broke. That marvelous prop is just scratched and repairable. John Thorp called the next day to find out what happened and made the generous offer of any tooling I need to get her flying again, and Lee Hamlin has offered me another set of glass to help. Sure makes me proud to associate with people like that, although I always have been one to go it alone. This time I think I'll accept all the help I can get. Even the wife says she will help more this time. I don't think she ever really comprehended what I was building until it was nearly done. A few trips over areas where we had spent days driving, convinced her we really had something that would go for us. Hope this hasn't spoiled your day, but be assured she will be rebuilt better than before.

Newsletter #24 - 4/68

Ron Zimmerman, 1915 McKinley St. NE, Minneapolis, MN 55418

Last October, my T-18 was damaged while attempting an unscheduled landing on a road. The cause developed from poor judgment by the pilot, followed by an electrical equipment failure. I was demonstrating the gliding characteristics to my passenger. An attempt was made to restart the engine with the starter. It turned through two compression strokes and ceased responding. When I realized the starter was hopeless (later found a poor connection inside the non-aircraft battery), I dropped the nose to gain speed for an airstart. I was a little shy of enough speed when I ran out of sky.

I lined up with a road below without any traffic. Just before touching down, the landing gear caught some unseen power lines. The contact with the wires was very gentle and I didn't feel any stall.

(2)

The plane hit the ground just off the road with the wings level and about some 5 degrees nose down. I estimate the speed at 50 mph. The main gear spring steel legs (tailwind type) bent back to where the wheels dented the wing skin and bent one nose rib. The tail came up as the plane bounded once, overturned, and came to a stop. Personal injury was taken care of with one Band-Aid - thanks to luck and SHOULDER HARNESSSES.

Most of the damage (and expense) was done from stopping bottom side up. The windshield, canopy and frame, fin, rudder were totaled. The fiberglass cowl and wing tips were broken. The wing now has two new spars, three nose and one center rib, all new skin, and a repair on one outer main spar. The damage to the fuselage can be described as "widely scattered minor damage".

Newsletter #26 - 10/68

ACCIDENT REPORT - As was announced in the Nov. issue of Sport Aviation, a second fatal accident has occurred involving 180 hp T-18's. During the Southwest EAA Fly-In at Georgetown, Texas, a T-18 experienced what is believed to be flutter of the horizontal tail, followed by failure of the spar at the 510 fitting. During the Fly-In, the pilot-builder was observed to make high speed passes across the field followed by abrupt pull-ups and zooms at extremely steep angles. The day before, a passenger reported seeing between 210 and 220 on the indicator. A credible witness said that during the final pass, the tail was observed to flutter before it failed. The wing was bent down and separated and the fuselage struck the ground under full power, killing the pilot.

Prior to the Fly-In, the builder had parked his airplane in his driveway and it had rolled down a hill tearing off the horizontal tail and associated fittings. Repairs were made and a new tail built, including the doubler tube. Three deviations from the plans were made. The ribs were not riveted to the spar, because he didn't think it was necessary. The 509 fitting was attached to the spar with a 1/4" bolt instead of rivets. 5/32 rivet holes were also drilled, but not used because the fitting has been positioned wrong. This is where the failure occurred. It is evident this accident would no doubt have been prevented if the red line speed had been observed. Just had a talk with John Thorp on the phone to get the latest progress report on the testing program. He thinks they have identified the problem as being related to the bending frequency of balance weight arm. Everyone will be notified when tests are completed.

John expects that the program will allow the establishment of a red line speed of 200 mph or slightly higher. He expects, however, to recommend that all horizontal tails be modified to the new configuration. If you haven't built your horizontal tail, I would recommend holding up until we receive word from John on any modification that might result from the test program. In the meantime, be sure to adhere to the present 180 red line, which has been verified through tests as being safe.

Newsletter #28 - 9/69

CAUTION: A forced landing has been reported caused by throttle cable failure. After two hours on a new T-18, the pilot was unable to reduce power, so he came over the field and cut the engine with mixture control. On final, a Cessna got in his way, so he elected to turn and re-apply power with mixture

(3)

control. However, the engine would produce no more than 1000 rpm, so he turned back to the field. Unable to reach the runway, he landed in trees, fortunately without major damage or serious injury. Probable cause - loose throttle cable clamp.

Don't depend on the FAA inspector to catch everything. Get one or more designees or chapter members to thoroughly go over everything before you fly. You'll be surprised at the things they find.

While we are on the subject, do you have a fancy push button throttle control that you can twist for fine control? If it is like mine, there is no provision to safety the end which screws into the fork at the carburetor. I drilled and safety wired mine to the fork.

Now we should never again have forced landings or close calls due to the following reasons, right?

1. Loose throttle linkage.
2. Loose oil filler cap.
3. Loose crankshaft seal.
4. Bad motorcycle battery.
5. Injested nut through intake system.
6. Bad airspeed indicator.
7. Lost canopy.
8. Ground loops.
9. Broken non-standard tail spring.
10. Loose bolt in brake.
11. Fuel system failure or obstruction.
12. Clogged fuel tank vent tube.
13. Out of fuel.

All of these have caused accidents or near misses. Can you find any that could not have been prevented? Very likely, the next one will fall into the same category. Better make this list part of your check list.

Newsletter #30 - 5/70

Burst an oil line from firewall to pressure gauge on third flight. Had small orifice in firewall fittings, so was able to get back before any damage was done. Advise builders to make sure of quality when installing hose and fittings. I took someone's word and it could have been disastrous. More later, as soon as I have the information.

Newsletter #34 - 11/71

NO NO'S - Now we have two more items to add to the list of things NOT to do with your airplane. One is, don't do a slow roll on take-off, even over a beach. Second, don't buzz a lake, for there might be power lines stretched across it. Two T-18's just ended up "in the drink" because of the above. Fortunately, all four occupants got out.

Newsletter #40 - 1/74

A not so happy ending is the Mike Simkanan story. He crashed in his T-18 a week before Oshkosh at Akron, Ohio. A subsequent autopsy showed that he died of a heart attack. We have lost a fine individual and a fine T-18.

(4)

Newsletter #42 - 4/75

SHOCK TEST - Howard Warren, Flint, Mich., reports that he washed out his T-18. He was making an approach in bad weather, when he struck a utility pole and went into a utility building. His son received a broken nose, and a few cuts and he got away with two broken ankles and a broken wrist. Following this accident, two of his friends, who were quite far along building wooden airplanes, switched to T-18's.

Newsletter #42 - 4/75

LOAD TEST - Chuck Borden took someone from the local airport, who knew how to do aerobatics, for a ride in his T-18. When Chuck was in the middle of a barrel roll inverted at 160 mph, his passenger, for some reason, yanked back on the stick. The result was a split S at very high speed and the g-meter registered over 6 g's. Weight was over 1400 pounds. Wrinkles occurred in the center wing skin and in the fuselage sides at the dash. The center wing was reskinned and it was found that there was no permanent set in the spar, except that the inner wing main beam (.040) became wrinkled. Thus, we have added 3/4 x 3/4 x .062 aluminum angles vertically on the front face of the beam in the T-18 -C wing. Two angles are equally spaced between the ribs in the center wing and are attached to the beam with five 1/8" rivets. It would be a good idea if stiffeners were added to the standard T-18 inner wing also, even though design loads were exceeded in this incident.

Newsletter #46 - 5/79

#### ACCIDENT REPORT:

Space this month doesn't permit full coverage, but I'll go into greater detail in a later N.L. The other day, I got a letter from an old friend, John Foy (3801 127th N.E., Bellevue, WA. 98005), one of the original T-18 builders. He told how the T-18 he had built (and donated to the museum) years ago was destroyed in an accident, caused by still another in-flight failure to a cut-down and re-pitched metal prop! This one was a Sensenich from a Cherokee, reportedly. The engine was a 150 hp O-320 Lyc. and there was about 100 hours on the prop since installation. This could have easily resulted in a double fatality, but pure luck and the rugged T-18 airframe enabled the pilot and his wife to survive.

Newsletter #56 - 10/82

BAD NEWS DEPARTMENT: FRANCIS RICHARDSON, one of my long time very good friends and a very enthusiastic T-18'er from its pin feather days in '62, died in a stall/spin accident in his T-18 on the first leg of his trip to Oshkosh. His oldest son, Danny, also died in the accident. He is survived by his wife and another son.

Circumstances of the accident, as related by an eyewitness (a pilot and the son of the airport manager) at the Neosho, MO, airport: Francis had called in on Unicom and advised his intention of landing there for fuel. Weather was not a factor, nor was fuel or engine stoppage. He entered a close left hand downwind at fairly high speed, but somewhat lower than normal pattern altitude

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(estimated 500' AGL). On his base leg turn, he overshot the runway centerline (extended). To correct back to the proper approach line, he made a very steep bank (in excess of 60°) at an altitude of not more than 200-300 ft. The airplane stalled in the turn and spun over the top, making two complete turns. Spin rotation was stopped just a few feet before it impacted in an almost vertical attitude. There was no fire. There was no fuselage damage aft of the cockpit.

His airplane (plan serial #1) had a standard fuselage, except for a modified canopy, with forward opening doors. The wing had the standard airfoil, but was the folding wing configuration. He had about 75 hours on the airplane and the engine and had had no engine or flight problems. This was Francis' 2nd T-18 and he had flown the first one over 300 hrs. when he lost it in what was either a departure stall or a violent little dust devil. Francis went with me when I flew my T-18 out to Calif. a couple of years back and I had him fly every other leg. On each one of his approaches and landings, he had a pattern of overshooting final approach, at too low an altitude, with incorrect rudder and aileron inputs. I talked the matter over with him on the ground after each landing, pointing out the potential lethal results of even a slightly accelerated stall in the turn from base to final, as verified by hundreds of such fatal accidents in nearly every type of airplane ever made. His main problem was that he couldn't accurately project ahead in computing the angle of bank that was required and when to start turning base to final, to accommodate to the conditions of wind, altitude, drift, and speed. I suspect this was very probably the reason that he made this final turn so low, that possibly he felt he could better judge the situation at a lower altitude and closer in. This is a judgement decision that all of us have to learn by experience, and really cannot be taught by an instructor. I always use to teach a new student to start the turn when the landing target spot was midway between the nose and wing tip (an angle of about 45°, more or less) and to start with a steeper bank angle, shallowing it out as required. This was a very mechanical method and in the beginning, I even suggested a pre-selected bank angle to correspond to surface wind velocity. Most people rapidly learned to visualize the invisible track of the airplane ahead and their "computer" soon stored the necessary information for future decision making and most of them soon learned what adjustments to the bank angle were necessary to fit the real time situation....But I also found that perhaps 10% of these people took much, much longer to really project ahead and a few of them were extremely deficient. I also noticed that these same sub-standard ones badly mishandled rudder, aileron, and speed coordination in this final turn, even tho' their coordination was acceptable in level flight turns. To me, this indicated they had one too many "balls to be juggled" at that time, thus overloading their computer. What has really surprised me over the years is that many experienced pilots carry those same bad habits right on. I've had experienced co-pilots on the airline that show a sub-standard ability to project ahead on entering the final approach course from base or downwind (in the airline business it's REALLY a no-no to overshoot final and have to make a bank in excess of 20°). In such cases, I've often wondered whether the fault lies with incompetent or sloppy primary instructors or whether a certain percent of pilots are genetically unable to handle multiple judgement calls in that segment of flight.

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In any case, the purpose of this discussion is not to be critical of Francis or anyone else, but to call attention to a potentially lethal situation for new pilots on the T-18 (and also for those that might tend to get a little careless, too). This can and does happen in any other type of airplanes, but high performance airplanes like the T-18 have different characteristics than the run of the mill factory built. First of all, the pre-stall buffet is either minimal or practically minimal in most of the T-18's I've flown and that's why John Thorp has recommended the installation of stall strips on the wing leading edge....to induce a more complete stall at the wing root before it spreads out towards the tips, thus sending more rough air back to hit the stabilator and warn the pilot. I've talked to builders that have tried them with widely varying results. Admittedly, it takes trial and error to get them located perfectly, but don't get discouraged. Let's be aware that there is only one thing that ever stalls an airplane.... excessive angle of attack ... pulling the stick back too much for the conditions of the moment. Very rarely will we ever stall an airplane straight ahead on the final approach (unless it is flared too high). It's the accidental stall in a turn....the accelerated stall....that's the killer. If the rudder or aileron control is being misused when the airplane is stalled in a turn, the airplane will spin. The direction of the spin will depend on which wing stalls first. To avoid a spin, it follows that we should not stall the airplane, but in order to have a trained reaction to avoid a spin out of the stall, it follows that we should really know what causes one wing to stall first and trigger the autorotation. Give yourself an honest little quiz and see if you really know - or are you just guessing?

Let's take a hypothetical case: The airplane is in a steep left bank, turning from base to final. The pilot has let his speed decay in the turn and now he attempts to unbank, using aileron alone (or mostly aileron alone) and he has applied the opposite aileron control rapidly and very strongly. Since the airplane is now very close to the critical (stalling) angle of attack, which wing will now stall and which way will the airplane spin? What will his ball/bank indicator be telling him when he has applied full opposite aileron? I'm sure that 99% of you know the correct answers, but how many of you had to stop and think about it a few moments? Any one of us can get rusty, but that's one situation we should stay super-sharp on. In the case of the T-18, 697 remembered that there is a differential throw built in that causes the up aileron to move more than the down one, but with full deflection the down aileron will cause more drag than it increases lift. The increased effective camber will trigger flow separation and the aileron drag will tend to slow that wing up and speed up the high wing. Result? Left wing stalls and it will autorotate to the left. As that wing (1) moved backward, the ball bank would show you the same thing as if you were holding left rudder....it would be on the far right side of the cage. In other words, a skid, which in itself is a speed losing maneuver.

Now, ask yourself what else might have happened as the airplane began to unbank? Remember when you were practicing steep turns and as you rolled out what happened to the nose? Unless you applied forward stick, the nose would pitch up sharply as the wings shed their G load. If the airplane was already close to the stall angle of attack, that little extra pitch up could do it. Right?

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Now, suppose a pilot is making a perfectly coordinated turn and the skid ball is in the center, but his entry airspeed for the turn was too low for his weight, the degree of bank, and the number of G's he has pulled for the particular angle of bank. In order to pull X no. of G's, he has had to pull back on the stick and increase the angle of attack. If he exceeds the critical angle of attack, the airplane will enter an accelerated stall (trying to force the wing to carry more load than it is capable of at that moment). Now... which way will the airplane spin?... Clue: Go out and stall your airplane with one wing say 10° higher than the other and see which wing will fall at the moment of stall. If there is no yaw at that moment, it will fall off toward the high wing. Try it with 20°, then 30°, then 40° bank and see how much more rapidly it will roll as the bank increases. The answer to the above question is that, yes, the airplane will spin over the tip in the direction of the high wing. Of course, if you experiment with any of the above (which you probably did during your test period), common sense would dictate you be well above 3000 ft. AGL, be prepared to spin and recover promptly with throttle closed. Don't let your speed get out of hand on recovery, but be very gentle and don't horse out of the spin recovery into a high speed stall or bend the wings, etc. Also avoid the tendency to pick up the low wing with aileron.

One other thought on the subject: The SPAN loading of the T-18 is on the high side. This isn't too worthy of consideration until you increase the angle of attack, such as in a climb, a glide, or a turn, and then it hurts. As this angle of attack increases, more and more lifting energy is siphoned off by the wing tip vortex. More of the high pressure air on the underside of the wing escapes towards the wing tips and the result is the same as if some giant had taken a pair of scissors and clipped off the outer few feet of each wing, and it loses a large amount of its potential lift. To compensate for the suddenly increased sink rate from this loss of lift, the pilot either has to increase his speed (thus generating more new lift) or increase his angle of attack. Well, you know what also happens when you increase the angle of attack to get more lift. The drag also increases, so you are in an ever increasing condition where the airplane loses speed at a rapid rate.

I've heard new T-18 pilots comment on how puzzled they were that the T-18 would lose speed so rapidly in a steep turn, mentally comparing it to other airplanes they had flown....particularly those with a much lower span loading. The subject of span loading doesn't often come up in the average bull session, so many pilots aren't really too well versed on the if's and and's I guess. At any rate, be aware of the limitations as you start to enter a steep turn. If you don't have the airspeed you need for a comfortable safety margin, don't be timid about getting the power in firmly. If you've waited a little too long to start your base/final turn and it's apparent you'll have to do something drastic to get back in the approach slot, why that's an excellent time to roll out and go around the pattern and do it right the next time. Besides, that's good PR if you give the ground bound troops a good low level fly-by in the process!

Newsletter #56 - 10/82

FUEL PUMP PROBLEMS ON INJECTED ENGINE: From EARL ODY, 28903 Gunter Rd., San Pedro, CA 90732 - Dear Dick: I remember that you were particularly in-

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terested in the fuel problems in my T-18 that led to my engine out landing at Gary, IN airport. Since several people have expressed an interest, I have written a commentary on the incident, had it duplicated, and am mailing a copy to you.

I really do appreciate your interest and concern, Dick - not only the incident in which I was involved in, but over all T-18's and all pilots.

I am enclosing a contribution to the T-18 Newsletter fund. Keep up the good work, Dick! Best wishes, Earl Ody. Commentary follows:

Thorp T-18, N8952 has been flying for 11 years and 1500 hours and is equipped with TWO Weldon Electric Fuel Pumps in parallel with each other and both in series with the engine driven fuel pump. The engine is a 10-320, which requires 16-26 lbs./in. sq. fuel pressure. Ideally, it should be 21-25 lbs./sq. in. (the engine will stall at 13 lbs./sq. in.). I have always flown the airplane with one of the electric pumps on AT ALL TIMES, since the engine driven pump would NOT maintain sufficient fuel pressure.

It should be noted that the Weldon Electric fuel pumps are approved for continuous duty and whether or not they are free flow by-pass pumps is optional. BOTH of my pumps were of the by-pass type.

During our trip East in July - August, 1982, electric pumps gave out at different times. On Sunday, July 25, we replaced the two pumps with a rebuilt Weldon electric pump in Cedar Rapids, IA. This electric pump was placed in series with the engine driven pump. Five days later, we suffered a loss of fuel pressure over Lake Michigan, the engine stopped, and we glided to a landing at Gary, IN, airport. (Whew!) While in Gary, we had a new engine driven fuel pump installed and a rebuilt Weldon electric fuel pump installed. At this point, we installed the single electric pump in PARALLEL with the engine pump and found that the engine driven pump would maintain sufficient pressure for flight and the electric pump would be needed only for starting, take-offs, and landing.

We departed Gary on Thurs., Aug. 12, for Bartlesville, OK, with a fuel stop in St. Louis, MO. Upon arrival in Bartlesville, we found that our electric pump was pulling 15-17 amps and popping fuses as fast as replaced.

Between Friday, Aug. 13, and Mon., Aug. 16, numerous corrections were discussed, but the decision was made NOT to fly until a satisfactory electric fuel pump was functioning. Since I had a collection of electric fuel pumps by this time, I matched a functional pump with a functional motor and had a system that worked. I flew to Calif. on Tues., Aug. 10, using only the engine driven pump in flight and the electric pump for starting, take-off, and landing.

An analysis and some conclusions:

I believe I could have flown for the first eleven years with only the engine driven pump IF the fuel was not passing through one of the elect. pumps, although both electric pumps were the by-pass type. I believe enough resistance was offered to the flow of fuel, that it affected the supply to the engine driven pump.

On our trip East, both electric pumps simply wore out. Upon returning home, I found the motor on one pump was good (that is the motor that brought me home from Okla.), but the pump section failed. The mechanic in Cedar Rapids took my other pump as a core. I am trying to get the pump back, as well as the \$290 that I spent for a rebuilt pump that lasted only five days.

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I believe our engine failure over Lake Michigan was caused by the motor quitting on the electric pump installed at Cedar Rapids, that it was NOT a bypass pump, so the fuel supply to the engine pump and to the engine was terminated. We put 12 volts to this pump in Gary and it did not work. I learned several things about the Cedar Rapids pump while in Gary. Weldon has not made this style pump for 11 years, parts are no longer available, and that particular pump was rebuilt on 7/2/75. I did not disassemble this pump to determine why it failed, as I have since returned it to Cedar Rapids.

I disassembled the rebuilt electric pump installed in Gary upon my return home and found that the motor had a frozen bearing; hence the high current draw and popped fuses.

Altho' it's probably too early to tell, I believe that I now have a workable system with the engine driven pump and the electric pump in parallel with each other. I believe that the solution to the problem is one where there MUST be an adequate supply of fuel flowing freely to the engine driven pump. At this point, I do not know why Lycoming 10-320 engines (that were supplied to Wing Aircraft where Earl got his) have customarily had these problems.

P.S. Since writing this commentary I have received a check for \$290 from the FBO in Cedar Rapids, the electric fuel pump which they kept, and an apology for their contributions to subsequent problems.

\*\*\* That was a superb and well written report, Earl, and one that could certainly save someone from grief. I well remember your telling me of the dead stick landing when you got to OSH and how close you came to not making it back to the field. I meant to ask you at the time what airspeed you used and what your sink rate was at that speed, but it slipped my mind at the time, I guess. I can't remember whether or not your airplane has a constant speed prop or not, but I think it does. It would be interesting to know what the comparative sink rates would be for one with a constant speed prop vs. one with a fixed pitch prop with the engine completely dead. I seem to remember a fatal accident that followed an engine failure (Burbank, I think), in which the airplane went into the approach lights and it was equipped with a constant speed prop. I remember discussing this with John and speculating on the possibility of using a prop that could be feathered for minimum drag. Do any of you with constant speed props have any figures on sink rates with the engine at idle? Or better yet, have any of you switched from a fixed pitch to a constant speed and had a chance to record the two different sink rates? It's a pretty good idea to know how far your airplane will glide, what airspeed is optimum, etc. Have you ever given serious thought to whether you would choose a road vs. a field for a forced landing? One of our local T-18'ers says he will opt for a road, everything else being equal. With the 21 ft. span, you could fit in most roads in pretty good shape and probably would have a better chance of staying right side up with the small wheels we have. I've flown coast to coast via T-18 and I find one of those big interstate highways to stay above when I can, even if it is a few miles farther. Giving yourself an extra break now and then makes the trip more enjoyable and just might pay off someday.

# T-18 NEWSLETTER - C.G.

Newsletter #23 - 8/67

CG LIMITS - Don't get the forward cg ahead of station 61. Most have been over 62. The limiting consideration is not elevator effectiveness, but rather possibility of nosing over on the ground - especially with a full tank and no passengers sitting on the ramp with gusts. Aft limit is 31% or station 70.5. Empty weights vary from 750 to 1050 lbs. Keep that weight down if you want performance.

Newsletter #26 - 10/68

CG MEASUREMENTS - One of the toughest problems in getting ready for a first flight is weighing the airplane and determining the cg. First is the matter of finding accurate scales with sufficient range. The airplane should have the tail raised to level the fuselage reference line and scales should be placed under all three wheels at the same time. It is nearly impossible to get consistent readings if the airplane must be moved to place scales under different wheels. The reaction at the main wheels will be about 400 lbs, so single bathroom scales won't do the job. If anyone knows a good source to rent or borrow platform scales, let me know. A poor substitute is two bathroom scales under each main wheel with a plank across them.

With aircraft in a level attitude on the three scales, remove all extra articles and close canopy. The fuel tank should be empty and oil should be full. Now, read all three scales. Drop a plumb bob from the leading edge of the wing and measure the distance from it to the center of each axle. This is extremely important in order to find the empty cg. The angle location may vary from sta 53 to 55, depending on the length and amount of deflection of your gear. If the 2 axles are not at exactly the same station, just split the difference. Locations for the various reaction points are: oil sta 28, fuel 48, main wheels 53 to 55, wind leading edge 55, passengers 87.6, baggage 111, tail wheel 214. Next issue I'll put in a set of sample cg calculations for my ship.

Newsletter #27 - ?/69

CG CALCULATIONS - In Newsletter No. 26 I made some comments about cg calculations and promised to include data for my T-18 in this issue. In order to assure accuracy, I reweighed my ship -- this time with platform scales under both main wheels at the same time and a bathroom scale under the tail. Was I surprised at the difference over the previous measurements taken by first weighing one wheel and then the other with pairs of bathroom scales! Instead of getting an empty weight of 826 lbs. without fuel or oil, it turned out to be 881. I knew the use of bathroom scales wasn't good, but I had no idea how bad. It turned out that our local airport had two pairs of ordinary platform scales like we used to use on the farm to weigh grain. If you aren't so fortunate, why not talk your EAA chapter into buying scales?

Be sure to accurately measure the stations for the main gear and tail wheel as referenced to the leading edge of the wing (sta. 55). Use a plumb bob for these measurements.

The cg of a full tank is sta 50. When there is only a small amount in the tank, the cg is forward of this.

T-18 (C.G.)

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The following calculations are for my T-18. The table lists data on some others which have flown. Notice that I can take only 75 lbs. in the baggage compartment with empty tank and not exceed the aft cg limit of station 71. I've verified in flight that station 71 is the neutral point, so don't plan to exceed it. If I could find room, I'd move my battery from the baggage compartment to the firewall. John Shinn has located his battery under the right front seat.

## CG CALCULATIONS FOR N4782G

|                  | Weight |   | Station | = | Moment  | %C | %C   |
|------------------|--------|---|---------|---|---------|----|------|
| Main Wheel       | 1019   | x | 54      | = | 55,026  |    |      |
| Tail Wheel       | 43     | x | 214     | = | 9,202   |    |      |
|                  | 1062   |   | 60.4    |   | 64,228  |    |      |
| Fuel (27.5 Gal.) | 165    | x | 50      | = | -8,250  |    |      |
| Oil              | 16     | x | 28      | = | - 448   |    |      |
|                  | 181    |   |         |   | -8,698  |    |      |
| Empty cg         | 881    | x | 63      | = | 55,530  |    |      |
| 1 passenger      | +170   | x | 85.5    | = | +14,535 |    |      |
| Oil              | + 16   | x | 28      | = | + 448   |    |      |
| Fuel             | +165   | x | 50      | = | + 8,250 |    |      |
| Most Forward cg  | 1232   | x | 63.93   | = | 78,763  |    | 17.8 |
| 2nd passenger    | 170    | x | 85.5    | = | +14,535 |    |      |
| Baggage          | 75     | x | 109     | = | + 8,175 |    |      |
| Gross Wt. cg     | 1477   | x | 68.7    | = | 101,473 |    | 27.4 |
| Fuel             | - 135  | x | 50      | = | 8,250   |    |      |
| Most aft cg      | 1312   |   | 71      |   | 93,223  |    | 32   |

## T-18 WEIGHT AND BALANCE DATA

| SN  | OWNER      | MAIN WHEELS | TAIL | OIL | FUEL | In. a | In. b  | EMPTY | cg AFT | (sta) FWD | Wt. GROSS |
|-----|------------|-------------|------|-----|------|-------|--------|-------|--------|-----------|-----------|
| 37  | Thenhaus   | 817         | 36   | 16  | 0    | 1.25  | 160    | 60.5  | 68.7   | 62.6      | 1450      |
| 37  | Hamlyn     | 866         | 45   | 16  | 0    | 1.25  | 160    | 61.65 | 69.7   | 63.2      | 1475      |
| 41  | Hansen     | 951         | 43   | 16  | 0    | 1.13  | 160.25 | 60.8  | 69.8   | 62.5      | 1600      |
| 62  | Ferko      | 815         | 43   | 8   | 0    | 1.75  | 161    | 61.32 | 70.2   | 62.9      | 1450      |
| 68  | Schureman  | 767         | 29   | 16  | 0    | 1.5   | 161    | 59.6  | 70     | 62.1      | 1350      |
| 77  | Sunderland | 1019        | 43   | 16  | 165  | 1.0   | 160    | 63    | 71     | 63.9      | 1477      |
| 79  | Kaergaard  | 672         | 42   | 16  | 0    | 1.75  | 160.75 | 62.7  | 71.7   | 62.9      | 1300      |
| 196 | Anderson   | 990         | 55   | 16  | 42   | 1.38  | 161    | 62.6  | 70     | 62.9      | 1600      |
| 328 | Martens    | 1051        | 48   | 16  | 0    | 1.38  | 161    | 60.65 | 69     | 62.3      | 1700      |
| 390 | Grammer    | 940         | 43   | 16  | 0    | 1.75  | 162    | 60.34 | 69.2   | 62.25     | 1575      |

### Comments:

- 37 - Thenhaus - no canopy, 0-290-G
  - 37 - Hamlyn - Canopy, Pants, New Cowl
  - 41 - Hansen - Const Speed Prop 180 Lyc.
  - 77 - Sunderland - 0-290-G
  - 79 - Kaergaard - No canopy - 0-290-G
  - 196 - Anderson - 180 Lyc
  - 328 - Martens - 180 Lyc
- a is distance in inches from wing leading edge to main wheel station.  
b is distance from main wheel station to tail wheel station with fuselage level

Newsletter #27 - 7/69

TAIL MODIFICATIONS - The flight test and shake test programs are now completed and new prints are being mailed out as fast as possible. Four modifications are involved:

1. The tail spar is changed to include an outer full length tube of .049 and a shorter double tube inside.
2. Two of the balance weights are removed and new bullet shaped weights are added externally to the tail tips.
3. A little .015 stainless stiffener is wrapped around the inside front corner of the tail tabs.
4. A stiffener is added to the balance weight arm.

BULLETIN - John Thorp urges all T-18 owners to make the No. 3 modification immediately. It had the most significant effect in raising the flutter speed. It simply stiffens the tab by tying in the inside rib with the leading edge and hinge. Note that it does not wrap around from top to bottom, but rather from front to side. This is such a simple modification and so important that it should be done immediately.

John is recommending that all four modifications be made to all T-18's, even the 125 hp models, just in case someone forgets the 180 red line for unmodified models. The new red line for modified models is 210 mph.

TEST PROGRAM - John will probably be documenting the test program in a future article, but I know you are anxious to hear about it, so here are a few details.

All tests were conducted on Dick Hansen's T-18, N299V. Shake tests, flight test instrumentation, and consulting engineering were subcontracted to Specialty Testing Services, who drew upon some of the most expert talent available in the field of flutter analysis. Sensors were placed on the horizontal tail and balance arm and outputs were recorded in flight.

The procedure used was to make a modification and perform shake tests on the ground which identified the bending frequencies of the various parts. Then flight tests were conducted by John Thorp to verify the predicted in-flight characteristics.

First, a new horizontal tail was built with the new two-piece spar. Tests showed that, at about 195 mph, the horizontal tail experienced a bending oscillation at 31 cycles per second with zero damping. This means that the oscillation reached a certain amplitude and got no larger. It was not actual flutter because flutter is defined as a divergent oscillation. That means it gets progressively larger until something gives. The condition was not detectable by the pilot, but showed up on the instrumentation.

The balance weight arm vibrated with a 16 cps frequency. Figuring that this was coupling with the tail bending at twice the frequency, they added a stiffener to the balance weight arm. But tests revealed that this lowered the speed at which oscillations occurred.

Next, the three lead weights were removed completely and John flew up to 200 mph with no problems. Now, a word of explanation about the purpose of these weights. They were not intended to give static balance to the horizontal tail to raise the flutter speed. Instead, they serve only to provide dynamic stability augmentation, or damping, to smooth out the ride in rough

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air. You have all observed how an arrow oscillates back and forth in its flight after being released. The bigger the feathers, the quicker the oscillations will damp out. An airplane acts the very same way with its "tail feathers" providing the damping when gusts disturb it. Now, without a balance weight the horizontal tail would fall down at the trailing edge indicating that the cg is aft of the hinge line. When a disturbance swings the tail of the aircraft down in flight, this mass unbalance causes the trailing edge of the tail to swing up. This created downlift on the tail, which rotates the tail end of the airplane down even more. This effect decreases the dynamic stability compared to the conditions with the horizontal tail held fixed. As weight is added to the balance arm, the damping is improved. With the specified amount of lead the tail is nearly statically balanced and the damping is very good, giving a smooth ride in rough air. With the weights all removed, the T-18 flies fine in smooth air, but in rough air the ride is not so nice because the damping is poor.

There is another type of stability called static longitudinal stability. This relates to the ability of an airplane to fly hands off. If it gets disturbed and later, on its own, returns to trim conditions it is said to be statically stable. But, when disturbed upward, for instance, if it continues to pitch up until it does a loop or stalls, it is statically unstable. That is, if the cg is forward of the neutral, it has positive stability and if it is aft of the neutral point, it is unstable. The balance weight affects static stability also. More weight decreases static stability and less weight increases it (moves the neutral point aft). This has nothing to do with flutter, but is only noted for your information.

Back to the flight tests. Since John felt that the balance weight was needed for a good ride in rough air, he had to put the weights back on. The tests indicated that the weight was causing a flutter problem since there was considerable flexure between it and the tail tips. So, to get the weight more rigidly connected to the tail tips, the two side weights were removed from the balance arm and streamlined weights were added ahead of the tail leading edge at the outboard ribs. Flight tests were run up to 220 mph with this configuration, but they still weren't out of the woods. A tail oscillation would still occur at 25 to 30 cps.

Next, the little stainless steel stiffeners were added to the corners of the tail tabs and the frequency went way up giving the biggest single improvement. Flight tests were then run up to 231 mph with perfect results. The damping from stick bumps was just as good at that speed as at 150 mph. John now thinks the tail would go all the way up to near sonic speed without flutter. However, his experts would not let him fly any faster, because other surfaces like fin, rudder and ailerons were not instrumented and there was no way to tell whether they were approaching flutter conditions. Since the FAA requires flight demonstration tests to be run at 10% above red line, that sets the red line at 210 mph. This is valid only for the flight tested configuration, which included all of the above listed four modifications.

Some people have asked whether a slab tail is more susceptible to flutter than a conventional tail. This is a fair question for the layman and let's face it, almost everybody is a layman when it comes to flutter. The answer is a definite 'NO'. Conventional tails have the same problems as slab tails and one can be made just as safe as the other. If you don't believe this, just take a look at all of the supersonic airplanes. Nearly all have slab tails.



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So what conclusions can be drawn? What caused the two accidents? There has been no official announcement and we do not know for certain, however, there is evidence that they were caused by flutter of the horizontal tail. In one case, there was strong evidence that the aircraft had flown much in excess of the 210 mph redline. In the other case, there was evidence that not only had the aircraft been flown at high speed, but that the tail had not been built in compliance with the plans.

T-18 owners can now have the confidence that their airplane has been through perhaps the most extensive flutter test program of any homebuilt.

Newsletter #28 - 9/69

STALL SPOILERS - John recommends that everybody now flying re-read my article in Sport Aviation on tuft testing and then add the spoilers. A recent stall spin accident, after an apparent engine failure, emphasizes the need for these. They don't hurt the speed any and are mighty good insurance. I still haven't permanently attached mine, but plan to just bond them on.

Newsletter #30 - 5/70

BULLETIN - John reminds all T-18 builders to complete the tail modification per the plans. When disassembling one tail to make the mod, they found loose rivets in the fittings. They were 1/8" pop rivets. Of course, some weren't long enough, since it is not possible to get them long enough for this application. John says the following is mandatory: Use only the AN 5/32 rivets specified for attaching the 510 horizontal tail fitting. Use no pop rivets for this fitting. To buck them, use a seven foot long steel bar 1" or larger. It is also possible to use a shorter large diameter bar with a handle taped to it. Gravity does the job of holding it against the rivet. John is very concerned about the tail modifications and wants everybody to make them immediately.

Newsletter #34 - 11/71

FLAP BULLETIN - John says that on T-18's with a forward cg loading, it is possible to get a phenomenon he calls "bunt" at a 40° flap setting and at speeds between 100 and 120 mph. He thinks this is caused by a horizontal tail stall, due to high tail loading and bad airflow due to the tail getting into the wing wake. He says that while flying solo, he can nearly always cause a pitch over in N299V and occasionally when dual. I've never experienced this, and can't imagine what it is like, but then, my cg is pretty far back. John says that the solution is for all T-18's to have the flap travel limited to 30°. Consider this a mandatory bulletin. John says this is a problem for T-18's with the cg far forward and probably explains why no one else has reported experiencing this phenomenon.

Newsletter #36 - 3/72

FUEL SYSTEM - L. D. Sunderland - After Jack Park and several others reported that they got power interruptions with several gallons of fuel in the tank, John recommended that a fuel pump be put on all T-18's. However, many of us don't use pumps and have no problems, even with 180 hp engines. Before Bill Warwick flew the first T-18, he ran a full power test with the nose elevated and there was no problem using up all fuel in the tank.

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So, what could cause fuel flow problems in some T-18's? Three possibilities - vent clogged or creating negative pressure, clogged fuel strainer or wrong carburetor float valve. If the vent tube faces forward into the wind getting full ram air, the pressure increase is equivalent to that if the fuel level in the tank were 7.2 inches higher. On the other hand, if the vent tube faces aft pulling a suction, it will be like lowering the fuel level. Depending on the amount of negative pressure differential, it could prevent fuel flow. What is wrong with facing the vent forward? It collects dirt. So it should have a screen to keep out contamination and perhaps more importantly, mud wasps. An alternate inlet should be made inside the fuselage just in case the main inlet becomes clogged. Drill a 1/16" hole in the tube for the alternate inlet.

My vent tube is made of 3/8" aluminum. It comes through the .040 floor board near the fuselage centerline and extends out about 1/2". The end is cut off at a 45° angle, with the opening facing fwd. Preen the tip forward making a small pocket to insure getting positive ram pressure. Air in the vent tube is virtually stagnant, except between the end and the alternate hole where water or dust will be purged by the airflow. I've purposely run my tank very low (it's fiberglass, so I can observe the fuel level in flight) and I've been unable to cause the engine to even hesitate in a steep climb.

If a filter or tank strainer is clogged, the solution is obvious. Someone has already had engine failure because of NOT having a screen finger strainer in the outlet of the tank. If your airplane doesn't have one, ground it until you install one. If you can't find a shutoff valve with a finger strainer, you can make one easily as shown in the sketch. The fitting, which screws into the tank, should be made of brass. Drill out the center hole about .080 oversize. Then make a 2" long sleeve from brass or copper screen. The sleeve ID should be at least as large as the original ID of the fitting. To secure the screen until it can be soldered, bend several wires into hooks. Tin the end of the sleeve with solder, tin the fitting, insert the sleeve and solder in place. Inspect to ascertain that the sleeve ID is as large as the original fitting ID so there is no restriction, crimp the sleeve and solder. If all homebuilders had done the above, there would be a lot more nice shiny airplanes around.

I've been told that carburetors have different float valves when designed for use with a fuel pump. Still haven't been able to verify that, but John Thorp tells me that there were some surplus carburetors available after the war which didn't cause a problem because the engine wouldn't even run without a fuel pump.

What are the disadvantages of a fuel pump? If your fuel system configuration is such that a pump is not required, then its use decreases powerplant reliability. (Al Neuntaffel says his fuel pump failed on takeoff on his first flight. Luckily, he made a safe landing back at the airport.) A pump by-pass with check valves can and should be added when a pump is used, but it all adds up to more things which can go wrong. A part can have no higher reliability than when it is not used.

While on the subject of fuel systems, I've heard of two T-18's that have run out of fuel, one in rugged terrain resulted in a fatal accident. We don't need anymore of those, so why not try making an extra fuel stop, if you don't have a one hour reserve?

Newsletter #37 - 10/72

Before the author installed both slip joints and ball joints in the crossover exhaust system of his T-18, during the first one hundred hours, the exhaust tubes and various supports cracked at least a half dozen times. This experience has been repeated several times by others. Several times builders have proudly opened their cowlings to show how they succeeded in keeping their crossover system together with various supports made of brake lining or tubes, but had to turn away with a red face when they found them broken loose. Without a large dose of luck, both ball joints and slip joints are an absolute necessity in crossover systems.

Newsletter #46 - 5/79

TAIL MOD THOUGHTS: It shouldn't be necessary to repeat this, but there are still some T-18s flying without the tail mods called out. The builders are likely telling themselves that, "I'm safe, as long as I don't go over 180 mph." NOT TRUE! Thorp says you are riding a bomb with a lighted fuse if you do. Altho' he had previously pushed N299V up much faster, he once got a "buzz" out of it at 165 mph! (Before the mods were done.) He now feels the stab is good up to 'sonic' speed, but has redlined it at 210, because other components of the airplane (rudder, ailerons, etc.) could enter destructive resonance regimes at speeds above those tested. Why gamble your life or your passenger's life - or those on the ground? An accident would give the T-18, EAA, Thorp, and yourself an undeserved black eye. Last year, I heard that one T-18 builder was cited by the FAA for "Operating his aircraft in a reckless manner", a careless act under F.A.R.'s, because he refused to make the mod when the inspector brought it to his attention. As you may know, the FAA recently boosted the minimum dollar penalty for violations, as an aftermath of the San Diego fiasco, so give it a serious think, huh? You can well imagine what a field day a lawyer would have in such a situation. I have been told that liability does not end if one sold the airplane.

Newsletter #48 - 11/79

DANGER ITEM - A local Starduster builder has a power failure on 1st takeoff, due to blockage of Aeroquip fuel line. In installing the fittings of the hose ends it's very easy to cut off a little rubber "doughnut" that remains in the line and will block it if allowed to remain. Blow the line out, look thru it, etc. but make sure it's not there. The builder also inspected oil lines to the cooler and found them blocked as well. A local Buecker builder flamed out on his first t/o for the same reason a couple years back, so don't overlook this item!

Newsletter #50 - 4/80

From JIM ROBERTS - To start at the beginning of my love affair with the aircraft, another man that worked for me (Earl Love) and I started construction and flying of N299V which was built for Dick Hanson, of Volpar.

During the early days of testing and Earl Love was flying it, the flutter problem surfaced. Earl was (prematurely) doing a high speed run when he encountered a severe vibration. Fortunately, he reduced power soon enough and by having a constant speed prop, he was able to come back in one piece. The

only casualties were a bent stabilizer and a badly blistered hand caused by the rapid stick movements.

The spar was reinforced and the problem studied while John put a 180 mph temporary red line in effect. The flutter problem came to a head when a Texas builder lost his life diving in on an airport at far over 200 mph and encountered tail flutter. (Documented facts later showed the builder had not complied with recommended changes on the stabilator in several areas, i.e. ribs were not even riveted to the spar - Ed.)

At this point, a full blown flutter investigation was initiated by John Thorp. Stan Rosmussen and Sandy Freznar (vibration experts) were summoned to do the testing. Strain gauges were mounted on the spar tube and the tape readout unit strapped in the right seat. I performed the first series of flight tests, which were done off the coast at Malibu.

My instructions were to set the speed, tap the stick sharply, and flip the switch to "record" increasing the speed in 5 mph increments. Before I started the actual tests, I searched out the highest speed that I could still open the canopy to get out in case of an emergency.

John indicated that there is an aerodynamic forward reaction on the canopy. I found I could not move it back above 120 mph, so I took along a big steel wrench for breaking out the canopy -- just in case.

My three trips up expanded the speed up to 180 mph, where John took over. He wanted to take the risk himself above 180, as he felt responsible. The rest is history, as you know. The results showed a definite flutter at the higher speeds.

Two fixes were called for -- one by moving lead weights to the outer forward surface of the spar from the center (or embedded into the leading edge). We chose the L.E. The other was a beef up of the tab rib.

The second precarious incident in N299V occurred after I installed the flaps and was making an approach to Whiteman Airpark at 90 mph IAS. I set flaps to 40° (30° wasn't in the system then) when suddenly the nose tucked down steeply, narrowly missing obstructions. Only by dumping flaps did it recover to normal attitude. After this incident, John suggested the approach speed of 90 mph was too high for the 40° position. (In short, I ran out of elevator effectiveness.)

(This subject discussed at length elsewhere in this month's N.L. We might note that a maximum of 30° flap extension is now recommended. Again, take note that the nose down pitch is a combination of too much speed and a far forward CG that overpowers the horizontal tail - Ed.)

Dick, I did a serious study of a few things as I was planning my T-18, so will briefly outline them. Above all I would express that these changes do not reflect any criticism of the standard T-18 aircraft.

In my calculations I discovered I could increase elevator effectiveness from 10 to 12% by just lengthening the fuselage 12". With this change I could have more baggage area, or 2 extra (limited weight) jump seats - up to 170# within the CG range. Also, I would be able to eliminate the need for lead weight in the tail to static balance (common on A/C with constant speed props and big engines).

During the ground vibratory tests on N299V, data revealed in the natural frequency mode that longer fuselages could produce more flexing, but 12" was acceptable (with proper reinforcement).

Newsletter #50 - 4/80

From JOHN G. WALTON, 5726 Boyce Springs Dr., Houston, TX 77066 - A few months ago you wrote in the M.A.S. NL regarding the 1978 accident at Oshkosh in which a T-18 stalled on downwind base in a low, slow turn to a landing. It consequently impacted inverted on the runway. A fire resulted after impact and this was, I believe, considered the cause of both fatalities. In the NL write-up you mentioned that the fire probably would not have occurred if the gasoline tankcap had not released (i.e., come out on impact).

I have been giving this event a lot of thought as I've been completing my T-18. I do not know what type of gas cap was involved in the above failure. I do know that a lot of them are like the one supplied in my aluminum tank from Ken Knowles. A picture of this is attached as shown on the copy of a page from the Aircraft Spruce Catalog. The cap in question depends on a to compress outward a rubber inner cap. The compression action is achieved by the squared cam-shape of the locking tab on the cap. This is adjustable by an internal AN 365 nut. There is no detent or lock for this tab such as is present on many military-type caps (e.g., T-33 wings and tip tanks) and others.

I have found that this cap will pop out simply by dropping my gas tank from a height of 3' on my lawn. I should mention that the adjusting cap nut was set for maximum compression in the lock-position while still allowing room to remove it when in the relaxed position. I do not know whether the subject aircraft in the accident has this same type of cap, but if it did, the release on the cap is not a great surprise based on the casual tests I made on my own tank.

In order to improve this situation, I have designed a restrictive "stop" on my flush cover over the cap in the cowl skin which rests against the top of the tank cap when in the locked position. The only way the cap could come loose with this top in the cover would be as a result of a combination of the necessary impact force vectors and significant skin distortion. The enclosed sketch might help to illustrate this description.

It is my feelings that this style of fuel tank cap is vulnerable to this type of release.

A positive lock on the cap itself might be preferred to my modification to my cover for the ultimate in corrective action. It is felt that the simple stop, as shown on the cover, will greatly reduce the potential of this type of release in almost all circumstances.

Newsletter #50 - 4/80

From BRYANT ROWLAND, 1007 Shell, Midland, TX -

The subject of my letter is the use of full flaps on the T-18. Please pass on the following in the newsletter as it well could save someone a very bad experience.

Some T-18's, mine included, have a very violent downward pitch, when full flaps are applied, or when speed is increased while full flaps are applied in a forward CG condition. The airplane is of course at it's most forward CG with one pilot aboard, full fuel and no baggage (such as would be for test flight) the downward pitch is very rapid and is totally un-controllable, not something that you would want to happen down close to the ground.

My airplane reacts this way:

- 1) With one 170# pilot aboard, no bags and more than half fuel which gives me a total weight of 1351 and CG of 63.2 In. Rapid downward pitch upon application of full flaps (30°).
- 2) With two people on board, less than half fuel (and some baggage preferred) no problem with full flaps, meek as a lamb. This loading gives me 1397 total weight and a CG location of 66.1 In.
- 3) When the CG is something between the two above conditions, full flaps may be applied at a slow speed (80 mph or slower) but will pitch down if the speed is increased. Stick buffet is the clue. If the stick buffet's with a forward tug, better get the flaps up or have a very tight seat belt and be ready to ride through the first half of an outside loop.

By the way, my empty CG is 61.6 In. and empty weight is 1013 #. For flight I call 1500 # max. with 62 In. forward limit and 70 In. aft limit. My weight and balance is good, I have double checked it on freshly calibrated aircraft scales. What I am suggesting to new T-18 pilots is, to explore the full flap and CG locations at altitude before any landings are attempted.

All of this has proved to be no problem to me, it's just a limitation that I have learned to respect. As you know, I fly airplanes for a living and have for most of my life. I fully agree with all the good things that are said about the T-18 and wouldn't part with mine for anything.

Newsletter #51 - 7/80

From BILL WARWICK: The boys in the PRPA came up with this a few years ago and it's mandatory on all the formula one's and Biplane racers. (He is discussing an Engine Restrainer, drawings for it are in the above mentioned newsletter.)

The main idea is to give the engine room to thrash about until it croaks without breaking the cable, so don't snug it up too tight. All it has to do is keep the engine from falling out.

Be sure the lugs are bolted to the landing gear attach and not the engine mount.

I've had mine in for years now. Gives wonderful peace of mind & cheap insurance.

\*\*Thanks Bill, for some very important advice. I lost a good friend from this very cause several years ago. He "planned" to put the restrainer on when he got back from the XC and had more time. He never made it. When the prop let go it shook engine, prop, and cown completely out of the airplane and it pitched up into a stall and augered in. It also shook one aileron off and the windshield as well.

Newsletter #53 -4/81

From JOHN WALTON, 5726 Boyce Springs Dr., Houston, TX 77066 - The newsletters are full of comments warning of the tendency for the Thorp to be squirrely in slow taxi. This is especially true with power off. The controlability in this situation is to a considerable degree, affected by the amount of tension put on the tail wheel springs. Don't leave them sloppy - they should be compressed about 1/2 of their original length.

Newsletter #53 - 4/81

From LYLE TRUSTY, 7500 N. Ave. A Lancaster, CA 93534 - Some fuel system basics: Here is a helpful hint concerning a gravity feed fuel system like most of us use.

When you get ready to run your engine up before going to the airport, block up the main gear, lower the tailwheel into a ditch or whatever you have to do to get the airplane into a 12 to 14 degree approach attitude. Put a gallon of fuel into the tank, put a container under the carburetor, disconnect the fuel line at the carburetor and see how long it takes for that gallon to run out.

$$\frac{14}{60} \text{ as } \frac{1}{N}, \text{ Therefore } N = \frac{1 \times 60}{14} = 4.28 \text{ minutes}$$

or 4 minutes and 17 seconds per gallon.

That's what it takes for a 150 horsepower Lycoming at sea level, full throttle. In order to avoid problems you really should flow about 150% of that required to run full throttle.

Newsletter #54 - 10/81

From HARVERY MICKELSON, 486 Novato Sunnyvale, CA - Remember BILL WARWICK'S tip about the safety cable, tying the engine to the frame, that was in a previous NL? Harvery writes about his recent trip to the Reno Air Races, where one of the racers almost lost his prop/engine in a race, but the safety cable kept the engine in, altho' it was hanging down 45 degrees and as a result, there was no fatal stall/spin, just a forced landing! 'Nuff said'.

Newsletter #23 - 8/67

TRIM INDICATOR - John says there is absolutely no need for a trim indicator since the stick force needed to overcome full trim is very light. It is safe to take off with trim in any position. He convinced the FAA to license the Sky Shooter without an indicator. As a matter of interest, one of the Blue Angels told me they fly all their performances with full nose down, trim cranked in. If anything happens this causes them to dive away from formation. This means they must constantly fight a 60 lb. force. The T-18 trim force is about 10 times less than this.

Newsletter #24 - 4/68

Bill (Johnson) had given me some good advice about handling the T-18. He said, "Don't try to pick the tail up until it is ready to fly. Use 1/2 flap on the first landing and 3-point it. This keeps the tail on the ground the maximum amount of time and thus gives better control."

But I wasn't ready to fly yet. I wanted to take it easy and not repeat some of the near catastrophies most of the other T-18'ers have had on first flight. John said that close calls are the rule rather than the exception and recommended a couple of hours in a T-6 or, as second choice, a Swift. Since we have no T-6's around, I got several hours in Paul Schriebmaier's Swift, shooting landings during the previous several weeks. Even with this experience and most of my recent flying done in tailwheel airplanes while towing gliders, I was still a bit apprehensive after hearing about how tricky a high performance plane like the T-18 was on ground handling. So I taxied out, resolved to spend a lot of time doing taxi tests before trying a flight.

Newsletter #24 - 4/68

THE FIRST 20 HOURS - LDS - ... As I mentioned before, for the first few landings I did only three-point landings to get my tail wheel on early for good ground control. I found, however, that these were not complete stall landings. When I got the feel of it a little more so I could hold it off until it started to shudder, the tail would hit first even with half flaps. One sunny day, when a nice thermal was coming off the center of the runway, if I would make a perfect three-point landing, it would roll awhile in that attitude and then balloon back up a few feet. So, under those conditions, I found it best to take wheel landings. There is no problem of directional control if you keep on your toes and don't start waving at spectators or enjoying the scenery until it stops rolling. But then what conventional gear airplane doesn't fall into that category. (Or should we tail draggers call ourselves "unconventional" now that we are probably outnumbered?)

Newsletter #27 - ?/69

AEROBATICS IN MY T-18 - BY DON CARTER - Vestal, NY - The keynote of this article is "Be Prepared." It is important that both pilot and aircraft are properly readied for aerobatics. Another important consideration is that just as no two pilots have the same experience and capability, there are no two T-18's exactly alike. This is especially true of power plants and CG locations, both of which are significant factors in aerobatic performance. The

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reader, therefore, should understand that the aerobatic performance to be discussed is not for all T-18's, but only for Serial Number 96 with the conditions as specified. It is powered with a 125 hp O-290-G engine.

Is The Aircraft Prepared? - The red line restriction should be considered in detail. The first question to be asked is, "What is the accuracy of my airspeed systems?" John Thorp advises that the red line has a known 10% margin of safety. From what I've seen and heard about pitot-static systems of homebuilts, errors greater than 10% are not uncommon. Serial #96 was checked on a ground course and verified against a factory job that had a high confidence level.

The red line has additional significance because, with a cruise CAS in the neighborhood of 150 mph, the red line represents only a small percentage increase. Since these T-18's are clean ships, that increase would invite exceeding the red line. That maneuver is conspicuous in its absence from those which #96 has performed.

Is The Pilot Prepared? - It is never wise for a pilot inexperienced in aerobatics to experiment on his own. This is especially true in the "Tiger" for reasons outlined above. Therefore, if the T-18 pilot is not an experienced aerobatic pilot, he should buy himself some insurance in the form of a good course in aerobatics. Such courses are offered by many local flying schools.

Aerobatics In Number 96 - Although I handled a number of T-18's in flight and Lu Sunderland generously let me do some airwork and make four circuits around the field as preparation for my first flight, I did not appreciate the beautiful handling characteristics of the T-18 until I was on my own in #96. Although I've flown a number of aircraft from the WACO to F-51's and F-80's, I have never flown a sweeter handling aircraft than the T-18. This statement comes from a pilot who prefers a very responsive aircraft.

Number 96 began aerobatics with an empty weight of 730 lbs. (bathroom scale accuracy) and a pilot weighing 175 lbs with chute. Depending on fuel, cg would vary between 20% and 22%. A GPU was up front. There is no tendency for either wing to consistently drop off in stall maneuvers.

Number 96's pilot has been through the formal aerobatic programs of CPT and Aviation Cadet training. In recent months, he had made a number of aerobatic flights in an EAA Biplane. Therefore, both pilot and aircraft were reasonably prepared for aerobatics.

I will discuss the aerobatic maneuvers in the order that I progressed through them. In general, I started with the positive "G" maneuver first. I would like to point out that my interest in aerobatics is generated by the desire to increase my skill in controlling my airplane and the pure enjoyment derived from them. I am not a contest pilot, nor am I even familiar with current standard techniques.

Barrel Rolls - I dive to 160 mph and pull the nose up 5-10° above the horizon at the same time banking about 20° opposite to direction of roll. Then almost full aileron with lots of rudder with the roll and a little back pressure to keep you comfortably in your seat and hopefully, the ball in the center. If the roll rate is relatively high, the nose won't deviate more than about 5° during the roll. With full aileron, #96 will roll 180° per second. I have done double and triple rolls by raising the nose proportionately higher at entry. I like this maneuver because it's comfortable, fast, and presents a real challenge in keeping it coordinated through recovery. One word of caution: start with nose high, up to 30°, on first attempts to avoid excessive speed in event you dish out. This roll could be entered at a slower speed, but it would not be nearly as tight.

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Loops - I enter my loops at 160 mph, with full throttle. Because of the wide range of speed in this clean aircraft, back pressure will vary considerably if the loop is to be round. Use lots of it in the first quarter, gradually letting off to a very light pressure as you go over the top. Remember that red line and throttle back in the third quarter. Biggest problems will probably be not enough back pressure in the beginning and too much going over the top. There is a natural tendency to pull too much back pressure at the top of the loop to hurry it up, but this is at the point where the aircraft is going the slowest and a stall or even a snap roll can be induced. Remember to pull those g's (2.5-3) in the beginning.

Immelmanns - Enter a tight loop at 170 mph using even more back pressure in the beginning so that enough speed to roll will be available at the top. Roll out at the top can be either barrel roll type or slow roll. For maximum comfort I like to barrel roll, which should be started just before going over the top. Full aileron and lots of rudder for the roll with back pressure gradually increasing. Perhaps the more proper method is the half roll at the top. When reaching the top apply forward stick to keep the nose on the horizon. Immediately start the roll with aileron and rudder and add lots of top rudder as the wings go vertical, decreasing as they approach level.

Spins - Spin entry is normal and recovery occurs immediately upon releasing back pressure and neutralizing rudder. No. 96's roll slows slightly about every half turn with forward cg. No difference in right and left spins.

Snap Rolls - As a precautionary measure to keep stick forces light, I have only performed snap rolls at 80 and 90 mph. I use stick full back and full rudder (no aileron). There is a slight hesitation as in a spin and roll rate is average (whatever that means). Recovery is instant with forward stick and opposite rudder.

Snap on Top of Loop - Enter at 170 mph and start snap about 10° before reaching the top. Nose should be about 10° down at recovery after 360° of roll. Complete loop normally. Keep first half of loop tight as in an Immelmann.

Slow Rolls and Half Rolls - Start by vacuum cleaning the office. A tight seat belt and shoulder harness will also help keep you from standing on your head on the canopy. Start your slow roll, after a shallow dive to 160 mph, with your nose slightly above the horizon. Begin your roll with stick and rudder together. From then on you're completely uncoordinated trying to keep your nose on a point. Top rudder is maximum when the wings are vertical and forward stick maximum when on your back. I find that I need all the rudder I have and then some to keep the nose up. Except for lacking rudder, the Tiger rolls nicely. The only difference in the half roll is that all action is stopped on your back and then you go back to the way you came. If you get into trouble, just apply full aileron and you'll be right side up in jig time. Avoid recovering in a split S.

I wanted an inverted fuel system so I could keep the engine going when I roll slowly. Number 96 has a poor man's inverted carburetor system and so I have to adjust the mixture when I go inverted. This makes things a little busy at this point.

Hammerhead Stall - If physical sensation is what you like, this is the maneuver for you. Dive to 160 mph, pull nose up as in a loop to vertical and hold her there until the airspeed approaches stall. Then apply full rudder and fall away. Your airplane will weather vane around to nose down vertically. Then quickly reduce power and recover to level flight.

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Conclusion - The high performance and superb handling characteristics of the Tiger make it a fine aircraft for aerobatic flight. The light control pressures also reduce the fatigue factor. However, I am sure some of the pro's would have some recommendations if the Tiger was to be used competitively. To date, I've only tested the inverted capability in slow rolls and sustained inverted flight. Inverted snaps and spins are yet to be explored. I've already messed up my Tiger by leaking a couple of quarts of oil while on my back. I'll probably modify my lubrication system for inverted flight before pulling many more negative g's.

I would like to conclude with the keynote "Be Prepared". I should not have to emphasize the significance of the red line. All Tiger pilots should observe it religiously. Below is a list of "Be Prepared" considerations.

1. Pilot should be experienced in aerobatics.
2. Aircraft should have accurate airspeed system.
3. C.G. should be forward for first flights.
4. Vacuum office for inverted flight.
5. Wear chute.
6. Practice opening canopy in flight to be prepped for emergency egress.
7. Have lots of air beneath you....like 7000 ft.
8. Get off airways to keep it legal.
9. Clear the area before each maneuver.
10. WATCH THAT RED LINE.

Newsletter #27 - ?/69

HOW TO TAXI - So you think this is a pretty silly subject. I assure you that you won't think so the first time you notice a gravel dent in the leading edge of your nice shiny new propeller. The fact of the matter is that practically nobody is using a 63 inch propeller. Mine, for instance, is 67 inches long and with a 68 inch pitch, is just perfect for the O-200-G engine. It turns up 2750 max. at 172 indicated. With a standard length gear, this puts the prop close enough to the ground to pick up loose gravel if you don't use some discretion in ground handling. Of course, it isn't as bad as a typical tri-gear airplane, but it will still pick up gravel. Here are some suggestions which could save your prop.

1. Never apply high power while standing still or moving at low speed over gravel. If you have to taxi over loose gravel, get speed up before reaching it and either coast over it or hold reduced power. Don't stop and proceed slowly thinking this will be easy on the prop.
2. Choose run-up areas carefully. Even pavement usually has some loose gravel laying around, so avoid it. Try to find a patch of grass for run-ups on unpaved fields.
3. When stopping for parking, such as at the gas pump, try to avoid gravel also.

If you want to see how a propeller picks up debris, just watch an airplane running up over a dusty area. The swirl under the prop picks up debris just like a tornado. So, take heed.

## T-18 (Flying)

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Newsletter #27 - ?/69

Ron Zimmerman, 1915 McKinley St., NE, Minneapolis, Minn. 55418 -

Back in October, 1964, I rode with Bill Hansen in his (N152A) new Trigear Tailwind to Mississippi State University. We spent a week there while Sean Roberts ran some tests on the Tailwind. They recommended nylon yarn for tufting. The tufts need only be 2½ - 3" long. They should be taped on in a staggered pattern -- this reduces the possibility of the slight turbulence of one tuft affecting the ones downstream of it.

On the subject of stall characteristics of the T-18, I experience a slight left wing heaviness both before and in a stall. The break was pretty much straight ahead. There was little or no warning (buffet) before the stall. I tufted and experimented with stall strips to get more warning before the break. I tried to get the wing to stall sooner in the area of the wing walk so the tail would pick up the buffet for a warning. I got the warning I wanted, but the whole center wing broke at the same time. I didn't think trading warning for a gentle stall was worth it, so I threw the stall strips away.

After re-building my T-18 and re-skinning the whole wing, my T-18 now stalls 10 mph (indicated) lower with the same indicator (calibrated) and pitot-static. At first, I wouldn't believe it, but the ailerons are not as responsive as before (in a stall), so it must be going slower.

Originally, I flush riveted only the nose ribs and main beam. When I re-skinned, I used flush rivets back to, but not including, the rear beam. Also, originally, I bent the wing skin L. E. around a radiused piece of 3/4" plywood. This required much sweat, 4-letter words (Darn, etc.), and an extra set of hands. The second time around, I used the method described in Newsletter #23, pg. 8 (1.7 dim). With this method, it can be done alone in ½ the time, during a church service. (Amen! Ed).

I don't think the extra flush rivets did much to reduce the stall speed, but I do think I got a better L. E. contour on the airfoil, which might be a big factor in the lower stall speed. I am not sure how close the airspeed indicator was calibrated before the crash, but it checked out very close after.

It is my personal opinion that the L. E. contour and uniformity has as much to do with stall habits as unwanted wing twist does. A little extra attention to these factors should be worthwhile. I have my horizontal tail off now to be updated.

Newsletter #28 - 9/69

Are flaps worthwhile? Absolutely yes. Not only do full flaps reduce stall speed about 5 mph, but they also greatly increase the glide angle. This significantly cuts the landing roll and makes getting into small fields much easier. If you are in a big hurry to fly, you can skip the flaps and then add them later. But I believe it is much easier to install them when building the structure, especially the fuselage parts. You'll probably just let them go and never get around to installing them.

Newsletter #29 - 12/69

TAXI TESTS ON 336 BY DICK WALEN - I have started taxi tests on No. 336 and have found that it's about more than I can handle right now. I'm not famil-

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iar with the tailwheel, so I'm checking out on a 125 hp Pacer. When I get her up to about 40 to 50 MPH and reduce power, I have fishtail problems. I'm just not proficient enough to handle it yet.

The noise level is surprisingly low. The cockpit is fitted with styrofoam 1" all around, with rolled and pleated upholstery. With the styrofoam filling the cavity between the angles, the upholstery is flush from the seats to the firewall. Here is some data on construction and equipment: 3 years, 2 months to build; \$5000 total investment; O-290-D2, zero time certified engine; full IFR instruments; Alfa 200 Genave Radio; Prop from a 180 Cherokee, adapted to fit extension, 68" dia., 70" pitch; weight - 950 lbs. Engine will turn 2200 static, 29" MP, with the tail tied down.

Newsletter #29 - 12/69

EDITOR'S NOTE: The foregoing comments about Dick's taxi tests are not surprising for two reasons. First, the difficulty in maintaining directional control, when the throttle is cut under 40 mph is typical. It is the only time a T-18 could be said to be even slightly hard to handle. Second, all his experience has been in mosegear airplanes. For this reason, I recommend that he find an experienced tail gear pilot to make the test flight. For making a first test flight in a new airplane, it isn't good enough to just be able to handle an airplane. The pilot should be able to handle all the unexpected things which can occur without worrying about normal control of the aircraft.

Newsletter #35 - 3/72

MANEUVERING SPEED - L. D. Sunderland - Don Carter finally got his T-18 approved for instrument flying. He needed to know the maneuvering speed for the T-18. John says it is 172 mph, with 1500 lbs. gross weight. It is the speed where you can't exceed 6g. CL max is 1.48.

Newsletter #38 - 2/73

SPEED INFO - B. C. ROEMER, Manitowish Watters, Wis 54545. We flew without pants at 3500 feet wide open down a road, noted RPM and air speed, landed, put on pants and re-flew the same area. We gained about 4 mph and around 25 to 35 rpm. Tested the same as above with and without gear fairings and gained 10 mph and around 100 rpm. Very surprising.

Newsletter #42 - 4/75

John Thorp has performed a stress analysis on the T-18C wing, using 1500 lbs. as the design gross weight. The wing was designed for the same design load factors (6 and 9 g's pos) as the standard wing, but I am not advertising it as aerobatic. Due to uncontrolled factors, such as workmanship and substitution of materials, it is up to the individual builder if he elects to verify a safe operating envelope through static loading tests on the ground. The T-18 is such a clean airplane that it is easy for an inexperienced pilot to build up excessive speed in aerobatic maneuvers. For this reason, John is not pushing it for aerobatics. You will see why in a subsequent article.

Newsletter #46 - 5/79

AEROBATICS IN A T-18: Before you go out and do aerobatics in your T-18,



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consider this point: A 6 G capability is ordinarily considered as the MINIMUM in strength capability for doing aerobatics...safely. Had you ever wondered why truly aerobatic airplanes can take up to 12G's? If your T-18 weighs over 850# empty, do you know how much fuel and pilot weight can be added before your G tolerance becomes LESS than the 6 G Minimum? Do you KNOW how many G's your engine mount can take safely? And how about your prop blades? Are you a smooth, competent aerobatic pilot? Are you REALLY competent to do aerobatics in a very clean and responsive airplane? Or has your experience been in slow, high drag airplanes, like a Citabria? Are you aware of the possible consequences if you exceed V-e if you fell out of a 'busted' maneuver? Have you considered the effect of G's on your gyro instruments? Do you think you could open the canopy at 200+ MPH? Inverted? After you've considered all these points, what do you think about the logic of flying your beautiful T-18 into a nearby airport where there is no FBO with a 2 place Pitts for rent to those wishing to stretch their neck a little?

A smoothly done barrel roll normally isn't considered an acrobatic maneuver (from a practical standpoint only), but letting the nose down while inverted could result (and already has) in excessive airspeed on pull out and G's sufficient to bend the main wing beam. Let's not clutter up the landscape with pieces of smashed tin and bloody hunks of meat. It makes the environmentalists furious.

Newsletter #49 - 12/79

MORE ON FLAPS - I had a couple of letters for builders that expressed some anxiety about a combination of a balked landing and an electrical failure (thus preventing flap retraction of the go around). To put it very simply, there is no problem at all. With flaps fully extended, the airplane suffers no great drag penalty. It will accelerate smartly and climb right on out at a healthy rate.

When checking someone out in my airplane, I always have them fly several practice approaches down to flare height and then take a wave off and we never touch the flaps until we have a least a couple hundred feet of altitude and 100-110 mph. It flies so well with flaps down that it might be easy to forget them. There is little pitch or trim change on extension or retraction of flaps, another feature that makes the T-18 a super-sweet airplane to fly. You've seen the TV commercial that says, "Thank you, Paine-Webber"? Well, every time I fly my T-18 I always say, "Thank you, John Thorp, for giving us the finest airplane flying today!"

FLIGHT TECHNIQUES: First of all, I would recommend using full flaps for landings in all conditions. We have always used full flaps for all landings in airline work and the very same reasons hold true for the T-18. Like the jets, the T-18 has a relatively high span loading. As the angle of attack is increased, the wing tip lift loss increases drastically. The shorter the span, the higher the span loading and percentage-wise the greater lift loss. In the high angle of attack position on a typical final approach with no flaps, it's analogous to having a giant pair of scissors clip off most of your outer wing panels. Thus the "remaining" wing has to "work" much harder. The only way the wing can compensate for the loss is to go faster or go to a higher angle of attack. If the angle of attack is already close to the stalling angle that door may be nearly closed. If the wind cannot compensate for the loss of lift via wing tip vortex, the result is an excessively high sink

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rate. If flare height is approached in a super high sink rate condition, it might take full power to achieve an adequate flare cushion.

I've seen some low time pilots "dragging" in the T-18 at a very flat angle, nose high, carrying considerable power, and not using their flaps. This is a dangerous practice! Anytime you crown your normal safety margin as a standard practice, you are inviting big trouble. Sooner or later it'll bite you.

The real purpose of flaps is to allow one to make safe, steep approaches over obstacles without picking up excessive speed. This translates to a lower angle of attack, much better visibility over the nose, less sink rate (per minute), and better speed margin over stall, and a slightly lower stall speed by virtue of flap extension.

Many T-18's have little or no pre-stall buffet warning, so it makes sense to maintain an adequate speed margin above stall. Approaching in turbulent or gusty conditions, you should tack on just a little bit more. Standard practice is to add the minimum of 30% of stall speed for approach.

For the low time pilot, or a pilot just barely tail-wheel qualified, I'd suggest you use full flaps on approach at 90-100 mph IAS (after you have flown several practice approaches at a safe, higher altitude and have verified that 90-100 mph IAS gives you a 30% to 40% margin above stall without flaps). I would also recommend making 2 or 3 practice approaches to flare height (2-3 feet) without landing. Your first few landings might better be wheel landings. A wheel landing buys you a few extra seconds to gradually lower the tail and maintain directional control.

Most pilots that are new to tail wheel flying get into trouble directionally, because they either aren't aware of directional divergence of the nose, or they wait too long before doing anything about it. They allow the nose to move too far directionally without correction and then they usually over-control badly, holding opposite rudder too long and this allows the airplane to diverge strongly in the other direction. By this time the new t.w. pilot is out of phase with things and is falling farther and farther behind directional control. All this time the airplane's speed is decaying at a progressively faster rate and this in turn is affecting rudder response.

I feel the REAL value of taxi testing a new airplane is that it allows the pilot to become familiar with directional control requirements at constantly changing speeds. Obviously, it is also of value in checking gear alignment. I think most experienced T-18 pilots will agree that the new pilot should not get up to 50-60 mph and suddenly yank off power. This puts you in the worst possible situation, because of the rapid rate of speed decay and rapid change in rudder response. It makes a lot more sense to gradually increase taxi speed in 5 mph increments, gradually reducing power to idle. 40 to 50 mph should be the absolute top limit of taxi speed. Don't advance your taxi speed bracket until you are truly competent to go a bit faster. Don't use brakes for this practice unless it's really a necessity. Consider taking a t.w. qualified instructor along with you on some of your taxi runs and let him critique your proficiency. It's perfectly legal to do so. It's legal to even take him along on flights, if he is a bonafide crew member.

One other bit of advice to the new T-18 pilot: Don't flare the airplane until you are within a couple of feet of the runway. We've had several "incidents" and accidents that began with a too high flare. Most T-18's will pitch the nose down briskly at stall. Even at 10 mph above stall the stabilator begins to lose power to raise the nose (without power) at the same time the very high sink begins. If this high sink is allowed to start and the nose is falling thru rapidly at the same time, a hard bounce, or

series of bounces, leads to big problems. If you make your flare and aren't on the ground in a second or two, play it safe and go around.

That's the reason that I favor a wheel landing attitude for new pilots and still another reason for using full flaps. Visibility is much better, along with better judgment of flare altitude. A slight ricochet from a wheel landing doesn't put one in a hazardous recovery situation. In case of doubt - punt - go around!

I've used the term "tail wheel qualified". In essence, this really means "competent to control the airplane in crosswinds or other directional divergence conditions". Be certain that you can control (any) tail wheel airplane in crosswinds clear down to zero mph.

Don't feel that I am "talking down" to any of you with the above advice just because I've been flying almost 50 years. I'm not. It's just that any tail wheel airplane is a different kind of critter, and when you give them cause to bite you, they'll just do it quicker in a small, quick coupled, and responsive airplane like the T-18.

I did a little instructing of a friend of mine on an American Yankee last year. I had never flown one before and was surprised to find that control response and sink rate characteristics were quite similar to the T-18. A couple or three hours of takeoffs and landings in one might be a good way to warm up for T-18 flying.

In 48 years of flying, I had never accidentally ground looped an airplane until last spring in my T-18. I had a 20 mph crosswind 90° to my right to my direction of movement. I was taxiing on a parallel taxi strip at about 5-10 mph, when my right shoe got caught under the top flange of the rudder/brake pedal. In the second or so that it took me to get my shoe out from under, it had weather-cocked into the wind and there was simply no stopping it, even at that low speed. I was amazed at how fast it went around. If I had been going 5 mph faster, I'm pretty sure it would have scraped the wing.

#### "WE NEVER GET TOO OLD TO LEARN" DEPARTMENT

Recently, I was demonstrating my T-18 to a new builder and on landing roll out, he commented what great rudder control it had. I enthusiastically agreed and vigorously yawned it back and forth at 15-20 mph to demonstrate. After 3 or 4 of these, it surprised me and took off for the boonies and despite full right rudder and brake (?), I couldn't stop it. It didn't go all the way around, due to our low speed, but it got my attention, as I could have dinged it some if there had been a runway light there.

I later simulated this in an open area and sure enough, it did it again. I first suspected my Maule tail wheel had sheared the locking pin (as Dan Dadash's T-18 had done when I was riding with him once. He came very close to losing it then). The Maule checked out.

I had first thought I'd lost my right brake, but what I found was that it was very nearly impossible to suddenly get any brake application with full right rudder applied. It has been known for years that the brake pedal will hit the tank cradle under those conditions and can be corrected by notching the right brake pedal. Let me strongly recommend you do this, even if you move rudder pedals back an inch or more! When taxiing in close quarters, to make a sharp right turn, I've always had to apply a little left rudder in order to get the right pedal back far enough to use right brake. Needless to say, my right brake pedal now is notched. Now, before you say to yourself, "I'll just move the tank cradle," take note that it affects the channel over the top of the tank, the skin it attaches to, etc. Don't do it. The notched

rudder pedal isn't unsightly and it gives plenty of room for even a big foot like mine.

Incidentally, Dan Dadash was so upset at the Maule that he took it off and replaced it with a non-full swiveling Lang. It takes a little more planning to maneuver in close quarters and to push in and out of the hangar, but he feels it's worth the extra peace of mind. The Scott seems to be the best and perhaps the extra cost is justified.

One other very important item: Tail Wheel Steering Springs:

Use only the so-called compression springs! These are double action and have one inside the other, acting like a solid link when stretched so far.

On my recent trip to Chino, I let Francis Richardson fly the leg into Pecos, Texas, where the wind was west at 30K. We landed on the West runway no sweat, but when he turned up the North runway to get to the gas pit, he couldn't hold it and it would weather-cock into the wind and go on around in a super low speed ground loop. This took place 6 times before we got to the gas pit. The culprit was the single action tail wheel springs. They had stretched and had caused my problem the week before.

I had an extra set of double action springs with me, so we pushed it behind a hangar out of the wind and changed them. Boy, what a difference! When I taxied out to the runway, I had perfect rudder control and never had to even touch the downwind brake, even with that 30K crosswind.

I talked to several T-18 owners about this at Chino and found they had all changed over for similar reasons, so, amigos, if you have single action springs, throw them away and write Ken Knowles for a set of compression springs.

Newsletter #50 - 4/80

Not many airplanes have encountered this problem, but please note that the two conditions necessary to overpower the horizontal tail are a nearly full forward CG and excess air speed. I've known of one T-18 builder that always kept a 75# tool box in his baggage compartment, primarily because of the forward CG he had as a result of the heavy C/S prop he had and a battery located under the seat.

It should be emphasized that every airplane is different and just because you have a GPU and wood prop doesn't automatically guarantee that there won't be such a problem arise. Check it out at altitude several times, verifying the speed.

From GLENN YOUNG - The only bad habit that we have found with the Thorp is, that when flying solo, the CG is more forward than with two persons. It is within limits, but it causes a pitch forward and a buffet on the elevator when two notches of flaps are extended above 80-85 indicated. Below this speed, the buffet disappears. A call to John Thorp on this confirmed that others have had this same problem when the CG is forward. John assured me that this would probably disappear when I put two persons in it. With two aboard, there is no buffet below 100 indicated. Both Ethel and I usually use 1 notch of flaps when flying solo, as there is no buffet or pitch down in that configuration.

Newsletter #51 - 7/80

ANGLE OF ATTACK INDICATOR - Glenn and Ethel Young

An angle of attack indicator can be a very valuable instrument for precisely controlling minimum safe speed on final approach. Several T-18's that I've flown have practically zero stall warning buffet... especially if you gradually "sneak" into one as you might on final and were a little careless about getting too slow. We have had a number of incidents and some accidents when some of the low time pilots flared too high or flared too rapidly. Some lean too far the other way and come in with much too excess speed and float so far down the runway that they use up all the runway and hang their neck on brakes at the last minute.

Such an A of A indicator is also valuable for selecting the proper climb angle and for speed control in turns. It might even save your life if you had a power failure and needed to maintain the best L/D without approaching an inadvertent stall, which is almost 100% fatal at low speed altitude. It might well be the best \$25 any of us ever spent, especially if your T-18 is one of those with zero stall warning. I plan to put one on mine, not only for the above reasons, but also for what it might teach me in cruising flight.

If you don't have a copy of the Sept '75 S.A. and can't get one from EAA HQ, I understand John Bergeson will photocopy specific articles for 20¢ per page. He's the one who puts out indexes for Sport Aviation and advertises in S. A.

Newsletter #52 - 10/80

From B. C. Roemer - A lot of the builders probably have the same feelings that I had when building -- that perhaps I was building an airplane that I couldn't handle -- just too much for my experience level and that I'd never be able to hack it. My advice -- forget that line of thought. This doesn't mean to go out, hop in, fire up and off you go when it's time. No. 1: Have someone experienced test fly the airplane. Then, get yourself checked out in it before you solo. I did this and it sure beats the high pucker factor -- wet palm route. T-18's are very easy to fly -- when you know how. Anything that goes 200 MPH sure is going to fly different than a J3 that goes 80 MPH. And another thing -- after you had your dual in your T-18 and you make your first solo takeoff -- concentrate on only one thing, -- flying the airplane away from the earth, period. Get altitude and then feel it out and play around a bit -- I definitely wouldn't advise take off, getting 15 to 30 feet high and landing again. Pulling the power creates a vast control feeling change, and gets you slow, sloppy and settling all at the same time; This is not the place to be learning how to fly a T-18. Try this in the airplane you are used to flying and see how you like it. Sure, some people may disagree, but it just ain't the place to be learning about anything. Add to this the unknown of a new machine (and anything can go wrong -- I had the elevator control jam at 20 feet on take off, because a mike fell in between and blocked it, it was flying with cover plates off) and you really have to do a lot of sorting out in quick time to save everything.

How hot is the T-18 landing?

Let's take some cases. Landing normally full stall is no sweat. Wheel landing are fine -- they burn up a lot more runway and you got to be more

precise as to feeling for the ground or you get bouncing especially with hard tires, but works well when you get it down pat.

How about landing with only one brake? A number of people have done this -- most times there was not a problem. Of course, landing with no brakes will use a lot of runway, but should give no unusual problem.

What's the worst condition possible to land a T-18?

How about one wheel locked dead and one wheel zero brake? Want to ride through that condition? First you're probably saying, how could that condition ever exist in real life? Rest assured, it can and did.

I landed with zero brake on the left and locked brake on the right on bare blacktop. The result was one worn out tire, a mild ground loop and the tying up of the main runway at downtown St. Paul, (a jet port) in Minnesota.

Our home port is grass and is not plowed for snow. We had about 5" on the ground and normally, this is no problem, however, the snow gets in the drum brakes we have and the water soaked linings give no braking.

I knew the wheels were full and figured they would freeze in the air. (Temperature was below freezing), but they always broke loose upon landing in the past, but not this time. The left wheel broke as expected, but was iced up and the zero brake. The right never broke and created a nice curved black skid mark until we ground looped. Not violent, but mild (1½ turns). The wing didn't even come up. I had to find some heat to warm up the brake drum to unfreeze it before I could move off the runway. When I did, the locked wheel was worn through 3 plys of the 4 ply tire.

So now, no one has to be afraid of the "hot landing" T-18.

There's not a lot you can do in this situation, except opposite rudder and wait for the ride.

Newsletter #53 - 4/81

ELECTRONICS INTERNATIONAL: EC-1 Operating Instructions - During descents to the traffic pattern, it is recommended maintaining the mixture at the leaned cruise condition with a gradual richening of the mixture, carrying some power and at a sensible airspeed to maintain the most efficient engine temperatures possible. Avoid low power--high speed descents which may cause sudden cooling, severe lead fouling, cracked cylinder heads, and warped exhaust valves.

Newsletter #54 - 10/81

ANGLE OF ATTACK INDICATOR: Thanks again, Glenn and Ethel, for the info. It's greatly appreciated. An Angle of Attack indicator would seem to be a very useful item. There are times when we might want to fly a little slower than V's + 30% on approach, but with the rather poor pre-stall buffet that most T-18's have, most all of us usually pad that figure a little, too. My T-18 indicates 58-60 at stall with two people and I normally approach at 90 until about 200 ft. and then I may work it back to cross the fence at 80 if I am

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going into a short field. Incidentally, I feel that to go in and out of any field less than 2000 ft., with two people aboard and an average 10 mph wind is using up most of our normal safety reserve (and that's a field with no obstructions on either end). With 180 hp and a constant speed prop, you might safely knock a couple of hundred feet off that figure and the new airfoil might trim another hundred more off. In very hot weather, light or no wind, and a turf field, a 2100 ft. field is my personal minimum, unless it's a case of "have to". I'd be interested in hearing how other T-18 owners feel on the above. I also wonder how many of you make a practice of using a forward slip on approach, with flaps extended? My airplane slips very well with full (30) flaps. John Thorp doesn't recommend (or approve) of this, but I've done it hundreds of times and some so steep I've had to use full rudder and MY airplane lets me know when I am close to the max control limit. (I'm not advocating it for anyone else. Just curious).

Newsletter #55 - 4/82

From DON THOMSEN 112 Station Ave. North Hills, PA 19039 - I fly from a 2100 foot strip and would like to offer my solution to short field landings. I have found a high, slow approach with full flaps works best for me. A 90 to 95 mph final, decreasing to 80 to 85 mph over the fence, seems about right. The rate of descent is controlled with power. At light weight, there is a little float, at heavy weight almost no float. Three point landings are used exclusively. Flaps are retracted at touchdown and very little braking is needed.

FLIGHT TIPS - I heartily agree with your technique for short field landings. To my way of thinking, that's the only safe way to do it. I've always been opposed to dragging a T-18 (or any other airplane) in a very flat glide path. First of all, if you have any sort of power loss you're in deep, deep trouble. Most T-18's have minimal stall warning buffet and flying the airplane close to the ground and the stall at the same time is a form of gambling that's in the same category as passing cars at the top of a hill. With a steep approach, you can precisely control your airspeed, sink rate, and glide path with a degree of accuracy that's simply not attainable with the other method.

FLAP USE - I give a considerable number of BFRs and if there is any one thing that is common in many private pilots, it is a reluctance, or timidity, to use flaps. If you will pay close attention to the way highly experienced pilots fly an approach, you'll see full flaps extended on all landings and you'll see landings with minimum float. When the pilot knows exactly where his aircraft will touch down and he has the airplane centerlined on the runway, he then only has two simple problems to solve for a safe and smooth landing: What altitude to start his flare and how rapidly to make it. If we analyze the difference between a no flap landing and a max flap landing, it's nothing more than the time factor. Speed will decay more rapidly with flaps extended, hence the flare must be executed in a shorter interval.

LANDING TIPS - When I check a new pilot out on the T-18, the first thing I show them (before we even start the engine) is where the horizon is in the 3 point position (which is fairly close to the stalling angle of the wing). On most T-18's it will be pretty close to the front and top of the nose cowl. I point out that if they don't quite raise the nose that high on landings, that they won't drop it in and 95% of their landings will be good ones, and

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at the most they might get a little skip. I go on to say that as one feels the mains first roll, to bring the stick all the way back. I also have them record that horizon position in their minds for use as a quick guide for a safe climb angle for takeoffs and waveoffs.

I'll also pass on a little tip I used to use on pilots that seem to have a problem in focusing their eyes the proper distance ahead of the ship (which usually is the primary reason he'll flare too high). On takeoffs, I try to get them to notice how far ahead that marks on the runway, or blades of grass, stop blurring from our speed and come into sharp focus and I try to get them to zero in on this at what they think is 2 or 3 ft of altitude. I also usually have them fly 6 or 7 approaches down to 3 feet without landing and then fly most of the way down the runway at that altitude before climbing out. The T-18 would never be flared above that altitude and if you will take care to do these things when you first fly your airplane (including the series of approaches without landing), you shouldn't get into trouble. Until you get very used to the airplane and get a bounce of a couple of feet or more, don't hesitate and try to save it, get full power in and go around and do it again. This time try to improve your airspeed control on final and concentrate on your flare height and rate.

OTHER FIRST FLIGHT TIPS: At any time you do any fast taxiing be absolutely sure THAT BOTH YOU AND THE AIRPLANE ARE READY TO FLY AROUND THE FIELD! I know of three accidents and one hair-raising incident that happened when the airplane got airborne when the pilot was not expecting it and when insufficient runway length remained for landing and stopping. In one of these cases the airplane ran out of gas just as it was crossing the field boundary on takeoff, causing major damage to the airplane. The pilot said his throttle stuck open and it rattled him so that he forgot the switch and mixture. A couple of years back, a T-18 pilot found himself 10 ft. high, the airspeed indicator not hooked up, the stick only stuck in the socket and he had drifted off the runway to the side... AND it looked like he didn't have enough runway left to get back on and stopped!!! Guess he had no choice but to try, and somehow or other he did get back on and stopped, altho' it ended up in a hair-raising, tire-screaming ground loop out in the grass at the end and nothing got bent except his ego.

TAXI EXERCISES: I have mixed feelings about the worth of doing high speed taxi runs, and most of those feelings are negative. If the pilot is not CURRENTLY A PROFICIENT tail dragger pilot, he should make every effort to put in 3 or 4 hours minimum of takeoffs and landings (not touch and go wheel landings). The T-18 is quick on the rudder and that takes a little getting used to. If you have only flown tri-gears, it might take a lot of getting used to. One thing I always advocate ANY new T-18 pilot to do is to get on a wide, unused runway or taxi strip and starting out at VERY slow speed (5 mph) make precision taxi turns of say 30° on each side of the center line. Do this upwind, downwind, crosswind for perhaps a half hour...at least until you are truly proficient with stopping the turn EXACTLY the same amount on each side of center. I have noticed new T-18 pilots doing this with me while riding shotgun with them: they inevitably sight the turn to the right, only going about 20°. I found out the reason was that they were using the spinner to sight the turn, not an invisible sighting line parallel to the C/L of the airplane. When I stuck a piece of tape on the nose cowl directly in front of them and had them use that for their front'gunsight, that ended that problem. As you become proficient doing this at 5 mph, you can gradually increase your

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taxi speed in 5 mph increments, but as your speed increases to a maximum of 25-30 mph, it is advisable to cut down the angular deviations from the center line to perhaps no more than 10° at the high speed end. While this exercise is best done using no brakes, you certainly should have your foot in such a position that you can immediately use brake if the occasion demands it.

T-18 TAKEOFFS: The T-18 has a marked tendency to turn left as the tail comes up on T/O, due to P effect. This usually starts the pilot to overcontrolling the rudder and getting one oscillation, out of phase with the nose swinging. Fortunately, the airplane is ready to fly at this time before the pilot embarrasses himself too badly. The airplane is accelerating so rapidly and the rudder is becoming so sensitive with full power slipstream, that there is a very natural tendency to overcontrol on the rudder and even experienced T-18 pilots will also do it if they haven't flown a T-18 for awhile.

The cure for all this is simple: Just let it fly off in the 3 point position unless you are very heavy and on a very short runway. In my airplane, flying solo, I can't tell the difference in the length of the takeoff roll. On a very hot day and with a load, I have found that if I raise the tailwheel no more than an inch or so after I am about 3 seconds into the takeoff roll, that takeoff roll distance and acceleration after lift off is about optimum. In this way I can take full advantage of the available tail wheel steering, which is much less sensitive than the rudder alone.

If you are inclined to be offended by such elementary advice as above, it isn't intended to offend. While building one's own airplane is a noteworthy accomplishment, it's wise to be aware that our ability to properly and safely fly our creation is completely UNrelated to the building process and the first flight should be approached with an attitude of humility. Tempering that attitude with a little bit of knowledge coming from practical experience will help to reduce the number of surprises.

Newsletter #55 - 4/82

MORE ON FLUTTER: Thanks again, Bob, for all your words of wisdom on the flutter speed's fixed relationship to the TRUE AIRSPEED. I sincerely hope one and all clearly understand the inherent danger associated with foolishly pushing the airplane's speed up to or beyond what is known to be safe. The T-18's speed and control response makes it an exhilarating airplane to fly and in some people, this also generates an overwhelming surge of "Look at me, Mom-itis"... the show-off urge, to be plain about it. Most of us can resist that urge at low altitude, but be alert about VNE at altitude. Don't ever assume you could react fast enough to stop flutter after it began. You can't. I interviewed two eyewitnesses within 15 minutes after they saw the start of the tail flutter until the airplane self-destructed in mid-air and they both agreed the total time interval was considerably LESS than 2 seconds!

If you don't have an OAT gauge in your airplane, perhaps you ought to sit down and figure how much less your airspeed indicator will read for each thousand feet of altitude you go up and make a little chart to keep in the airplane and refer to. You can use standard temp dropoff figures and be pretty close. Right now, you should also be asking yourself "I wonder how accurate MY indicated airspeed is?????" That's a pretty good argument for finding out just how accurate your airspeed is. Right?

Newsletter #19 - 11/66

OIL PRESSURE - Some GPU engines will provide too low a value of oil pressure even though all bearings, etc., are within tolerance. This is probably because the pressure relief mechanism is set too low. This cannot be corrected by replacing the spring with a stronger one. The problem lies in the cage that the pressure relief ball sets in. In some of these cages, the holes are larger than standard for aircraft. Remove the cage and replace it and the pressure should fall in the correct range.

Newsletter #27 - ?/69

HOMEBUILT MAINTENANCE - Now that you've got your homebuilt aircraft flying after those seemingly endless months of toil and sacrifice, you can finally relax and enjoy flying again on all those nice sunny days, instead of being cooped up in the workshop. Also, you can do some of those odd jobs around the house which you've been promising your wife you'd do "just as soon as I get 'er flying". Wow, what a great feeling! You can even take a little snooze after supper without feeling guilty. No longer do you go to work the next day with zinc chromate stains on your hands, cut fingers, or burns from a hot welding rod. Yep, you can just fly to your heart's content or until the gas bill gets too big.

And just think how much money you are going to save on maintenance and annual inspections. Isn't it silly all the rules the FAA has about maintenance on type certificated airplanes? Sure hope they don't get any idea like that about homebuilts. That would be ridiculous, since anyone who can build an entire airplane can surely keep it running. Besides, you are going to stay on the safe side and check it over good once in a while.

Up to this point, the picture is all roses, but it is all too easy to let human nature take over and give that ball-of-fire homebuilder a case of the "put offs." Since there is no absolute deadline on maintenance, it is easy to just relax and enjoy life and wait a little longer to do that preventative maintenance.

The disciplines and skills learned by the homebuilder are not necessarily those required by a good aircraft mechanic. Before a person can make a part from new materials, he is forced to learn how to go about it, otherwise he will end up with scrap. Building an airplane is thus a mandatory learning process for the novice. He has nothing to lose but his time and money if he goofos -- and even that is a very effective learning process. Maintenance, however, is another story. There is considerably more at stake than time and money if maintenance is not performed until it is forced upon us by a failure of some part. Much as we dislike being policed by the FAA, that is really the reason for all the emphasis on maintenance and inspections.

Currently, all preventative and actual maintenance on homebuilt aircraft can be performed by the owner with an annual re-certification inspection performed by the FAA at least once a year. Our FAA office does a good job on these inspections, but they emphasize that they are not meant to be a substitute for good periodic inspections. Just what should periodic inspections consist of and how often should they be made? This is where the average homebuilder should resume the learning process. To know when and what to do he should, by all means, study a book such as one which is intended to prepare a person for the A&P mechanics test. An example is the Zweng manual on this subject. If you can't answer the sample questions that apply to your type of airplane, then you should do some studying.

(2)

Regarding inspections, the homebuilder should discipline himself to stick to a rigid, preplanned program. EAA chapters can help by devising such a program and take positive action to see that it is enforced. For insurance, ask each aircraft owner to voluntarily submit his log books to a designated chapter representative once per year and thus show evidence that inspections are being performed.

Here are a few suggestions which might be of help in establishing your maintenance program:

1. Enter all maintenance actions in a log book.
2. During the first 25 hours, remove all cowling every 5 hours and thoroughly inspect the powerplant. If your cowling can't easily be removed this often, including the nosepiece, without removing the propeller, then it isn't designed right.
3. Every 25 hours thereafter, remove cowling, wash down compartment, and inspect engine mount for cracks, baffles, exhaust system, tightness of fittings and nuts, jugs, and check oil screen for metal particles.
4. Repack wheels every 100 hours and check plugs and points.

Newsletter #27 - ?/69

VALVE PROBLEM - If you haven't had a stuck valve on takeoff, you really haven't lived. This happened to me during climb out recently. Fortunately, I was at 600 ft. altitude and about at the end of the runway. I was able to just make it back and land across the other runway, with only minor damage when I ran through the snow at the edge of the runway. Inspection of the engine revealed nothing wrong, except that a piece of carbon had gotten under an exhaust valve. This kept the valve from seating properly, and, with no heat sink for cooling, the valve got overheated and expanded in the guide. Even though the valve stem to guide clearance was within tolerances, the valve stuck open. This not only caused a power loss, due to one less cylinder, but it also caused severe backfiring. This must happen when burning exhaust gas from the other cylinder is sucked in through the open exhaust valve at the same time the intake valve is open. Believe it or not, this makes a very noisy glider out of an airplane. John tells me that Bill Warwick had a similar close call when his 180 Lycoming powered T-18 ingested a nut from the induction system and this got lodged, jamming a valve open.

Changing Spark Plugs - John Thorp says that it is very common for carbon to get lodged under a valve when spark plugs are changed. Removal of the top plug can break loose chips of carbon, which fall down past the valves. If a valve is open slightly, the chips will collect around the seat and when the valve closes, it will smash and sometimes stick fast. Since the valve can't touch the seat, it becomes very hot and may either stick or start to burn. John said this happened to him on three different types of engines, until he figured out what was causing it. He thinks that 90% of the pitting of both exhaust and intake valves is caused by this.

First, he removes the bottom plugs. Then, before removing each top plug, he brings the piston up on compression, thus insuring that the valves are closed. For added safety, blow air through both spark plug holes. John says he has never had any burnt valves over the years since he began following this procedure. He has written to both Lycoming and Continental to bring this situation to their attention. I don't know whether my valve problem was caused by changing plugs since I haven't had them out top recently, but you can be sure that I will remove the bottom plugs first now that I'm aware of this situation.

Newsletter #19 - 11/66

WHAT RPM IS RED LINE? John Thorp tells an interesting story about how the 2600 rpm red line got established for light aircraft. After WW II, an SAE committee meeting was called to set standards for engines and propellers for light aircraft. Representatives from the various air frame, engine and propeller manufacturing companies were present, including John Thorp and Fred Weik. Mr. Weik stated that it looked like the propellers in post war airplanes would be in the 72 to 78 inch length range and that for the wooden props then in use, 2600 rpm would be a good maximum. So, since that time most of the airplane manufacturers have specified 2600 rpm as the maximum. But this is not necessarily hard and fast limit, based upon engine or propeller design considerations.

The Hughes helicopter uses an O-360 Lycoming engine, which cruises at 2950 rpm. John was involved in its design. The only problem which arose was that the valve mechanism had a shorter life, so they had specially hardened cam shafts and lifters installed. John thinks the O-290 series engines can be turned at cruise speeds up to 2800 rpm without adverse effects.

You have heard that propeller tip speeds cannot exceed the speed of sound and that this limits maximum rpm. The speed of sound at sea level is 1100 feet per second, but you shouldn't attain tip speeds this high. A wooden propeller turning 3100 rpm has a tip speed of 1000 fps. The best maximum tip speed depends somewhat on blade pitch. So, for T-18 length propellers you can cruise at up to 2800 rpm.

How do you determine the 75% power point for your airplane? Power varies roughly as the cube root of rpm. So, to determine the 75% power point, first determine the maximum level flight rpm for a given temperature and altitude. Your engine is delivering its maximum horsepower for that set of conditions, but you don't know what it is (or don't need to know). Now, reduce rpm by 10% and you are obtaining 75% of the original maximum power. If you assume a maximum of 2900, the 75% point is 2610 rpm.

Newsletter #19 - 11/66

COWLING - Be sure to have enough outlet area for best climb speed. Since the best climb for the T-18 is greater than 100 mph, an ejector type cooling system will give no advantages and is more complex. (At 100 mph at sea level the ram air provides about 5" of pressure.)

Newsletter #28 - 9/69

MANDATORY BULLETIN - If you sell your T-18, give the owner the plans and notify John Thorp of the change of ownership. Why is this so important? We very nearly had a serious accident in a case where a T-18 was sold, but the new owner did not get the plans and knew nothing of the tail modification. One tail tab became fatigued at the root rib attachment rivets and the rib became detached in flight. The tab fluttered at 155 mph, but the pilot got down safely. He knew nothing of the tail mod because he didn't get the plans or T-18 Newsletters. The purchase of a set of plans licenses the owner to build one T-18, so, legally, you can't keep the plans and build a second one anyway. And since an owner of a homebuilt needs the plans to make repairs, they should form a permanent part of the aircraft records.

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Newsletter #29 - 12/69

TAILWHEEL STEERING SPRINGS - During the first 150 hours on my T-18, the springs on the tailgear became uncoupled at least a half dozen times. I tried several different weight springs and bent the ends in more, but still they became unhooked. I finally found a fix that really works, and makes ground handling much easier. I simply restricted the amount of stretch of each spring with an extension of the connecting chain. New chains were made about 6" longer than normal. The first link of a chain was hooked to one end of a spring in a link, which permits the spring to stretch about an inch before taking up the slack in the chain. The chain then continues on to be hooked to rudder horn. Since making this change, I have never had an unhooked spring, and directional control is much improved. This, along with the longer, softer main gear legs, has really made a world of difference in my T-18. I strongly recommend both.

(Most people refuse to take my advice. You really should try it!)

Newsletter #44 - 4/77

The steel tail gear makes all the difference in the world. I have flown Fred Kracht's Thorp CF-YEI a lot and early on we had the aluminum tail spring on it. When I got my steel one made up, we got two and changed Fred's as well. That aluminum one should be banned.

Newsletter #45 - 1/79

There have been a lot of changes that have taken place since the T-18 design left the runway in 1962. In the intervening 16 years, the airplane has gradually evolved into a rugged, reliable, high speed vehicle, with a capability that equals or exceeds the finest, most sophisticated factory builds, costing many times more. About 250 have been built to date, with at least that many more somewhere in the construction process. Mandatory changes and "ADS" are remarkably few, certainly a tribute to the design expertise of JOHN THORP. Many of these airplanes are approaching the 2000 hour mark and several are well past that figure. Some of these "high timers" have done most of their flying from rough, unimproved landing areas, which is even more evidence of design excellence. Surely an aggregate total of 100,000 flight hours would be on the conservative side. Even the accidents have shown the T-18 to be very "survivable", as long as it isn't a stall/spin situation.

The rugged "A" frame landing gear and heavy members and attach beams from the seat back forward, are mainly responsible for protecting the occupants from serious, or fatal injury. The outward curving shape of the fuselage in that area is also a potent safety factor, as crash researchers have discovered in Ag aircraft accidents.

With the gear acting as a "pylon", with the engine hanging from one side and the rest of the structure from the other, very high G forces on the airframe are greatly softened and slowed up, thus allowing gradual deformation of the structure, the key to survival of high G impact. The A frame gear's ability to soak up huge amounts of energy before failure also validates its unique role as an effective barrier to prevent the engine from smashing thru the firewall and crushing the cockpit occupants. I know of no other single engine design that has this very valuable safety feature.



Newsletter #28 - 9/69

OUNCE OF PREVENTION - Lyle Fleming just had a spectrographic oil analysis run and discovered warning signs. Disassembly of the engine revealed three broken rings. Ads for this type of service appear in the Aviation Magazines. Sounds like a good idea.

Newsletter #28 - 9/69

OIL SEAL RETAINERS - If you want to buy some real cheap insurance, just add a retainer to your crankshaft oil seal. Several T-18 owners have had problems with blown-out oil seals. You will recall Lyle Fleming's forced landing in the middle of nowhere and Bill Warwick had two blown seals before he discovered a washer installed wrong in the breather. Lycoming now uses as standard equipment, on all engines, a split retainer ring, which attaches to the front flange on the crankcase with four number 8 screws. It would be very easy to make such a retainer if you can't locate one. I strongly recommend that one be installed on all Lycoming engines. The flange on the O-290-G case isn't any too wide, but there is ample material to drill and tap for four number 6 screws.

Newsletter #30 - 5/70

MAINTENANCE TIP \* For 180 hours, I've been plagued by a problem which I've finally solved. When at full throttle, occasionally the engine would give a little jerk like it missed once. Thought it had to be carb, but it was bad mag. Hooray!

Newsletter #31 - 9/70

Never remove top spark plugs, unless the piston is at top dead center, on the compression stroke. Cracked loose carbon may otherwise get under a valve seat, later burn itself fast and bye-bye valve. This advice was learned the hard way, through experience, so take all of it seriously.

Newsletter #35 - 3/72

Oil Consumption is a very important trend to monitor in an engine. The operator and maintenance people should know the general history of oil consumption during the life of the engine. It is typical of an engine during seating of new piston rings that oil consumption may be erratic or high, but after the rings are seated, generally within the first 25 to 50 hours, oil consumption should level off below the maximum limits established by the manufacturer. Later, during the life of the engine, if there is a noticeable increase of oil consumption within a 25 hour period, this could be a possible danger signal and calls for an investigation. The oil screens and filter should be carefully observed for signs of metal. Maintenance personnel should take a compression check of the cylinders, preferably using differential pressure equipment, and also look inside the cylinders with a boroscope or gooseneck light to detect any unusual conditions.

Newsletter #41 - 7/74

SERVICE TIPS - B. C. Roemer sends this list of service items he has found

necessary in the first 400 hours. You other owners should also send in any items you may have.

1. 2 1/2" rubber washers on landing gear failed. Replaced with belting type.
2. Oil cooler bracket, carb heat valve, carb heat box and mixture control wire all failed or cracked.
3. All rivets from skin to horizontal tail tube had to be replaced, they were pops and he replaced with cherry structural type. Also a number of pops in leading edge wing ribs were replaced.
4. Horizontal tail tabs next to rudder are flexing with air loads and need strengthening. (Ed Note: This is a very important point and relates to the flutter modification. My observation is that an .020 thick tab is much stiffer.)

It has not been previously reported that so many rivets have come loose. Usually, the only cracks in paint around rivet heads occur in the main spar to skin rivets near the fuselage, but they have never seemed to really get loose.

John Shinn reports that everyone should frequently check alternator brackets for cracks. It is absolutely essential that the nosepiece be easily removable.

Newsletter #41 - 7/74

There is a slight twist in my outer panels, but the way it is twisted, I expected the plane to have a tendency to roll to the right, but just the opposite happened. Would like any suggestions on correction of this problem. I have heard of guys lowering their left wing slightly and raising the right at the fitting. (Ed. Note: I'm glad to hear that someone else had this problem even when they went to all the trouble to jig up the wing. I just built mine with matched hole tooling and checked it with a big level before riveting. To cure the left wing heaviness, I just massaged the aileron, as John called it. That means bending the trailing edge a bit (up on the left aileron and down on the right of course, for left wing heavy). This gives the appearance of flying with the left aileron drooped a bit, but it doesn't seem to slow me down any.

Newsletter #45 - 1/79

TCP: I regularly add TCP to the 100 LL fuel as a bulwark against valve and plug troubles that plague so many nowadays.

I'm pretty interested in preventing troubles in that area, as last year, after my return from OSH, my GPU swallowed a valve (on the left rear cyl.) on my 1st takeoff after returning. Luckily, I had another airport 2 miles straight ahead and had just enough power left to stagger in. The fuel was 100 LL and I had run out of TCP.

You may have heard that the Embry-Riddle flight school in Florida put TCP in half of their trainers and that half had no problems, but the other half had valve and plug troubles galore on the 100 LL. Results were definitely conclusive.

Newsletter #47 - 8/79

More on seats: In the area of survivability, don't overlook the importance of the seat. Several years ago, a T-18 pilot suffered a broken back when his seat collapsed on impact. A dust devil got him a few moments after t/o. His daughter was uninjured, except for bruises made by shoulder straps, but his seat failed downward. His additional body weight failed bulkhead #592 in compression. His fix on his next T-18 was to add short pieces of vertical angle on #592, just below the 2 hinge points (that allow his seat to be tilted forward for baggage comp't access). You might want to take a long hard look at this item.

To that seat, I would add a woven barrier below the seat for crash-worthiness. The seat sling would normally never touch the  $\frac{1}{4}$ " wide woven strips of aluminum pop riveted to a tube or extrusion frame. Its only function would be to stop the vertical movement of the body, if impact forces were high enough to fail like the sling and lacings. I, too, would add vertical support legs for the barrier frame.

An outstanding feature of that seat design was the tubes at the juncture of the bottom and back were not a single, common tube, as is normally used. The bottom tube of the back was well below the level of the bottom tube frame and also the rear tube of the bottom was well aft of the back frame plane. Thus one's sensitive tail bone area never came into contact with a hard point and the effect was like being suspended in a hammock.

News letter #31 - 9/70

Jim Reed had pictures of the propeller blade failure, which caused the accident in Maryland. He said that the prop had been sent back to Sensenich once for straightening and, then, after being bent a second time, had been straightened over a car bumper. For this reason, it would be difficult to draw meaningful conclusions from the incident.

Newsletter #31 - 9/70

The O-290-G crankshaft is the standard O-235 shaft. It differs from the O-290-D shaft in two ways: the sludge tube passages are larger and the propeller flange is not as thick. Although the sludge tube passages are larger and this does give somewhat less strength in that area, it is not known to be a problem. The O-235 shaft has a propeller flange of 0.190 inch thickness. Starting with the O-290-D and going up to the O-360 180 hp engine, the flange is 0.260 inch thick. Although there have been few problems with the G flange over the years, within the last year there have been four cases reported of either cracks or complete flange failure when metal propellers were used. Two of these involved 4" shaft extensions. For this reason, the propeller and ring gear should be removed periodically, at least at annual inspection, for a close examination of the flange for cracks. The cracks start at the jagged edges of the two 1032 tapped holes. These holes should be deburred and the screws should not be used. BULLETIN: Take off ring gear and inspect flange before flying again. It is evident that the G shaft flange should be reinforced (especially since mine was one of the four). Figure 1 shows a flange support, which can be installed without disassembly of the engine. This not only will sufficiently stiffen the flange so it will be kept below the fatigue limit of the flange material, but even in the event of complete flange failure, it will prevent the propeller from separating from the airplane. Due to tolerance considerations, it is not possible to tightly clamp the split ring to the shaft. The epoxy is used only as a shim. Holes for the lugs must be precision bored for a press fit. The flange is counter-bored because the lugs are only at maximum diameter for .25" and they need to be a press fit in both flanges. I'm running a test on this reinforcement with frequent inspections. John concurs with this mod, but feels it wouldn't need to be quite as heavy, but then he never had one fail. This may be a belt and suspenders situation, but then sometimes it's necessary if we don't have big enough hips.

A bigger problem to the homebuilder appears to be with propeller blade failures on metal propellers. Recently, two cases have been reported when homebuilts have lost about 16 inches from metal propeller blades. This, of course, is not exclusively a homebuilder's problem, for the factory jobs have their share of blade failures. Blade fatigue is less of a problem with lower compression engines like the O-290-G, but the only way to be sure that a propeller installation is safe is to run an in-flight vibration survey test for each different propeller length and pitch, engine horsepower, and engine mount combination. It is very expensive and complicated and can be run only by someone in this type of business who has all the necessary equipment. Arrangements are being made to run such tests on a T-18. (More on this later.)

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Newsletter #34 - 11/71

Depending upon a propeller's geometry (thickness, width, length, pitch, and shape) at certain rpm's, the blade stresses will be higher than at others. This is basically because the propeller is like a very stiff spring, and, when it is excited, it will vibrate at a certain fundamental frequency like a tuning fork. If the firing and compression impulses occur at the same frequency that the prop wants to normally vibrate, then the size, or amplitude, of the vibration will be much larger. Just like on a playground swing: if you lean forward and backward at the right rate, you will make it swing, but if you move at the wrong frequency or rhythm, it won't go.

On certificated aircraft, there must be a placard against operation at rpm's where propeller blade stresses are too high, if indeed there is such an rpm within the operation range of a particular installation. But with homebuilts with unknown propeller, engine, and engine mount characteristics, it is difficult to determine the rpm's to avoid. Two propeller blade failures have now occurred on T-18's, both with 68 inch long 74-DM propellers. Both were on 160 hp engines. Consequently, John Thorp is getting very concerned about the need for a vibration survey. According to John, all propeller manufacturers have Dave Bierman, Vice President and Chief Engineer at Hartzel do all their vibration surveys and he is the only one in the US which the FAA recognizes as qualified to do this type of work. He has quoted a price to John of \$10,000 for each combination tested. A survey involves instrumenting a propeller with strain gages and recording their outputs during actual flight.

Newsletter #34 - 11/71

Since writing the above, I discovered that Bob Dial, who nearly lost 19 in. of his 74 DM cut down to 68 in. on his O-320, is already making arrangements with Hartzel to start the tests on his airplane, a T-18. Bob now has an M 76 and it will be tested with two different prop extensions. Then Parker Miller will have his T-18 tested with a 74 DM. So, the machinery is all set up. Let's do our part.

Newsletter #35 - 3/72

May I give a few observations about props? An incident prop failure (due to vibration fatigue) cannot be detected by any inspection method prior to flight. Stone nicks, gouges, etc., are obvious causes for not flying, but a prop can be in perfect visual condition and still fail.

The vibration modes which will fail a prop cannot be felt in flight.

Injected engines place less stress on props than carburetor engines.

High compression engines place higher stresses on prop than low compression engines.

The elastic stress failure on 2025 forged aluminum props is at about 100 million cycles. This is about 2400 RPM x 2 x 350 flight hours. The moment of truth on a new prop would then be about 300 - 500 hours.

The most critical parameters are engine, prop extension, and propeller. The engine mount, compression ratio, airframe, aerodynamic exhaust system, cowling, etc., all have some bearing on the stresses on the prop, but the big items are the ones mentioned.

All prop extensions, no matter how well designed or built, increase the stresses on the prop and the engine.

Prop extensions decrease the natural frequency of a crankshaft and the natural frequency of the prop. (That's what all the tests are about -- how much?)

Clipping the prop increases the natural frequency of the prop.

Newsletter #36 - 3/72

**PROPELLER BULLETIN** - The propeller in-flight vibration survey has been concluded at Hartzell. Bob Dial's 160 hp T-18 was used for all of the tests. Twenty-three flights were made with three different props (M74 cut to 68", M74 cut to 69", and M76 cut to 70"), and three different propeller hub extensions (1070, 1072, Thorp spool extensor and a Sensenich type bolt-through barrel extension). Hartzell is still writing the test report, but several conclusions have already become evident and should be brought to the attention of anyone using a cut-down Sensenich propeller. Cut-down M74 Sensenich propellers and light 1070 extensions, should not be used on 160 hp Lycoming engines. They probably should not be used on the 150 hp O-320 engine either.

A full report on the tests with information extrapolated for the smaller engines and on the effect, can be obtained from Editor, T-18 Newsletter, 5 Griffin Drive, Apalachin, NY., 13732, by sending a donation of \$5.00 or more to help pay for these tests. Twenty-seven persons have donated \$575 to date to help pay for them, but we need to raise about an additional \$1500. The report will reveal some surprising things about propeller extensions, engine timing, and cut-down props, which should be of interest to all home-builders. A Tailwind with an O-290-D2 engine was recently found to have a bad resonance point right in the middle of his operating range.

Newsletter #46 - 5/79

Your choice of a prop is one of the most important decisions you'll make in building your T-18. Previous newsletters have spelled out what you should and should not do about selecting a prop and John and Lu's article on prop failures in Sport Aviation is worth re-reading. Perhaps we ought to reproduce it in its entirety. Above all, don't blindly buy a prop. If you don't really know, don't be afraid to ask. The M-76 is ok apparently.

If you lose part of a prop in flight, you might shake the engine out before you could get it shut down. If that happens, about your only hope of keeping it from stalling would be to quickly roll it into a steep turn. I lost a prop on an old biplane in 1937 and I can promise you that you'll never have a more exciting time in your life. The M-74 is not!

Newsletter #47 - 8/79

We're including Chris Fast's prop test sheet in this newsletter and I think you will find it educational. I would suggest you drag out a copy of the article about propeller fatigue, written by Lu Sunderland in the Nov. issue of Sport ('78) Aviation, pg. 23, and carefully review the subject, if you are using, or thinking of using a cut-down metal prop. Your choice of a prop is one of the most important decisions you'll make in your life! Your very life can depend on it! Don't blindly buy a metal prop.

Newsletter #47 - 8/79

Note that page 11 is the chart on Chris Fast's prop vibration survey, as done by Specialized Testing Service, 10758 Burbank Blvd., North Hollywood, CA. 91601, phones: Office 213/877-7317, res. 344-1851.

Note that the chart is a plot of Cycles per minute vs. RPM or FO vs. N., as they denote it.) Modes 1, 2, & 3 refer to where the modes (nonvibrating points) are located with relation to the tip. Again referring to Lu's article, you can decipher the chart quite easily when you learn the meaning of the various symbols in the equations. If any of you do not have the Nov. 1972 Sport Aviation, send me a dollar to cover the costs of postage and Xeroxing and I'll send you a copy -- or if enough of you request it, I'll reproduce all 4 pages of Sport Aviation and run it in a future N.L. On second thought, I'll do that, as that article should be a vital part of your reference file on the T-18, so scratch the Xerox offer.

You may note that due to less damping at higher altitudes where the air is thinner, stresses on a prop can be as much as 75% higher above 10,000 ft. than those below 5000 feet. Be aware that on the "bad" M-74 prop, cut down to 68", that the allowable stress of 4800 lbs. per sq. inch was exceeded by another 2000 lbs/sq.", when the prop was turning 2630 rpm.

These danger area rpms spread out to 50 rpms each side of the critical rpm, so it is absolutely essential that you have an accurate tach! To verify tach accuracy easily, run the engine at night with a fluorescent light near the prop. At multiples of 600 rpm, the strobe effect from the 60 cycle current will cause the prop to appear to be stopped.

It's too bad the owners of the T-18 that crashed in Washington a few months ago weren't aware that this information was available. John Foy originally built the airplane, powered with a GPU, and he donated it to the EAA Museum several years ago. The museum sold it to Wag-Aero, who in turn sold it to a Mr. Christian in California. It has been re-engined with a 150 Lyc and a cut-down and re-pitched prop from a Cherokee was installed.

When the prop failed over Ukima, with a loud explosion, the vibration shattered the left side of the windshield and unlatched the canopy, sliding it back. Mr. Hallstrom, the pilot was practically unable to see because of air blast and vibration and most of his vision was only a blur until he touched down. He cut the throttle and mixture and stalled the aircraft in an effort to stop the prop, and this almost succeeded after two attempts, that also resulted in short spins. He spotted a plowed field and attempted to land there over a grove of cherry trees. He went through a couple of small cherry trees and then over on his back. They later found he had hooked a steel cable on short final (a 3/8" thick braided power cable).

He and his wife had some difficulty getting out of the inverted ship, but he got out and tried to lift the wing to free his wife. By this time a fire had started and passerbys helped him get her out, altho' she suffered burns on her legs in the process.

John visited the accident site and inspected the wreckage in detail and he and the Hallstroms are convinced that only the rugged construction of the T-18 kept this from becoming a real tragedy and they all thanked John Thorp for such an excellent design.

I think this story should make one and all realize the seriousness of selecting a prop for an airplane. As we pitch props more and more to reach higher cruising speeds, we are indeed tickling the tail of a roaring dragon,

(5)

as Thorp says. To repeat, "Selecting a prop for your T-18 is probably the most important single decision you've ever made!!!"

Is a metal prop safe? Obviously it is or you'd see wood props on factory built airplanes, but a metal prop is NOT safe if you haven't had a static vibration survey run on it. Don't let anyone tell you otherwise. Since most of the newer T-18's will probably have engines of 150 hp and up, it's even more important. The formula that tells when a metal prop will fatigue and break is very simple: It's  $F \times T$  or Force times Time.

Many of the experts will say that a wooden prop is only about 90% as effective as a metal one, but Bill Cassidy's wood Pacesetter prop pulled a Mustang II thru the traps at 225 mph on 150 or 160 hp. That same prop on my 160 hp T-18 gives me a top of 196 mph TAS, as verified by timed runs. Show me a factory built airplane that will match that kind of performance, gear up or down. Gravel and rain are problems with any prop and more so with wood, but you can buy two wood props for what you'd pay for one GOOD metal one, and you can repair gravel damage on a wood prop. You file metal away on damaged metal ones. If you feel compelled to fly in rain, perhaps you'd better be thinking about a constant speed metal one.

Newsletter #51 - 7/80

SOMETHING NEW IN PROPS: While a wood prop is more easily damaged than a metal one, it's much lighter and I can have at least 2 (and maybe 3) of them for what a new metal prop would cost me. Above all else, I like the peace of mind that it gives me. A cut-down and re-pitched metal prop can be lethal if it isn't tested to define the rpms that can cause it to self-destruct, as most of you well know.







● **NOTICE: (STANDARD DISCLAIMER)** As always, in past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas, opinions, and personal experience and anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.

● **PROGRESS REPORT ON SAFETY AND OPERATIONS MANUAL:** First of all I'd like to call your attention to page 20 of N.L.#58. PLEASE take it out and re-read it. It is a full page letter from VERN PEPPARD, in which he lays out what will be necessary for YOU to do if we are to have a truly worthwhile Operations and Safety Manual. Did you notice that Vern is underwriting the entire production expense of such a manual. It will be a bound volume, with the ability to add pages in the future. It will be a VERY valuable part of either your flying T-18 or your T-18 project when and if you sell it some time down the line and will be a definite plus for a builder or owner if a question of liability arises. It will certainly enhance the value of the newsletters to the oncoming builders, too.

I guess most of you read that and said, "Yes, I'd like to help, but I'm in the dark as to what to write about or what category to volunteer for." That seems to be the situation, as only a trickle of response has come in so far. I well know it's human nature to procrastinate to the point that it disappears completely from your mind. Right? I well know, too, that each and every one of you guys that have finished building your T-18 could write down a whole volume of problems and solutions, experiences flying it, small or large maintenance problems that you have encountered, and suggestions, warnings, etc., for avoiding potentially troublesome or dangerous situations...EACH AND EVERY ONE OF YOU. Every T-18 is different! No two are exactly alike, so you DO have SOME area you could write about. For an idea, perhaps it would help to re-read some older issues of the newsletters. For instance...do you remember EARL ODY's excellent account of his problems with electric fuel pumps? Have you ever had a forced landing or had to make a precautionary landing in your bird? What events lead up to it?

● Here's one of my T-18 experiences: I was checking out a new T-18 builder on how to make power off approaches to accurate spot landings from the down wind leg. When I pulled the throttle back to idle, it just kept on coming back...about a foot or so. The hard piano wire inside of the protective flex sheath had fatigued and broken where an improperly installed safety clip was secured to an engine mount member...and in less than 25 hrs. of flying, too. My new builder was pretty apprehensive when I cut the switch, but it was apiece of cake just flying a speed and relative angle profile. I even made it look easy by not braking it and letting it roll up to the hangar ramp at the far end, thus giving him a better measure of confidence.

Now this brings up a safety point that everyone should know, but I have found a surprising number of those I've done Designee inspections on that didn't. If your throttle breaks, the arm on the carb should have a spring attached that will cause it to go to the FULL throttle position. You could manage to fly quite a long way and make an approach and safe landing by flipping the ignition switch on and off. You could even make a go around if the first approach didn't look good. The spring set-up is required on factory types and it makes good sense.

Now does this remind you of something in your experience that would be good to pass on? Even if it pertained to another type airplane, but would be applicable to the T-18 let's try it on for size. Perhaps you have access to the newsletter of another type of airplane and come across an

item that could also apply to the T-18. Send it in.

It's been several weeks since I wrote page #1 of this N.L. and to all of you that have been wondering what happened to the T-18 newsletters I must apologize for the delay. About the first week of Feb. I began to feel really lousy, had no energy, went to sleep every time I sat still, plus developing severe abdominal pain and a few other symptoms. I went in for a complete physical and found out that I had developed diabetes. It took three weeks more to get in to see a specialist and when I did he hospitalized me that same day. I spent a week there and then went into a clinic for another week, where 25 of us underwent 30 hours of intense, concentrated classroom instruction by doctors from Southwest Med School, who taught us how to live the rest of our life as diabetics and exactly what to do to control it. It requires a rigid diet and exercise program, and the following of this program has eaten up most of my time since then, but it seems to be getting results. I lost my medical, of course, but I have hopes of getting a waiver for a 3rd class a little later. I may wind up having to sell my T-18, but I'll cross that bridge when I have to. Anyway, I hope you all will be patient until I can get things under control. We hope to get at least the first part of the T-18 Owners Manual out before OSH time this year. I won't make it this year, but I made 29 straight, so I can't complain I guess. LOU SUNDERLAND will be there and he, LEE SKILLMAN, and JOHN WALTON will handle the T-18 Forum. The regular T-18 Annual Dinner will again be held on Tuesday nite at Butch's Anchor Inn, with Gerri Knowles and John Walton handling the reservations. DON TAYLOR will speak on his flight over the North Pole, so it should really be a good 'un. Have fun, amigos. Wish I could join you, but I've promised the family we would take a long delayed auto trip around the Western part of the U.S.

● **SOON TO FLY:** KARL LIPSCOMB, 100 Grand Ave., Lamar, MO, 64759 was signed off to fly in late May, so he probably has flown by now. Karl has a wide body, with folding wing. He has a new Lyc. 180 and c/s prop on the nose. His wing is the one Kenny Knowles had on his wide body and is the std. airfoil. This saved Karl many weeks of work. Karl and I go way back. We both learned to fly in Springfield, MO in the early '30s and both of us flew for Braniff. He bought a Starduster Too from me that I had up to the cover stage and finished it out beautifully. It was judged the best of the 'Toos and was the Too representative at the Dayton Air Fair a couple of years back. Maybe next year he'll get to go back to Dayton with his T-18, who knows? Competition will be stiff, tho'. Sure are lots of fine looking T-18s showing up these days. Some of them are second or third owner airplanes and the new owners have outdone themselves with slick new paint schemes, new instrument panels, new upholstery, etc. **(IT FLEW)**

● **ANOTHER NEW ONE:** BOB HIGHLEY, 211 Bloomingfield Dr., Brandon, FL, 33511, writes: "T-18 ser. # 835, N711SH finally flew on 19 Feb 84 after 11 1/2 years of building! It flew hands off and far exceeded my expectations. Quite a relief after bragging so long about how good it was going to fly." Here's some specs on it:

- \*Standard Thorp with sta'd wing.
- \*Electric trim, electric flaps
- \*O-360-AlGG (180 hp) Lyc, Hartzell c/s prop
- \*Empty wt. 984# with oil, no fuel.
- \*15# lead in tail.

Some prelim performance numbers:

- \*High cruise at 1000' MSL, (24 x 24) 195 mph IAS
- \*Low cruise (21 x 21) at 1000' MSL, 170 IAS
- \*Top speed level flight at 1000' MSL-206 mph IAS
- \*Sea level Rate of climb, one pilot, 15 gals. fuel, 4000 ft/min (!)
- \*At 10,500' MSL cruises 165 IAS, and still will climb 2500 ft./min !

(cont,d)

(cont'd)

I have done some mild aerobatics (3½ Gs max) and find the roll and pitch rate very pleasing. As I fly the F16 Fighting Falcon for a living and it takes a LOT to impress me. Believe me, the T-18 IS impressive!

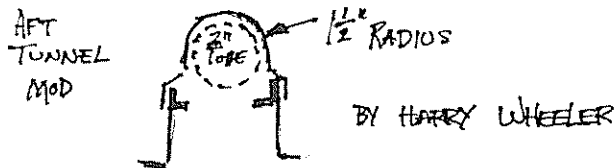
Will be looking forward to the Safety and Ops manual. Thanks for your hard work on the newsletter." Bob Highley. (Thanks for the kind words)

- ④ STILL ANOTHER NEW 'UN: FRED GINDL, 101 Broomfield Dr., Agincourt, Ont. Canada, M1S 2W3 says: "I now have 13:10 on my #558 "Tiger" as of 1 Feb. and I LOVE it. Was a little left wing heavy, but installed Norm Smith's electric Airo-trim and it now flies hands off. I figure the last ten years were well spent."

- ④ A 2nd OWNER WRITES: PETER LEEFE, 16 Ketch 1, Marina Del Rey, CA, 90291 says: "I bought #126 from builder ROY Oberg. It was bought over a 15 year period, with first flight in July '81. When purchased it had 42 hrs on it. It now has 125 hrs on it and is doing very well." (he made it to OSH with it last year). Some specs on it:

\*O-320 150 hp Lyc  
 \*67 x 66 wood prop  
 \*Max speed 2700 rpm @ 500' MSL 60° OAT 195 mph IAS  
 \*Cruise, 75% power, 8500', full throttle 175 mph TIAS  
 \*Economy cruise, 2300 rpm, 150 mph, 7.4 gph  
 \*Rate of climb: solo, full fuel 1400 fpm  
                     dual, full fuel, 1100 fpm  
                     solo, half fuel, 1600 fpm  
 \*Empty wt. 950 lbs.  
 \*Has Rattray cowl, wing tips, wheel pants.

- ④ HARRY WHEELER, 2 Marion Rd., Salem, MA, 01970, another enthusiastic 2nd owner sent in a picture of his new paint job. Design and colors by his son, with his wife doing the new nylon and naugahyde interior. He spent a year doing the complete overhaul and refurbish work. One of the improvements made was the moving of the rudder cables outboard (as per Bob Dial's sketch in the N.L.), eliminating the forward tunnel. He also was able to reduce the width of the tunnel between the seats by splicing on a piece of sheet metal at the top, which was formed with a 1.5" radius, which gives ¼ in. clearance on each side of the elevator push-pull tube. (see sketch below). He didn't say whether or not he had retained the manual flap handle, that little torture contraption that gouges one's leg on a long XC, but if so he probably made a saddle affair to mount on the top of the tunnel. Harry's mods certainly should help the in-flight comfort situation for large people. If you are getting close to the upholstery stage there are quite a few of us that strongly recommend you use Harlo McKinty's Temperfoam for your seat cushions, even tho' it is expensive as compared to polyfoam. Your lower left and right cheeks will thank you over and over again at the end of a long XC. The standard T-18 is admittedly "cozy" in width, but the above mods will make life a lot more enjoyable. You can buy a lot of extra comfort by keeping your upholstery very THIN above the WL 42 extrusion. Otherwise the copilot is probably going to have to put his arm around the pilot's shoulders on a long XC and that can get a little tiresome. Don't just sit in the bare airplane and make a quick, snap judgement that there will be plenty of room. Get two of you in there and sit there for a couple of hours. You might be surprised at how things can "grow" inside.



The following letter from Tom Kerns should be of considerable interest:

18 March 1984  
 4218 Ticino Valley Dr.  
 Arlington, Tx. 76016

T-18 MAS  
 10529 Somerton  
 Dallas, Texas 75229

Dear Dick;

Thank you for another excellent newsletter. I have been busy lately getting ready to move my family to Columbus Ohio. I have accepted a position with North American Rockwell as a designer/analyst in their Navy fighter design group. I will move on March 29 then return to Texas to pick up my T-18 sometime in April or May. I would like to comment on two items that appeared in the last newsletter.

④ MANEUVERING SPEED, V<sub>a</sub>

The maneuvering speed on page 6 of the "flying" section must be in error. Maneuvering speed is the speed at which the wing is just capable of reaching design load limit (max "G") at stall. Theoretically, the airframe cannot be damaged by gusts or abrupt maneuvering when flying at or below maneuvering speed.

Using data published in John Thorp's brochure on the T-18, the C<sub>lmax</sub> would be 1.31 with flaps up. My airfoil tables and textbooks show a range of 1.02 to 1.34 for the airplane depending on surface roughness. These C<sub>lmax</sub> yield V<sub>a</sub> = 159 and 182 MPH calibrated airspeed respectively for the design condition of 5.0 "G" at 1500 LBS gross weight. This means that V<sub>a</sub> on a clean winged T-18 with standard airfoils would be 159 MPH CAS.

Many builders are using advanced airfoils similar to the Whitcomb GAW-2. A T-18 wing with GAW-2 airfoils has a much higher maximum lift which would reduce V<sub>a</sub> to about 139 MPH CAS (based on 2-dimensional C<sub>lmax</sub> of 1.75 for GAW-2).

④ "TUCK" WITH FLAPS DOWN

On page 7 of the "danger directives" section of newsletter #58 there is an excerpt on Bryant Rowland's violent pitch down problems with 30 degree flap and forward C.G.. Bryant says that with increasing speed he gets stick buffet and a forward tug followed by violent pitchover due to stabilator stall.

My airplane (N10TK) has never "tucked" but it did show strong signs of onset which I was able to cure. In my early test flights, I had triangular cross section wing root fillets patterned after those I have seen on many California T-18s. I installed them

because builders told me the fairings would promote pre-stall buffet. They did cause a lot of buffet with flaps down but it was due to turbulent flow at the flap/fairing interface rather than true stall. With flaps down flying solo above 100 MPH my stick would oscillate fore and aft 1/4 inch at about two cycles per second, and increasing amounts of backpressure were required for trim at increasing speeds. The stick oscillations and reversal of stick force gradients were very disconcerting.

The underside of my wing root fairing directly above the flap was open, leaving a triangular cross section cavity in which turbulent air could swirl when the flaps were lowered. I closed this cavity with a "floor" per the dashed lines in my sketch, reducing turbulence at the flap/fairing junction with flaps down.

With the "floor" in place, my airplane behaves normally in tests up to 120 MPH. Simultaneously, the buffet which the fairings generated with flaps down disappeared. The only quirk which remains in flap down operation of my airplane is a very slight forward tug on the stick when I slip with flaps down at forward CG. I will try installing endplates at the inboard ends of my flaps to see if they have any effect on this.

Builders with a tuck problem who use wing root fairings should try removing them or installing a floor as I did.

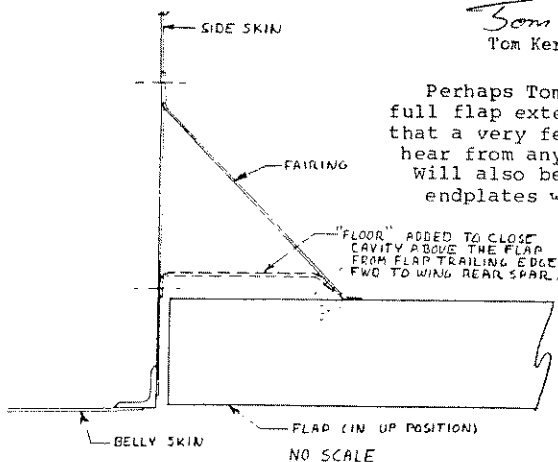
Respectfully,

*Tom Kerns*  
Tom Kerns, sn.71, N10TK

Perhaps Tom's fix on the tuck tendency with full flap extension will alleviate the problem that a very few T-18s have. I would like to hear from any builders that try this fix ASAP. Will also be interested to learn if flap endplates will show marked improvement.

We sure hated to lose Tom from our area. He's a very sharp young engineer, who has done a most professional job in the building & testing of his T-18.

(Ed.)



Tom also attached the following note to his article on Va & flaps:

"Dick, this might do as a simpler explanation of what  $V_a$  is:

Maneuvering speed ( $V_a$ ) is the speed at which the wing will encounter an accelerated stall just before exceeding the maximum design "G" capability of the airplane. At speeds above  $V_a$ , abrupt control movement or a strong gust could overload the wing, causing structural damage. At speeds below  $V_a$ , the wing will (theoretically) stall before damaging load levels can be generated.

When flying in heavy turbulence the prudent pilot will slow to  $V_a$ , or a bit less, to protect against possible structural damage.

Thanks again, Tom, for the articles. All of really do appreciate your sharing of your professional expertise with us.

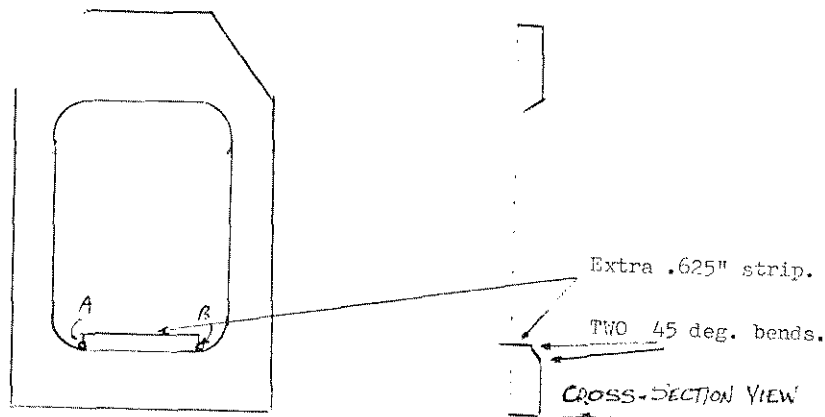
In 1963, when I started my first T-18, another EAA type living less than a mile from me (Merle Soule) ordered his T-18 plans a couple of months after I did and it was natural that we built both together. When Merle's T-18 looked like it could fly in a couple of weeks he developed severe health problems and was eventually forced to sell it. It sold to a cattle buyer in Waco, TX, who died soon after. The widow finally sold it a couple of years later to LOU FALCONI, an engineer for LTV in this area. Lou kept being loaned to Boeing-Seattle for a year or so at a time, but last summer when his retirement date was almost on him the airplane was finally ready to fly. Since most of Lou's flying was on sailplanes he wisely called on Tom Kerns to test it for him. Outside of out of round tires causing vibration problems it flew okay. Tom finally checked a very nervous Lou out on it, but he needed quite a bit more practice to be truly competent with it. Lou's retirement home is in Roswell, NM, about 400 miles west of Dallas and all agreed that it wouldn't be wise for him to fly it out there, so Tom and I used that as an excuse to go T-18 flying. We flew formation out there and since I'd never flown Lou's T-18 before, I made my first landing with it on our fuel stop at Snyder, TX. The airplane flew quite well and it was quite a nostalgia trip for me to fly a bird I'd helped build so long ago. I reluctantly said goodbye to it and Lou at Roswell and rode back home with Tom. I was also very pleased with the way his flew and how well he flew it. While each T-18 is unique and different, they are all a delight to fly. To really appreciate what a great airplane they are, fly one and then get right out and go fly a Cessna or Piper, etc.

I have heard from a lot of T-18 builders out there that spent 10 years or more building their T-18 and one fact stands out loud and clear: Not only is the T-18 one of the finest designs anywhere, but there are a lot of builders out there that are made of exceptional stuff, that have taken all sorts of discouragement, frustrations, etc. without breaking their spirit and have doggedly pushed on...sometimes only an inch at a time.. and to me this says a lot about a man's character. Some have had to sell out when adversity temporarily won out, but a surprising number have started all over again when things smoothed out for them. While EAA people in general are pretty super people, I believe that T-18 people are truly the salt of the earth. People like Don Taylor or Clive Canning, just to mention a couple.

The next few pages relate to T-18 builders in New Zealand, but I think the subjects will be of general interest.

- **BULKHEAD FORMING TIP:** from JOHN BURKE, 216 Tomswood Hill, Hainault, Essex, England. He says, "When laying out material for fuselage frames allow a little extra (about .650") on the lower inside edge, which is to later be bent to 45°. An extra bend of 45° on the additional strip will take the flange to 90° for supporting a board or plank during construction or maintenance. This reduces the risk of splitting the flange during forming while trying to get it to 90° in one go. Don't forget to punch relief holes at A & B and be sure to SMOOTH ALL EDGES."

A very good tip, John, and very practical, too.



(To balance newsletter space better we've put letters from two more of our English builders a little farther along in the NL)

- **TAILWHEEL TIP:** KEN RHOADS, 175 Hickory Lane, Peoria, IL, 61611, called a few days ago to tell me his T-18 had just flown for the first time and it flew just great. Ken didn't feel qualified to be a test pilot, so he got an airline pilot friend (who also has a Pitts) to fly it the first time. PAUL KIRIK flew his new T-18 down from Moline, IL and he flew Paul's bird around a few times to get used to T-18s. He also spent quite a little time taxiing both Paul's and Ken's and it was his opinion that ground steering via tailwheel was much too sensitive on the T-18. A conference with a local Designee resulted in a simple, but very effective "fix". The solution was to bolt a piece of alum angle (3/4 x 3/4) to the rear set of holes in the rudder "mast" (the steel plate arm that transfers rudder cable steering commands to the tail wheel via chains and springs). The holes that the chains/springs attach to on the mast are moved INBOARD by 1" on each side. This means that it takes a much larger movement of the rudder pedals to get the same response from the tail wheel.

I personally feel that this is almost as good as a non-steerable tail wheel as far as making it easier for a pilot with little or no tail wheel time to master the lightning quick response of the T-18 to rudder movement. I think most new T-18 pilots get into most of their trouble in their over eager rudder pedal action that is usually too much and too late. This is another way of saying over-controlling, which in itself is an out-of-phase response to directional changes of the airplane, caused by crosswind or

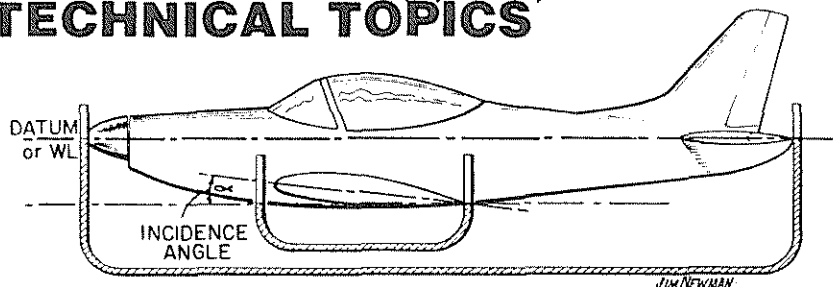
- **(TAILWHEEL TALK CONT'D)** whatever. Most of this sort of trouble originates when the airplane is on final and when it begins its flare without all drift correction taken out and the airplane pointed straight down the runway. I've observed even experienced pilots trying to point the tip of the spinner down the runway instead of a point on the cowl directly in front of them. I've even had to put pieces of black tape on the nose cowl directly in front of the pilot and another on THEIR center line just ahead of the windshield to break them of this bad habit.

Anyway, I think this tip of Ken's is a four star one. Now take note that this method does NOT change the full throw of either the rudder pedal or the tail wheel. It simply means you will have to move the rudder pedal more to get as rapid a tail wheel response as before. If you are going to sell your T-18 it might be a good idea to put one of the de-sensitizing angles on for the new owner to use for awhile. Perhaps later the holes could be moved halfway between the 1" and the original position as the pilot gets more accustomed. Perhaps you might want to modify the original mast to have more than one set of holes if you are at the rudder building stage of your project. I'd appreciate your comments on the subject if you try this little mod.

- **CECIL HENDRICKS (SEATTLE)**, who is the son of long-time T-18er, FORD HENDRICKS, flew his T-18 for the first time this past year and he sent me a brief note saying that he had modified his Scott tailwheel so that it could be locked or unlocked for steering in close quarters, and that he would send a sketch of the details soon, so perhaps by next NL time we'll have the dope. I wonder if any of you have done that with a Maule?
- **STILL ANOTHER NEW ONE FLIES:** PAUL KIRIK, 2921 28th Ave A, Moline, IL, 61265, flew his bird for the first time back about April. I think. He called me before he flew and we discussed some of the procedures and cautions for initial flights and some of the pre-planning that should be done for any "surprises" that might surface on the initial flights and how to cope with them. The basic principle is to take each and every aircraft system and plan an acceptable emergency action if any part of that system goes sour. Paul had had some 15 or 20 hours of time flying a couple of T-18s in this area, so was better qualified than many are at that stage. I had gone over his project thoroughly when it was about 75% finished and I was sure that he would have one of the outstanding T-18s, if workmanship was any criteria. Sure enough, it flew beautifully in every respect and he was soon in love with it. He promises a complete report on it as soon as he has 50 hrs. on it. Paul is maintenance supervisor for John Deere's corporate jet fleet at Moline. You may recall some of the construction tips he sent for NL #46. You might want to go back and re-read them. Anyway, congratulations Paul, Ken, Fred, Karl, Bob, and all the rest of you guys with new birds in the air. As you now know, there really is a treasure at the end of the rainbow and dreams really CAN come true.
- **HOMEMADE CRIMPING TOOL:** RON BOSTIC, 7334 Vallejo, Dallas, TX, 75227 came up with this one. Recently he had an occasion to crimp some sheet metal, but had no tool. His cleco pliers were laying there with a cleco nearby and suddenly the light came on. He used the cleco as the male die with the fork of the cleco pliers as the female of the die. The cleco is positioned over the fork part of the pliers, with the solid button part doing the pushing of the cleco barrel between the tangs of the fork. I tried it and it makes every bit as good a crimp as a pair of store bought crimping pliers, so Ron just saved himself about \$15 that he can use for something else. Have any of you come up with any handy little tools or jigs that can be a wampum saver for the homebuilder? A simple sketch or description will do fine... (hint, hint).

# WATER LINE LEVELER T-18 NEWSLETTER # 59 TECHNICAL TOPICS

PAGE 13

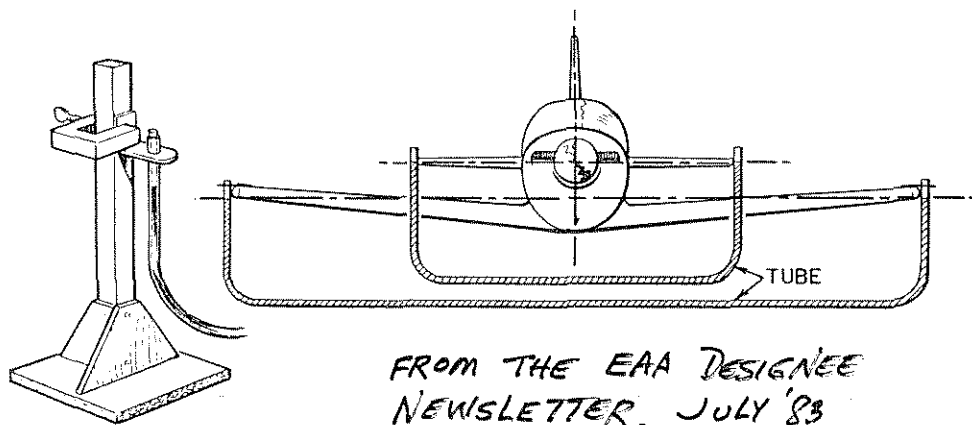
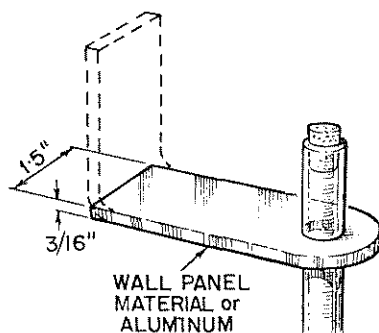


## PLASTIC TUBE ALIGNMENT GUIDE

From the Dalworth Chapter 34 SKYWRITER  
Method for checking alignment with a water level made of plastic tube

This method has been used by several builders. 1/4" to 1/2" plastic tubing is used filled with a solution of water, any type ink and a very small amount of liquid dishwasher soap. The soap is used to reduce the surface friction in the tube. This method is a very accurate way of setting incidence angles, water lines, wing tip wash out, and incidence angles between wing and stab. Scrap wall panel make good holders to keep tubes in. Position drill holes for plastic tube for snug fit.

NOTE FROM ILLUSTRATOR Jim Newman, EAA 109981. I use this system extensively on construction projects around my house and to check the rig of my radio control models. As a consequence I have shown the alternate of having a 90° bend in the bracket — allowing it to be clamped or taped to a vertical surface. I have also illustrated the simple stands I use around my (model) planes and these are an enormous help, along with card tabs strategically taped to the plane and on which the datum is marked. The tabs sticking out allows them to be set against or behind the liquid column. I also use an alcohol food dye mix to preclude bacteria growth in the tube and subsequent discoloration.



FROM THE EAA DESIGNER  
NEWSLETTER, JULY '83

(SUBMITTED BY T.J. MCCORMICK)

T-18 NEWSLETTER #59

page 14

This answers my question on pg. 12 about converting a Maule. From Aug. '82 issue of Sport Aerobatics, available from EAA HQ, OSH, submitted by T.J. McCormick, of Hamer, S.C.

Altho' we are reproducing both these pages full size the details on the illustrations are hard to read without magnifying, so you may need to secure a copy of the mag for clarity.

## TAILWHEELS, AGAIN

There are several subjects which seem to be perennial Tech Safety subject, and "tailwheels" is certainly one of them. The following article submitted by an IAC member concerning a common tailwheel malady is excellent in its detail and instructions.

### "Why Lock Up Your Maule?"

"I think everyone will agree that the Maule SFS is a great tailwheel for taxiing around an airport, particularly since you can steer with the rudder and because it is full swivel. Unfortunately, if you're landing a short coupled airplane like a Pitts, on pavement, in a crosswind, it can be a real handful, especially for a low-time pilot.

HENRY  
HAIGH'S  
TAIL  
WHEEL

"So, I tried one of the popular locking tailwheels on the market today. The locking tailwheel which I tested made the plane extremely difficult to steer when there was any kind of a wind because it wasn't linked to the rudder. In addition, the use of a torsion bar instead of a leaf spring caused an omnidirectional bouncing in the tail which I didn't like. It was a little lighter but you usually need extra weight in the tail of a Pitts anyway; it was also more aerodynamic, but someone who needs a locking tailwheel is probably not ready for unlimited competition anyway, so a few extra miles per hour doesn't make that much difference.

"To solve my problem, I decided to try to modify the Maule tailwheel which I originally purchased for my Pitts. It was relatively simple and worked extremely well so I decided to share my experience. Following is an explanation of how to convert the Maule SFS to a lock tailwheel as I did.

"The first step in the conversion is to replace the ring on the steering arm. To remove the old ring, I used a mill. Prior to welding on the new ring, you must be sure to completely remove any remaining brazing allow. I used a sandblaster for this.

"Next, clamp the new ring on the center line of the steering arm. Since the steering arm is hardened, I recommend tig welding using TigTectic 680 filler rod, a product of the Eutectic Corporation. Weld size should be no more than 1/8" to avoid warping the steering arm. To complete the steering arm, reassemble the locking pin in the arm making sure it slides freely.

"Next, a flat must be machined into the upper sur-

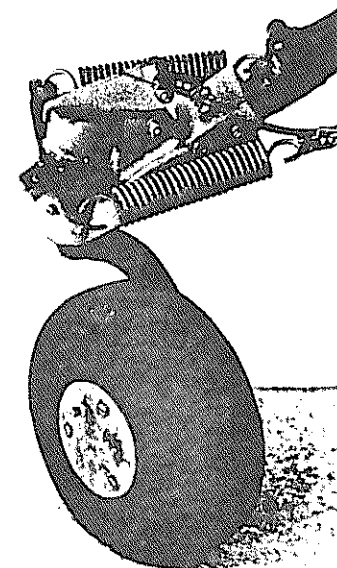
face of the casting with a 1" mill cutter, removing only enough material to present a flat surface for the mounting block to seat on. Corners near the king pin can be squared off with a 1/4" mill cutter. See Figure 1.

The milled slot must line up with the bushing center line and must be parallel with the spring surface.

"The mounting block can now be attached to the casting with an AN6 bolt to assure that all parts will line up. This should be done before the final brazing is done.

"If all parts fit and move freely, the mounting block can be brazed to the casting in the following manner: silver brazing alloy sheet can be obtained from your local welding supplier. Cut a piece of the sheet to fit exactly under the block. Cut a generous clearance hole (3/4") for the bolt. You don't want to braze the bolt in place. Coat both sides of the sheet liberally with flux, then bolt the block to the casting, sandwiching the silver sheet between the two. Torque the bolt, as you want a preload on it when the silver melts. Heat the entire assembly until silver is seen to flow from under the block. The idea is to heat the entire block and casting in this area broadly and uniformly to the flow point of the brazing alloy. When the silver is seen to flow from under the block, you can add a small amount to form a fillet around the block to help relieve stress at this point. The casting must be cooled down slowly. An easy way to accomplish this is to wrap insulation around a large can and place it over the part as soon as the brazing is finished. The part can be sandblasted clean after it is cool.

"Final Assembly: the push pull cable and all other hardware are AN quality and can be purchased from any aircraft parts supplier. Mine came from B&F Aircraft in Oak Lawn, Illinois. Attach the cable inside the fuselage using ty-raps. Safety wire all bolts. The 1/2" compression spring can be found in any hardware



1 1/2 O.D. 1 1/4 TO 1 1/2 I.D.

store. Get several sizes of springs so you can adjust the locking tension. A strong spring, aided by vibration, will assure that the wheel is locked on landing, even if you forget to lock it. Mine is this way, and I had to make a positive lock to keep it open while taxiing. With the tailwheel locked, the tailwheel connector springs allow full use of the rudder; you can also make small corrections with light braking.

"The AN3 bolt and sleeve for the push wire are simply drilled as shown in Figure 2 and then adjusted with washers.

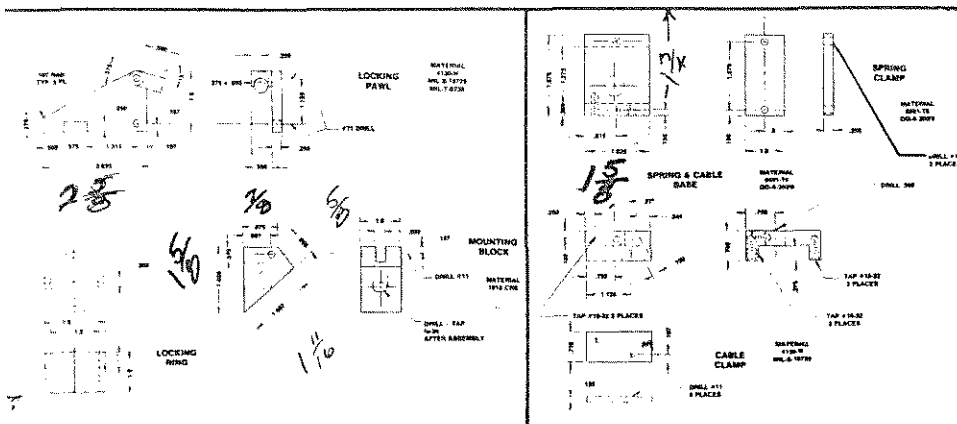
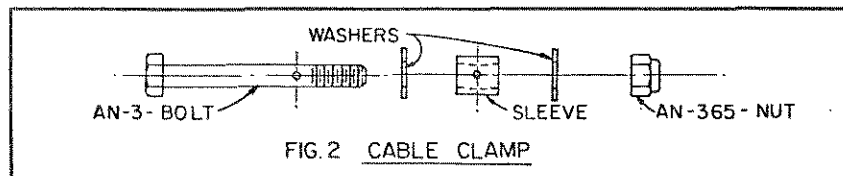
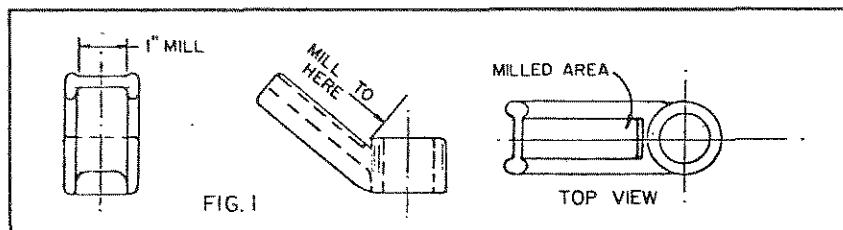
"If your machine work is accurate, you will have a tailwheel that makes your airplane track straight. If the all-important silver brazing and welding were done properly, your tailwheel will withstand even the most severe side loads.

"My locking Maule is on a Pitts which has been

landed mostly on pavement. I had only seven hours in a taildragger before I flew my Pitts. My locking Maule tailwheel improved the landing performance so much that I can boast of over fifty hours and hundreds of landings without even being close to a groundloop."

The above article exemplifies the worth of the IAC Technical Safety Program: a forum where we can all pool our experiences/knowledge for our mutual benefit. A large IAC "thank you" is due the IAC'er who made the effort to assemble the above article and share his knowledge and experience with other IAC members. Each IAC member should remember that he is part of the IAC Tech Safety Committee and that his input is essential to the operation of this Program.

Fred L. Cailey  
Chairman  
Technical Safety Committee



T.J. McCORMICK not only submitted the reprints from the Sport Aerobatics magazine on the Maule locking tailwheel conversion, but also the Designee newsletter reprint on the liquid leveling method. He also sent in a stack of other goodies that I'll use in NL #60, as I will need to take some time (that I don't have right now) to type up the copy and draw some illustrations over to better arrange on available space on the NL pages. I have to try to use as much of the page as possible, so at times I have to delay printing someone's letter or excerpts until a later NL, so if I don't print your letter or tip right away, just be patient. I really do thank you T.J. for submitting all that info. It's great! (he sent in a drill grinder set-up for grinding sheet metal drill bits, a tool to bend fuselage extrusions (longerons), an exhaust tubing flanging tool and method to fit one within another, a safety item for using bench grinders, and a slick little tool to bend a neat little 1/8" edge at about a 30° angle that gives that professional look to the edges of sheet metal panels). T.J. built a Pitts before starting the T-18, so he's picked up some goodie ideas along the line.

- **AUTO VS AIRCRAFT ALTERNATORS:** This article from Nov. 1983 issue of Plane and Pilot News and was submitted by an FAA certificated Aircraft Accessory Shop. It reads:

#### BE AWARE

Differences between aircraft and auto alternators using a Ford belt driven 12V or 24V Alternator for comparison

Aircraft alternators include features not found on automotive alternators.

1. Altho' alternators are bi-rotational, aircraft engines turn opposite of automotive. This means cooling fans must be canted in the opposite direction. Also pulleys and belt sizes vary according to coming in speed.
2. The through bolts are of higher tensile strength utilizing an anti-rotational device in the form of a lock tab. The rectifier assembly has a heavy duty diode with higher voltage and amperage capacity. Also, one excites at 90 PIV and the other at 150 PIV. Radio suppression is designed for 108 frequencies and up, which is the VHF band, and 108 and down, which is the FM band.
3. The brushes have a higher graphite content and they utilize a tin plate on the brush leads to prevent corrosion.
4. The stator is of the Delta wind, rather than the "Y" wind and it does not utilize the stator terminal. The aircraft unit also carries "H" insulation, which is capable of 200° Centigrade temperatures. It is also rated at 60 amperes, instead of 55.
5. The rotor has a shorter shaft and a smaller thread size. Because of the opposite rotation, it is wound in the opposite direction. It also utilizes "H" insulation and Havel varnish.
6. The front and rear housings are the same as automotive. With this brief description I hope I have enlightened you on the difference between aircraft and automotive alternators. Using automotive units in an aircraft creates a potential safety hazard, as well as shorter alternator life and unreliability.

If you suspect an automotive unit on an aircraft, check with your nearest FAA approved accessory shop or your local FAA GADO office.....END.

I'm not qualified to comment on the above, but perhaps some of you are. I do know that a good many homebuilts have used and are using automotive alternators and I haven't heard of anyone having problems, have you? I still have a generator on mine. With modern radios, which are practically no current drain, your greatest electrical load is the starter. You can minimize even this by pulling the prop through several blades by hand before activating the starter. Of course all safety precautions should be observed.

(THANKS TO WHOEVER SENT THIS IN TO ME)

### ② T-18 Carburetor and Engine do not match

I bought a factory reman engine 0-320-A2B - 150 HP, Lycoming, zero time, equipped with a Marvel-Schebler MA4SPA, part # 10-3678-32 carburetor.

After installation in my Thorp and ground run of 2 hours plus one flight around the pattern I decided the carburetor was not right. The ground run-up produced heavy soot, rich mixture and fouling of plugs. Leaning 3/4 distance made some improvement but not totally. I was getting 1950 max RPM on static run-up. (MUCH TOO LOW)

Called Lycoming in Williamsport, PA (1-717-327-7077) and talked to Ken Johnson, Mgr., who gave me the nearest Western Regional Office: Avco Lycoming Division 9841 Airport Blvd, Suite 1130, Los Angeles Cal. 90045 (Phone 1-213-645-1760). After talking with representative Ivan Gunston and many calls back and forth with him and Don Lewis and Bob Walters I secured a loaner carburetor from them. This carburetor part # 10-5135 improved engine performance considerably. After 5 hours of flight time I was satisfied with the carburetor. Engine ground run on this carburetor reached 2100 RPM's, EGT 1250, leaning mixture to EGT 1400 increased 20 RPM gain and this was satisfactory, I thought.

Then came a very disturbing event. The plane ran fine on Wednesday and was fine when shut down. On Saturday I took it up for a run. The first time the engine quit (as though no gas) when I was about 25-50 feet off the ground. It did not quit entirely but was on and off. After shutting it down to idle and landing it sounded OK on the ground.

I taxied to the pumps, filled the tank (14 gallons), and drained and checked the gas in the filter. Upon ground run up everything

was fine, no misses. All seemed well so I taxied to the end of the runway, ran it up and as it sounded great I took off. I got off the ground to 300-400 feet when it shut off. It came on again and thinking it would clear up I continued to the south, making the turn, still climbing. The plane was shutting off about 3-4 seconds and then back on 3-4 seconds. This continued half way down the downwind leg where it cut down to an idle and wouldn't run at full throttle.

A Cessna was about to land in the pattern. I radioed "emergency" and came around in front of him which meant a short landing. I set down halfway down the field at about 90 MPH, and began braking it at touchdown and braked to the end of the field. With no choice and unable to make the turn because of my speed I ran straight forward onto the grass at the end of the runway.

The threshold lights extended across the runway about 6-8 feet apart. I hit the middle approach light with the left wheel. The tip of the prop ticked the light and I broke the left pant and bent the strut cover. Also cracked the right pant cover and scratched the fuselage, thankful that no more damage was done to my new "baby".

I hit the ditch at the end of the blacktop and the tail flipped up and the plane nearly went over. It righted itself and ran 200-300 feet down the grass where it stopped. The engine was still running so I taxied back to the runway with the engine sounding fine and running beautifully on the ground. I wondered what could be wrong with the gas: was it the carburetor, vent, gas line plugged, a plugged screen or an air block in the line? Why today when it ran so good two days prior?

At this point I returned the 10-5135 loaner carb.....



I tried to trade my 10-3678-32 carb for a 10-5135 with no success. Lycoming's explanation was my O-320-A2B engine and 10-3678-32 carb are mated for the Super Cub, Tri-pacer or Cherokee 140 planes. However, they offered to sell me a new carb for \$1,120.20, which I felt was out of the question. I then sent the 10-3678-32 carb to Lycoming in Williamsport PA for corrective action. After several months and many phone calls it was finally returned with "no service required". The carb was in the middle of the performance curve according to their tests.. One dealer in California would take a trade-in (\$285.) for a rebuilt carb, but it must be an identical part number, which I did not want. They offered a rebuilt carb for sale outright, no exchange at \$483.

While waiting for the return of my 10-3678-32 carb from Lycoming

I found a used 10-5009 carb for \$300. I now have one new 10-3678-32 for sale. Remember Lycoming said it "performs in the middle of the performance curve".

After checking all other possibilities and finding no defects, the plane was back in the air after a 6 month delay. It now runs perfectly and has been signed off by the FAA on 2-25-83

My advice to anyone buying a Lycoming 150 HP engine is to make sure you get a 10-5009 or 10-5135 carb with it . Dealing with Lycoming manufacture direct did not seem to get results, after the fact.

A used engine from a Cessna Cardinal with a 10-5009 carb, is running fine for my friend Ford Hendricks' T-18.

I conclude by saying this whole experience was a most trying and unexpected one for me.

FROM  
→ John Kenton, 16611 126th Pl. SE, Renton WA 98055 (206)255-7110

Thank you JOHN KENTON, old friend, for that info. I'm glad, too, that you didn't bend your pretty bird on the forced landing. John further added that he felt that this information is especially important to all new builders that are using the carb air box that Ken Knowles sells (which essentially is the same as the one that George Leider built and that we ran pictures on in NL #45).

✿ AIRBOX SIZE VS CARBURETOR JET SIZE: I can identify with John's problem with the carb. When I installed the O-320 160 hp Lyc in my bird I couldn't get it to turn up more than 2000 rpm static before it began backfiring and belching out black smoke. I even tried it with the cowl off, thinking my air filter might be the culprit. The engine had been installed in a Super Cub and of course ran great. The fellow I bought it from, Bobby Osborn, even put it on a test stand and ran it for me before I bought it and it just did great. I couldn't figure out for awhile why it would run fine in one airplane and not in another, until I remembered that on the test stand run we had no airbox on it. That was the common denominator. I called a friend who had put this same engine in his Mustang II and had had the very same problem and it was solved by going to a leaner jet. When Piper had put that engine in the Tri-Pacer they had problems and there was an AD put out to change to this leaner jet. Yes, they had made airbox changes. So if you are about ready to fly a bird with one of the O-320 series engines and have this sort of problem arise, you might well look at the carb first. Be aware that the shape and size of cowlings aircoop could well make a significant difference, too.

✿ 5:00 x 5 TIRE PRESSURE: I had trouble finding out what the optimum and recommended tire pressure was for 5:00 x 5 tires and in the past I had just eye-balled the tire, using a pressure that raised the outer tread ribs just off the pavement. I decided to ask TOM KERNS what he could find out thru his engineering contacts. Here is what he said: "I have access to a Goodyear Aircraft tire application book, which is used to determine tire size, pressure, and deflection under load.

Working with Goodyear design tables, I calculated an optimum tire pressure of 28 PSI for Goodyear Flight Custom II 5.00 x 5 tires of either 4 or 6 ply rating (this is for 1400 lb. gross weight. Pressure would be proportioned up or down for other weights.)

The 4 ply tire has a maximum inflation pressure (under load) of 32 PSI and a maximum static design load of 800 lbs. per tire. The 6 ply tire has a maximum inflation pressure of 51 lbs. PSI and a max static load of 1260 lbs. per tire.

Use of 28 PSI on a T-18 tire should give even tread wear. I experimented with higher pressures and I was surprised at how much harder the airplane rides....and bounces! Lower pressures will increase rolling friction.

Happy Flying, Tom Kerns s/n 71 N10TK

Thanks, Tom, for the info. We're going to miss you around here, but your recent letter sounds like you are going to enjoy your new job with NA in Columbus, OH. Hope you make OSH this year with your bird. If not, perhaps you can make it back down this way in Oct. when we organize a 2nd Annual dinner and conflag of T-18 types like we had at Temple, TX, in '83.

(We'll hit on that in NL#60, that will be in the mail by 1 Sept.)

Mid October '83

Dear Dick,

Herewith £ 15 for the fund. I know it costs more to mail newsletters here. Sorry you could not make it here. My phone number is not listed but if you are this way again and require picking up from Heathrow or wherever (after 5p.m.) it is 0329 - 832754.

Enclosed is a photo of my T - 18 - possibly the most advanced in Europe - certainly in the UK, taken during trial assembly a couple of months ago. I now have it indoors, the U/C has been heat treated to the satisfaction of my inspector and I am finally assembling the fuselage. I started with small parts - fin, rudder, ailerons etc, then wings. This gave an important psychological boost - always something to look at as signed out. It also made for easier storage and cash flow. I was able to keep and fly my previous homebuilt until a year ago. The cash I got from selling it financed my nav/com., engine and soon, I hope, propeller, canopy and paint job. Had I started on the fuselage I would have had a lot of outlay at the beginning with little to show for it and would have had to sell my Nipper Mk3 a couple of years earlier. As it was I just had to fly the statutory 5 hours this year to keep up my licence.

My T-18 is wide bodied with folding wings and 2" longer u/c. I have a Narco nav/com. and instruments for a complete IFR panel (although it is only legal to fly homebuilts VFR here). I suspect I'm a bit of an instrument nut but, having had two flameouts with my previous VW engined mount and having heard from my CFI friend how their Cheetahs with similar engines to mine cruise on 4½ (imp.) gallons quite happily when leaned out correctly, I reckon the more monitoring one can do the better for one's safety and pocket.

My inspector is very much a belt and braces bloke. On his suggestion I am fitting an electric turn & slip, vacuum driven artificial horizon and I have gone for a Hamilton vertical card compass - a real jewel, this. He got me ~~a~~ new Cessna wingtip strobes <sup>for</sup> at much less than the price of one but I have jibbed at ~~the~~ fitting more weight near the wingtips. The aircraft will be finished cream and red in a similar pattern to that of John Shinn's aeroplane (which stares accusingly from my living room wall when I eat or watch TV) but, in our crowded skies, I still reckon to need all the seeability I can get, particularly around VOR beacons at weekends. I originally went for the Ken Knowles fin tip radio aerial but, having seen it in mock-up have decided it spoils the

- 2 -

chunky look of the beast and also, with VOR aerial in wingtip I wanted an anti-collision strobe on my fin. The flasher unit fits neatly on its modified bracket on the bottom longerons between bulkheads 576 & 575. This is not as accessible as I would like nor as near its strobe but, like most things to do with aeroplanes a barely acceptable compromise. The rudder cables clear it nicely and their exit holes provide ventilation.

The trial assembly was for two reasons. Firstly I wanted to be able to position the wing fixings accurately on the fuselage. Secondly I needed to see what a T-18 looked like at close quarters and let the PFA, our equivalent of the EAA know that I had not given up.

When I put the fuselage together for the first time I only taped the 601 bulkhead in position with a pointer to centralise it on the 592 bulkhead. I found the Ken Knowles fuselage skins accurate but was not prepared to risk the 596 and 601s being too close - unable to get wing in or too far apart - resulting in stresses being set up drawing the two together. What I did was to assemble the centre main spar of the wing to the 601 bulkhead and drill and ream the 522 and 602 fittings together.

Having centre drilled 3/32" the 597 fuselage and rear spar fittings I put the clecoed up fuselage on trestles and eased the wing centre section into place and supported it. Once the wing was seen to be correctly positioned and parallel with the stabilator I drilled the rear spar holes out to 5/16" and bolted them up. I then bolted the 601 bulkhead to the centre spar and drilled locating holes through it, the fuselage and the 494 shear plate. When I measured from each wing rear spar to centre of stabilator spar there was only 1/8" between them. I hope to be reasonably sure that when, next spring, having fitted my Lycoming O320 E2G, instruments, controls etc, I take the whole fuselage outside for final assembly, there should be few problems.

I have gone for monel a/c pop rivets almost everywhere because I am working single handed for 99% of the time. If I were to get my wife to help I would be expected to mow the lawn, prune the trees and generally do the jobs non-builders do around the house. As it is she cheerfully accepts that I do not own an aeroplane - it owns me.

Best wishes,

*Jim Waller*  
 JIM WALLER

Thanks, Jim, for your very excellent report. I hope the rest of you blokes here in the USA appreciate how much easier we have it in dealing with the bureaucrats.

mechanical "crutch" you can use in a pinch. In practice(at altitude)you should closely observe the very minute differences of horizon location, using airspeeds of 80, 90, 100, 110. Pay careful attention to how much rpm being used at those speeds and record them. Your rate of climb indicator will give you still another clue. Get in the habit of checking your sink rate/min EVERY time you glance at the A/S on final approach. When you are practicing stalls with and without power notice what the R of C does just prior to flow separation.

### \*\*\* STALLS \*\*\*

- I feel that practice of stalls on a regular basis is very beneficial for any pilot, regardless of their experience and regardless of their familiarity with the airplane. Most T-18s have little if any pre-stall warning buffet, so it's good to accumulate as many pre-stall clues as one can. Another most important objective in stall recoveries is to prevent the airplane spinning and this takes a trained and practiced reaction. The natural, but WRONG reaction to picking up a low wing is to use AILERON. That low wing is already stalled and actually trying to move BACKWARDS, while your high wing is moving FORWARD and still developing SOME lift. A 'down' aileron to pick up a low wing in effect increases the camber of that wing, GREATLY increases the drag on that wing and tends to deepen the stall.....The RIGHT reaction is to ALWAYS pick up that low wing with RUDDER....Actually you should get in the habit of immediately and fully OPENING UP YOUR HAND on the stick as a practiced, trained reaction to a stall. This is a time when one's natural INSTINCTS ARE wrong...and they could be DEAD WRONG at low altitude. Many people don't like stalls, so they don't like to practice them, telling themselves 'I'LL never stall MY airplane'. Old timers will tell you that there are only 2 categories in this respect....those that have accidentally stalled an airplane and those that will...and when it happens you'll likely be at or below traffic pattern altitude. Keep that fact in mind as you practice, too, and make note how much altitude a stall can cost you and see what that does to thinking on what your minimum altitude should always be when making your turn from base to final....for that is the danger spot in many cases.

- In NL#60 I am going to include an 8 page article (that we have reduced down to 4 one-half size pages) by an acrobatic pilot, which records his research results on a simple spin recovery method, a one, two, three method...that will work for ANY spin, inverted, flat, or otherwise. The first action is to close the throttle, 2nd, release the stick, 3rd, kick full opposite rudder against the spin direction. (This article will be for insertion in your T-18 Operation and Safety Manual).

This method has been thoroughly tested by IAC chapter members and recently the local IAC made a video tape of spins of all types, using a video camera mounted on the vertical fin, and I assure you it was an eye-opener. I wish all of you could see the film and hear the commentary, but I've been told it will be several months before such a tape will be available. I think it will first go to IAC chapters and then EAA chapters, etc.

- A BEAUTY FOR SALE: LEE SKILLMAN, whose T-18 you've seen at OSH and some of the other fly-ins is reluctantly (almost) decided to sell his T-18. His beautiful bird was the T-18 rep at the Wright Bros./Dayton Air Fair two years ago, so that tells you a bit about what a jewel it is. Lee has been transferred to Mobile, AL, 36608 (6964 Airport BLVD, Apt. 82. His home phone is 205/342-3967 (evenings only). I lost the slip of paper that had all the vital stats on his bird, but I remember he was going to price it SOMEWHERE in the vicinity of 21 or 22K, so if you are interested in a creampuff, give him a call.

Here's an item you should file...along with a reminder to tell you NOT to depend on your own 'educated'sense of touch when tightening nuts and bolts and to use a torque wrench. If you don't want to take time to do it RIGHT, when will you find time to do it over and do it right then?



### TORQUE LIMITS

By Dewey Ballard, Designee 1064, as printed in TOUCH & GO, Overland Park, Kansas Chapter 200's Newsletter

One of our Chapter members mentioned that he would like to have a convenient chart of torque limits for use with the more common airframe nuts and bolts used in aircraft construction. The values in the chart below are for standard cadmium plated nuts with oil-free threads and used only in metal-to-metal assemblies. In joining wood, unless bushings are used, nuts are torqued up only tight enough to prevent rotation of the bolt and without crushing the wood fibers. In the chart, column A is the torque range for tension type nuts (AN310, AN365), column B is for sheer type nuts (AN320, AN364). The values are in inch-pounds.

| Tap Size            | A       | B       |
|---------------------|---------|---------|
| Fine-thread bolts   |         |         |
| 8-36                | 12-15   | 7-9     |
| 10-32               | 12-15   | 12-15   |
| 1/4-28              | 50-70   | 30-40   |
| 5/16-24             | 100-140 | 60-85   |
| 3/8-24              | 160-190 | 95-110  |
| 7/16-20             | 450-500 | 270-300 |
| 1/2-20              | 480-690 | 290-410 |
| Coarse-thread bolts |         |         |
| 8-32                | 12-15   | 7-9     |
| 10-24               | 20-25   | 12-15   |
| 1/4-20              | 40-50   | 25-30   |
| 5/16-18             | 80-90   | 48-55   |
| 3/8-16              | 160-185 | 95-100  |
| 7/16-14             | 235-255 | 140-155 |
| 1/2-13              | 400-480 | 240-290 |

A bolt of the proper length should have no more than one or two threads showing when tightened with the proper torque. Checking for cotter pin hole alignment after reaching the low end of the torque range allows for a bit more turning to secure alignment without exceeding the torque limit for the bolt and nut. Never back-off a nut to obtain hole and castellation alignment. Self-locking nuts (AN364, AN365) require no specific alignment. They can be used on drilled or undrilled-shank bolts.

When using them on drilled-shank bolts be sure that there are no burrs around the cotter pin hole. A self-locking nut can be used more than once, until it can be turned on or off by finger pressure alone. Just remember, a self-locking nut must not be used on a bolt which is subject to rotation, unless it happens to be one of the super-duper nuts which have a self-locking feature plus castellations for a cotter pin.

From the Designee File: Lyle Trusty, Designee #52

**CHECKING YOUR AIRSPEED INDICATOR ON THE GROUND**  
from a 1976 edition of *The Omaha, Nebraska Chapter 80 Newsletter*.

**Materials:** Ten feet of clear plastic tube (inside diameter to fit outside diameter of pitot tube.)  
One dropper. One measure (inches or centimeters). One stick or board. Water.

Bend the plastic tube to form a skinny "U" about 3 feet long and attach this to the stick or board. Fill bottom 4" of tube with water. Attach one end to pitot on airplane (water should be the same height in both sides of the "U".)

Now add water, drop at a time, until your airspeed indicator reads 60 mph (52 kph) tapping the tube to make sure all the water gets down. Then measure the difference in the heights of water and record your reading. Repeat with airspeed indicator reading 10 mph higher each time. Readings should be close to those in the table below. **CAUTION:** DO NOT ALLOW WATER TO ENTER PITOT TUBE.

Next check for system leak by checking for reading changes after five minutes at the highest pressure. There should be no change.

| MPH = miles per hour and KPH = Nautical miles per hour |     |        |         |     |      |        |          |
|--|-----|--------|---------|-----|------|--------|----------|
| MPH  | KPH | cm/H2O | in/H2O  | MPH | KPH  | cm/H2O | in/H2O   |
| 60   | 52  | 4.5    | 1 13/16 | 120 | 104  | 18.0   | 7 1/16   |
| 70   | 61  | 6.2    | 2 7/16  | 130 | 113  | 21.3   | 8 3/8    |
| 80   | 69+ | 8.0    | 3 1/8   | 140 | 121+ | 24.5   | 9 5/8    |
| 90   | 78  | 10.0   | 3 15/16 | 160 | 139  | 32.5   | 12 13/16 |
| 100  | 87  | 12.5   | 4 15/16 | 180 | 156+ | 41.5   | 16 5/16  |
| 110  | 95  | 15.0   | 5 7/8   | 200 | 174  | 51.0   | 20 1/16  |

THANKS AGAIN TO LYLE TRUSTY

This is a relatively simple way to insure a reasonably accurate ball park reading on your A/S in the low speed range prior to your first flight. It will also show up leaks in the pitot system, which aren't too uncommon.

- TACH CHECK:** If you don't have a good speedometer shop in your area to do a bench check on your tach for accuracy there is another rather simple way. This is a ramp check that will be very accurate in a couple of the rpm ranges you are interested in. The only requirement is that it be done at night. Simply position the aircraft in the light of a mercury vapor or fluorescent light. Immediately you will be aware of the pronounced stroboscopic effect on your prop blades. This is due to the 60 Hz AC line cycle current. The prop blade will appear to be motionless anytime you are at an rpm multiple of 60 (1200, 1800, 2400) etc. If the test is also observed outside the aircraft a two bladed prop will show an "X" pattern at 1800 rpm and if you could turn up 2400 rpm you would see a six-pointed star.

**THE WHISTLE SLOT:** Probably most of you gents in the frozen North are aware of this, but just in case you aren't.... There have been any number of forced landings in bitterly cold weather when the breather tube froze over. This causes pressure to build up in the crankcase, so that it will eventually rupture the nose seal. When that happens most of the engine oil will be lost in short order. The results could be a badly bent airplane or a ruined engine, or both. If you have to relocate the breather tube where part of it may be subject to freezing, be sure and cut a little notch or hole where it will be in the warm area and the moisture that is being expelled from the crankcase can vent inside the cowl. If the exposed part of the tube should freeze over and block the exit of oil the back pressure forces it out thru the whistle slot.

- FOR SALE:** A local builder, Robert Clark, passed away from cancer about a month ago and we are helping his widow dispose of his T-18 parts and tools. He has a wide body fuselage that I built for him, with just about everything needed to complete the fuselage and tail group. He also has a set of spar caps (main wing only). All parts were given a coat of zinc chromate and all parts were purchased from Ken Knowles in late '79. The gear is the long gear and is complete with wheels, brakes, axles, tires. He also has a set of T-18 plans, newsletters, WB plans, and CW plans. Also some extra items. Mrs. Clark would like to get the inventory ('79) price out of it all in one pkg, but will consider parting it out to some extent. It's a good buy for someone, about 20% cheaper than current prices with much of the work already done. It is clecoed now, ready to rivet. If you are interested, call me at 214/351-4604 anytime between 9am and 10pm CST (if the phone rings before 0900 my wife has been known to snarl).

- HARTZELL CONSTANT SPEED PROP:** This prop flew on Hugh Grammer's T-18 a few years back. It is 70" in dia. and is for Lyc. 150-160 hp and has full feathering capability and I think has been recently overhauled. I've lost the model # and other details, but the price is \$550. T-18 builder BOB YEAKY, 9729 Bellewood, Dallas, TX, 75238. (Just found the specs on the prop. It's an HC 82X L-2C, serial # is 52-4-R, Model PC10. It has a manual with it, too. Bob's home phone is 348-2947 (214), evenings only, please. His work # is 214/351-6093.

It's now the middle of July and getting mighty close to OSH time, so I will bring this NL to a close, even tho' I have a good sized stack of all sorts of really good stuff that will have to go in #60. I feel certain that I can get it in the mail by Sept. 1, as much of the material is usable as is and doesn't require typing or re-writing. I apologize for taking so long to get this NL out, but there have been so many things to interfere this year. The latest was my Mother fell and broke her leg in May and at her age of 97+ she simply couldn't come back and passed away in late June. Since then it's taken me an extra long time to get geared up to writing. I also had three magazine writing assignments that I had to get out, but I'm up to speed now and plan to have #60 at the print shop by mid-August. The Opnx/Safety Manual is coming, too. Please be patient. Sorry to miss OSH, but you all go around and pet T-18s there for me.

Best wishes for a great fly-in, amigos,

Dick Gavin

N.A.S.A.D.

(NATIONAL ASSOCIATION OF SPORT AIRCRAFT DESIGNERS)

## AIRCRAFT BILL OF SALE

FOR EXPERIMENTAL-AMATEUR BUILT AIRCRAFT. THIS FORM SUPPLEMENTS & DOES NOT REPLACE FAA FORM AC8050-2. N NUMBER (IF ASSIGNED:) N  
 SERIAL NUMBER (OF BUILDER'S CHOICE:) \_\_\_\_\_ THIS AIRCRAFT IS A  
 FACSIMILE OF AN AIRCRAFT KNOWN AS A: \_\_\_\_\_

This aircraft is not designed or built to meet any standards of airworthiness, as with a certificated aircraft. This aircraft does not have a FAA Form 317 Statement of Conformity on file, since there is no FAA approved data to conform to. This is an experimental aircraft and the registered owner is the experimenter. The aircraft was not built in a permanent jig and parts are not interchangeable with any other aircraft of the same facsimile. FAA records list the registered owner as the manufacturer of an experimental-amateur built aircraft. The registered owner is free to make any modifications or changes he so wishes. The aircraft is an example of the owners creative ability. The new owner of an experimental-amateur built aircraft becomes it's manufacturer, when it is registered to him. He becomes responsible for it's aerodynamic and structural concept. The new owner is responsible for the performance and fit for purpose of every part and piece on the aircraft. Warranty is not expressed or implied for any feature or part of this experimental-amateur built aircraft.

I accept the terms of this Bill of Sale and all responsibility for the aircraft described herein.

PURCHASER  
 NAME: \_\_\_\_\_  
 ADDRESS: \_\_\_\_\_  
 SIGNATURE: \_\_\_\_\_

I this \_\_\_\_ day of \_\_\_\_\_ 19\_\_\_\_, do hereby sell, grant, transfer, and deliver all rights, title, and interest in and to such aircraft.

SELLER  
 NAME OF SELLER: \_\_\_\_\_  
 ADDRESS: \_\_\_\_\_  
 SIGNATURE: \_\_\_\_\_

This Bill of Sale must be signed by both parties. The seller keeps the original and gives a copy to the new owner. Send a copy of the original to FAA with the canceled registration (if registered.) Sign before a notary if required by the state where the transaction occurs. FAA dropped the requirement for notarizing in 1972.

TO ALL T-18 BUILDERS AND OWNERS

THE FOLLOWING FEW PAGES ARE THE FIRST OF A SERIES OF SUBMISSIONS FROM T-18 BUILDERS AND OWNERS AND THIS SERIES WILL BE FOLLOWED BY OTHER SUCH ARTICLES AND SUBMISSIONS IN THE NEAR FUTURE.

WE REGRET THAT CIRCUMSTANCES HAVE DELAYED THE PUBLICATION AND DISTRIBUTION OF THE T-18 BUILDERS AND OWNERS SAFETY AND OPERATION MANUAL.

THIS MANUAL WAS THE IDEA OF MR. VERN PEPPARD, OF DALLAS, TEXAS, THE PRESIDENT OF GEOMAP, INC. MR. PEPPARD ANNOUNCED SUCH A MANUAL AT OUR FIRST ANNUAL T-18 REGIONAL CONVENTION AT TEMPLE, TX, LAST OCTOBER. HE IS ALSO MOST GENEROUSLY UNDERWRITING THE COMPLETE COST OF THE PRINTING AND BINDING OF THE MANUAL. I KNOW I ECHO THE SENTIMENT OF ALL OF YOU IN EXPRESSING OUR GRATITUDE TO MR. PEPPARD FOR HIS SINCERE EXPRESSION OF GOODWILL AND CONCERN FOR THE WELL BEING AND HAPPINESS OF HIS FELLOW MAN. IT'S ANOTHER WAY OF HIS SAYING, "THANK YOU, JOHN THORP, FOR GIVING US SUCH AN OUTSTANDINGLY FINE AIRPLANE."

WE ARE ALSO IN DEBT TO HANK STEIGINGA, OF 45528 NEWTREE AVE., LANCASTER CALIFORNIA, 93534, FOR SUBMITTING THIS MOST EXCELLENT AIRCRAFT HANDBOOK FOR HIS PARTICULAR AIRPLANE. WE SUGGEST THAT YOU USE THE FOLLOWING PAGES AS A GUIDE IN THE OPERATION AND INSPECTION OF YOUR OWN AIRPLANE, USING IT TO PREPARE YOUR OWN MANUAL FOR YOUR INDIVIDUAL AIRPLANE.

PLEASE NOTICE THAT ANY AND ALL INFORMATION CONTAINED IN BOTH THE T-18 NEWSLETTERS AND THE T-18 BUILDERS AND OWNERS SAFETY AND OPERATIONS MANUAL IS PRESENTED AS A CLEARING HOUSE OF IDEAS, OPINIONS, AND PERSONAL EXPERIENCES OF VARIOUS PEOPLE, INCLUDING ANY SUGGESTIONS EXPRESSED, AND ANYONE USING ANY PART OF THE INFORMATION PRESENTED BE AWARE THAT THEY ARE DOING SO AT THEIR OWN RISK AND DISCRETION. THEREFORE, NO RESPONSIBILITY OR LIABILITY IS EXPRESSED OR IMPLIED AND IS WITHOUT RECOURSE AGAINST ANY OF THE PARTIES INVOLVED IN THE WRITING, PUBLICATION, OR DISTRIBUTION OF THE EXPRESSED IDEAS, OPINIONS, AND EXPERIENCES.

UNTIL SUCH TIME AS THE BOUND HANDBOOK ARRIVES, WE SUGGEST THAT YOU REMOVE THE VARIOUS ARTICLES PERTINENT TO THE BUILDERS AND OWNERS MANUAL THAT HAVE BEEN PUBLISHED IN PAST NEWSLETTERS AND PUT THEM IN A LOOSE LEAF BINDER FOR THE PRESENT. THERE ARE SEVERAL SUCH PAGES IN NEWSLETTERS #58 and #59. THANK YOU FOR YOUR PATIENCE AND UNDERSTANDING.

DICK CAVIN

NOTARY SEAL SPACE

SAMPLE BILL OF SALE -- NOT NECESSARILY A LEGAL INSTRUMENT

THORP T-18  
 OPERATOR'S HANDBOOK  
 SERVICE AND INSPECTION MANUAL

Serial # 512

Registration # N-512S

First Flight - 13 October 1979

Aircraft certificated by James Wong, EMDO #43, on 13 December 1979

Aircraft designed by John W. Thorp

Aircraft built by: Henry Steinginga  
 45528 Newtree Avenue  
 Lancaster, CA 93534  
 Phone: (805) 942-3046  
 EAA #: 57338  
 Designee #: 1333  
 A&E #: 686686

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THORP T-18  
SERVICE AND INSPECTION MANUAL

|  |   |
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## FOREWORD

This Thorp T-18 "Operator's Handbook" and "Service and Inspection Manual" has been expressly prepared for the owner and/or operator of T-18 N512S. Its purpose is to familiarize the pilot with the airplane preflight and post-flight requirements, ground handling, and flight characteristics.

The inspection and maintenance requirements are noted in the "Service Manual" section of this handbook. Federal Aviation Administration inspection requirements in accordance with F.A.R. Part 43, Appendix "D", can be satisfied when all inspection items in the service manual have been complied with.

A complete set of blueprints for all inspections, maintenance, and repairs are provided.

The builder's looseleaf manual is also an important reference to any part of this airplane.

IT IS MANDATORY TO OBEY ALL LIMITATIONS NOTED IN THIS HANDBOOK.

## DESCRIPTIVE INFORMATION

T-18 N512S is a high performance flush riveted all metal two place low wing monoplane with fixed main landing gear having new Cleveland wheels and brakes installed. A new Scott 6 x 2.00 tail wheel is installed. It has a new certificated Lycoming O-360-A2A, 180 H.P. engine coupled to a new Hartzell light weight constant speed propeller. A "Thorp" all metal cowling is installed. The windshield frame doubles as a "roll bar". The canopy is a "Gee Bee" and rolls forward and aft on stainless steel tracks and ball bearings. A canopy latch and lock are provided. Wing tips, wheel pants, and fin tip are fiberglass and are secured with flush screws and nut plates. Position lights and strobes are installed in the wing tips. The main fuel tank holds 29 gallons and the auxiliary holds 16 gallons. A selector valve directs fuel from either tank to the engine.

A full instrument panel is installed. The flight instruments are arranged in the standard "T" configuration. A new Narco Com 11B, Nav 12, and AT50A transponder are installed. The radio selector switch has 3 positions: "HOT MIC", "INTERCOM", and "TRANSMIT". "HOT MIC" position provides intercom use without pressing mic buttons. All instruments are "Bill Johnson" certified (Van Nuys, CA). The panel is lighted and solid state dimmer controlled. Cabin heat is controlled by a push-pull control on the left side of the panel. A controllable "fresh air vent" is provided near the aft end of the canopy and is very efficient. The pitot is located under the left wing and is heated. The static source is located on each side of the fuselage at Station 149 and W.L. 38. Landing light is installed in the cowl. A 35 amp battery is installed. There are "warning lights" for "low oil pressure" and "alternator out" mounted in the panel. A "pitch trim light" illuminates when the aircraft is trimmed for takeoff and landing.

The controls are conventional except for a one piece "all flying" horizontal stabilizer with electrically controlled pitch trim tabs. The stabilizer and ailerons are push-pull controlled. The rudder and landing flaps are cable operated. The paint is Dupont Centari with hardener and provides a very durable high gloss finish.

The empty weight is 1036.6 lbs. and the gross weight is 1700 lbs. The airplane is F.A.A. licensed in the "Experimental" category.

The designer, John W. Thorp, flutter tested the T-18 at 233 MPH. The "V" speed is 210 MPH, thus providing a 10% safety margin. The aircraft cruises at a relatively high speed. The controls are light and sensitive and extremely well balanced and coordinated.

Airplane Make \_\_\_\_\_ Model \_\_\_\_\_  
Airframe Serial No. \_\_\_\_\_ F.A.A. I.D. No. N \_\_\_\_\_

100 HOUR OR ANNUAL INSPECTION

CONSTANT SPEED PROPELLER

Model No. Hartzell HC-F2YR-1F  
Blade Design 7666A-4  
Blade Serial No. #1 - C63507, #2 - C63530  
Hub Serial No. CM75

Model Number Designation

H - Hartzell  
C - Controllable  
F - 3" shaft extension  
2 - 2 blades  
Y - Type blade shank  
R - Shaft mounting  
1 - Non-feathering  
F - Cylinder size

Installation

1. Install spinner bulkhead using spacers. Torque 22 foot pounds.
2. Clean shaft and hub flange.
3. Insert "O" ring P/N PRP-909-6 into groove (coat with engine oil).
4. Install propeller evenly. Torque  $\frac{1}{2}$ " bolts 60 foot pounds.
5. Wire safety pairs of studs together.

NOTE: Visually inspect propeller prior and after each flight.

100 Hour Inspection

1. Remove spinner.
2. Inspect hub and blades for nicks and cracks. Remove all nicks, scratches, and gouges in accordance with instructions in propeller manual.
3. Inspect mounting bolts for security and safety.
4. Inspect for oil and grease leaks. Grease zerks sparingly with Texaco Marfak #3.
5. Make entry in propeller manual log verifying this inspection.

PREFLIGHT INSPECTION

1. All switches off. Throttle off. Mixture in idle cut off. Wind and set clock.
2. Battery voltage: press to test with master switch on (12 volts).
3. Inspect battery vent, fuselage, empennage, surfaces, tabs, hinge points, and tail gear. Check "take off trim", (tab control arm approximately centered between "gold diamonds").
4. Inspect left wing, flap, aileron, and hinge points. Remove pitot cover. Remove left wing tie down.
5. Drain fuel bowl and inspect for contaminants and correct type of fuel. Inspect landing gear, wheels, and pants, tires and brakes.
6. Inspect engine and propeller. Check oil and fuel quantity.
7. Secure cowling.
8. Inspect right wing, flap, aileron and hinge points. Remove right wing tie down.



## FLYING THE T-18

### STARTING CHECKS:

1. Fuel selector "Main Tank On".
2. Mixture "Full Rich".
3. Throttle "Full", return to idle, then set just above idle.
4. Master switch "On".
5. Engage starter. Release when engine starts. Check oil pressure - 25 PSI minimum.
6. Warm engine at 1000 to 1200 R.P.M.
7. Check instruments for proper operation.
8. Alternator switch "On".
9. Radio switches "On".

### TAXI:

Advance throttle slightly and the airplane will begin to roll. Directional control is easily maintained with rudder pedal inputs to the steerable tail wheel. Sharp turns are made by individual use of the toe brakes and the swiveling feature of the tail wheel.

### BEFORE TAKEOFF:

1. Set altimeter to "Field Elevation".
2. Flaps "up", or 10° or 20° if desired for maximum lift.
3. Mixture "Full Rich".
4. Magneto check at 1800 R.P.M. Max drop 125 R.P.M. 50 R.P.M. max. difference between left and right magneto.
5. Check carburetor heat. 50 R.P.M. drop.
6. Check propeller operation. Pull for 300 R.P.M. drop and return to low pitch (IN).
7. Check all controls. Set pitch trim for takeoff. Actuate trim switch "Nose Up" until trim light just comes on.
8. Set clock "Take Off Time".
9. Close canopy.
10. Obtain radio tower clearance and "Look See".
11. Set directional and attitude gyros aligned with runway.
12. Lean mixture as necessary at elevations exceeding 5000 ft.

### TAKEOFF:

Cockpit and engine checks complete, canopy closed. Apply throttle gradually to "Full" keeping stick neutral. Steer with rudder pedals, steerable tail wheel. Rudder becomes aerodynamically effective about 40 M.P.H. at which time ease the stick forward raising the tail. At 75/80 M.P.H. ease stick aft and at lift off relax back pressure to allow 110/120 M.P.H. indicated air speed. Maintain 110/120 M.P.H. for best rate of climb. Adjust R.P.M. to 2500 and manifold pressure to 25" H.G. during climb.

### CRUISE:

Adjust propeller control to desired R.P.M. and throttle to desired manifold pressure. Adjust mixture control to peak exhaust gas temperature. Tweak electric pitch trim for level flight.

NOTE: Avoid continuous operation between 1900 and 2300 R.P.M.

### DESCENT:

Carburetor heat as required. Not normally needed on Lycoming O-360. Reduce throttle to 15" manifold pressure. Adjust propeller control to 2300 R.P.M. Cylinder head temperature and oil temperature will remain within limits. Fuel "Main Tank On". Adjust mixture as required during let down. Slow to 130 M.P.H. entering down wind. Propeller control forward (low pitch). Throttle approximately 12" H.G. Below 130 M.P.H. lower flaps one notch = 10 degrees. Below 100 M.P.H. lower flaps 3 notches = 30 degrees.

CAUTION: 40 degrees of flaps (4 notches) are prohibited at low gross weights and forward CG conditions.

Hold 85 to 90 M.P.H. on final, flare past threshold, hold off and touch down around 65 M.P.H. Raise flaps, turn off strobes and unnecessary switches.

### SHUT DOWN:

1. Radios off, turn coordinator off, and lights off.
2. Check magnetos prior to shut down 1800 R.P.M.
3. Magneto "Ground Check" (Mag switch momentarily off - engine quits - on again and engine continues to run)
4. Mixture to idle cut off.
5. All switches off (Mags, alternator, master, etc.)
6. Top off fuel as required.
7. Post flight. Make cursory inspection of entire airplane.

END THORP T-18 OPERATOR'S HANDBOOK

(Black pages inserted for future information, if necessary)

THORP T-18  
N512S  
SERVICE AND INSPECTION MANUAL

Airplane Make \_\_\_\_\_ Model \_\_\_\_\_

Airframe Serial No. \_\_\_\_\_ F.A.A. I.D. No. N \_\_\_\_\_

25 HOUR AIRPLANE  
AND ENGINE INSPECTION

1. After last flight while engine is hot, drain oil, replace filter. Replenish with Aero Shell 40/80W. Safety and leak check.
2. Inspect main tires, brakes, and wheel pants.
3. Inspect battery and service.
4. Inspect all flight controls.
5. Inspect fuselage and wings.
6. Inspect propeller for nicks and cracks and security.
7. Inspect cowling.
8. Inspect engine for leaks, safety and security.
9. Inspect windshield and canopy.
10. Inspect position lights, strobes, landing light and instrument lights.
11. Make entry in airplane and engine log books verifying this inspection.

Return to service

Airplane Make \_\_\_\_\_ Model \_\_\_\_\_

Airframe Serial No. \_\_\_\_\_ F.A.A. I.D. No. N \_\_\_\_\_

100 HOUR OR ANNUAL INSPECTION

(AIRFRAME)

NOTE: In addition to complying with the 25 hour inspection, do the following:

1. Clean, inspect, and grease main wheel bearings.  
(a) Install and safety
2. Clean, inspect, and grease tail wheel bearings.  
(a) Install and safety
3. Remove wing gap covers and inspect aileron controls and bell-cranks. Inspect flap return springs.
4. Remove main spar gap cover and inspect walking beam controls, aileron and elevator push pull tubes. Reinstall cover.
5. Inspect aileron and flap hinges for safety and security.
6. Inspect rudder for safety and security.
7. Inspect horizontal tail hinges and tab hinges for safety and security.
8. Remove horizontal trim access panels. Inspect trim mechanism, limit switches, drive mechanism, motor and wiring for safety and security. Reinstall covers.
9. Inspect rudder and brake pedal mechanism and cables for safety and security.
10. Inspect instruments, plumbing, engine controls, and panel mounting.
11. Inspect vacuum regulator filter aft side of fire wall, and instrument air filter L.H. forward side instrument panel. Replace if necessary.
12. Inspect wiring, switches and circuit breakers forward of instrument panel.
13. Preflight aircraft and test fly.
14. Make entry in airplane log book verifying this inspection.

Airplane Make \_\_\_\_\_ Model \_\_\_\_\_

Airframe Serial No. \_\_\_\_\_ F.A.A. I.D. No. N \_\_\_\_\_

100 HOUR OR ANNUAL INSPECTION

(ENGINE)

NOTE: Oil and filter changes due every 25 hours depending on dust conditions.

1. Fly to warm up engine thoroughly.  
(a) Take oil sample for S.O.A.P. test.  
(b) Perform differential compression test. Record results in log.  
(c) Drain oil and remove filter if due.  
(d) Remove and inspect oil suction and pressure screens. Clean and reinstall and safety.  
(e) Replace oil filter and safety. Replenish with 8 qts. 40/80 Aero Shell "W" oil. Straight mineral Aero Shell 40/80 used the first 50 hours.
2. Spark plugs.  
(a) Remove spark plugs noting their location.  
(b) Clean and gap if necessary. Clean ceramics and cigarettes with isopropyl alcohol and swabs. (Do not touch ceramics in plugs or cigarettes).  
(c) Rotate plugs. Install and torque 30 ft. lbs.  
(d) Inspect and lube magnetos.  
(e) Check magneto timing.  
(f) NOTE: Every 400 hours remove rocker covers. Inspect rockers, keepers, and springs. Replace covers with new gaskets.
3. Inspect engine and propeller for fuel and oil leaks. Correct as necessary.
4. Inspect engine mount, baffles and exhaust system for cracks and security. Inspect cabin heat muff.
5. Inspect fuel system for leaks.  
(a) Remove fuel bowl. Inspect for water and sediment. Inspect screen.  
(b) Reinstall and safety.
6. Inspect carb air box, carb heat valve, linkage and duct assembly for cracks, security and operation.

100 Hour or Annual Inspection

(Engine)(Cont.)

7. Inspect engine controls.
8. Run engine and check for fuel and oil leaks.
9. Preflight and test fly.
10. Make entry in engine log book verifying this inspection.

EQUIPMENT LIST

Engine Accessories

|                  | <u>Manufacturer</u>          | <u>P/N</u>   | <u>S/N</u> |
|------------------|------------------------------|--------------|------------|
| Starter          | Prestolite                   | MZ 4206      | 3E000365   |
| Alternator       | Prestolite                   | ALY-8403     | 6C000014   |
| Prop. Gov.       | Woodward                     | Model 821681 | 11S8093P   |
| Vac Pump         | Airborne                     | Model 211 CC | 11W5058    |
| Carburetor       | Marvel Schebler-<br>(MA 4-5) | 10-3878      | G-46-6400  |
| Oil Cooler       | Harrison                     |              |            |
| Spinner          | Brock                        |              |            |
| Mag LH (impulse) | Bendix S4LN-21               | 10-51360-37  | A-42248    |
| Mag RH (impulse) | Bendix S4LN-21               | 10-51360-37  | A-41108    |

Electrical

|  |               |          |         |
|--|---------------|----------|---------|
| Alternator Regulator                     | Prestolite    | VSF-7203 | D000028 |
| Battery (35 amp)                         | Rebat         |          |         |
| Strobe Lights                            | Whelen        |          |         |
| Master Relay                             | Cutler Hammer |          |         |
| Start Relay                              |               |          |         |
| Circuit breakers & switches              |               |          |         |
| Ignition Switch                          |               |          |         |
| Instrument Light Dimmer<br>(solid state) |               |          |         |

Flight Instruments

|                                       |         |
|---------------------------------------|---------|
| Compass ST3Y                          | Airpath |
| Directional Gyro                      |         |
| Att Ind (vertical speed<br>indicator) |         |
| Turn Coor                             |         |
| Altimeter                             |         |
| Air Speed                             |         |
| R.O.C.                                |         |
| G-Meter                               |         |
| Clock (8 day)                         |         |

EQUIPMENT LIST  
(Continued)

|  | <u>Mfr.</u>    | <u>Mod</u>   | <u>S/N</u> |
|--|----------------|--------------|------------|
| <u>Engine Instruments</u>                  |                |              |            |
| Man Press Gauge                            |                |              |            |
| Tachometer                                 |                |              |            |
| Oil Press                                  |                |              |            |
| Oil Temp                                   |                |              |            |
| Vac Gauge                                  |                |              |            |
| Fuel Quan (Main & Aux)                     | Stewart Warner |              |            |
| Voltammeter                                |                |              |            |
| Cyl Hed Temp                               |                |              |            |
| EGH Gauge                                  | Alcor          |              |            |
| <u>Miscellaneous</u>                       |                |              |            |
| Wheels - Main Gear                         | Cleveland      | 5:00 x 5"    |            |
| Brakes - Main Gear                         | Cleveland      |              |            |
| Tail Wheel                                 | Scott          | 2000         |            |
| Main Tires                                 | McCreary       | 6 ply        |            |
| Main Tubes                                 | Goodyear       |              |            |
| Com Radio                                  | Narco          | 11B          |            |
| Nav Radio                                  | Narco          | 12           |            |
| Transponder                                | Narco          | AT50A        |            |
| Transmitter Ant                            |                |              |            |
| Receiver Ant                               |                |              |            |
| ELT  | E.B.C.         |              |            |
| Propeller Constant                         |                |              |            |
| Speed                                      | Hartzell       | Light Weight | 76         |
| Throttle, mixture, &<br>propeller controls |                |              |            |
| Cabin Heat Control                         |                |              |            |
| Carburetor Heat Control                    |                |              |            |

DIMENSIONS AND AREAS

DIMENSIONS;

|                    |         |
|--------------------|---------|
| Span               | 20'-10" |
| Length             | 18'-11" |
| Height             | 5'-3"   |
| Tread              | 5'-3"   |
| Wing Chord         | 4'-2"   |
| Cockpit Width      | 3'-2"   |
| Propeller Diameter | 72"     |

AREAS:

|                 |                       |
|-----------------|-----------------------|
| Wing            | 86.0 ft. <sup>2</sup> |
| Ailerons        | 6.8 ft. <sup>2</sup>  |
| Horizontal Tail | 14.2 ft. <sup>2</sup> |
| Vertical Tail   | 8.0 ft. <sup>2</sup>  |
| Fin             | 4.8 ft. <sup>2</sup>  |
| Rudder          | 3.2 ft. <sup>2</sup>  |

PERFORMANCE SPECIFICATIONS  
AND LIMITATIONS

POWER PLANT:

Lycoming O-360-A2A engine rated at 180 H.P. at 2700 R.P.M.

OPERATING LIMITATIONS:

|  |                |                 |        |
|--|----------------|-----------------|--------|
| Engine - Lycoming Model O-360-A2A, 180 H.P.  |                |                 |        |
| Limit for all operations - 2700 R.P.M.       |                |                 |        |
| Maximum allowable temperatures: (Degrees F.) |                | (Degrees C)     |        |
| Cylinder head, bayonet probe                 | 500° F         | 260° C          |        |
| For maximum service life                     |                |                 |        |
| High performance cruise maximum temperature  | 435° F         | 224° C          |        |
| Economy cruise maximum temperature           | 400° F         | 205° C          |        |
| Exhaust gas temperature                      |                |                 |        |
| Sea level to 5,000 ft. - full rich           |                |                 |        |
| Above 5,000 ft. - 150° on rich side of peak  |                |                 |        |
| Cruise - peak E.G.T.                         |                |                 |        |
| Fuel Octane - 100/130                        |                |                 |        |
| Oil - 8 qts. of Aero-Shell 40/80W            |                |                 |        |
| Oil temperature above 60° F                  |                |                 |        |
|  | Desired        | Max             |        |
|  | 180° F (82° C) | 245° F (118° C) |        |
|  | 170° F (77° C) | 225° F (107° C) |        |
| Oil pressure                                 | Maximum        | Minimum         | Idling |
|  | 90             | 60              | 25     |

PERFORMANCE:

|  |                         |
|--|-------------------------|
| Maximum speed at sea level 2700 R.P.M.                   | 210 MPH                 |
| Cruise speed 75% at 7,500 ft.                            | 194 MPH                 |
| 65% at 10,000 ft.  | 187 MPH                 |
| 55% at 10,000 ft.  | 175 MPH                 |
| Maneuvering speed  | 170 MPH                 |
| Maximum flap operating speed 10°                         | 120 MPH                 |
| 30°  | 100 MPH                 |
| Stall speed - no flaps                                   | 67 MPH                  |
| 40° flaps  | 63 MPH                  |
| NOTE: 40° flaps not to be used with forward CG condition |                         |
| Acceleration - G'S                                       | 6+, 3- at 1250 lbs.     |
|  | 4.2+, 2.1- at 1700 lbs. |

CRUISE RANGE:

|   |             |
|---|-------------|
| 65% power. 45 minute reserve (37.3 gal. used)       | 968 miles   |
| (21.8 gal. used)                                    | 566 miles   |
| Rate of climb (gross weight sea level)              | 1800 F.P.M. |
| Absolute ceiling                                    | 25,000 ft.  |
| Take-off distance 20° flaps                         |             |
| 1250 lbs. ground roll 600 ft. over 50 ft. obstacle  | 750 ft.     |
| 1700 lbs. ground roll 1150 ft. over 50 ft. obstacle | 1600 ft.    |

GROSS WEIGHT AND CENTER OF GRAVITY LIMITATIONS:

|  |             |
|--|-------------|
| Maximum gross weight   | 1700 lbs.   |
| Empty weight   | 1036.8 lbs. |
| Useful load  | 663 lbs.    |
| Most forward CG - 15.2% (fus. sta. 62.6)   |             |
| Most aft CG - 32.4% (fus. sta. 71.19)  |             |
| NOTE: Maximum baggage allowance at gross weight 53.2 lbs.                            |             |
| Maximum baggage allowance with no fuel in auxiliary tank 125 lbs.                    |             |
| NOTE: See weight and balance calculations in packet located in aircraft seat pocket. |             |

FUEL AND OIL CAPACITY:

|                     |           |           |
|---------------------|-----------|-----------|
| Main fuel tank      | (useable) | 29 gal.   |
| Auxiliary fuel tank | (useable) | 15.5 gal. |
| Oil                 |           | 8 qts.    |

# INSTRUMENT MARKINGS

## Cylinder head temperature

Green Arc - Normal  
Red Line - Max.

## R.P.M.

Green Arc - Normal  
Yellow Arc - Caution  
Red Line - Max.

## Manifold pressure

Green Arc - Normal  
Yellow Arc - Caution  
Red Line - Max.

## Vacuum

Red Line - Max.  
Green Arc - Normal  
Red Line - Min.

## Airspeed

White Arc - Flap oper.  
Green Arc - Normal  
Yellow Arc - Caution  
Red Line - Max.

## Oil pressure

Red Line - Min.  
Green Arc - Normal  
Red Line - Max.

## Oil temperature

Green Arc - Normal  
Red Line - Max.







Late August '84: OSH '84 is history and according to all reports it was bigger and better than ever. Sure wish I could have made it, but I'll have to admit that I wasn't up to it physically. I just plain ran out of gas I guess. Thanks to JOHN WALTON, who kept me posted with reports and some photos, and JOHN BUFFINGTON AND BOB JAEGER, who sent me tapes of both the T-18 Forum and the T-18 annual dinner, I was able to capture a goodly portion of the flavor of events there. Sure hated not to be able to visit with all you guys again. Really missed seeing so many of my good friends. Maybe next year. To all of you that have inquired by letter and phone I deeply appreciate your expressions of concern and I'm happy to report that I am feeling considerably better. If I keep on this way I'm hopeful I may crank up enough energy to make the Kerrville Fly-in in mid-Sept.

Here's the list of T-18s at OSH this year that JOHN WALTON sent me:

|          |                                |                      |
|----------|--------------------------------|----------------------|
| N51863   | John Walton                    | Houston, TX          |
| ● N83MK  | Karl Lipscomb                  | Lamar, MO            |
| N18VP    | Vern Peppard                   | Dallas, TX           |
| N89RB    | Dan James *                    | *                    |
| N88DT    | Don Thompson                   | North Hills, PA      |
| N118GG   | Gary Green                     | San Antonio, TX      |
| ● C-GFPB | Fred Gindl                     | Agincourt, ONT       |
| N12055   | Bob Griffith*                  | Hampshire, IL (?)    |
| ● N76KC  | Dan Culhane                    | So. Windsor, CT      |
| N5GL     | Gayle LeCount                  | Georgetown, IL       |
| N8428    | Pete Eversole                  | Stoddard, WI         |
| N89SB    | (owner unknown, do YOU know?)* | *                    |
| N8952    | Earl Ody                       | Torrance, CA         |
| N583C    | Cecil Hendricks                | Seattle, WA          |
| N2NE     | Nate Eastman                   | Kimball, NE          |
| ● N1308B | Jerry Stallings                | Ferriday, LA         |
| ● N3124T | Steve Holbert                  | Houston, TX          |
| N3706    | C. Shuster *                   | Park Ridge, IL       |
| ● N2819L | Wayne Irwin                    | Merced, CA           |
| N3WC     | Bill Cox                       | Baytown, TX          |
| N9996Q   | Harold Weeks*                  | *                    |
| ● N31BD  | Bob Dial                       | Bloomfield Hills, MI |
| N851LT   | Lyle Trusty                    | Lancaster, CA        |
| N50RH    | Robert Hastings                | Modesto, CA          |
| ● N69HC  | Harlan Cavin                   | Miami, OK            |
| C-GRAF   | R. A. Froebel                  | Westhill, Ont.       |
| N600HH   | Howard Henderson               | Kirkwood, MO         |
| N(KONG)  | Bob Hudgins *                  | ...MI                |
| C-FYFI   | Bob Affleck                    | Harrow, Ont.         |
| N1396    | Bob Griffith*                  | *                    |
| C-GIBH   | Bert (?) Hamilton*             | *                    |
| N12055   | Ed Burke                       | Pittsburgh, PA       |
| N3020    | Cecil Williams                 | Cooper City, FL      |
| N2KP     | Ken Parton (*)                 | *                    |

The \* following the name indicates a NON member of the T-18 Builders and Owners Association and we do not have an address on them. If you know the address (all or part) of any of these people please let me know so we can track 'em down and let them know of our group and its aims...the furthering of T-18 safety standards, exchange of service problems, etc. We now have a goodly number of owners that are not builders, so it's essential we get in touch with these new owners.

CONT'D ON PG.2

(● ABOVE = 1ST TIME AIRPLANE AT OSH)

(cont'd).....Estimates on the number of T-18s that have flown range from 450 to perhaps 600-700. My personal wild guess is about 500, but no one really knows for sure and it would be very difficult to find out, even using the U. S. Civil Aircraft Register (which I understand isn't published any more). One trouble is that a number of them are listed as the "Jones Special", or "Smith-Thorp Special", etc. Using listing from those that registered at OSH (as published in Sport Aviation) we come up with about 125 and our records indicate about another 60 or 70 that have belonged to the MAS. There are about another 75 that have flown in Canada, Australia, New Zealand, Mexico, Barbados, So. Africa, etc. and perhaps those numbers are on the high side. For some reason a sizable number of new builders or new owners never get around to notifying John Thorp, Ken Knowles, Lu Sunderland, or myself that they have flown their birds. If you know of a T-18 anywhere near you or one you've seen at a fly-in someplace, or have even heard a rumor of one someplace, PLEASE notify us and maybe we can somehow track down the owner. If you sell your airplane or project, it would be a big help if you would send us the details. Also, if you change your mailing address I would appreciate it if you would immediately let me know. In mailing NL#59 I had 6 of them returned by the PO Dept. because it had been too long for them to forward mail to the new address. I well know that at least 5 of those 6 will write me in a few months and wonder why they no longer are getting the NL. I would greatly appreciate your help in these matters, gents, as I have a heck of a time keeping up with correspondence in this area. I won't plead old age just yet, but I've noticed that when one gets to be 68 that they drop the ball a lot more often than they did before. I'm involved in several other very time-consuming activities and sometimes it's a problem to squeeze in a couple of hours to cut my yard, so please forgive me if I'm super slow, forgetful, or absent minded sometimes, amigos.

Listening to the tape on the T-18 Forum I couldn't help noticing that there were quite a few tips, opinions, experiences, etc. on quite a variety of subjects about build and flying that were sounded out and discussed at some length and there were several items brought up that all would benefit from. I became puzzled at this point: Now if you guys can get up in front of an audience and expound on these things, would it be too much trouble to set it down on paper to use in the NL???? I well know that some people are most reluctant to write anything, but usually those same people are timid about public speaking in any form, too. Anyway, friends, I think you get the point without my beating it to death.

If any of you have a complete set of color prints of all the T-18s that were at OSH this year I'd be most grateful if you'd get another set run off and send 'em to me. I'll reimburse you for them and postage, of course. I usually shoot a picture of each airplane's interior and inst't panel, too, so if you also have any of these I'd sure appreciate.

How would one of you like to own one of those slick little handheld 720 channel Narco HT-800 transceivers??? Especially if it didn't cost you a single penny?....!! Now have I got your attention? Well, some lucky paid-up member of our T-18 Builders and Owners Association will soon do just that! Here's the how and why:

First the why: In order to expand our newsletter subscriber base, so that we can reach more T-18 owners and builders (like I wrote about in the preceding paragraphs) and perhaps stimulate the ones searching for a project to build a T-18, plus widening our statistical base and increasing the input of informative material, we have come up with a plan to accomplish

those goals...(I hope). If this is successful it should also lower our unit cost per newsletter a bit.

Here's the how: Everyone paying their 1984-1985 dues of \$10 between Aug. 8, 1984 and Dec. 31, 1984 will qualify for a chance to win the Narco HT-800. Our fiscal year will run from just after OSH to just after OSH the next year. Each member will be assigned a 4 digit number in the order of when they send in their subscription. A letter containing their personal no. will be sent immediately on receipt and this letter will also contain a questionnaire sheet to be filled out and returned no later than Jan. 15, '85. **ONLY THOSE RETURNING THE QUESTIONNAIRE WILL QUALIFY FOR THE NARCO DRAWING!**

In order to remove any suspicion of hanky-panky, 4 independent selections of the 4 digit numbers will be made by non-interested parties. (The 1st digit will be picked by John Thorp, the 2nd by an EAA HQ person, the 3rd by Mr. G.B. (canopies), the 4th by Steve Wittman. The winner will be announced no later than Feb. 10, 1985. Incidentally the odds are fabulous in your favor, in comparison to most such drawings.

Incidentally, if you've never seen or tried the Narco it really works great. I've tried out several of them and I can work the tower from my car from 5 miles away (loud and clear both ways) and while riding in 5 different airp. planes lately I had no trouble working the tower 15 miles away, and all this was using the little "rubber ducky" antenna. It is a simple matter to attach it to the regular aircraft antenna via a B & C connector and you can also plug in a remote mike and earphone. You can store 10 channels and use all the 720 channels between 118.0 and 136.0, too. It also has a scan feature that's pretty handy. We can get them from the local dist'r for \$476 (plus state tax), but I imagine any of you can probably get the same price most anywhere else. Be glad to get you one, but better wait until we have the drawing. You just might be the lucky one.

In case you are a new member of the T-18 B & O Association, please be advised that since its beginning in 1963 that it has been and is a non-profit group, with the newsletter costs entirely supported by donations of its members. Also, NOTICE: (STANDARD DISCLAIMER) As always, in past, present and future newsletters, we would make you aware that this newsletter is only presented as a clearing house for ideas, opinions, and personal experiences of both members and non-members in both building and flying and anyone using these ideas, experiences, or opinions, do so at their own discretion and risk. Therefore, no responsibility or liability is either expressed or implied and is without recourse against anyone.

On pg. 1 in the list of OSH T-18s, a brand new T-18 was chosen as the Peoples Choice and it was built by Karl and Mazie Lipscomb, of Lamar, Mo. I was pleased to hear this, as Karl and I go 'way back together to the very early '30s when we both learned to fly in Springfield, Mo and it was my pleasure to help him get started on his T-18 in late '80. Karl also built a Starduster Too, that was judged the best Starduster at OSH, and was the SA-300 rep at the Dayton Air Fair, so again, Karl, congratulations! He was also a Braniff captain until the early '50s, when he temporarily lost his medical on a fluke. We'll have his story in a later issue.

Speaking of OSH T-18s, another slick one was Nate Eastman's, of Kimball, NE, and he represented the T-18s this year at the memorial Wright Bros. ceremony that's part of the Dayton Air Fair. Nate, like the previous T-18s at Dayton, was overwhelmed with the red carpet treatment of the sponsors of the event. (His story is in another part of the NL). Congrats, Nate!

# ● "WELDING CANOPY FRAMES".....contributed by LU SUNDERLAND

When I recently went to show my new son-in-law, Jeff Van Gorden, how to oxy-acetylene weld a canopy frame for his T-18, I had to turn to the old T-18 Newsletters to refresh my memory. It's been many moons since I made mine in 1967, but it looks as though I was too busy finishing my airplane to document that operation. It was good to re-read the old newsletters anyway. After a day of re-learning aluminum welding, here is what I discovered:

I did find a comment in the newsletter saying that aluminum welding is easy. Don't believe it. The easiest welding is on 4130 steel. Next is stainless exhaust tubing and the hardest is thin wall aluminum tubing. I used to think that only 6061 aluminum could be welded, but now I find that with the new rods available that you can also weld 2024 alloys. The rod specified for 2024 is called "brazing rod", but it is applied in exactly the same way as aluminum welding rod as far as I can tell.

The problem with welding aluminum is that it conducts heat away so rapidly that before you can recognize that the base metal is hot to accept the filler rod, the whole surrounding area overheats and starts to sag.

When starting a fresh joint before it gets coated with flux, it is possible to observe a slight texture change under the flame when it is hot enough to flow rod. But as the weld progresses, the flux makes an orange envelope in the exhaust flame, practically obscuring the puddle.

First, let's look at the materials used for oxy-acetylene aluminum welding. It is possible to use ordinary acetylene gas, but it is preferable to use hydrogen instead, since it produces a lower temperature flame.

There are a number of types of welding rods available. Some are bare aluminum alloy and some are coated with flux (or filled with flux). It is necessary to use a special flux for welding aluminum. It is more convenient to use the flux-filled rods rather than the bare rods, which must be dipped continuously in flux. The only problem with the filled rods is that they are quite large (1/8") and after you decide that the base metal is hot enough for adding rod, it takes awhile to get the rod heated. If you stick the rod in before the base metal is hot enough, the flame can melt the rod and a huge ball will form on the end of the rod. This must be shaken off and discarded before proceeding. Also the filled rod makes a larger fillet, which doesn't look very attractive. You might like to try it, however. I personally prefer it.

The flux-cored aluminum torch alloy rod I used was MG420, made by the MG Products Co., Menomonee Falls, WI. Tensile strength is 34,000 psi and it melts at 1100° F. Instructions say, "With oxy-fuel torch adjusted to a slightly carburizing flame (excess acetylene), heat work to about 1000° F." It does not say how you know when you reach 1000° F. Here's how you know. If it gets hotter than that the base metal will sag and possibly cause a hole. If it is under 1000° F and you stick in the rod, it won't flow, but will make a neat ball about like a glob of mercury laying on a table. The only real way to detect temperature is to try applying rod. If it doesn't flow, flick it off and apply more heat. The instructions continue, "Melt 1/4" of the rod; continue heating until the alloy flows out. Lower the angle of the torch; continue adding alloy a drop at a time until weld is complete. Whatever you do, practice on scrap tubing before attempting the real thing.

(CONTINUED)

The bare 1/16" rod is fairly easy to use, but you can't make rapid progress because you must dip it in the flux. The secret is to get a rod that melts at low temperature.

It is generally better to weld only a short distance at a time and then back off for a short while. (This is called "puddle welding with steel.") Otherwise the surrounding bare metal can easily become overheated.

Bending the .035 wall tubing for the T-18 canopy frame can be rather tricky especially the front member which joins the windshield frame. It can be done without kinking if a 3/4" tubing bender is used and care taken. You can soon find that the tubing can be worked through the bender with less tendency to kink if it is fed with the straight, yet-to-be-bent part being forced down around the radius. If you proceed in the other direction, lock out.

If you elect to take your frame to a shop for welding, it can be Pop riveted together on the airplane, using sheet aluminum or steel gusset plates across the joints. Cut out clearance areas in the gussets to allow room for welding. Once the frame is tacked together, the rivets can be drilled out. Don't get the rivet holes where Riv-nuts will be located. The tack welding can be done on the airframe, but be sure to use sheet steel plates to protect the skin.

There is no need to bend the tubing continuously around the corners at the rear end. Instead a single piece can extend across the back, with joints at each rear corner.

If you can't locate aluminum rivet nuts for use in the frame, J. C. Whitney has them in boxes of 25. You'll need three boxes at \$5.00 a box.

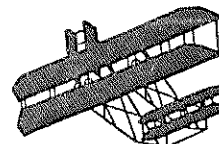
Drilling the 1/2" holes in the windshield and canopy is a breeze if you can locate or grind a sheet metal grind drill. These are ground with a little nib in the middle and the outer edges projecting down enough to cut out a disc.

Thanks, Lu, for still another excellent how-to-do-it article. We are very lucky to have a contributor with the caliber and talent that Lu has. He not only has the expertise, but also the ability to draw a word picture that is very clear. Thanks again, Lu.

At this year's Forum, ROGER DENGLER, of Arlington, TX, passed on a very good tip on drilling the 1/2" holes in the plexi. He used the Unibit, a step drill, that is sold by many specialty tool suppliers that cater to machinists and tool makers. I can also vouch for this drill. In addition it is really handy to have around for drilling large holes in aluminum. Some builders have also used wood countersinks or various type grinding stones to drill the plexi. In any case, NEVER, NEVER USE A REGULAR DRILL ON PLEXI! A regular drill will grab as it goes thru and it only takes one such grab to crack your canopy and ruin it, so don't gamble.

We drew a rough sketch of what a sheet metal grind looks like in N.L.#55, in case the term is new to you.

I might add one thing to Lu's words on tube bending. Years ago I was trying to bend the canopy frame to fit the windshield roll bar, using one of hickies that electricians use, and I found you must use a form block to bend to a shape accurately. Don't try to freehand bend if you want to save a lot of frustration.



## THE AIRPLANE FACTORY INC.

7111 BRANDVISTA AVE.

DAYTON, OHIO 45424

More info on the cutting and drilling of plexiglas (from JOHN WALTON)

### PLEXIGLAS HINTS

1. Cutting: An abrasive disc powered by a high speed drill, a Dremel tool, or a hand held circular saw is recommended. We have found that abrasive cut-off wheels of aluminum oxide or silicon carbide provide excellent cutting results. A six inch disc is available at most hardware stores for around \$3.50. A small grinding disc or Dremel saw disc will also give good results. Reciprocating saws like saber saws are not recommended and will probably break your canopy. A tool that progresses slow and hot to grind through the canopy is best. Tape a poly plastic cover on the canopy and mark your outline with masking tape. Never cut a cold canopy. Allow the canopy to warm to 70° or more for at least an hour. Don't allow the canopy to vibrate or chatter during the cutting or it may chip and crack. Support your canopy on a flat surface so it will not twist or spread during the trimming. Duct tape is handy to hold things in place. Remember: cut slowly, don't push the cutter. Let the tool do the work. Be sure to use eye protection. Plexiglas chips can be a problem in your eyes since they are clear and difficult to see.
2. Drilling: The drill should be ground off to a zero rake angle to prevent digging in, chipping and cracking the Plexiglas. A standard drill bit, ground with no cutting edge pitch, is a safe method of making holes. Be sure to make the holes oversize to allow for motion caused by thermal expansion and contraction. The drill bit should not be allowed to chatter or it will chip and break the Plexiglas.
3. Cleaning: A damp soft cloth or an air blast will clean the saw dust away. The damp cloth will also dissipate static electricity. To clean dirty plexiglas use plenty of water and a non abrasive soap or detergent. Dry with a clean chamois or soft cotton. Never use acetone, benzene, carbon tetrachloride, lighter fluid, lacquer thinners, leaded gasoline, window sprays or scouring compounds. Grease or oil may be removed with kerosene, white gasoline, naphtha or isopropyl alcohol. Small scratches can be buffed out with "Mirror Glaze" HGH-17 and lot of rubbing. Hard automobile paste wax should be applied as a protective coating and buffed with a soft cotton flannel cloth. Do not use cheese-cloth, muslin or shop cloths, they scratch. For deep scratch removal, procure a hand polishing kit from a Plexiglas dealer or your canopy supplier.

Experiment with all the above on scrap plexi before you tackle the real thing. Like everything else, perfection comes thru practice.

THORP T-18 BUILDERS & OWNERS ASSOCIATION  
EAA CONVENTION, WITTMAN FIELD  
OSHKOSH, WI. 54901

July 31, 1984

Mr. John Thorp  
Box T  
Lockeford, Ca. 95237

Dear Mr. Thorp;

This Association met tonight in Oshkosh for its Seventh Annual Meeting. Over 125 members and guests were in attendance. During this meeting the following statement was drafted and unanimously endorsed for forwarding to you.

The Thorp T-18 Builders & Owners Association salutes John Thorp on this the Twentieth Anniversary year of the first flight of the first Thorp T-18, N96752 (See enclosure).

Your Thorp T-18 design has accrued over 120,000 hours of flight time; making it one of the most proven homebuilts. In addition the Thorp T-18 is widely admired and regarded as one of the premiere lightplane designs, regardless of licensing classification. This achievement would not have occurred without your considerable vision, design skills, and tenacity.

This association takes this opportunity to extend its admiration, thanks, and best wishes to you.

Sincerely,

Thorp T-18 Builders &amp; Owners Association

By John G. Walton

And all of us that weren't at OSH, we, too, add our deep felt thanks to John Thorp for giving us the finest homebuilt aircraft design in the world....and after over 20 years, it's still the best!

AUGUST, 1964 — 50c

VOL. 13, NO. 8



# SPORT AVIATION

Official Publication of The Experimental Aircraft Association International, Inc.  
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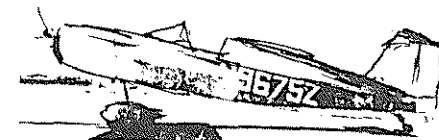
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## The T-18 Flies

By Bill Wancick, EAA 3775  
5726 Clearside, Torrance, Calif



I FEEL somewhat justified in writing what I consider to be a most incomplete report, due to the fact that I know a lot of Thorp T-18 builders were getting anxious to hear about my T-18. Possibly, I can make amends at a later date with a more factual report.

At the time of this writing, the airplane is incomplete as far as upholstering, landing gear fairings and canopy are concerned. These items should arrive with the ship at Rockford.

I have a Lycoming 0-300 engine with a Hartzell constant speed propeller and full electrical system, so my empty weight came out a bit on the high side at 903 lbs. Even so, I think that it all paid off with an outstanding rate of acceleration and climb and I'm sure that with a canopy, a most respectable cruise.

Now, you're probably wondering why I haven't given any figures on these points and the reason is that, at this time, I just don't know! With the static system it now has, I can indicate an easy 140 mph on a power setting of 19 in and 2200 rpm, which is too high, I know.

At any rate, I haven't been too concerned with this sort of thing as yet. My most pressing problems have been to get my required flight time in the test area, which is 50 miles from home, and to get a canopy built.

The "A" frame gear is working out quite nicely in my opinion. I don't like a mushy gear, nor a hard one either, and this one seems to be a happy medium. If your flying is to be done off sod fields, then you might consider it too stiff, which might necessitate 6.00 x 16 wheels, but for hardpan and concrete, it's okay!

For those of you who are accustomed to long winged Cessnas, or lungeed "Tri-Pacers," you're in for quite a surprise. The aileron control on the T-18 is one of the best you'll ever feel. Incidentally, a very nice coordinated turn can be made with the feet on the floor. Rudder control is very positive just as soon as a little prop wash gets back there and I've never experienced any difficulty keeping her straight either on take-off or landing.

Since there's no trim system as yet, it takes back pressure for climb and forward for cruise. This item rates high on the priority list due to the discomfort of holding a stiff arm. However, the control about the pitch or lateral axis is good and positive.

I do hope that I've succeeded in touching the spurs to the T-18 builders, because I'm sure now that when you finish, you will be the proud owner of one of the most popular little sportplanes ever to come along. I am!

● **TAILPIPE DRAG:** A rule of thumb in estimating drag of a standard exhaust pipe is to assume that the pipe extends 18" beyond its actual end. This extension allows for drag loading caused by pressure differential generated at the tailpipe end as the slipstream bends the exhaust plume.

If two 2.75" pipes exit the cowl at 45 degrees and extend 4 inches into the slipstream, the resulting drag at 170 MPH is about 24 pounds. Total drag of a clean T-18 at this speed is about 220 pounds. Those tailpipes are costing 8 MPH in drag! Reducing the angle to 30 degrees will cut drag to 14 pounds or 5 MPH.

In an effort to get the most speed from my airplane, I used "ejector stack" tailpipes on my crossover exhaust system. Use of simple ejector stacks should eliminate the drag penalty and add 3 to 5 pounds thrust. The price of ejector stacks is a bit of fabrication effort and an exhaust stained belly (my flush ejector stacks leave two trails of light grey soot back to the tailwheel).

My ejector stacks consist of rectangular tailpipes dumping into rectangular nozzles cut flush into the belly of the fuselage. The fast moving exhaust gas mixes with engine compartment air in the nozzles and exits flush from the belly giving a net jet thrust greater than that of a standard tailpipe.

The "nozzles" are rectangular ramps cut into the 523-2 forward floor skin and the firewall. The left ramp is 4.6" wide placed between the floor extrusions that are either side of the pilots left foot. The ramp ends 5.5" aft of the firewall lower corner, and is as deep as possible at the forward end, extending up to the edge of the 527-2 extrusion which runs across the firewall. The D-609 drawing top view shows such a ramp. The right hand ramp is identical, located under the co-pilots right foot.

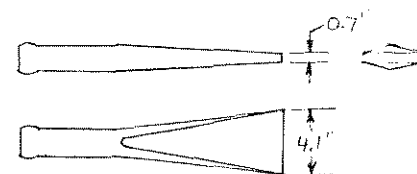
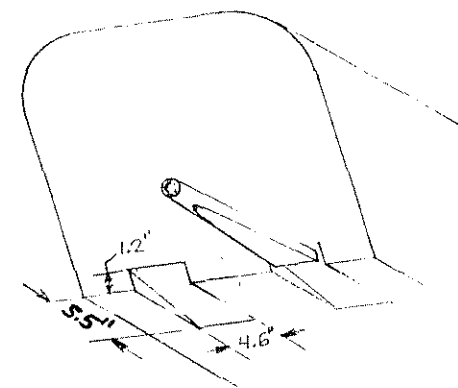
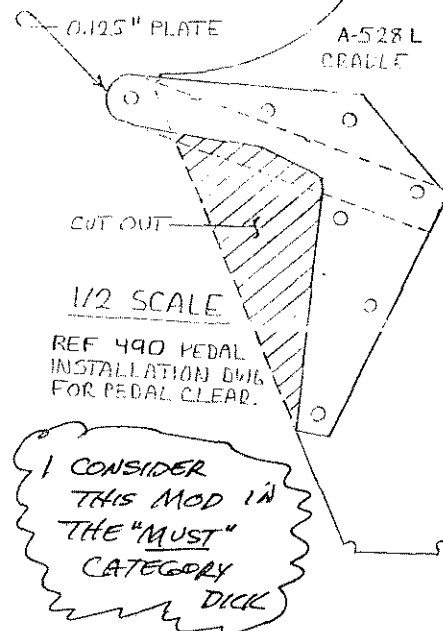
The resulting openings in the firewall are 1.2" by 4.6", and a bend in the lower cowl increases this area to 1.5" by 4.6". The 0.7" by 4.1" (I.D.) rectangular tailpipe ends are centered in the openings with ends coincident with the firewall face.

The "ramps" are extended forward of the firewall into the engine compartment by 1.5" radius .025" aluminum inlet guides to eliminate sharp corners of the firewall edges.

Heat shields for the "ramps" and the floor skin were fabricated from .016" aluminum (extending 24" aft of the nozzles). A sheet of asbestos paper between the .016" heat shields and the airframe provides insulation.

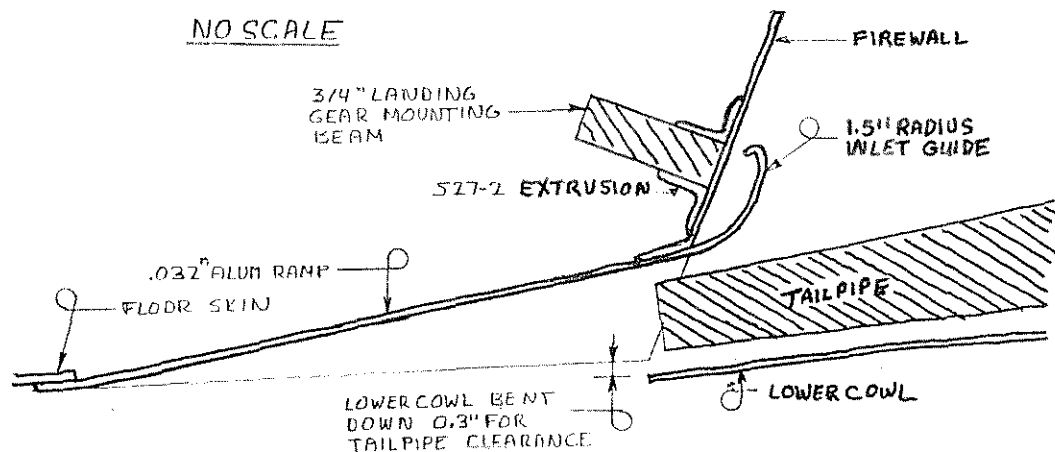
The basis of my exhaust system is a DIX crossover exhaust with ball joints connecting to my custom tailpipes. The left pipe is a straight run from the crossover to the nozzle, but the right pipe needed an 'S' curve bent into its forward end to keep the pipe exit parallel to the airplanes belly.

*Thank You for the newsletters Dick!  
Tom Kerns*



STANDARD TAILPIPES WERE CUT LENGTHWISE, SPREAD APART, AND TRIANGULAR PLATES WERE WELDED IN TO FORM THE TOP AND BOTTOM SURFACES OF THE TAILPIPE.

NO SCALE



INSPECTION ALERT: (to be part of the T-18 Owners Safety Manual)

From B.C. ROEMER, Manitowish Waters, WI.: He writes, "I now have over 1000 hours on my T-18 and when I did the annual this year I found nothing, but last year we found the steel reinforcement "L" plate mounted at the bottom of the rear bulkhead (#576), where the tail spring mounts on, was cracked in MANY places, including the bend! This is the .060 4130 steel plate, that they put in in place of the original .040 one (which had also subject to cracking). I replaced the .060 one with one of .090 of regular flat cold rolled steel and I feel this softer steel will soak up the shocks better without cracking like the 4130 did. The 4130 cracked at many different rivet holes that were not even near the bend. It must have age hardened. Looked real good this inspection, so maybe the cold rolled is the answer. In case you are wondering, we have the steel tail spring, not the original solid aluminum one."

- ④ Please inspect this fitting on your airplane as soon as possible. If any of you find a similar condition please forward a simple report to us. A simple sketch of any failure areas would also be helpful.

B. C. further writes, "We find it IMPORTANT to keep the coil springs tight (the ones between the rudder mast arm and the tail wheel steering arm). When you put two people in it and possibly some baggage it will cause the geometry to change (as on a hard landing), causing the springs to slacken and steering goes to hell and direction control can get dangerous."

Thanks, B.C. for both of those timely tips. We all need to know about these things ASAP and the NL is the only conduit of information for the great majority.

- ④ From LYLE FLEMING, one of the many T-18ers living in Lancaster, CA, writes, "On page 16 of NL #59 you had an article about alternators. I had a Motorola automotive alternator on my O-360-A1A Lycoming for over 1000 hrs. with not one bit of trouble.

I know the alternator ran backward to what it did in a car, but it worked just fine. I did not change the cooling fans, either. It was 35 amp capacity.

The landing gear on my T-18 developed a crack just below the lower bolt at the corner of the fuselage, but this didn't show up until after I had 1000 hours of landing on the VERY rough airstrip I normally used most of the time. This might be an area that other T-18 owners may want to check pretty carefully."

Thanks, Lyle, for your reports. I had my tongue in my cheek when I ran that alternator article, since it was written by a repair station operator. In any case, it's good to see both sides of a situation. As for the gear cracking comments it seems that the occurrences reported are probably isolated instances that show up after excessive rough field operation. Dr. Cottingham, who now has well over 3000 hrs. on his T-18, with 90% of his T/O and Ldgs. made on rough, turf fields, and he hasn't had any such problem. Bill Warwick probably has well over 2500 hrs. on ol' Tiger and he, too, has been free of gear crack incidents. Nevertheless, such reports serve to highlight the fact that every T-18 is an individual airplane, even tho' they look alike, so it would seem prudent to not get careless and take things for granted, don't you think.

Again, we solicit your prompt reports of ANY problems.

From our old buddy, BOB DIAL, who also needs no introduction to newsletter readers:

(received prior to OSH '84)

Dear Dick,

Got your last newsletter a few days ago and, as usual, you have done a fine job.

I have finally finished my second T-18. Painted, inspected, licensed and ready to go, --I thought. I filled the gas tank and ran the engine for the first time and the tank leaked badly. I had assumed the builder of the tank had pressure tested it and that was a bad mistake. Consequently, I had to take the tank out and you well know what that involves. I ended up building a new tank and by the time I finished it the weather had turned bitter cold and I don't do nuthin' at my hangar in cold weather. The tank is sitting out at the hangar ready to be installed and the airplane is all apart and that is where it will stay until warm weather next spring. The airplane is beautiful. I had the paint job done professionally as well as the interior and it turned out really well. The empty weight of the airplane is 325 pounds, neither light nor heavy. It is a simpler airplane than my first one. A good basic instrument panel with post lighting, a new KX-155 state of the art radio, electric flaps but no electric trim. It has running lights, landing lights, phone jacks and intercom on both sides, a new, solid state, Davtron comm head with localizer, adjustable seats, and a few other really nice goodies. It is powered with an O-320A1A Lycoming O time first runout with all new accessories, plugs, harnesses, mags, vacuum pump, starter, 30 amp alternator, and whatever else it took to make it new and first class. It is a 160 hp engine. Right now, I have a new Sensenich wood prop on it but I think I will chance that to a metal prop since the wood prop is overpitched and won't let the engine turn up enough. This airplane is much cleaner externally than my first airplane and I think that it will be quite fast. I'll send you pictures as soon as it gets warm enough that I don't freeze my buns taking them.

Incidentally, I can add a little to the history of Arch Maxwell's airplane. The airplane was built by Bill Hart here in Detroit and he moved to Arizona before he finished it. It was one of six that was started here by a group that included Parver Miller, Bill Davidson, George Kittle, Bill Oliver, and two others whose names escape me. The only two that were finished and are presently owned by the original builders are Parker's and Bill Oliver's. The others were bought and sold many times and finished by other builders. All six were finally finished and are flying today. One is owned by Nick Saraphinoff here in Detroit. Another was finished and turbocharged is owned and flown by Tom Bachanyi in Olmsted Mich. Another was finished by Dick Burlingame of Milad Mich. and has since been sold. Arch has the other one.

There are presently seven T-18's at Pontiac airport here. There are four in my hangar: mine, Bill Oliver's, Dick Bernards's, Don Bournier's. Then there is Al Rosinetti's, Gary Coblenz's, Nick Rosden's, and one was sold last week and went to the west coast. That one belonged to Mark Younggren.

I will write to Vern Peppard and volunteer for the C.G. section of the proposed manual. I have a nice program that I wrote for my computer for weight and balance for the T-18 and if anyone wants to send me their data I will run it through the computer and send them a nice print out like the one I am enclosing. The only thing I ask is a self addressed, stamped envelope. I have the capability of computing the weight and balance for any T-18 if I am just furnished the weight on each main wheel, the weight on the tail wheel, and the max gross weight of the airplane. WARNING! THIS WILL ONLY WORK FOR A STANDARD T-18. THE GAS TANK MUST BE IN THE POSITION CALLED FOR ON THE PLANS. EVERYTHING MUST BE LOCATED AS PER PLANS. THE GAS TANK CAN HAVE ANY VARIOUS CAPACITIES, JUST LET ME KNOW. If some one has a non standard arrangement, (extra gas tanks, etc), I can still run it out for them but I would need all the various arms to work with.

Also Dave Johnson from down in Virginia called me the other day about buying plans for the T-18. I referred him to you and it occurs to me that maybe you could ask some of our good members through the news letter if they know where plans are available now that John is out of business. I know that Ken Knowles has the wide body version but I seem to get a lot of queries about the standard plans.

If you think there would be any demand for it, I would be happy to draw up some sketches for electric flap installations and my version of the instrument panel installation.

Hang in there and let me hear from you.

Regards,

Bob

Bob also enclosed the following three examples of CG computation on his latest T-18:

### MOST FORWARD C.G.

\*\*\*LOADING SUMMARY\*\*\*

| ITEM         | WEIGHT (LBS) | ARM (IN) | MOMENT (INCH/LBS) |
|--------------|--------------|----------|-------------------|
| EMPTY WEIGHT | 933          | 74.01    | 69050.00          |
| FUEL         | 174          | 66.00    | 11484.00          |
| OIL          | 15           | 34.75    | 521.25            |
| PILOT        | 180          | 99.50    | 17910.00          |
| PASSENGER 1  | 0            | 0.00     | 0.00              |
| BAGGAGE      | 0            | 0.00     | 0.00              |
| TOTALS       | 1242         | 274.26   | 92955.25          |

PLANE IS WITHIN LIMITS BY 338.00 LBS.  
C. OF G. IS AT 74.89 INCHES  
C. OF G. IS WITHIN LIMITS 73.50 AND 83.00

### MAX GROSS WEIGHT

\*\*\*LOADING SUMMARY\*\*\*

| ITEM         | WEIGHT (LBS) | ARM (IN) | MOMENT (INCH/LBS) |
|--------------|--------------|----------|-------------------|
| EMPTY WEIGHT | 933          | 74.01    | 69050.00          |
| FUEL         | 174          | 66.00    | 11484.00          |
| OIL          | 15           | 34.75    | 521.25            |
| PILOT        | 180          | 99.50    | 17910.00          |
| PASSENGER 1  | 180          | 99.50    | 17910.00          |
| BAGGAGE      | 90           | 119.50   | 10755.00          |
| TOTALS       | 1572         | 493.26   | 127634.25         |

PLANE IS WITHIN LIMITS BY 8.00 LBS.  
C. OF G. IS AT 81.19 INCHES  
C. OF G. IS WITHIN LIMITS 73.50 AND 83.00

### MOST AFT C.G.

\*\*\*LOADING SUMMARY\*\*\*

| ITEM         | WEIGHT (LBS) | ARM (IN) | MOMENT (INCH/LBS) |
|--------------|--------------|----------|-------------------|
| EMPTY WEIGHT | 933          | 74.01    | 69050.00          |
| FUEL         | 18           | 66.00    | 1188.00           |
| OIL          | 15           | 34.75    | 521.25            |
| PILOT        | 180          | 99.50    | 17910.00          |
| PASSENGER 1  | 180          | 99.50    | 17910.00          |
| BAGGAGE      | 90           | 119.50   | 10755.00          |
| TOTALS       | 1416         | 493.26   | 117334.25         |

PLANE IS WITHIN LIMITS BY 164.00 LBS.  
C. OF G. IS AT 82.86 INCHES  
C. OF G. IS WITHIN LIMITS 73.50 AND 83.00

Bob, many thanks for the newsy and informative letter and for your other contributions to the NL in the past. You have a great wealth of T-18 experience that you have most generously shared and we all truly do appreciate it! Also, thanks for your efforts as an M.C. at the Annual T-18 Dinner and for the work that you, Lu Sunderland, and John Walton did at OSH on the T-18 forum.

Now that Bob is the coordinator for the CG Section of our new manual, I'm going to ask him to do a detailed article on how to go about weighing a new T-18 and how to compute the CG location at various loadings. Now Bob is in effect an editor for this section and as an editor he needs reporters to feed him "stories", so how about YOU sending him your figures on the CG computation for YOUR airplane???????

(MORE CG INFO IN NL #61)



The following two pages are reprinted from the EAA Designee Newsletter:

# AIRCRAFT HAND RIVETING

by Charles W. Penry, from EAA Chapter 168 Newsletter, Dallas, Texas

FIG. 7 SHOWS BOTTLE BAR DRILLED TO ACCEPT HAND OR STANDARD .401 DIAMETER RIVET SET SHANK.

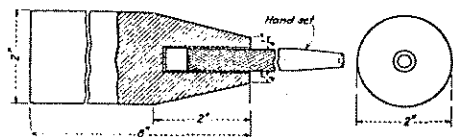


FIG. 7 - BOTTLE BAR

Under certain conditions and circumstances aircraft riveting must be done by hand. Hand riveting is simply upsetting the shank end of the rivet with a hand set and hammer while bucking the manufactured head with a hand set and bucking bar (Fig. 1). The upset head should be formed on the structural side wherever possible.

## Flat-Head and Countersunk Rivets

If the parts are small and flat head rivets are to be driven, they may be placed on a bench plate with manufactured heads down (Fig. 2a). When the hand operation is to be done on the airplane structure, a flat bucking bar is used to buck the manufactured head (Fig. 2b). Never drive the manufactured head with the buck-up tool.

## Oval-Head Rivets

When the manufactured head is oval-shaped, a straight hand set and buck-up tool or a hand-set adapter and cupped dolly may be used, either by placing the set in a vise or by bucking it up with a heavy bucking bar or bottle bar (Fig. 3). Figure 4 shows buck-up set in a vise with a helper holding the parts to be riveted. The rivet is in place with manufactured head in lower set. Material is held firmly at right angles to set. Slight pressure is exerted downward to prevent parts from bouncing off the set and to keep the manufactured head tight against the sheet. Lightly tap the material on each side of the rivet to draw up manufactured head and to eliminate any sheet gap (Fig. 5). This technique eliminates use of a draw tool but care must be taken to prevent cutting material around rivet shank with tool edge if it is tilted. With flat hand set on the rivet shank at right angles to sheet, strike the set one or two blows to start the heading process. Repeat drawing operation only if necessary. Immediately after striking the hand set, it should be pulled upward away from the

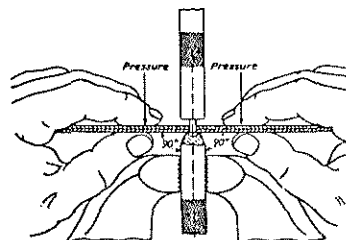


FIG. 4 - HAND RIVETING IN A VISE

rivet shank to prevent marking or "pulling" the head to one side by the rebound. If the shank shows signs of bending to one side, it may be pulled back by rapidly drawing the set in the corrective direction simultaneously with the impact of the hammer (fig. 6). The remainder of the rivet shank may be formed with one or two additional blows. A ball peen hammer whose weight is 12 to 16 ounces works fine on 3/32 and 1/8 diameter aluminum rivets. Swing hammer to obtain blows similar to that of driving a nail in wood. Drive shank to obtain the acceptable 1/2 diameter rivet shank height and 1-1/2 O.D. head.

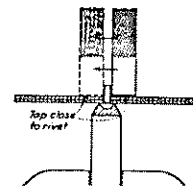


FIG. 5 - "DRAWING UP" WITH A FLAT HAND SET

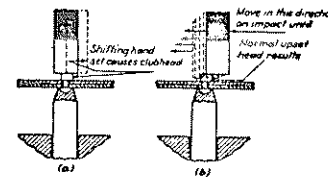


FIG. 6 - HAND-SET OPERATIONS. (a) RESULT OF SHIFTING HAND SET (b) CORRECTING AN OFF-CENTER (CLUB-HEAD) RIVET WITH A FLAT HAND SET

## SOME THOUGHTS ON AIRCRAFT WIRING

by Dave Palmer, from EAA Chapter 165 Newsletter, Little Rock, Arkansas

The following admonishments were garnered from a real avionics designer with whom I am honored to work at Arkansas Modification Center (and who I am endeavoring to proselyte! This is, according to Paul P. and SPORT AVIATION, the Experimental Aircraft Association...even for avionics folk!).

My pal, Al Wright, offers this for openers:

- Make sure engine block grounds to airframe and (-) side of battery.
- All ignition and generator and running light wires shielded.
- All airframe metal parts bonded to ground (-).
- Install generator and magneto filters (RF).
- Strobe lights, use shielded wiring and must have ground bonded.
- Install static wicks.
- Install separate circuit breakers and/or fuses (isolate functions as much as possible).
- Be sure wiring is of adequate size --- use as few splices as possible.
- DO NOT use electrical tape.
- DO NOT run radio wiring in same bundle as battery or generator cables.
- DO NOT use standard hook-up wire (flammable insulation).
- Use fiberglass or teflon insulated wire.

(LETTER FROM DAN CULHANE)

Hello Dick

I just received the latest newsletter with your little mind jogger on the back and I have to admit that I have been a little delinquent in filling you in on the progress of my T-18 project. So, here it goes.

It was just four years ago that you called to tell me of the T-18 project that Keith Cobb had for sale and it was in May, 1980 that I made the purchase and brought the project home. But after seeing Keith's nice big workshop, I told myself I would not build another airplane project in a one-car garage. So, I had a 24'X 34' building constructed in my back yard and I finished the inside including wiring myself, which all took time. I'm not a very fast worker, I must admit.

Well, I finally started working on the T-18 in the spring of 1981. As you may recall, the basic airframe shell, with the exception of the fuselage belly skin, had been all riveted together by Keith. I completed the airframe with seat and baggage compartment installations, engine installation, windshield & canopy inst'l, ~~engine~~ engine cowl inst'l, fuel & electrical system inst'l, made MLG fairings and fit wheel pants etc., etc., and finished up with a DuPont Imron paint job this past August, 1983.

This is the first item that I have ever spray painted and I was a little hesitant at first. I read all of the helpful hints in the newsletters, talked with local EAAers who had painted their airplanes with no previous experience, and bit the bullet. It doesn't look quite as nice as a Keith Cobb special (that guy is good), but it is presentable I think. I probably put too much paint on and suffer the weight penalty, but that's the price of gaining experience. One thing I underestimated was the amount of work involved in painting an airplane, and my paint scheme is a very simple one. Enough of this; on to some vital statistics. Keith's reg. no. (N15KC) was not retained; I kept my old reg. no. N76KC but it has his initials.

T-18, S/N 1165, N76KC

Builders: Keith Cobb/Dan Culhane

Fuselage: Standard configuration with .032 side skins

Wing: Standard configuration with .032 center wing skins and 12 gal fuel tanks in the outboard wing L.E.

MLG: Long gear Paint: Imron over Corlar epoxy primer

Engine: Lycoming O-360-A2F Engine Cowl: Rattray

Prop: Sensenich 68LY80 with epoxy L.E.

Instr. Panel: Full gyro with Comm, Nav, &amp; Xpdr

Empty Wt.: 985 lbs. Empty Wt. C.G.: 2.5" or STA 63.5

Fwd CG Extreme: 8.8"/STA 63.8 (Pilot, 0 bag, 0 fuel)

Aft CG Extreme: 15.2"/STA 70.2 (Pilot, CP, 60#Bag, 0 fuel)

(cont'd)

(cont'd from pg. 20)

First flight: 7 Oct 1983

Stall speed: 65 mph IAS

Max speed to date: 195 mph IAS @ 2000' MSL, 2700 rpm, 26.5" H<sub>2</sub>O  
45°F OAT

Handling characteristics: Excellent.

I installed a fixed tab on the left aileron to counteract a slight right wing heavy tendency, but with a 160# pilot this is not required. I weigh 150#. Lateral weight distribution does have an effect as you well know. I have yet to fly with the wing tanks fueled.

I should note here that the pitot/static system is not B/M T-18. The pitot is a Piper blade type mounted under the left wing just inboard of the wing break, and the static consists of a port on each side of the fuselage at approx STA 149. An airspeed check was made along side a Beech Bonanza; at the low end (100 mph) my reading was approx 4-5 mph lower and at the high end (195 mph) my reading was 13-15 mph lower than the Beech. A ground speed check (no wind) was made which verified the lower IAS readings. A trip has been installed just upstream of the static ports and now the airspeed readings seem to be more in the ball park. Stall speed did not change.

In retrospect, I must thank you again for introducing me to Keith Cobb. He did a fine job on the airframe-- no complaints.

HAPPY NEW YEAR!!! Hope to see you at OSH 84.

Sincerely,

*Dan Culhane*

Congratulations, Dan! As you know, I didn't make it to OSH in '84, so didn't get to see the fruitage of your labors. I'll have to admit, too, that it would have pleased me to see a beautiful flying T-18 like yours that once started out on my workbench as some flat sheets of aluminum.

Thanks, too, Dan, for taking the time to send the most excellent loading envelope (note that they show both limit load factors and CG location for pilots weighing 150#, 170#, & 200#, with various combinations of fuel and baggage). We are reproducing these sheets full size, because of their importance. Please retain these sheets for inclusion in your Operation and Safety Manual. Using Dan's graphs, you can construct your own loading graph by simply interpolating the data. Thanks again, Dan. Hope to see you at OSH '85.

(Note the graph pages are not numbered and are at end of NL)

(LETTER FROM RICHARD ORIBE, 5130 E. CHARLESTON BLVD., LAS VEGAS, NV, 89122)  
Since most all are interested in Loran C these days, here's a report:

HI DICK,

I'M SORRY THE FIRST ACCOUNT OF MY TRIP WAS LOST IN THE MAIL, SO HERE GOES AGAIN.

I DEPARTED BISHOP, CALIF AND MADE IT ALL THE WAY TO PIERRE, S.D. THE FIRST DAY WITH FUEL STOPS AT SALT LAKE, AND NEWCASTLE, WY (7 HRS FLYING TIME WITH TAIL WINDS). THE NEXT DAYS FLYING WENT FROM PIERRE TO DALLAS, TEXAS WITH A FUEL STOP AT HUTCHINSON, KAN. I FINALLY GOT TO MEET DICK AND SEE HIS BIRD (AND GOT A CAN OF TOP -- 80 OCTANE WAS HARD TO FIND). FROM DALLAS TO SOMERSET, KY WITH FUEL STOP AT LITTLE ROCK. NEXT DAY -- SOMERSET TO NORTH-CUMBERLAND CO. AIRPORT, PENNSYLVANIA WITH A PIT STOP IN MARYLAND. I SPENT FOUR DAYS VISITING FAMILY AT THE PEAK SEASONAL COLOR CHANGE. THE FALL COLORS REALLY MADE AN IMPRESSION ON ME I'LL NEVER FORGET.

FROM PENNA. SOUTH TO ROCKY MOUNT, N.C. FOR FUEL AND THEN NORTH MYRTLE BEACH, S.C. WITH DETERIORATING WEATHER. GOT OUT OK IN THE MORNING BUT ONLY AS FAR AS SAINT SIMMONS ISLAND, GA. -- SPECIAL VFR (THAT'S WHERE MY LORAN-C REALLY PAID OFF). I SAT IT OUT FOR FOUR DAYS BEFORE HEADING SOUTH AGAIN ALONG THE FLORIDA COASTLINE - THE MOST FUN PART OF THE TRIP THOUGH AT ALTITUDES LOWER THAN ONE IS NORMALLY COMFORTABLE WITH. FORT. PIERCE, FLORIDA FOR FUEL AND THEN EASTBOUND FOR THE GRAND BAHAMA. THAT WAS SPOOKY! I'VE FLOWN ACROSS THE WESTERN SIERRAS MANY TIMES BUT THERE'S SOMETHING ABOUT FLYING OVER WATER THAT'S DIFFERENT. SEVENTY MILES BEACH TO BEACH -- LESS THAN 30 MIN. - THE LONGEST 30 MIN I'VE EVER SPENT. TO MAKE MATTERS WORSE I COULDN'T SEE THE ISLAND BECAUSE OF BUILD-UPS AROUND THEM EVEN THOUGH IT WAS CLEAR OVER THE WATER. MIAMI CENTER WAS WITH ME ALL THE WAY ACROSS, CONFIRMING MY LORAN-C DATA. THE RETURN FLIGHT WASN'T QUITE SO BAD EVEN THOUGH I COULDN'T SEE THE FLORIDA COASTLINE. IT SURE WAS GOOD TO GET TO Ft. pierce again.

THE NEXT DAY SOME HARD FLYING. FT. PIERCE TO PANAMA CITY, FL. TO ALEXANDRIA, LA. TO GRAND PRARIE, TEXAS ( AGAIN 7 HRS FLYING TIME WITH TAIL WINDS). TWO NIGHTS IN FT. WORTH AND THEN THE LONGEST DAY -- GRAND PRARIE TO ROSEWELL, N.M. TO FLAGSTAFF, AZ. TO BISHOP, CA. -- THIS TIME WITH HEAD-WINDS -- 8 1/2 HRS -- MADE POSSIBLE PARTLY WITH TEMPERFOAM SEAT CUSHIONS AND AN INFLATABLE BACK SUPPORT.

A GREAT TRIP! ONLY TROUBLE WAS WATER IN THE STATIC SYSTEM AFTER HEAVY RAIN IN PA. (A GOOD WINTER PROJECT IS TO ADD A DRAIN) AND MY TRANSPONDER WENT OUT ON THE RETURN TRIP.

ALL TOTAL, 44.4 hrs AVERAGING 156 MPH AIRPORT TO AIR-PORT (INCLU CLIMB AND WINDS). MY T-18 WAS BUILT BY RUDY ADLER AND IS POWERED BY A JOHN THORP BUILT O-290-G. I AVERAGED 7 GPH GIVING 22.3 MPG. TOTAL FUEL COST WAS AROUND \$600. NOW THAT'S AFFORDABLE FLYING!

(cont'd)

-2-

MY LORAN-C WAS THE MLX BY SRD LABS IN CALIF. WEST-COAST RECEPTION IS GREAT. JUST SOUTHWEST OF SALT LAKE IT BEGAN TO DETERIORATE. SIXTY MILES EAST I BEGAN TO PICK-UP THE GREAT LAKES STATIONS THOUGH INNACURATE. BY PIERRE, S.D. I WAS STILL 7 MILES OFF (THE MLX ONLY HAS THE SOUTH-ERN FILTERS. THE NEWER L-NAV 25 WHICH I'VE SINCE UPGRADED TO HAS ALL THE FILTERS FOR TOTAL U.S. COVERAGE). BY HUTCHINSEN, KAN. IT WAS RIGHT ON AGAIN. WORKED GREAT IN TEXAS AND ON ACROSS UNTIL MARYLAND AND PA. WHERE IT BECAME UNRELIABLE. NOT UNTIL SOUTH OF RALEIGH, N.C. COULD IT BE COUNTED ON AGAIN -- BUT FROM THERE TO THE GRAND BAHAMA AND AROUND THE GULF STATES IT WAS FLAWLESS (VFR FLAWLESS). JUST WEST OF ROSEWELL, N.M. I LOST IT AND GOT IT BACK JUST EAST OF LAS VEGAS, NEV. FOR WHAT THE UNIT DOES AND ESPECIALLY THE PRICE I WAS REAL SATISFIED WITH IT.

JUST WRITING ABOUT IT MAKES ME WANT TO GO AGAIN. AFTER ALL, I'VE GOT TO TRY OUT THE NEW LORAN-C UP IN THE NORTH-EAST TO SEE HOW THE NEW FILTERS WORK.

THANKS FOR ALL YOUR HELP, DICK! KEEP UP THE GOOD WORK!

SINCERELY,

*Rich Oribe*

Thanks, Rich, for a most interesting travelogue. What a great space ship John Thorp has given us, a solid and dependable air vehicle that can take us just about any place on the face of the globe (not only can, but HAS)!

B.C. Roemer was probably the first to install Loran. They mounted it in the center of the top of the instrument panel, actually cutting out a section of the glare shield above the panel to inset it. I can't seem to find the note they sent me on it, but I do remember that their unit was a very low priced one (under 1K) and that they were delighted with it. I have recently had occasion to use a Micrologic on several flights in a couple of airplanes and I was impressed with its accuracy and usefulness. It basically did everything the quarter-million dollar INS sets we had in the 747s would do, with the exception of a couple of functions, and even those functions would be easy to plug in in future units. It is so very versatile that it could actually be used like a synthetic ILS, by using a pre-selected descent profile from a synthetic X mile DME fix from the runway. (I've done it and it brought me down the centerline of the runway when I raised the hood to visually flare). It certainly would be a really marvelous tool for finding any airport anywhere when the visibility was down. It is possible to pre-program nearly every airport in the U.S. far in advance of flying a trip and if necessary to deviate around wx enroute you just tell it to take you to airport X or Y and it tells you the heading and distance and your Ground Speed. It's a simple matter to get an ETA from those figures. If you are tight on fuel or are having an engine problem it would be a valuable help in decision making.

Someone asked me the other day if I had to make a choice of putting in a Loran C or an artificial horizon in my T-18, which one would I choose? I said the Loran, because the T-18 is very easy to fly on instruments, using only primaries (by a competent inst. pilot, of course) and since I wouldn't deliberately fly IFR, I wouldn't need an artificial horizon. Depends on what drummer you might listen to.

● FOR SALE CORNER:

LYLE FLEMING, 46035 20th St. E, Lancaster, CA, 93535, 805/942-2481 is building his second T-18 and has the following items very reasonably priced: Dynafocal Engine Mount; Gas tank; Fuselage (needs some repair); set of wheels, brakes, & axles; Horizontal tail assembly; Rudder pedal assembly; Lyc. 0-360 A1A disassembled (crank NG). All accessories, mags, recently rebuilt, 800 hrs. since rebuilt (engine).

Frank Lanier, P.O. Box 195, Colorado City, CO, 81019, 303/676-4142. has an engine mount ring horseshoe (flatback) with pilot holes drilled for \$50; dynafocal mount rings that can be used to make up a dynafocal mount for \$75 ea.; a 67-68 prop )SMOH for \$175; a battery box \$20 (35 amp).

Russell Ross, Box 318A, RR#1, Sioux City, IA, 51108, has (all new) Rattray cowl w/gill fairings, prop extension, spinner, two fiberglass seats, and says prices are reasonable.

John Walton, 5726 Boyce Springs Dr., Houston, TX, 77066, 713/440-8093 still has that superbly built std. wing for sale that he removed from his T-18 when he built the folding wing. Someone is really missing the boat on this wing. He's selling it for replacement part cost from KK and someone will get some 1st class craftsmanship for practically free. I've about talked him into building a new fuselage for it and selling a complete air frame unit if someone doesn't buy it soon, so don't delay too long.

Lee Skillman, 6964 Airport Blvd. Apt. 82, Mobile, AL, 36608, 205/342-3967 still has his prize winning bird for sale (as per NL #59) and if you are one that appreciates excellent workmanship, you won't go wrong with his.

PAUL STANLEY, 2012 29th St., Galveston, TX, 77550, writes: "My airplane s/n 671, has been flying over 9 yrs. now, accumulating well over 300 hrs. on a GPU engine burning no-lead auto gas exclusively, with no fuel related problems of any kind. Several years ago a new set of wings were made that are similar to the current folding wings. It has an 8 ft. center section with two 6 ft. outer panels. I made the ailerons 6 ft. long, matching the outer panels. The flaps are about 2 ft. long, matching the center section. This arrangement simplifies the control mechanism with very little change to the flight characteristics. The flap effectiveness is really not very outstanding, as you might expect with only 2 ft on ea. side, but the original wing had no flaps. "

Thanks, Paul, for that brief report. I'd like to hear more details about that wing. Sounds interesting.

TOO LATE TO FINALIZE AT PRESS TIME: We are trying to possibly put together an all T-18 event like we had at Temple, TX last year if there is enough interest. It has been proposed to hold this year's conclave at the Holiday Inn at Sherman, Tx, with daytime activities at Grayson County Airport (formerly Perrin AFB) which has 12,000 runways, a huge ramp, large hangars, several FBOs, etc. Sherman is about 70 mi. north of Dallas on hiway 75 (DAL-TUL) and is adjacent to the huge Lake Texoma. The last week end in Oct. or the 1st week end in Nov. has been proposed. If you are interested in attending plz write me IMMEDIATELY and state your date choice (weekend, not your wife) and if enough commit we'll advise via personal letter or phone. Time is short, so plz don't procrastinate (like I do!)

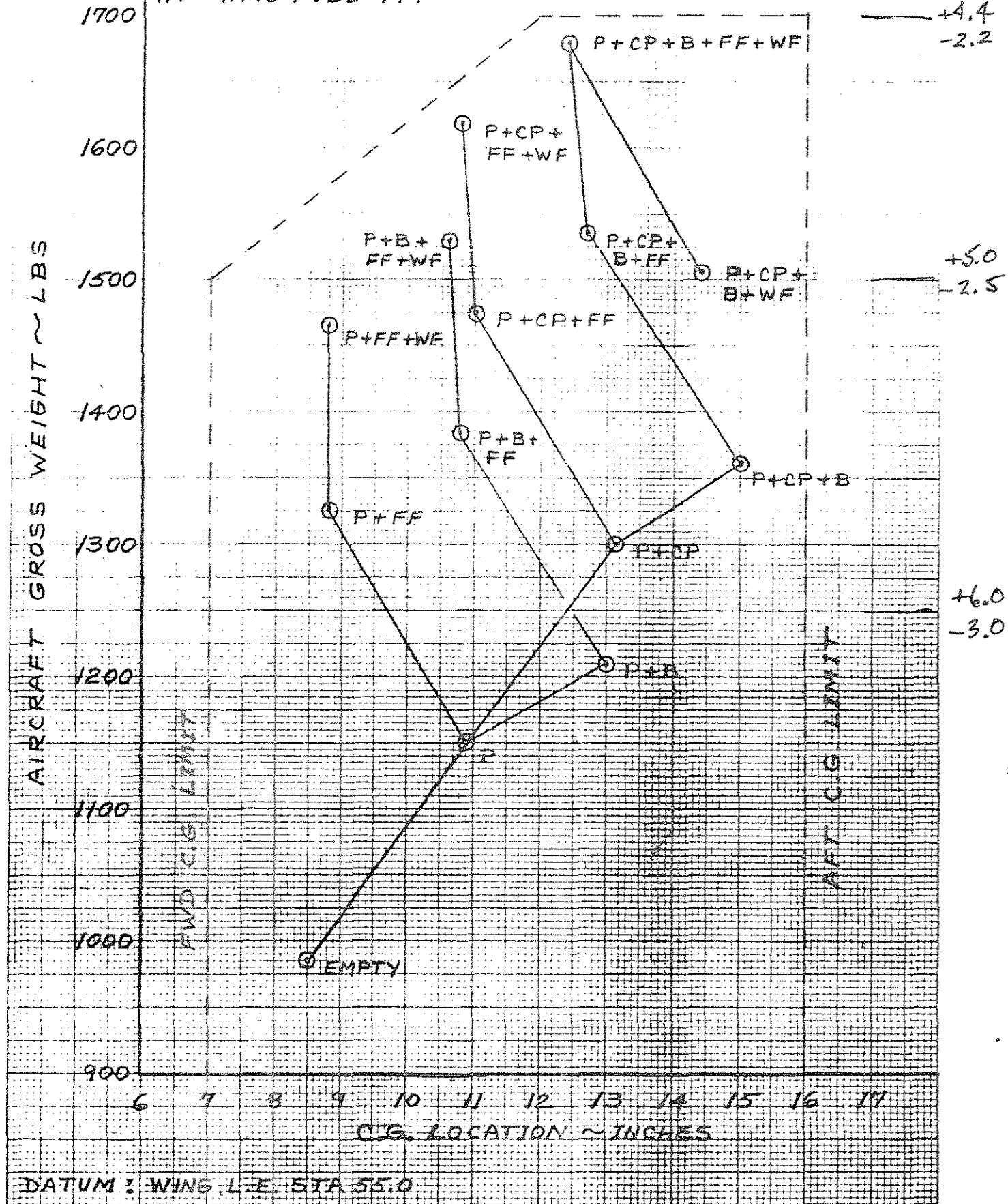
NEWSLETTER #61 will be mailed about Thanksgiving time.

*Sick Carrin*

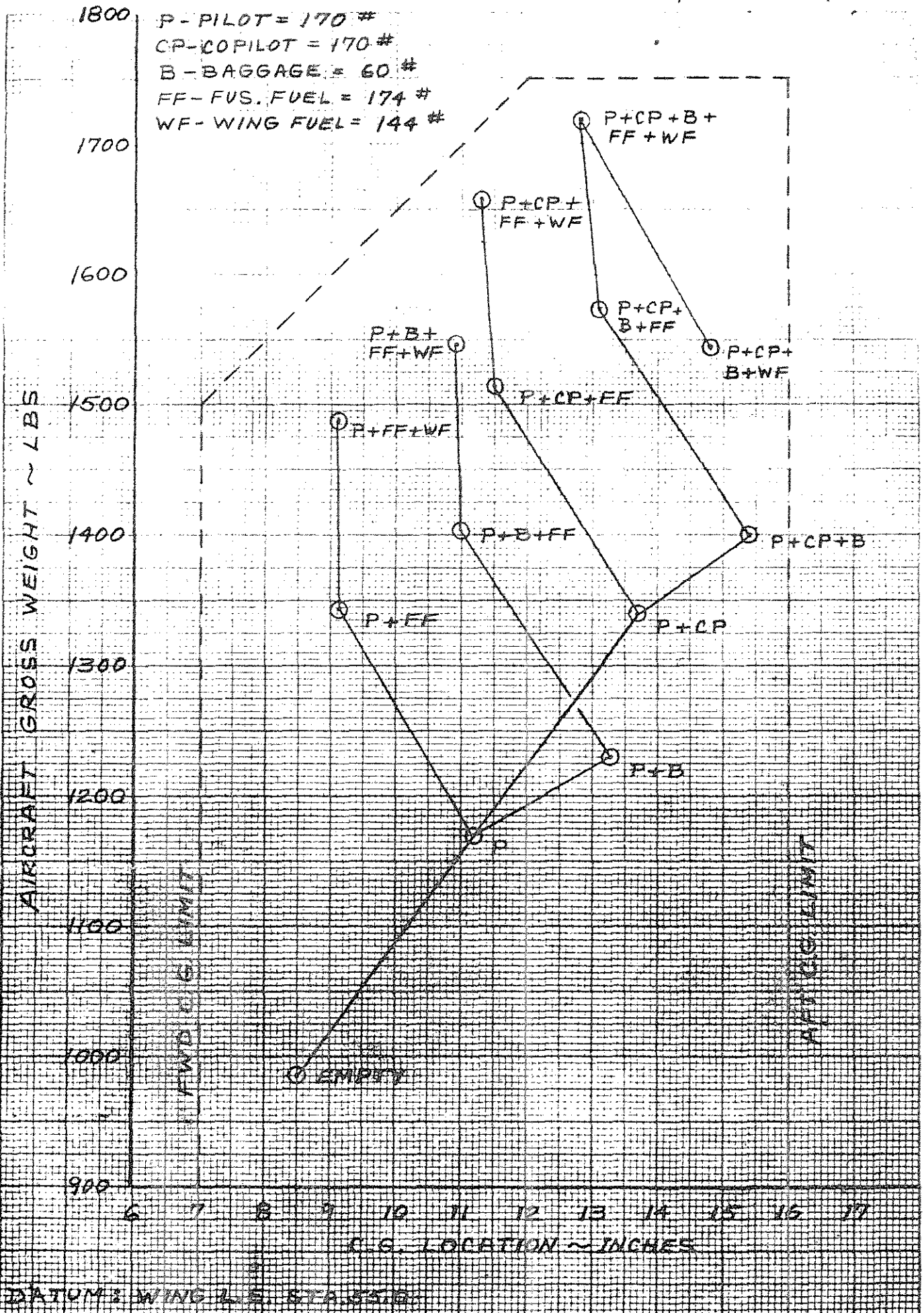
N 76 KC

P - PILOT = 150 #  
 CP - COPILOT = 150 #  
 B - BAGGAGE = 60 #  
 FF - FUS FUEL = 174 #  
 WF - WING FUEL = 144 #

- LIMIT LOAD FACTOR  
 ↓

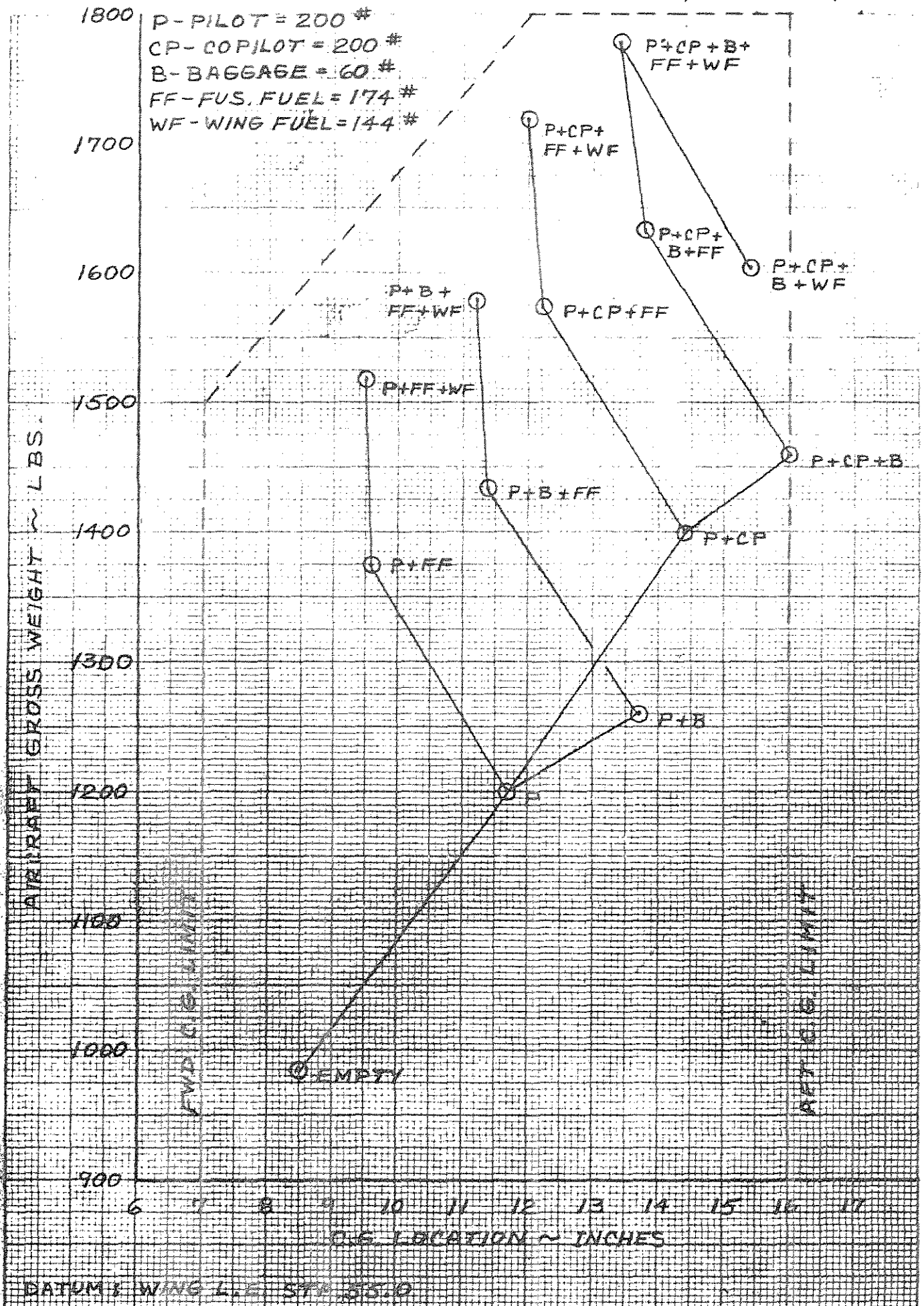


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N 76 KC









Greetings Gents: 1984 is now almost history and of one thing I am certain: There were far fewer hours in the day this last year than in previous ones. That HAS to be the explanation for my lowered production level. Perhaps some of you have also noticed this phenomena? At any rate my intentions to get #61 in the mail by Thanksgiving didn't quite make it. To expedite this issue I'll do it mostly by "paste ups" of letters (typed) from you guys. (I simply trim the letter to fit our page and attach it with paste or transparent tape. We then shoot a photo of it to make the printing plate and if the original typed letter contrasts well it will come out OK. If it doeasn't, we have to type it over...so thank all of you that sent in those typed letters. It makes my job easier). Here's the 1st letter:

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Hello Dick,

Oct 6, 1984

Just got my News Letter, great idea on the radio drawing, here is my \$10.00 dues.

Was good to see you at Kerrville. As I told you then, I would like to have another T-18 get-to-gether, expecially since I was unable to attend the last one. The last weekend in Oct or first weekend in Nov would be fine with me so far as I know. The second or third weekend in Nov would not be any good for me (have to fly).

I had a fuel pump failure on my T-18 about two months ago. Was on a VFR local flight at 12,500 feet, level at the time it went. The engine became very rough and I thought at the time it was going to quit altogether, looked at the fuel pressure gage and it was on the peg at 0. I was able to make the engine (O-320E3D 150 HP Carb) run a lot better by pumping the hand operated primer (3 cylinders). I stayed at that altitude and went back to the field (35 miles) with the engine running quite rough, no primer, full rich mixture. When I came down to lower altitudes (4 or 5 tho) the engine became smoother (slightly rough). I have 500 hours on my airplane and have never had a problem of this sort. I always thought the gravity back up would work better than that. My fuel system is all standard, no aux tank, gravity flow by-pass with check valve, all fully tested on the ground, down to 3 gal in tank, vent faces forward. I went all through the system and found nothing except the bad engine driven pump. The pump did not pump fuel overboard via the dump line. I installed a new pump and everything is back to normal. I have since concluded that when using an engine driven pump and it goes out, the gravity flow will get you to the field, but not all that smooth.

Well enough of that, just thought someone might be interested in that little tid-bit. Hope to see you at Sherman.

Bryant Rowland  
1007 Shell  
Midland, TX, 79705

Best Regards,

*Bryant*  
Bryant

*Thanks, Bryan, for your very professional report.*

Dear Dick,

I am writing this letter in response to your request for information on tailwheels and brakes. Since we have 15 T-18's based here at Torrance (CA) airport, there is much information available.

I have had nothing but bad experience with the Maule Tailwheel, both on my T-18 and my Pitts S-2. The tire does not wear evenly, chunks of rubber tend to come loose, shimmy is commonplace, but worst of all, we have had two T-18's (one of which was mine) break the caster arm on a landing when the tail wheel hit the reflectors in the center of the runway. I had a Scott Tailwheel on my bird for a short period of time, but found that it was very difficult to disengage. I became tired of pushing my airplane around the hangar with the tailwheel sliding sideways, so I took it off and got rid of it. Next, I purchased a Lang Tailwheel from Aircraft Spruce (they manufacture them). I have about 600 hours on this tailwheel with absolutely no problems. It has all the good points of the Scott with none of the bad, and is cheaper. Frank Christen chose the Lang Tailwheel for the Eagle and he has gone first class with everything on the Eagle. One of our T-18 owners recently installed a tailwheel made by Aviation Products, Santa Paula Airport, P.O. Box 857, Santa Paula, CA 93060, Phone: (805) 525-3663, on his T-18. He likes it so far, but has less than 50 hours on it, so the jury is still out. This tailwheel sells for \$84.95 versus \$220.00 for the Lang and \$258.00 for the Scott. Some of our fellows have replaced the wheel on the Maule unit with a Lang wheel. I understand that this necessitates turning a sleeve and shortening the axle, but the people seem happy with the results.

One other point, Dick. I would strongly recommend using compression springs rather than tension springs on the tailwheel. Our Pitts came with tension springs and one recently popped out of the steering arm on a landing. Fortunately, the pilot was on the brakes and recognized the problem.

I have the long Cleveland brake cylinders on my T-18 and am putting them on the one we are presently building. I compensated for their length by raising the location of the hole in the 491-2 mast. In over 1700 hours on my bird, there has been no problem because of the change in geometry. I would strongly urge builders to put brakes on both pilot and co-pilot side. One may say that he is not going to check anyone out, but if the occasion arises it is nice to sit in the right seat with brakes available if the necessity to use them arises. Incidentally, Aircraft Spruce has a diagram in their catalog showing how to install brakes on both sides.

I would strongly urge builders to invest in an Aircraft Spruce catalog. It has many helpful hints for builders, as well as almost anything that goes into a homebuilt. They are available for \$4.00 (refundable with a \$35.00 order) from Aircraft Spruce and Specialty, P.O. Box 424, Fullerton, CA 92632, Phone: (714) 870-7551.

Enclosed you will find a contribution to the newsletter. Keep up the good work, Dick.

EARL ODY  
28903 Gunter rd  
San Pedro, DA, 90732

Your Friend,

*Earl*  
Earl Ody

(Thanks a million,  
Earl. Good info.)  
*Dick*

The following 7 pages of most excellent reporting are from PAUL KIRIK, 2921 28th Ave A, Moline, IL, 61265. I want to give Paul the very highest commendation for his most professional report and would encourage all of you to use it as a model. Such info is invaluable to all. As maintenance Supervisor for the John Deere jet fleet, he is highly qualified on his comments on various airframe inspections. I know all of you join me in expressing our sincerest appreciation to Paul. Thank you, my friend!

15 October 1984

Mr. Dick Cavin  
T-18 Builders & Owners Association  
10529 Somerton  
Dallas, Texas 75229

Hi Dick,

Sorry I took so long in writing you, but here's the information on my T-18 N11PK s/n 549.

Engine and Prop-Lycoming O-320-A2B 150 HP with Cassidy Pacesetter 200, 68-66 Prop. Aircraft has F.G.P., KX 175 with VOR, KX 145 with VOR & KT78TXP. Intercom & Brittan wing leveler.

Electric flaps and electric pitch trim per Bob Dial's drawings.

#### Weight & Balance

Empty Weight 892 lbs.  
Gross Weight 1510 lbs.  
Empty Weight C.G. 63.10 in.  
Fwd C.G. (figured with full fuel & 150 lb pilot) 63.54 in.  
Aft. C.G. (1 gal. fuel 180 lb. pilot & pass. 65 lbs. baggage) 70.90 in.

First flight was February 25, 1984 at MLI and except for a lean running engine, it was a perfect flight (I didn't even bounce the landing). I had installed a M-S MA4-SPA p/n 10-5062 carb. (Lycoming told me it was ok for an O-320-A2B), but it ran very lean on initial climb out with high cylinder head & exhaust gas temperatures. I pulled the power back and cruise climbed at about 125 MPH & temps came back into the green arcs. I had to change the carb. to a p/n 10-3678-32 & now have no problems. I have a George Leider carb. air box.

The aircraft flew hands off in cruise with a very slight left wing heavy condition. However, on a later flight with 170 lbs. of sand bags in right seat, it was slightly right wing heavy. A very sensitive machine on the roll axis.

Needless to say I was very elated with the first flight performance of N11PK. It was more exciting than my first solo!

I now have about 86 hours on it and have not had any other problems.

My first flight was video taped in its entirety, with sound, by Ken Rhoads of Peoria. I was talking to them on the ground. W've watched that tape at least 50 times.

Two areas of flight testing my aircraft were approached very cautiously, (1) Flap extension speeds & (2) Stalls.

My flaps are limited to 30° travel, but after reading & hearing so much about the tendency to tuck under, I addressed this testing on my first flight. I have electric flaps, so I marked 10°, 20° & 30° increments on the outboard edge of the left flap so the readings can be seen at the trailing edge wing shin.

I slowed to 90 MPH & extended 10° of flap & found no roll or tuck tendency. I increased speed slowly to 110 MPH, then to 115 MPH. This was also repeated at the 20° & 30° flap settings. At 30° extension a pronounced nose down attitude would occur, but no tendency to tuck under or "stick shake", There was adequate trim to slow aircraft to 75 MPH & probably more.

The flaps were again extended at 110 MPH at each setting.

I realized that someone may extend the flaps inadvertently above 110 MPH, so I increased airspeed to 120 with full flaps, retracted & then re-extended the flaps. There was no tendency to tuck under. I am considering adding 10° more flap & repeating the same procedure.

The initial stall series was also of concern to me. I have flown about 7 different T-18s & found only 2 or 3 of them to have adequate stall warning. Some had very nasty "snap" tendencies without any warning.

I jigged my wings prior to riveting & knew they were free of any measurable twist, so I expected a straight forward stall. I also wanted to have the pre-stall buffet.

I taped a stall strip to each inboard wing per Lu Sunderland's "Tuft Testing" article in Sport Aviation. The strips were about 1/8" above chord line.

The first stall was power off, flaps up with the aircraft beginning to rumble at about 75 MPH. Controls got soft at about 70 MPH with airframe buffet & it stalled at about 65-67 indicated with just a bit left wing drop, with good aileron control.

I lowered the left stall strip about 1/32" & raised the right about the same. The next stall was just the reverse - right wing dropped slightly. Moving the right stall strip back to original position gives straight ahead stall.

I am very pleased with the pre-stall warning. Mr. Don Barrier from Peoria, Illinois, a long time airline pilot who flies aerobatics on weekends, flew with me & said you would have to be asleep or drunk to get into trouble with this aircraft. I highly recommend stall strips.

A stall with full flaps power off was the next step & what a step! I eased into the stall nose high & the aircraft broke straight ahead at 58 MPH but pitched straight down or even seemed to whip past vertical. I thought my seat belt was tight but my head hit the canopy. The aircraft built up speed rapidly but recovery was completed below max flap speed. I had full fuel & just me on board (170 lbs.). I lost over 200 ft. of altitude.

Subsequent testing with 170 lbs. of sand bags in the right seat & full to half fuel showed no such pitching tendency.

Does anyone else have this situation with a forward C.G.?

All of my C.G. excursion testing was done with sand bag ballast rather than human ballast, even though I had lots of volunteers.

My son, Steven, who helped me build this aircraft over a 6 yr. period, was really chomping at the bit over that program.

Steve is a private pilot with about 70 hrs. total time. He has about 15 hrs. left seat time in N11PK now, & his instructor said he will solo him shortly in it.

My airspeeds are as follows:

|                             |                     |
|-----------------------------|---------------------|
| Stall-full flaps            | 58 MPH              |
| Stall flaps up              | 66 MPH              |
| Cruise - 2450 RPM 4,500 ft. | 162 MPH - Indicated |
| Top Speed 2,500 ft.         | 190 MPH - Indicated |

My cruise speed was about 10 MPH slower than that before gear leg fairings were installed. I could hardly believe the difference. Wheel pants were installed before the first flight. Get those leg fairings installed!

I have a Piper blade type pitot tube installed just forward of the front spar on the gap strip of the left wing.

My static system is per Howard Henderson on the fuselage sides. My air-speed indicator is a calibrated instrument & system checks to be very accurate.

The T-18 is by far the finest piston powered aircraft I have ever flown!

I experienced an odd occurrence after installation of leg fairings. I ran out of nose down trim with aft. C.G. loading & this had never occurred before.

I suspect that the gear legs were of such a drag component that they pitched the aircraft downward? Streamlining them reduced this drag to a point (10 MPH cruise increase) that more fwd. trim was needed? I guess I will have to bend the tab arms for more fwd. trim. Anyone have any other ideas?

The question of relocating the fuel shutoff valve keeps reappearing, so here are my comments.

I am only aware of one fuel tank cracking around the welded outlet boss. This was mentioned in a very early news letter. I have examined numerous T-18s for fuel line installation & have found many of them with an aluminum or copper line from the tank-mounted shutoff valve to the firewall. These aircraft had anywhere from 150-800 hrs. on them & none have shown any cracking around the bottom of the tanks.

In the event of an accident, it seems to me that the safest place for this valve is tank mounted & not remotely mounted where a rubber hose could be torn loose. I highly recommend that a flexible rubber supply hose be installed between the shutoff valve & firewall, to allow for flexing between these points.

I also noticed that many of these aircraft do not have a remote shutoff handle for the tank mounted valve. How do you shut that valve in an emergency wearing a shoulder harness? The handle should be remotod. I installed my handle on the instrument panel just below the throttle using a 1/4" aluminum tube. It works great doesn't put a heavy load on the fuel tank & is very accessable.

I have annualled several local T-18s & have talked the owners of these aircraft into doing these mods.

Getting someone knowledgeable on T-18 structure to inspect your aircraft prior to first flight or before you buy a used T-18, is highly recommended. I have found the following doing this type of inspection:

1. No jam nuts on aileron stop bolts.
2. 3 out of 7 rivets missing on each inboard wing, inboard center rib that attaches it to the main spar.
3. 4 non structural screws used in right outboard wing attach fittings instead of structural bolts.
4. No rivets in bottom flange of aft. tunnel to attach it to belly skin, 16 required.
5. Ailerons travel only 20° up & 8° down.
6. 1/8" vertical play in rudder.
7. Aileron push rods cutting into wing ribs.
8. Seat belts attached to fuselage structure with 1/16" bent up aluminum clips.
9. Severe interference in aft. tunnel between rudder cables, trim drive tube, flap handle, flap cables & elevator push pull tube.

10. Unvented battery box.
11. All rivets missing from vertical stabilizer aft. spar doublers except where riveted to fin skin.
12. Rivets missing from inboard & outboard aileron ribs that attach stiffener for counterweight arm & control horn to rib.
13. Rib missing from fiberglass wing tips just outboard of aileron.
14. Aluminum fuel line from tank valve to firewall putting full valve in heavy bind. Enough Said?

I have taken pains to sound proof the cockpit & seal the canopy. People who have flown in my aircraft tell me it is the quietest single engine they have been in. I also have exhaust mufflers.

One of the problem areas in sealing the canopy was the forward track area. I found the solution to be installing a rubber seal from a Cessna Citation Jet main gear door. (see attached sketch). It works very well. It is attached to the bottom of the canopy frame by drilling the frame, inserting the rubber tips & pop riveting it to the frame at the front edge.

I have the Ken Knowles brake master cylinders on the left side of my aircraft & Gerdes cylinders on the right. They are connected with 3/16" Nyloflow high press. tubing & "Swage Lock" fittings to the firewall & 3/16" aluminum tubing from there to the Cleveland brakes. This system works great. I have over applied my brakes & brought the tail off the ground during taxi testing.

I strongly recommend that anyone building a T-18, without prior experience in this type of aircraft, install dual brakes. You will really need them before your instructor turns you loose.

I have a Lang tail wheel, full-swivel type, on my T-18 & do not have any directional control problems. My son Steven did not fly a taildragger before getting into a T-18 & has not had any trouble with directional control. I use the 2 piece compression springs from Ken Knowles on the tail wheel, compressed about 1/3 travel when setting on the ground. I have set my main wheels to  $\frac{1}{2}^{\circ}$  toe out & aircraft is very stable.

My electric trim motor is the Camaro headlight motor used on many T-18s. It seems to be a bit slow, 17-18 sec. I would like to see about 10-12 sec. Does anyone know if this can be done?

I have also enclosed a copy of my Weight & Balance numbers & loading schedule.

Many thanks again, Dick, for all the untiring effort you have put into the T-18 program & the support you have given me during the construction & test flying of N11PK.

Sincerely,



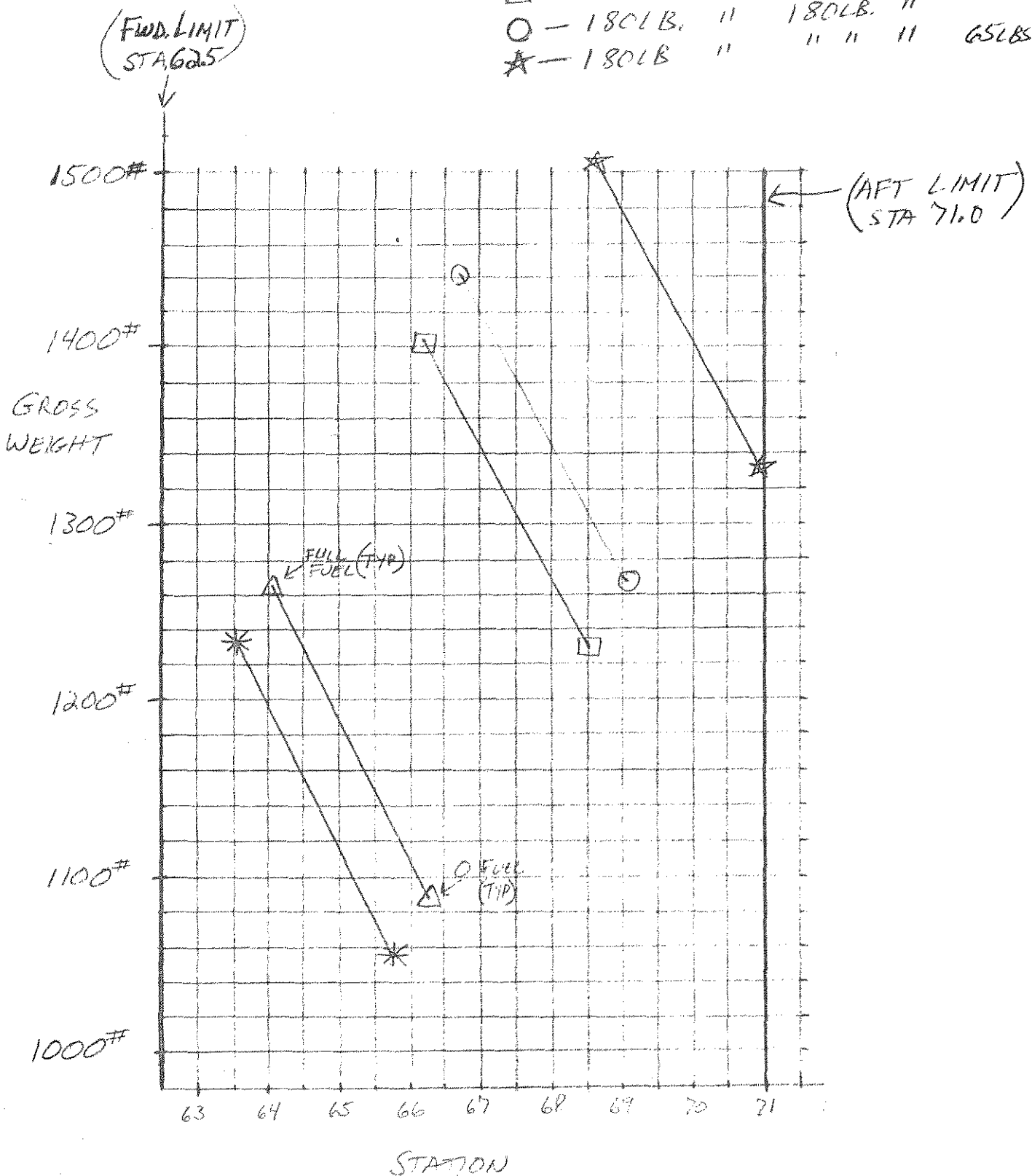
Paul J. Kirik



# T-18 NIIPK S/N 549

## C.G. RANGE.

- \* - 150 LB. PILOT NO PASS. NO BAG.
- △ - 180 LB " " " " "
- - 180 LB. " 140 LB PASS.
- - 180 LB. " 180 LB. "
- ★ - 180 LB " " " " 65 LB. BAG.

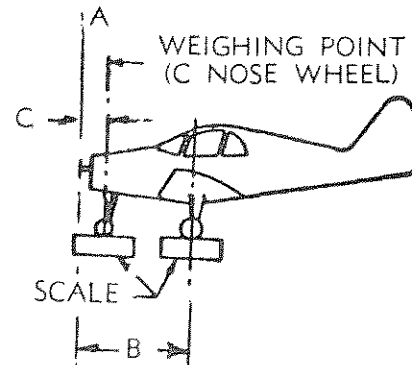
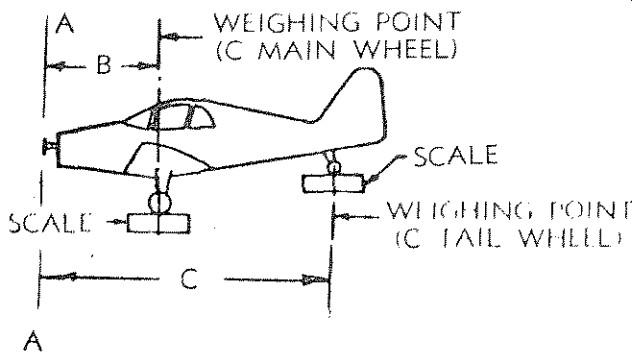


## WEIGHT AND BALANCE FORM

Owner's Name .....

Aircraft N 11PK Date 9-27-83

Address .....

THORP T-18

A—Datum for Horizontal Arm as defined by designer or builder

B—Arm: Main Wheel Centerline in inches

C—Arm: Auxiliary Wheel Centerline in inches

| Item            | Scale | Tare | Lbs.<br>Net | Inches<br>Arm | In. Lbs.<br>Moment |
|-----------------|-------|------|-------------|---------------|--------------------|
| Left Wheel      | 423   | —    | 423         | 54.595        | 23,093.69          |
| Right Wheel     | 418.5 | —    | 418.5       | 54.595        | 22,840.00          |
| Auxiliary Wheel | 47.5  | —    | 47.5        | 213.780       | 10,154.55          |
| Less Oil        |       |      |             |               |                    |
| Fixed Ballast   |       |      |             |               |                    |

Empty Weight Total Moment... 56,096.24 in. lbs.Empty C.G. =  $\frac{\text{Total Moment}}{\text{Empty Weight}} = \frac{56,096.24}{889} = 63.10$  inchesSEE OTHER SIDE FOR ADJUSTED EMPTY WEIGHT 892.0 LBS.  
FORWARD AND REARWARD CG EXTREMES

| Item        | Weight | Arm   | Moment    | Weight | Arm   | Moment    |
|-------------|--------|-------|-----------|--------|-------|-----------|
| Aircraft EW | 892.0  | 63.09 | 56,276.24 | 892.0  | 63.09 | 56,276.24 |
| Oil         | 15.0   | 28.0  | 420.0     | 15.0   | 28.0  | 420.0     |
| Pilot       | 150.0  | 85.5  | 12,825.0  | 180.0  | 85.5  | 15,390.0  |
| Passenger   | —      | —     | —         | 180.0  | 85.5  | 15,390.0  |
| Fuel        | 174.0  | 50.0  | 8,700.0   | 6.0    | 50.0  | 300.0     |
| Baggage     | —      | —     | —         | 65.0   | 109.0 | 7,085.0   |
| Totals      | 1231.0 | 63.51 | 78,221.24 | 1338.0 | 70.90 | 94,861.24 |

Forward CG 1 — 63.51 in.Rearward CG 1 — 70.90 in.Maximum allowable weight is: 1510 lbs. CG limits are62.5 in. Forward CG, and 71.0 in. Rearward CG

Equipment installed when weighed is as described in Aircraft Manual, Equipment List dated .....

....., except for the following items.

| Item | Inches<br>Arm | Lbs.<br>Wt. | In. Lbs.<br>Moment |
|------|---------------|-------------|--------------------|
|------|---------------|-------------|--------------------|

WELDING ALUMINUM: I recently received the following letter from old friend, LLOYD TOLL, that many of you know personally or by reputation:

"Hello Dick-Enclosed is my dues for '84-85 MAS. Hope I can win that Narco. We T-18 builders who have contributed so little have rec'd so much. I will forever be grateful to you, Lu, and others, who have done so much.

Many skills and much knowledge is required of an individual to properly build an airplane such as the T-18. Very, very few of us are absolute professionals in ALL of the required technical skills needed.

Lu mentions in N.L.#60 that someone stated that aluminum was easy to weld and he said, "Don't believe it". Well, you know anything is easy if you know how. It can also be very hard if you are not experienced and are not completely knowledgeable about what you are doing.

After more than 50 years of experience in welding in 4 different aircraft factories (14 years at Douglas and Northrop) and having been certified in every method, on every metal that is used in the aircraft industry, I say that aluminum welding is the easiest of all.

Here are some of the things that I disagreed with Lu on in his article, "Welding canopy frames":

First, aluminum welding and aluminum brazing are two completely different things. Hydrogen is the best by far over acetylene....but not for the reason that it has a lower temperature. You can get a piece of steel plenty hot enough to braze with oxy-hyd, but there is no way that it will adhere to or flow on the steel. When using oxy-hyd on alum you get a beautiful controllable flow in the molten puddle....But with using oxy-acet the molten puddle is much less fluid and it has an oxide film over the top of the puddle that makes it very hard to control. This tells me that there is some sort of chemical reaction causing the difference. I cannot, and no one else can do high quality alum welding with oxy-acet that he can do with oxy-hyd.

To my knowledge there is no accepted method yet devised to fusion-weld alum alloy 2024, primarily because of crack sensitivity and loss of other mechanical properties. This is why John Thorp specified the T-18 gas tank be made of 6061-T4 (35,000 psi) instead of 2024-T3 (65,000 psi). Let's hope that no one ever builds himself a T-18 tank using 2024.

Dick, I cannot explain the chemical reaction that takes place, but I want to give you another example: In the factory we used a hydrogen burner we had to pre-heat certain weldments. It was also used to keep scale (which is oxidation) from forming on the opposite side of the piece you were welding. You could weld on the outside of a tube and with a small hyd flame inside absolutely no scale or oxidation would occur inside.

I had a bottle of butane here once and used it to keep the inside of a tube clean on which I was welding. After it had cooled properly I tried drilling the hole larger. It was as hard as glass. You could cut it with a diamond bit, but this was 4130 steel. Running out of paper, so Good luck and Good health, old buddy... LLOYD.

Well, LLOYD hit the nail on the head several times in his letter. I stand in awe of his expertise in welding. When watching him alum weld I always think back to when I was at Luscombe in '37 and just after being certified to weld alum I offered to weld a tiny leak in a radiator tube for a friend's OX-5 Waco. My face was deep red when I burned a big hole in the tube and had to get my instructor to repair my work. After a few more such experiences I decided to leave alum welding to the pros. (The following pages from a welder's journal were sent to me by another builder and I think you will agree are quite a tribute to LLOYD. We are most lucky to have experts like LLOYD in our midst). We truly appreciate your many contributions to EAA and to our newsletter, LLOYD.

## Meredith TIG Torch donated to the Miller welding collection

The following report written by Jim Grist, Miller Vice President-Research, is the culmination of a chain-of-events beginning with Jim's enthusiasm for aircraft and his attendance at the EAA Convention. This event is an annual fly-in and air show sponsored by the Experimental Aircraft Association at Oshkosh, Wisconsin. There, Jim met Lloyd Toll, official welder of the EAA. Mr. Toll, also an aircraft enthusiast, turns out to be a many faceted individual with an interesting background and colorful personality. He flies a plane which he personally built, operates a welding school in his hometown of Hazen, Arkansas and was a member of Mr. Russell Meredith's team at Northrup Aircraft Co., Downey, California. Mr. Meredith, as you will remember, originated the TIG (GTAW) welding process with the development of his Meredith TIG torch. The Meredith torch and a series of collets can be viewed at the Miller Customer Center in Appleton, where it is on permanent display. Here is Jim's account.

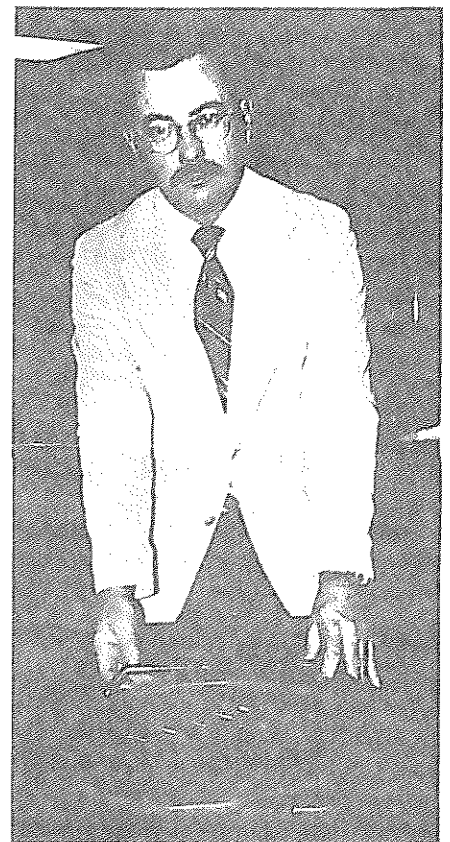
At the Experimental Aircraft Association Convention at Oshkosh, Wisconsin, some of the more popular stars were performing aerobatic gyrations in the sky, trailing plumes of smoke through wild loops, rolls and hammerhead stalls in home-built airplanes they had constructed in their basements. During the six-day aerial extravaganza, more than 500,000 visitors watched as tiny biplanes and giant warbirds cavorted against a backdrop of blue with scattered white cumulus. I watched a lumbering 450 horsepower Stearman, blatting its way down the runway at an 80 db noise level, gaining just enough



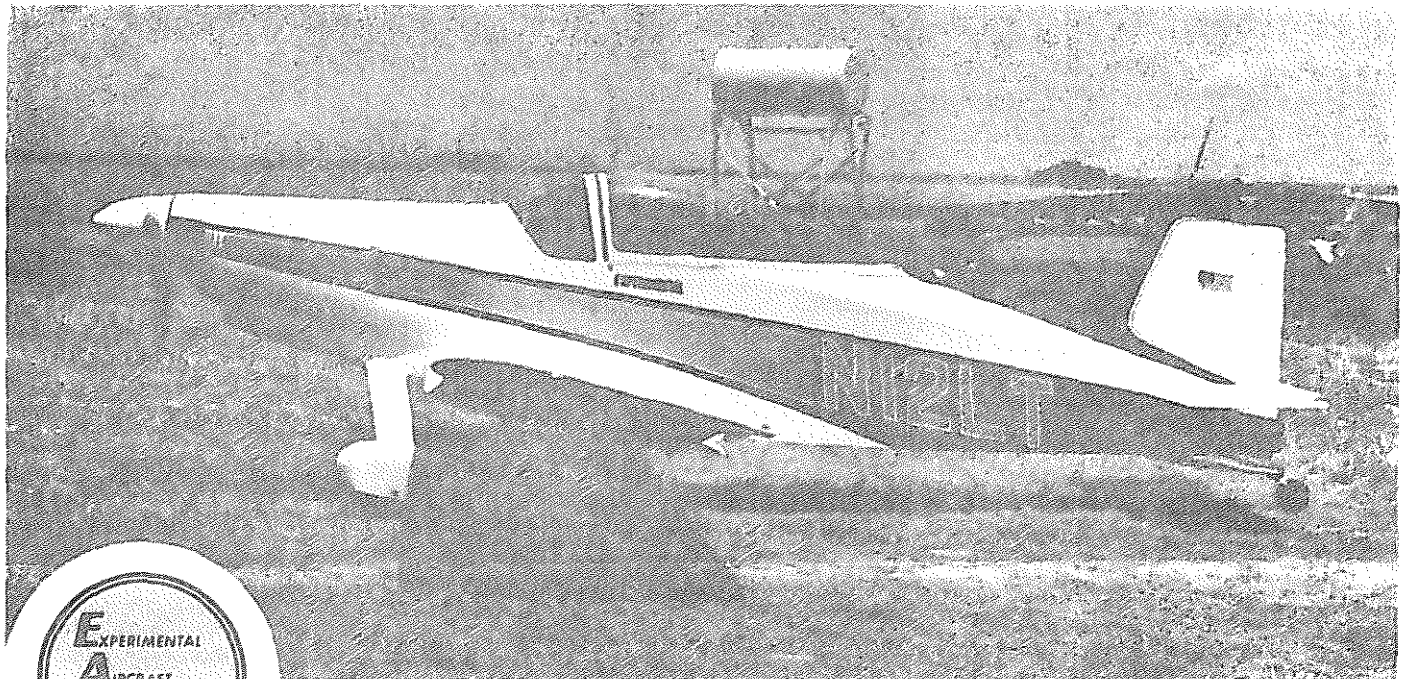
*Lloyd Toll (left), pictured with Jim Grist. In the background is a Miller Syncrowave 300, the unit Mr. Toll uses for his present-day projects.*

altitude to do an axial roll on takeoff. Smoke billowed from his exhaust and the crowd gasped as the pilot flirted with disaster in low level antics.

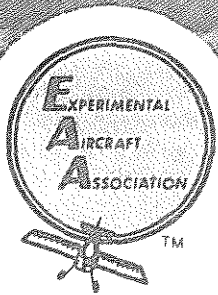
Meanwhile, back of the crowd, in a tent labeled "Welding," another star was performing. He caused only occasional whiffs of smoke, and rather than a crash helmet, he wore a welding helmet. Behind that helmet and inside that massive 200 pound plus frame, I found Lloyd C. Toll. He snuffed out the arc and lifted his helmet and you could tell immediately that he was an old timer in the business. I then watched and listened as he explained to the assembled group just how he manipulated the torch and the filler metal to come up with the beautiful welding beads which are characteristic of his work. Lloyd is considered one of the premium welding authorities in the EAA membership. Each summer he travels from his home in Hazen, Arkansas to Oshkosh for several weeks of preparation and demonstration at the EAA Convention. He'll do maintenance welding, repairs, etc. on the dozens of vehicles, implements and equipment which the EAA owns and operates in the business of putting on their annual convention. Then during the show he gives hands-on demonstrations for the assembled aircraft builders. A



*Bill Butler, a Technical Sales Representative, doubles as curator of the Miller historical welding equipment collection. Here Bill displays the early Meredith TIG torch and five assorted collets.*



Lloyd Toll's "experimental aircraft," a plane which he personally built and flies between his home in Hazen, Arkansas and the EAA Aviation Center at Oshkosh, Wisconsin.



master of both TIG (GTAW) and oxy-acetylene, Lloyd has been welding a long, long time.

**Q: How long, I asked him... and where did he start?**

**A:** "My dad was a rice farmer in Arkansas. In 1928, when I finished high school in Little Rock, I saw an ad in the Gazette about an electric course at the Commander Aircraft Company. They built about 700 airplanes beginning in 1928 before they went broke during the depression. They were advertising an electric course where you paid them \$15.00 and you went down each night and listened to a department head. Then you could decide what department you might want to work in. Well, this friend of mine and I said, 'Everyone wants to be an engine mechanic... or something like it... let's be different, let's be welders.' I said, 'Fine, we'll do it,' and that's where it all started, right there. So I've been a welder for about 32 years now."

**Q: What kind of welding was it in those days?**

**A:** "In the early days it was a lot of gas welding with acetylene. Commander Aircraft had about 700 people working there, and do you know I can hardly believe it, but in the beginning there wasn't one electric arc welding machine in that factory. Isn't that amazing... the

advancement that has been made since then? A big factory like that with no arc welders. Now every farmer, well practically every farmer, has an electric welding machine. But right there was a factory with 700 people and they didn't have a single one. Well that didn't last long. We got them into electric welding alright.

"Anyway, that job got me interested in airplanes and I've been nuts about them ever since. I was about eight years old in 1919 during WW I and airplanes were really fascinating to me and I still like flying them. I've been flying for 51 years now."

"The first time I heard about EAA was in 1965 at Rockford, Illinois. Here were all these guys assembled who had built their own airplanes and were flying around. In fact, a Don Taylor of California had built what is known as a Thorp T-18 model and flown it around the world. It's a pretty sophisticated little aircraft. So I built one of these nine years ago and I flew it to Oshkosh for three years, 1972, '73 and '74. The first year I won "Best in Class" and the second year I won "Best All-Metal Workmanship." I still fly it... I love to fly."

I learned later from Lloyd that he had worked at Northrup Aviation in Downey, California as a welding tech-

nician. His group leader was Russ Meredith, the inventor of the TIG (GTAW) welding process - often referred to as heliarc welding.

**Q: Then you were there when TIG was invented?**

**A:** "Yes, we had three technicians. John K. Northrup felt that magnesium was going to be the coming metal of the future for the aircraft industry. It was light and it was strong. We were told that magnesium was one of the most plentiful elements on earth and that there would be plenty of it. He wanted to develop a way to weld it. He couldn't do it with acetylene, it would catch on fire and burn. It burns real hot. So that's where they got the idea that they would do it with some kind of an inert gas in an arc.

"Well, Russ Meredith, he was the engineer there, got the project going and he developed the TIG torch and the process. As it turned out later, it isn't used nearly as much for magnesium as it is for aluminum, stainless steel, titanium and steel and a lot of other metals. Magnesium just never made it big in the aircraft business as they first expected it would."

**Q: So you were the first person then to actually weld with a TIG torch?**

**A:** "Well, there were two other fellows there with me, we kind of alternated,



but I was one of the first."

Later I learned that that first model torch built in their lab had been given to Lloyd as a keepsake when he left Northrup. Furthermore, I found that he still had it tucked away in his shop, preserved for prosperity. He doesn't use it of course, he has a Syncrowave 300 now, and a modern torch. We prevailed upon him to consider donating it to the Miller collection of welding artifacts so that it could be put on permanent display at the Miller plant. He eventually agreed and it has been refurbished to its original condition and placed on display.

"It was a little crude of course, but it worked. We used a hospital regulator for the gas... and DC current, straight DC. We'd weld magnesium with DC and helium, there was no argon at the time. We didn't have high frequency start either, you just had to scratch it a little and it would start. For awhile we used carbon electrodes, about 3/16" diameter black carbon rod. You had to sharpen it a little like sharpening a pencil. You had to sharpen it often because it wore down so fast. It wasn't very practical. Then tungsten electrodes became available.

"Well, from there it just took off and TIG welding was used to build lots and lots of parts for aircraft during that War.

"I remember us building a thing they called the Ram jet, not referring to the

engine on it, but to the type of aircraft. It had four wheels, it was made almost completely out of magnesium, two wings made in halves and all welded and bolted together and they were the fuel tanks too. The pilot laid down in it because there was so little room between these two jets. It had three inches of solid steel on the leading edge of the wing and no armament. It was supposed to fly into enemy aircraft and just chop their tail off.

"The test pilot was Ray Crosby and I knew him well. We used to kid him about the time they made the plaster mold for him to lay in to fit his body, his chin and all. It was like a custom fit coffin. Well, sure enough, on his third flight he tried to eject and didn't make it. His chute didn't open.

"They also built the P-61 Black Widow night fighter there. It went into production and a lot of them were made. One thing they were used for was against the buzz bombs going over England. They'd fly up along side one of those things and hit it with their wing and just tilt it a little and throw it off course. They really stopped a lot of them like that.

"Today they don't use nearly as much magnesium. They had numerous crack problems, structural failures and things like that."

**Q: So that was your introduction into the airplane business, and**

**you've been building and flying ever since?**

A: "Oh yes, I fly all over. One Sunday, years ago, I was flying with my young son (he's 42 now) in southern California. I noticed a lot of aircraft down around the harbor. I thought to myself, I wonder what's going on down there. So we flew over to the harbor and just as we arrived at about 2,000 feet of altitude, I saw that big "Spruce Goose" making its first flight with Howard Hughes at the controls. There I was, right overhead and no camera. At the time I didn't grasp the significance of the event, but I do now."

Well, Lloyd looks back now on a full, rich life of welding and flying.

The EAA is building a new aviation center at the Oshkosh, Wisconsin convention site which will be filled with aircraft of all vintages. Lloyd is being called upon to execute his "miracle" welds on various restoration projects for this and other EAA endeavors. He also teaches, — runs a school for weldors in the Arkansas area. A busy guy, a skilled craftsman, and always ready, willing and able to talk about welding up a fuselage, or an engine mount, or a set of tail-feathers, a busted landing gear, bellcrank, wing strut, rudder horn, tailwheel and on and on and on.

*A small section of parked "fly-ins" during the EAA convention.*



"  
FUEL INJECTION INSTALLATION ON A T-18:

by... N110AT  
O. A. TOKLE  
Reno, NV.

Dear Dick (Mr. T-18):

Hopefully the following information about my fuel injected 180 Lycoming will be of help to your readers who might be considering a similiar installation. In all the years since completing the installation, my engine has performed beautifully.

The first article and pictures, about my engine, "Thorp T-18, Fuel Injection System"; was written up in the December, 1975 issue of Sport Aviation.

Thanks not only to his one biting comment, "You don't want a 1929 carburetor system on that modern sophisticated aircraft!", but more importantly the continued encouragement from Joe Pass, of Redwood Aviation in Santa Rosa, California; I decided (as they say in the current vernacular), to "Go for it!" and convert to injection.

To begin with, I traded my new O-360 carb, oil pan, intakes and etc. for the Servo, pan, fuel lines and etc from a wrecked IO-360. These were sent out and returned as new.

The IO-360 pan was installed only to find some real problems. An unwanted modification to the dynafocal mount, required since the Servo would go right thru the X-member and after other mods the fine all-metal Roberts cowl would not have fit over the stainless X-over exhaust and intakes.

Needless to say the O-360 pan was re-installed. Disappointed, yet determined to have an injection system, I sat under the engine for a couple of days trying to figure how.

Knowing how successful Piper had been with their light twins, using tight cowls, bringing induction air over the top of the cylinders, down the back and into the Servo, it was simply a matter of how to look back from under the carb pan for the servo attachment.

Hours were spent looking for a tight (close) weldable el. Finally in an old plumbing shop, the 80 year old owner took me back thru piles of debris and went right to a box that contained exactly what I needed. He generously demanded a grand sum of \$2.00.

The 'el' has 1/4" walls with a 45 at both ends. Two <sup>FLANGES</sup> were cut from 1/4" 4130 steel. The four bolt holes were properly drilled in each. The flanges were put on my lathe and opened up with 45 chamfers to mate with the el. A few spots of epoxy held the three parts, properly aligned, until they were heliarc'd by the towns best. This Weldable El was the key to the conversion.

To have the servo clear the pan and also for control hookup, a spacer, available from Lycoming, was used to move it back the right amount. One end of the spacer was milled with a few degree offset for an additional clearance. To the back of the Servo an Induction Air Box was fabricated from .025 2024 to mate the 3" air hose from an air filter. The air induction box has a spring loaded-closed, flapper valve, designed into the bottom, for alternate air in the unlikely event that one would loose normal air. The filter is mounted behind and below the left cylinders. I cut the parts and had them welded for me. The filter takes a standard Fram.

The initial test hop was flown, somewhat reluctantly, with the Weldon electric on continuous, due to insufficient pressure from the mechanical pump. I immediately replaced this pump with a high pressure (22-26 psi) mechanical pump required by an injected engine. The Weldon is used as a backup for pressure loss and during takeoff and landing.

Enclosed are some pictures that should be of help. I wish I had the one that shows the el, spacer and air box when I converted my O-360 to fuel injection.

The stainless steel 601 fuel lines, shown in the pictures, were replaced with aeroquip 303. Don't use the pretty stainless as before long they can become a sieve. Noting the location of the gascolator and the Weldon pump in relation to the exhaust stacks--stainless heat shields were placed inboard on the stacks.

With a tight cowl and baffling system there is an abundance of air for: Induction air, Engine cooling, and cooling for the Oil, Fuel Pump and Mags. Cowl pressure can run into the 7 psi range.

Dick, I hope this is helpful. All present T-18 drivers and those to be, would do well to re-read a lot of the fine tips from your last book of knowledge. I really liked your tip on the simple task of proper engine runup before takeoff.

*Oats*

Oats Tokle  
N110AT

Many, many thanks, OATS, for that most helpful solution to a knotty problem several builders have had to address. Thanks, too, for the kind words.



(see lower part of page 17 for further info from  
OATS TOKLE)

112 Station Ave.  
North Hills. Pa.  
19038

October 15, 1984

Mr. Dick Cavin  
T-18 Mutual Aid Society  
10529 Somerton  
Dallas, Texas  
75229

Hi Dick.

Glad to hear that you're feeling better. You missed a great OSH.

In the last news letter you asked about wheels and brakes. Initially I had expanding tube type brakes. Bad news, the braking was nil and they had a habit of sticking on when the plane was parked out in the rain (no hander available). I never figured it out. When this happened it took a lot of pushing and pulling on the airframe to make the brakes release. They would release with a bang and would be ok until the next time. These were replaced with Clevelands for about the same price as a new set of segments (linings). The Clevelands were a great improvement, except for wear. I am based on a 2000' strip and a lot of braking is required on every landing. The discs would rust between use then grind away the linings. My solution was to grind .005" off each side of the discs then chrome plate .010" and grind to the original size. Before the chrome, the linings lasted 35 hours. The present linings have been on four years and show very little wear. The FAA was against chrome plating until just recently, their fear was that the plating would peel and jam. Cleveland started to sell chrome discs recently. I asked one of their salesman what type of chrome they use and he didn't know. I think hard tool chrome is a better choice than decorative chrome such as you find on your car bumper.

In a recent issue of the newsletter, automotive alternators were discussed. I use a 35 amp Ford alternator and regulator. After 430 hours everything works fine. The only change I think is necessary is to mill a keyway in the shaft and bully and install a key to prevent the reverse rotation from unscrewing the bully nut. When troubleshooting an electrical problem (that turned out to be the battery) it was nice to buy a new voltage regulator at the local auto parts store for under \$10.

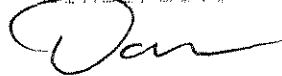
As a point of interest, I have been using auto gas for over two

Page 2

years with great results. The gascolator and screens are cleaner than they were with avcoas.

Enclosed is my check for the coming year. Keep up the good work with the newsletter.

Sincerely,



Don Thomsen

Those are two great tips, DON, and both are money savers, too. Almost everyone is using Clevelands and this certainly seems to have solved a problem we've all been plagued with. It's a safety item, too, as there may be times when we really NEED to clamp on the binders and get max available braking. Thank you kindly, DON. We appreciate.

MORE ON FUEL PUMPS (Letter from OATS TOKLE)

Dear Dick-Your last T-18 letter was much appreciated. What a lot of work to put together. How do you find the time? After reading EARL ODY's problem and a fine job of getting it down deadstick in Gary, IN, I was reminded of my first test flights. Taxi tests at low power worked fine. When moved into runup for takeoff with the Weldon electric pump OFF the engine would quit at approx'y 1800 rpm, so turned on the pump to complete the runup and elected to make the initial test hop this way (reluctantly). The engine ran fine during a 10 min. hop and the only problem was an inop airspeed indicator. The ENGINE pump was removed and replaced with another pump delivering 20/26 psi. Since my engine is a fuel injection type, this requires higher fuel pressure than carburetor types. The Weldon electric pump was also checked for free flow by-pass (so it would not starve the engine driven pump if it failed). I only use the Weldon elect. pump for T/O and LDG and occasionally even forget it even then, but have had no trouble since the first flite. Don't think an electric pump should be relied on for continuous use (as Earl found out).....Thanks again, OATS.

Again, OATS, our thanks for more info on the subject. OATS also sent me several very good pictures of a worm's eye view of his injection system and we will probably run them in the next NL when we have more time, etc.

FITTING THE CANOPY: Sage, sad words by FRANK SNEDEKER, an airline pilot, who lives some 2500 miles west of San Francisco on the island of Oahu, who will be retiring soon and probably moving to the mainland. His trials and tribulations with his canopy are on page 18, but he sent me another short note from Snohomish, WA, where he and his wife had traded houses and cars for a month to see whether they want to retire there. I got a real chuckle out of the following: "I'm having a real terrible time with that canopy and there are times when I feel like it would be good to invest in a chain saw and reduce the problem to non-existence!" Guess most of us have been tempted that way once in awhile, too. Take note how Frank came up with a "fix" for his problem and at least temporarily put off spending \$500 for a new canopy. This fitting of the plexi to the frame is an area that we could use some write ups from you guys that have the experience! OKAY? How about it?

Frank Snedeker  
45-504 Ha'amaile Pl  
Kaneohe, HI 96744

October 16, 1984

Dick Cavin

T-18 Mutual Aid Society  
10529 Somerton  
Dallas, TX 75229

Dear Dick,

I have put off writing long enough. I wanted to write when I first returned from Oshkosh this year. I missed you there more than you can know. You are my main contact with the T-18 family. A cohesive force...or is that a 'force vector' measuring my parralax application to the project.

Anyway, though I am not putting other projects aside I do have a renewed interest and am getting some progress. You asked me at one time to write about how to install the canopy. I cannot. I can only write on how not to do it. I can only hope to cover it with enough paint that it will not be noticed. Not knowing where to cut the bubble I tried matching it to the frame. (Mistake). Having to work amone the problem was keeping the left side in place whilst working on the right side. (Mistake). Get a second pair of hands. I drilled all the holes for rivnuts and in the plexiglass as though I was right. On closing the canopy the forward edge dipped 1½ inches inside the windshield frame. I cried inside. Over \$500 to obtain a new one and to start over. I shifted the canopy forward, drilled new holes and formed clamps to fasten the canopy to the frame. The outside trim pieces are wider than normal. I raised the forward end of the track 3/4 inch. More head room which I like and the frame and windshield meet pretty fair but I am still not happy with it so have moved away from it...which is the best advise I can give and am now working on the rudder pedals, forward tunnel and bottom skin for that one construction. I have drilled to install it with nut plates for removal. Fortunately your last newsletter shows details for making room for the travel of rudder pedals during full brake and right rudder. It will be incorporated.

Enclosed is my check for \$10.00 for dues. Let me know if more is needed. I very much appreciate it...and your efforts.

Mahalo Nui Loa

*Frank*

Frank Snedeker      I still wear a yellow feather.

November 15, 1984

T-18 MAS  
10529 Somerton  
Dallas, Texas 75229

Dear Dick,

Enclosed is a \$10 dollar check for the 1985 news letter. I did not receive N.L. #60. I borrowed a copy from Dick Pennman.

I am very fortunate to have Bob Dial, Bill Oliver, Dick Pennman, Dick Amsden and Gary Copeland a very active T-18 group in my area. We are based at Oakland Pontiac Airport in Michigan. As you can imagine there is always a lot of Hanger Flying on LFR days.

N8AL is a standard T-18 on a standard gear. The engine is a 0-290 GPU with a Sensenich 66-76 wood prop with fiberglass tips. Cruise is 165 mph on 6½ gallon automotive fuel. Stall is 65 mph indicated. The A/C weighed in empty at 905 lbs. I have a basic instrument panel. FLT instruments include VAC. ART. HORZ. and D.G. ELECT. Turn and bank angle of attack indicator, air speed, rate of climb, and alt. engine inst. include standard and C.H.T. The radio is a Narco MK-24 NAV/Com. I also have a Ford Trip computer installed providing time of day, date, elapse time, fuel flow rate, total gal. fuel used, and total fuel to go. The fuel tank has explo-safe installed and, the fuel cap is from a helicopter and is double locking. Taming the Tiger has not been easy. I have had my share of problems starting with my engine. The oil sump was inadvertently sand blasted both inside and out. I thought I cleaned it thoroughly after, but apparently some sand was imbedded in the sump. Every so often a grain of sand would get caught between the oil pressure releafe ball and the seat causing my oil pressure to drop to about 25lb. A engine oil and filter change every 5 hours has eliminated the problem. I have not had any problem in the last 20 hrs. My other problems deal with the flying characteristics of the T-18.

When I first started flying my T-18 I aquired the services of a instructor with approx. 15,000 hours, most in a tail dragger. The plane had a violent wing drop at stall. And the stall would come with no warning. My instructor even thought I had a flutter problem in the tail. After talking the problem over with Bob Dial we decided to tuft the wings with yarn and find out just what the problem was. We had Bill Oliver flying chase in his T-18 and went through a whole series of stalls. The right inboard wing was stalling about 10 mph faster than the left panel. I changed the angle of incidence in the right wing by ½ degree. I haven't has a chance to tuft the wings again but it stalls much better. The second major problem I had was the landing transitiiton roll out. To say that I was all over Pontiac Airport when landing is an understatement. I just couldn't get the hang of it. Bob Dial could set the plane down and it would run straight as an arrow. When I landed there was a good chance

of me going backwards the last 500 feet.

About a year ago a Pitts owner told me to lock the tail wheel. I tried several different ways but settled on the way described in News Letter 59. I ran the cable through the fuselage to just below the throttle. I haven't made a bad landing since. It has made all the difference in the world. I now regularly go in and out of 2,000 foot strips with absolutely no problem.

Well I guess this is enough for now I will write again describing my angle of attack indicator. It works quite well.

I am enclosing a couple of pictures of my plane.

Keep up the good work.

Thanks,

AL

Al Bosonetto

---

Many thanks, AL, for your report. We'll be looking forward with great interest to your report (and simple sketch) of the angle of attack indicator as this is an item that any airplane with minimal stall warning can use to advantage.

HT-800 radio drawing: Your drawing serial number is displayed immediately after your name on the address label on this newsletter. The winner and winning number will be announced in the next NL. We'll notify the winner the day of the drawing.

Addenda to the Questionnaire: There wasn't sufficient space to add a question about whether you are now using or planning to use electric trim or electric flaps. If so, what make and model electric motor are you using? Also, a question about what make of tail wheel you will/are using and a service report on it if applicable. Please use the reverse side of the questionnaire sheet. All results will be tabulated and published in the NL. Please answer all questions that you can, as accurately as possible. The results may have a bearing on insurance rates, too.

PRIMARY AIRCRAFT PETITION TO FAA: URGENT!...URGENT!.... URGENT!.....  
Note the following attached two pages at the end of this NL. These were just received from EAA HQ. OUR INDIVIDUAL WRITTEN SUPPORT OF THIS IS VITAL. Time is VERY short. ALL of us agree in principle with the petition, I'm sure, but the FAA DOESN'T KNOW THAT IF WE DON'T WRITE. Remember the results a couple of years back when the FAA (ATC) was attempting to control nearly all airspace everywhere???? The volume of letters from EAA people defeated it. Do YOUR part...Don't wait for GEORGE to write the letter. A simple letter in your own handwriting is adequate. They are really looking at the NUMBER of letters received. Again, this issue could have a really important bearing on both aircraft and life insurance rates. Everyone bitches about the cost of airplanes and aircraft parts. Here's your chance to DO something positive about it. If EVERY member of the T-18 B & O Ass'n will write FAA it will have much greater impact than you can imagine. Let's do it, gents. It's to OUR advantage.

10-10-84

T-18 Mutual Aid Society  
Dick Cavin  
10529 Somerton  
Dallas, Texas 75229

Dear Dick:

A multi-purpose Letter-

- 1 Find enclosed my \$10 dues for your great news letter.
- 2 I am sorry that I shall be in California during the last week of October and the first week of November. In my T-18 of course. \*
3. I am using Ken Knowles brake master cylinders. I have used them two and a half years and 200 hours. No Trouble.
4. I am also using a Maule Tail Wheel. No shimmy, but I replaced the wheel at about 150 hours since it was worn so badly worn on one side.
- 5 I am using an ARNAV 20 which I purchased at Oshkosh. We hooked it up to power, grounded it and placed the included Antennae on the deck. We held it in our laps and it worked perfectly to Omaha where we stopped over night and could not get the response the next day. I have since installed it in the dash and it works in Kimball (Right in the heart of the Mid Continent gap) where it consistently shows errors of less than a half mile on the ground or in the air. It does flash any ~~warning~~ "Accuracy warning" in this area that it may not be right. I can pick up the West Coast grid here but not well enough to make it work well. I will try it when I go to the west coast this month. I am really excited about the results. Much better than I expected. I used it both ways going to Columbus Ohio for the Hump Pilots Convention. Worked well on both the Great Lakes and Northeast US grid.  
(Incidentally-one of the Humpsters flew in his Bonanza and they told me that he has a FBO and instructs. He was very upset because they would not rent him a car-too old. Only 83. I didn't get his name, wish I had.) Sure was a lot of "Old Guys" at that Convention!

\* A late Spring T-18 get together would be great also. Let me know when you have it. Maybe I can make it. My wife is supposed to retire after the first of the year.  
I am glad to hear that you are doing better health-wise. Keep up the good work.

Sincerely



From Nate Eastman, Kimball, Neb.

Our thanks, Nate, for that report on the brake cyls, tail wheel, and the Loran. Such info by actual users of various pieces of equip't are very valuable to new builders contemplating purchase of such items, and in addition are also valuable to other actual users who might be having some problems with an item, but who don't know if they got a lemon or not.

## SHORTLINES

From Walt Giffin, 4277 Kenmont Pl., Columbus, OH, 43220: "Dear Dick, Count me in for the Narco Drawing. My dues check encl. You asked about brake cyls. I have Scott master cyls. on the pilot's side and modified Clevelands on the pass'ger side (from a Cherokee). I milled the base of the Clevelands to fit the floorboard brackets. It seems to me that same technique (using an external master reservoir would work on the left, too). Keep up the good work and get healthy. Walt" (SEE SKETCH BELOW)

From Dick Amsden: "Hi, Dick: I'm the guy with TWO bent landing gears. (Both are the long gears). My partner was trying to solo it, but never had enough time back to back. He had 18 hrs. dual over 1½ years. I'm just not convinced the gear (long) is strong enough. Anyhow, after talking to Lu Sunderland, Bob Dial, you, and Ken Brock, I finally had the old Jenkins gear straightened and re-heat treated. Instead of Rockwell 39 (180,000#) like the old one, we took this one to Rc 42 (190,000 psi). It is flying again and sure is fun to fly with a 150 LYC. Hope you are doing well, Dick" Thanks, Dick. We'll be interested to hear how it does at the new Rc. I wonder if any of you have heard of anyone bending the long gear in landings (hard)? From what Dick told me on the phone there were a number of hard landings....probably dropped in full stall from a good height. There's a limit as to what any landing gear on any airplane will take when dropped in. I personally believe that the T-18 gear (long and std) is an exceptionally strong gear, as well as being the #1 protective device for the pilot and airplane. I've seen gears bent from going thru ditches, etc., but have never heard of them bending as above.

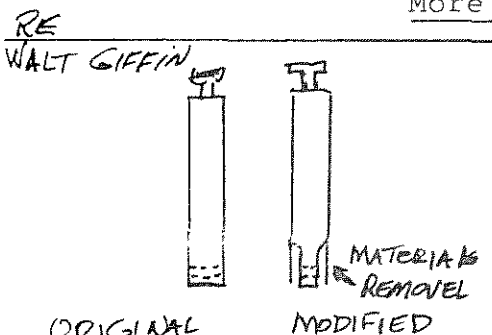
We might review a previous NL writeup on landing the T-18, which cautioned about flaring too high and/or raising the nose above the 3 point position on the ground. The airplane will pitch sharply nose down if fully stalled, so a very high flare could allow the airplane to be in a 45° nose down attitude, in which case there would be a much more rearward force that was applied to the gear. All this is pure supposition, of course.

For Sale: PETE BASHFORD, RT. 1, Box 152E, Morrisville, NC, 27560 919/467-0725 had a little hard luck on a sandy field where his T-18 stumped its toe in a soft spot and very gently went over on its back. Fuselage is sprung. Has an IO-360 and Hartzell C/S prop, both ok. Gear ok. Tank, cowling ok, wing and stabilator ok, fin and rudder damaged, canopy frame ok, but canopy cracked. roll bar slightly bent, inst. panel all ok, controls ok, std wing all ok, seats, upholstery, custom shoulder harness ok, radios, antennae ok. Has 300 hrs. A/F & Eng. Tot. Very nice panel, lighted, nearly IFR, radio is KX-145, upholstery is tan Naugahyde, very nice seats. Electric trim. Pete will sell the entire airplane for about \$11,500, or may consider parting it out later. He has no time available to rebuild, is his reason for selling. Sounds like a good buy for someone.

Another FOR SALE: 1965 Thorp T-18, 685 TT, 582 SMOH on Lyc. 0-320, 150 hp, Sensenich wood prop, Full gyro panel, EGT, Genave Alpha 200B Nav/Com, \$12,500. For details contact Catlin Aviation, P.O. Box 59906, Oklahoma City, OK, 73144 (405/ 681-2331) Att: Gene Nailon, Sales dept. .... I understand the airplane was originally built by Otto Zauner, of Vineland, NJ and was one of the 1st ten built. At present it is unpainted. ~~It has no flaps, I think.~~ It is an estate sale of an ag pilot, who lived in Duncan or Lawton, OK.

More FOR SALE: LYLE FLEMING, 46035 20th St. E, Lancaster, CA <sup>93534</sup>

is building his 2nd T-18 and he still has a LOT of T-18 parts left over from #1 (that he's parting out) and the price is right. Call him at 805/942-2481 for details. Estate sale: Ken Hamilton, local builder passed away in Nov. His WB-CW project partially riveted will be for sale as soon as it clears probate. Contact me if you are interested. I'll handle sale for his mother. Will probably go for inventory.



Amigos, I have a little news for you that some of you already know about:

On a recent weekend Paul and Audrey Poberezny were in Dallas to visit their daughter, Bonnie, and son-in-law, Bud Judy, and also their new granddaughter. To make a long story short, Paul and I got together for quite a long discussion and as a result we came to an agreement in which I would soon begin serving as an Associate Editor for the new magazine, The Lightplane World, in addition to Sport Aviation. I will continue to live in Dallas, but will do a significant amount of traveling to cover various events and projects. In the coming months you can look for quite a few changes in the format of both magazines and I do believe you will enjoy the publications even more (if that's possible). While the immaculate show planes will still be covered in detail, you'll see a lot more how-to-do-it articles and columns, lots more about the people that make up EAA, lots more about the little guy and his projects, more info that instructs and educates...in short, much more emphasis on the area of homebuilding than has been possible in the past. Actually, there will be two magazines with much the same content of subject material. Sport and recreational aviation encompasses such an ever-swelling volume of people and subjects that a magazine that of necessity has to limit itself to 92 pages per month (i.e. Sport Aviation) simply cannot cover but a small per cent of the available news. Like most news gathering organizations EAA publications must focus on "fresh" stories in the main. Stale or re-hashed story coverage would soon cool the enthusiasm of many readers.

My wife and a number of friends have raised their eyebrows at my taking on this job at my age, but I look on it as a challenge that I look forward to with relish. All my life I've been totally fascinated by anything that flies....particularly any new development in aviation, so this will provide the opportunity to indulge my addiction of hangar snooping to the fullest.

Will it affect the T-18 Newsletter or the soon upcoming Safety and Operations Manual? Not if you gents will continue to communicate your experiences in building and operating the T-18 in sufficient volume without too much arm twisting on my part. If I, as editor, can simply put your letters and pictures together to make master plates, I can get some local help on the printing, collating, addressing, and mailing. It will make life easier for me if you will type your letters, but if you can't do this easily go right ahead and hand write your letters. I have a fellow EAAer here that has offered me some help in this area. He also has a computer and has agreed to help me get a lot of the day to day record keeping better organized (which now takes up 90% of the time I spend on the T-18 Newsletter). He'll be a very capable assistant, as he once put out the PL-4 NL until a health problem arose and he had to back off.

Anyway, you will soon read the announcement in the Hot Line section of the magazine, so I won't beat it to death now.

Because of a considerable number of high priority things interfering with my intention of getting this NL in the mail by around Thanksgiving time the current time frame is close to Christmas, so now I hope to have this in the mail by JAN. 5th when the Xmas mail rush subsides. Incidentally, to all of you that sent holiday greetings I truly thank you for your consideration and I'd like to take this opportunity to extend our best wishes for your good health, happiness, and prosperity in the days ahead.

Inasmuch as we are late in getting this NL out, we have decided to extend the deadline for subscription/membership renewal to Jan. 30th, 1985. This extra time will allow time for all members to return the questionnaire sheet that is attached to this NL.

Please remember: YOU MUST FILL OUT THE QUESTIONNAIRE SHEET AND RETURN IT TO ME IN ORDER TO QUALIFY FOR THE DRAWING ON THE NARCO HT-800 RADIO. The winner will be announced in February.



CARB NOZZLES/ JETS: JOHN WALTON's experience...."Refer to JOHN KENTON's write-up in recent NL...John went from a 10-3678-32 carb to a 10-5135 ( don't find this one in my Aircraft Spruce Marvel-Schebler table), then to a 10-5009 carb. Skipping the 10-5135...it didn't seem to work too well any way, but it seems the 10-5009 does.....If you compare these carbs in the Aircraft Spruce table you can see the principal (only) difference between the two (A10-3678-32 & A10-5009) is the Nozzle itself. (A47-773 & A47-813, respectively). ....My friend, Del Hainley, recently finished a Glasair & had similar carb problems (but he did a little more of his test work on the ground)(not at 50-100')!!! In a completely independent effort, Del ALSO ended up with the above A47-813 nozzle in his original A10-3678-32 carb & has had good results since the change. Nozzle costs \$45. Regards, John.. John sent a copy of that letter to John Kenton, who replied, "He cured his problem in a more economical way...replacing jets instead of carbs. Please print this in the NL, as I believe there might be many T-18ers running their engines with mixture control pulled half out, and this sort of info is invaluable and might save a forced landing. Sincerely, John".

I had a note I saved that said that Glenn Young (O-290-G) said on his airplane the MA-4 carb (3678-32) was bad and the 10-3323 or 10-2827 was good. (The quotes above were for O-320, 150 hp)....Also, when I installed my present O-320 B2b 160 hp engine, which had come out of a Super Cub, I couldn't get it to run above 2000 rpm without breaking down, etc. The only real difference between airplane installations had to be the air box (the induction system). It was much too rich in my T-18. A Mustang II owner, that I had done the orig'l test hop for told me he had the same problem with his engine before it was ready to test. A FBO told him about an old AD on the engine that called out a nozzle change. I replaced nozzle (jet) #47-77-3 with #47-82-8 and it has run fine ever since. Without leaning at low altitude @ 75% power it burns 8.0 gal/hr....Have some of you had similar experiences? How about a report?

MORE FOR SALE AIRPLANES: MIKE DEANER, P.O. Box 2472, Capistrano Beach, CA, 92624 has N711RF for sale, \$16,500. 200 TT, IO-320 300TTSN, KX-155, KT-76, strobe, Imron, intercom, cover, plans. Would trade for C-182. 714/851-2348, day, or 714/ 661-8170 evenings.

EAA Museum has the display T-18 for sale. It is the partially finished airplane built a little each year in the metal workshops. It is not painted and will still require some work to complete. It is pop riveted as I remember and because it is not a completed cream puff type, it has been declared surplus. I didn't get any details from Paul when he told me about it, so if you are interested you might drop them a letter. If you are really interested, take a flat-bed with you to OSH '85 and bring it home, eh?

Another first flight: DONALD F. DERBY, 300 E. Tropicana Ave., #10, Las Vegas, NV, 89109, 702/736-3726, plan s/n 1423, N444DD (CW), flew the 1st time on 8/14/83, and has a Lyc. O-320 D2A 160 engine in it, with a Hartzell c/s 72" prop, King Silver Crown radios, and it took him 3 yrs. and 8 months to build. Cost was over \$30k. Has gear cuffs, and wheel pants and is exactly to plans, except for seats. It is flush riveted.

Congratulations, Don, and we'll be looking forward to seeing it at OSH or other fly-in.

The attached Annual Inspection Procedures are to be retained for your Operation/Safety manual. We have still another one for next NL.

Please don't forget to fill out the questionnaire, even if you did not enter the drawing for the HT-800..Best wishes to all of you for the coming year.

*Dick*

T-18 QUESTIONNAIRE PG 1

(MUST be filled out and returned in order to qualify for HT-800 drawing)

JAN. 31, 1985 is the last day for receiving questionnaires to qualify!

Please fill out BOTH sheets on all items that are applicable to your project (whether flying or not).

1. YOUR NAME, ADDRESS, ZIP, PHONE.....
2. TYPE (st'd, CW, WB).....
3. DATE STARTED.....BY YOU?.....or OTHER(who?).....
4. IS PROJECT NOW FLYING?.....1st FLITE DATE.....TEST HOP BY YOU?.....
5. PILOTING EXPERIENCE: WHEN & WHERE DID YOU LEARN TO FLY?.....  
 License and ratings.....TOTAL HOURS.....  
 Hours, yearly average.....Qualified aerobatic?.....Taildragger?.....  
 Military experience, type of flying jobs held, etc. Any info about you that  
 would be of interest. (Held confidential if desired).....
6. AIRCRAFT MECH'L EXPERIENCE (SAME TYPE INFO AS ABOVE) A&P LICENSES HELD,  
 Type of maintenance or aircraft building experience, how long, any special  
 skills, etc.....
7. Have you used Matched Hole Tooling on your project?.....To what extent?.....  
 Your opinion of MHT.....What parts did  
 you jig build?.....
8. Were plans difficult to understand?.....or easy?.....Same questions on  
 the WB and CW plans if applicable?.....
9. HAVE MATERIALS or PARTS BEEN DIFFICULT TO LOCATE?.....Your opinion of  
 cost of purchased parts?.....Your opinion of quality of purchased  
 parts.....Promptness of parts delivery.....
10. What parts have you found the most difficult to make?.....  
 WHY?.....
11. CAN YOU MAKE AN ESTIMATE OF THE NUMBER OF MAN/HOURS IN VARIOUS ASSEMBLIES  
 (i.e. fitting canopy, fitting cowling, building and rigging flaps, etc)?  
 .....
12. HOW LONG did you take to complete your T-18 (or think it will take)?  
 .....
13. Why did you select the T-18 for your airplane project (or why did you  
 buy a T-18)?.....
14. Appr. what size is your workshop?.....separately heated or cooled  
 .....
15. What do you have in the way of power tools?.....  
 Hand Tools.....
16. Please check the items you have completed: All.....fuselage shell.....  
 rudder.....fin.....stabilator.....ailerons.....flaps.....outer  
 wing panels.....center wing.....canopy.....seats.....control  
 systems.....brake system.....electrical systems.....engine control  
 systems.....induction system.....exhaust system.....oil cooler  
 inst'n.....baffling.....spinner inst'n.....cowling.....wheel pants  
 inst'd.....gear fairings.....wing tips.....nav lites or strobe.....  
 upholstery.....painting.....radios and antennae.....(specify  
 makes & models installed or planned.....  
 instruments installed or planned. (A/S).....(R.of.C).....  
 A.Hor'z'n.....Alt.....Dir. Ind'r (specify type).....T & B (or turn  
 ind'r.....compass.....VOR/OBS.....accelerometer.....fuel quan  
 ind'r.....fuel press.....tach.....M.P.....oil press.....oil temp  
 head temp.....EGT.....fuel flow meter.....amp/volt meter.....  
 Other (plz list).....What do you estimate your entire inst.  
 installation will cost \$.....Cost of avionics? \$.....
17. Please use rest of page to explain what areas of NLs you found to be  
 most helpful. Also plz itemize what areas you would like to see more fully  
 covered in NL. Be as specific as possible. (plus any other comments you  
 might have ..gripes included. Use reverse side if needed on any items. Thank  
 you!



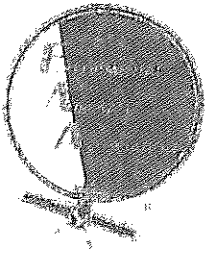
- (1) AIRCRAFT N \_\_\_\_\_ PLAN SERIAL # (IF KNOWN) \_\_\_\_\_  
ENGINE (MAKE & MODEL #) \_\_\_\_\_ HORSEPOWER \_\_\_\_\_  
EMPTY WT. \_\_\_\_\_ # L. MAIN \_\_\_\_\_ # R. MAIN \_\_\_\_\_ # T. WHEEL \_\_\_\_\_ #  
EMPTY CG \_\_\_\_\_ MAX C.G. \_\_\_\_\_ FWD C.G. \_\_\_\_\_ AFT C.G. \_\_\_\_\_
- (2) PROPELLOR: MAKE \_\_\_\_\_ MODEL \_\_\_\_\_ LENGTH \_\_\_\_\_ PITCH \_\_\_\_\_  
FIXED PITCH (WOOD OR METAL) \_\_\_\_\_ CONSTANT SPEED \_\_\_\_\_  
STATIC RUN UP RPM \_\_\_\_\_ MAX IN FLITE RPM (OBSERVED) \_\_\_\_\_
- (3) PERFORMANCE: NORMAL CRUISE @ 75% POWER \_\_\_\_\_ IAS \_\_\_\_\_ ALT. \_\_\_\_\_ ft \_\_\_\_\_ °F  
RPM @ NORMAL CRUISE \_\_\_\_\_ M.P. \_\_\_\_\_ "  
(75% power on fixed pitch=max rpm less 10%)\*  
Full power IAS @ LOW ALTITUDE \_\_\_\_\_ @ 7500FT. \_\_\_\_\_ (RPM @ 7500') \_\_\_\_\_  
RATE OF CLIMB SOLO \_\_\_\_\_ FT/" AT OR NEAR GROSS \_\_\_\_\_  
IAS @ STALL, SOLO \_\_\_\_\_ MPH (CLEAN) IAS FLAPPED \_\_\_\_\_ MPH  
@ MAX WT. \_\_\_\_\_ CLEAN @ MAX WT. FLAPPED \_\_\_\_\_ MPH
- (4) AVERAGE TAKE OFF ROLL IN FT. OR SECONDS: SOLO \_\_\_\_\_ @GROSS \_\_\_\_\_  
(SPECIFY WHICH)  
AVERAGE LANDING ROLL (FT.) \_\_\_\_\_ AIRSPEED CARRIED ON FINAL \_\_\_\_\_ MPH  
IAS IN PATTERN: DOWNWIND \_\_\_\_\_ ON BASE \_\_\_\_\_ IN TURNS \_\_\_\_\_  
AMOUNT OF FLAPS USED \_\_\_\_\_ COMMENTS \_\_\_\_\_  
YOUR ESTIMATE OF SAFE CROSSWIND LIMIT FOR T/O \_\_\_\_\_ MPH LANDING \_\_\_\_\_ MPH
- (5) FUEL CAPACITY: FUSELAGE (FWD) \_\_\_\_\_ G. (AFT) \_\_\_\_\_ G. (C.SEC) \_\_\_\_\_ (O.BD) \_\_\_\_\_
- (6) TYPE COWL: THORP \_\_\_\_\_ RATTRAY \_\_\_\_\_ OTHER \_\_\_\_\_  
TYPE EXHAUST: \_\_\_\_\_ (IF OTHER THAN CROSS-OVER, DESCRIBE)  
OIL COOLER \_\_\_\_\_ WHERE MOUNTED \_\_\_\_\_  
AVERAGE HEAD TEMP: CRUISE \_\_\_\_\_ °F/C CLIMB \_\_\_\_\_ °F/C  
PLEASE LIST ALL INSTRUMENTS INSTALLED AND ALL RADIOS, AUTOPILOT, ETC.

LOCATION AND TYPE OF PITOT AND STATIC (DESCRIBE)

COMMENTS ON ANY OF ABOVE: (USE BACK OF SHEET IF NEEDED)

YOUR OPINION OF HOW AIRCRAFT FLIES (CONTROL PRESSURE BALANCE, CONTROLLABILITY, STABILITY, IFR CAPABILITY, STALL CHARACTERISTICS, ETC)





# EXPERIMENTAL AIRCRAFT ASSOCIATION

WITTMAN AIRFIELD, OSHKOSH, WI 54903-2591  
PHONE: 414 426-4800

December 17, 1984

Mr. Dick Cavin  
T-18 BUILDERS AND OWNERS ASSN.  
10529 Somerton  
Dallas, TX 75229

Dear Dick:

You are probably aware that EAA and AOPA worked with a committee of concerned aviation leaders to prepare and submit to FAA a petition to amend FARs to permit the certification of a new aircraft category, to be called "Primary Aircraft".

The proposed amendments would permit the Administrator to accept airworthiness standards and establish certification procedures appropriate for primary aircraft, including engines and propellers, based upon the degree of complexity of the design contemplated and issue type certificates for these aircraft, engines and propellers.

This category is defined to be aircraft with a single engine of not more than 200 hp, seating not more than four people. They could be used for flight training but could not be used to carry passengers or property for hire. Owners of primary aircraft could perform some special maintenance and inspections on their aircraft; primary aircraft could be factory produced or owner built from prefabricated parts; and certain standard aircraft in the normal, utility, or aerobatic category could be operated in the primary category, if the owner so desires.

If you would like a copy of the complete petition, just call me or Bill Fraser.

The petition has been assigned to FAA docket #23345 and is still open for public comment for a limited time. Because approval and implementation of this proposal is so vitaly important to the future of recreational and sport aviation, we ask for the support of you and your membership in helping us provide the FAA with a great abundance of thoughtful, favorable comments. Here are some things to consider when writing:

1. Comments that contain your own reasons for support of the petition carry more weight than those that merely say, in effect, "I support the petition." Your thoughts and concerns are what FAA is looking for.
2. Individual letters are regarded more highly than petition lists with multiple signatures, or signed form letters.

December 17, 1984

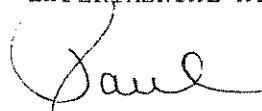
Page 2

3. The homebuilt movement has proved that safe, simple and economical aircraft can be constructed and flown with reasonable certification and compliance standards.
4. Owner assembly of kits for aircraft certificated in the Primary Category will make flying even more affordable for those who are willing to add their own labor - but who are unwilling or unable to produce homebuilts under the 51% rule.
5. General aviation desperately needs help. Primary aircraft (really a return to the basics) may provide the needed stimulus by making factory and kit planes, flight training and aircraft operation more affordable and accessible to more and more people. It can be done without any sacrifice of safety. More new people will become involved in aviation and previously trained pilots will become reinvolved. Underused airports will become more active and job opportunities will increase. Despite the limited owner/maintenance provision, A&Ps will have more work, rather than less, and CFIs may even be able to support themselves full time.
6. Even though the cut-off date is January 3, 1985, comments will be accepted for a reasonable length of time (perhaps 2-4 weeks) after that date. But please don't procrastinate. It is imperative that your comments be on record ASAP!

Your support is vital. Aviation must move forward and grow. Young people must be attracted. New manufacturers need to be encouraged. Please act now before it's too late! Your help is appreciated. Thanks very much.

Sincerely,

EXPERIMENTAL AIRCRAFT ASSOCIATION



Paul H. Poberezny  
President

Send your comments re: Primary Aircraft to:

Federal Aviation Administration  
Office of the Chief Counsel  
Attn: Rules Docket (AGC-204)  
Petition Docket No. 23345  
800 Independence Avenue, S.W.  
Washington, D.C. 20591

← SEND TO

NOW!

lmt

*Click -  
We are sending  
this letter to a group  
of type clubs*

## ANNUAL INSPECTION PROCEDURE

OWNER'S NAME

ADDRESS

AIRPLANE REG. NO.

SERIAL NO.

AIRFRAME TIME

ENGINE TIME

DATE INSPECTION COMPLETED

| A. OPERATIONAL INSPECTION               | INSP. | B. POWER PLANT (Cont'd.)          | INSP. |
|---|-------|-----------------------------------|-------|
| 1. Starter                              |       | 15. Spark plugs                   |       |
| 2. Engine controls                      |       | 16. Engine accessories            |       |
| 3. Engine instruments                   |       | 17. Alternator                    |       |
| 4. Alternator output                    |       | 18. Electrical wiring & equipment |       |
| 5. Ammeter                              |       | 19. Control linkages              |       |
| 6. Fuel quantity gage                   |       | 20. Heat & vent system            |       |
| 7. Brakes                               |       | 21. Engine mount                  |       |
| 8. Power check                          |       | 22. Cowling                       |       |
| 9. Magnetos                             |       | 23. Compression check             |       |
| 10. Carburetor heat                     |       |                                   |       |
| 11. Flight instruments                  |       | C. CABIN & FRONT FUSELAGE         |       |
| 12. Radio operation                     |       | 1. Skin                           |       |
| 13. All lights                          |       | 2. Structure                      |       |
| 14. Heat & ventilating system           |       | 3. Rudder pedals                  |       |
| 15. Idle rpm & mixture                  |       | 4. Brake system                   |       |
| 16. Idle cut-off                        |       | 5. Rudder cables                  |       |
| 17. Flaps                               |       | 6. Fuel lines                     |       |
|   |       | 7. Wing attach fittings & bolts   |       |
| B. POWER PLANT                          |       | 8. Control sticks                 |       |
| 1. Spinner & bulkheads                  |       | 9. Trim system                    |       |
| 2. Propeller                            |       | 10. Flap cables & pulleys         |       |
| 3. Engine cylinders & baffles           |       | 11. Instrument plumbing & wiring  |       |
| 4. Exhaust system for leaks & condition |       | 12. Electrical wiring & equipment |       |
| 5. Induction system                     |       | 13. Instrument air filter cleaned |       |
| 6. Alternate air door & hinge           |       | 14. Drain static lines            |       |
| 7. Carburetor air filter                |       | 15. Engine controls               |       |
| 8. Plumbing                             |       | 16. Windshield & canopy           |       |
| 9. Fuel screens                         |       | 17. Seats & safety belts          |       |
| 10. Oil cooler                          |       |                                   |       |
| 11. Oil sump & screens                  |       |                                   |       |
| 12. Drain plugs                         |       |                                   |       |
| 13. Magnetos                            |       |                                   |       |
| 14. Ignition harness                    |       |                                   |       |



## ANNUAL INSPECTION PROCEDURE

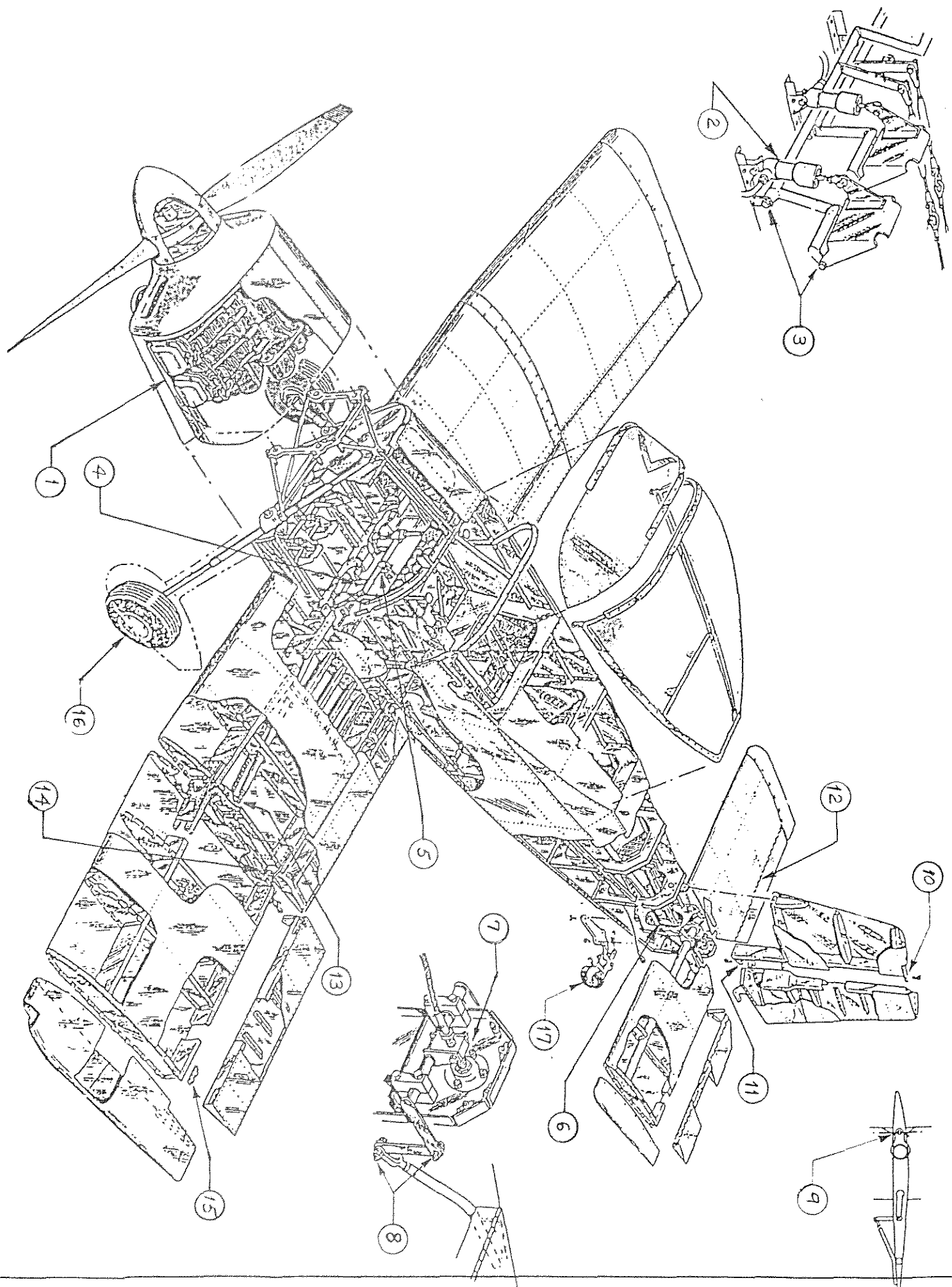
|  |      |
|--|------|
| D. <u>WINGS</u>                                      | INSP |
| 1. Skin  |      |
| 2. Structure (outer wing attach fittings & bolts)    |      |
| 3. Access panels                                     |      |
| 4. Push-pull tubes & bellcranks                      |      |
| 5. Ailerons  |      |
| 6. Flaps   |      |
| 7. Navigation lights                                 |      |
| 8. Strobe lights                                     |      |
| 9. Electrical wiring                                 |      |
| 10. Pitot probe                                      |      |
| E. <u>LANDING GEAR &amp; BRAKES</u>                  |      |
| 1. Wheels & tires                                    |      |
| 2. Brake linings & disc                              |      |
| 3. Landing gear struts & axles                       |      |
| 4. Gear attach bolts                                 |      |
| 5. Tail wheel & steering linkage                     |      |
| F. <u>REAR FUSELAGE &amp; EMPENNAGE</u>              |      |
| 1. Skin  |      |
| 2. Structure   |      |
| 3. Elevator push-pull tube                           |      |
| 4. Rudder cables                                     |      |
| 5. Trim system                                       |      |
| 6. Empennage structure                               |      |
| 7. Empennage attach fittings                         |      |
| 8. Control surfaces                                  |      |
| 9. Anti-servo tab system                             |      |
| 10. Electrical wiring                                |      |
| 11. Static ports                                     |      |
| 12. Battery  |      |
| <u>GENERAL</u>                                       |      |
| 1. Aircraft cleaned & serviced                       |      |
| 2. Aircraft lubricated IAW manual lubrication chart. |      |

MAKE APPROPRIATE ENTRIES IN THE AIRCRAFT AND ENGINE LOG BOOKS.

# LUBRICATION CHART

| <u>* LOCATION</u>                    | <u>LUBRICANT</u>                             | <u>RECOMMENDED INTERVAL</u> |
|--------------------------------------|--|-----------------------------|
| 1. Engine sump                       | Ashless dispersant SAE 40                    | Every 50 hours              |
| 2. Brake cylinders                   | Brake fluid - MIL SPEC 5606<br>or equivalent | As required                 |
| 3. Rudder pedal pivots               | Lubriplate or equivalent                     |                             |
| 4. Walking beam                      | Lubriplate or equivalent                     |                             |
| 5. Stabilator push-pull tube (front) | Lubriplate or equivalent                     |                             |
| 6. Stabilator push-pull tube (rear)  | Lubriplate or equivalent                     |                             |
| 7. Elevator trim jack-screw          | Dry graphite or equivalent                   | annually                    |
| 8. Elevator trim linkage             | Lubriplate or equivalent                     |                             |
| 9. Stabilator pivot fittings         | Lubriplate or equivalent                     |                             |
| 10. Rudder top hinge                 | Lubriplate or equivalent                     |                             |
| 11. Rudder bottom hinge              | Lubriplate or equivalent                     |                             |
| 12. Servo-tab hinge                  | WD-40, LPS-1 or equivalent                   |                             |
| 13. Aileron bellcranks               | Lubriplate or equivalent                     |                             |
| 14. Flap hinges                      | Lubriplate or equivalent                     |                             |
| 15. Aileron hinges                   | WD-40, LPS-1 or equivalent                   |                             |
| 16. Main wheel bearings              |  | Annually                    |
| 17. Tail wheel bearings              |  | Annually                    |

\*See attached diagram for locations







I see I'm still running true to form as far as getting things done on the T-18 newsletter is concerned. The Feb. '85 issue I hoped to get out is now the April issue (if too many other distractions don't show up before I get it completed. Sorry, again, gents. My good wife says I just have too many irons in the fire all the time. She follows that statement by saying, "Yes, and some of them seem to get cold pretty regularly, too.

I'll have to confess that my editorial and writing work for Sport Aviation, Lightplane World, and the Antique/Vintage magazines have kept me far busier than I anticipated. I've been going at it hammer and tongs since a little before Xmas, cranking out around twenty stories since then. Each one requires considerable time spent in research, follow ups, shooting pictures, doing interviews and then transcribing the tapes, etc. and when most of them have to make deadlines I have to rearrange my priorities on an almost daily basis. There are compensations of course. I recently had to make a 4 day trip to the LAX area and did manage to squeeze in a dinner visit with old friends, Dan & Stella Dudash. I also did a story on Ken Brock, his plant, his Avion U/L, got to fly his 2 place gyroglider (was fun!), saw his home workshop (unbelievable) and his new T-18 (it had the most fabulous engine installation I've ever seen on a T-18). I also got a quickie look at his "Sweet Marie" T-18 and his award winning Stinson at Corona Airport. Ken has a hideaway cabin out at El Mirage dry lake, out close to Edwards AFB, where we flew the Avion and the gyroglider and while we were there Bob Hovey came in to Ken's airstrip in his T-18. I'll be going back out soon to do a story on him and to fly Ken Knowles' Super Delta Hawk U/L biplane. Gerri Knowles incanted a voodoo witch's curse on me for getting so close to their home in Corona and not coming by, but I had to hustle and get back to LAX for the trip home.

That trip used up four days, plus another week of writing when I got back and then it was time to hit the road again for Sun 'n Fun, which used up another ten days. I had to spend 95% of my time with the ultra lights and new Very light airplanes, new engines, equipment, etc., so I hardly got to look at the T-18s there, much less visit with the builders. I did get to spend an evening with John and Lee Walton over dinner. I've been hot at writing ever since I came back home, along with doing the usual non-aviation chores, like yard work, painting, etc.

Well, anyway, amigos, I really haven't been goofing off as you probably thought and I've had the best of intentions about the NL. I hope to get out three more issues this year if you guys will cooperate and send in stories of your labors and experiences building and flying your T-18. If you can type it up so I can simply do a "paste up" on the page, so much the better, as far as my time is concerned. If you can't, just write it out in longhand and I (hopefully) can rewrite it. In any case, please keep the accounts coming or our well of information for the NLs will run dry. Plz remember, too, that just because someone else has written an account of your subject, don't let that stop you. It's of value to new builders to learn that more than one builder concur with the technique or process and have used it successfully.

I was pleased to receive the survey forms that were sent out with NL# 61. You also are interested in who won the drawing for the Narco HT-800 hand held 720. It was won by Pete Gonzalez, of Colorado Springs, CO. We could not have picked a nicer guy if we had tried. Pete has been a NL contributor several times. He has an O-290 G powered T-18 and he has it out of service for awhile, as he is installing a turbo in it. A friend with a computer

is now writing a program on all the material that was covered in the survey forms and once he finishes that we'll publish results of all the categories in the NL. Probably all of us will be surprised on some of the items. I've already noticed a variety of propellers and the different diameters and pitches used. Correlating that with performance in the various flight regimes should be very illuminating.

In fact, there will be a wealth of information in various categories that should be valuable to the beginner, as well as to the one that has flown his airplane quite a number of hours. I am somewhat disappointed that in spite of the fact that filling out the survey form was a required item to be eligible for the HT-800 drawing, that 27 of you failed to send the form in. I would like to encourage you to take a few minutes to fill it out and send it in now. Most all of you at one time or another have said, "I really appreciate the NLs and wish I could send something in, but I can't seem to think of anything, etc". Well, now, here's your chance to do something for the NL.....and it truly is valuable info. So PLEASE send it in....before you forget it again. If you have lost or have misplaced the form let me know and we'll send another.

In case you don't read FLYING or overlooked it the May '85 issue carries a full page ad on page 41 about another hand held 720 t/r that sells for \$299.50 postpaid! It carries a 90 day satisfaction guarantee, you can charge it on the Visa & Mastercard, and you can call them on a toll free 1-800-238-2300 no. (800-323-0368) in Ill. It stores 10 channels and has a 3 year guarantee, with 24 hour service. It appears to do everything the Narco HT-800 does and about the only difference I saw was the buttons and controls were in the top of the unit instead of the bottom. It sure looks like someone is giving the long suffering pilot a break. When I went to buy the Narco for the drawing winner, they had jacked the price up to \$600, instead of the \$476. Said that was only a temporary promo price. Maybe so, but it sure smelled of ripoff to me. I had several ham friends look at it and they said it was identical to a hand held ham unit that could be bought for \$250 anywhere. Anyway this co. is called STS, Satellite Technology Services and their address is 2310-12 Millpark Drive, St Louis, MO, 63043. Just yesterday a friend of mine got one and let me try it. It worked great. He has used it in his airplane and had no problems working the tower 20 miles out. Now if we could just get a low cost VOR.....

As a matter of fact, I'm in the process of doing some research on an article I'm about to write for Sport Aviation on an all new system that not only will locate you anywhere with a + 1 ft accuracy, but also give you an instantaneous course and distance to the nearest airport or the nearest large flat field...plus literally dozens of other functions not available today. It will cost about \$400 and be about the size of a cigarette carton. It's called GEOSTAR. It may be available as early as '86. Mark that name down. You'll be hearing lots more about it soon.

GEAR INSPECTION ALERT!!!! BRYANT ROWLAND, 1007 Shell, Midland, TX, 79705, 915/683-6617 called me last week to tell me that in the process of doing an annual that he had discovered cracks in the weld where the gusset and the gear leg tube meet. Cracks were about 1/4" long and were on both the front and back side on one leg and on the front only on the other. He has about 500 hrs on it and has never operated off anything but hard surface. The gear is a long gear. He thinks it came from Ken Knowles, but isn't sure, since he bought the partially finished project from an estate in Las Vegas and some of the documentation was incomplete.

Bryant's as yet unsolved problem is what to do about it. He can get it re-welded in Midland (Heliarc'd), no problem. It has to be re-heat treated then and that IS a problem. There is a heat treat co. here in Dallas (Dominy) that does work for Bell and others and has an oven large enough to handle the gear in one piece. The cost is around \$100. Several years ago (10 or 12) three of us went together and built long gears and had them heat treated at Dominy for \$25 for all (the minimum), but we had to have them run the second time, as they were very careless with handling them when they came out of the oven and let them warp. Even after the 2nd go 'round we had to insist they use a large press to get them accurate.

I called Ken Brock about Bryant's problem, asking him what in his opinion is causing cracks. He said possibly we should be asking John Thorp, but of course I am reluctant to do that because of John's health. Ken said as far as he knew that none of the gears his firm made have ever had that problem, but he was inclined to think that the gear might not have been stress relieved (annealed) before it was heat treated. When I visited his plant he took pains to show me that every weldment they made from engine mounts to landing gears went into the annealing oven for stress relief before being heat treated.

It's only a guess, but the cracking problem may be a combination of the locked in welding stress (as above), plus resonance stress, that is concentrated at that point. Also suspect is the tendency for the gear to try to bend spanwise at landing impact. Even slight spanwise movement at a certain vibratory frequency would tend to pull the welded seam apart after a number of cycles. Just like what takes place on a metal prop to cause its failure is Stress x Time, with the nodes of the sine wave crossing at a critical point.

Whatever the cause, if any of you discover landing gear cracks please let us know without delay. If you make such a report it would be of value to know as many of the pertinent facts as possible: aircraft EW and GW, engine and prop used, whether operated off unpaved strips and how much, total airframe time, who mfg. the gear, any problems with wheel and tire balance, whether any previous problems with bolt shear where LG is bolted to the attach beam on the firewall, condition of engine shock mounts...in fact anything that might affect the gear by unusual vibration.

While it seems that these crack problems may well be only isolated incidents, as we have several T-18s that have 2000-3000 hours with no problems, but I think most of these like BILL WARWICK's or DR. COTTINGHAM's have the shorter gear, so the problem may focus only on the longer gear.

A few builders have made their own gear, some of them using gas welding only, but I don't think it would be safe to assume that they would be immune from the problem just because they weren't MIG welded. Altho' you can't easily inspect the back side of the gusset area, you should make regular and careful inspection of the front side, using a bright light and magnifying glass.

If any of you have opinions or suggestions on this subject, I'd appreciate hearing from you and if you don't want your opinions published I'll certainly respect your wishes, or I'll simply say it is an anonymous opinion. The first problem surfaced in New Zealand and was reported on in previous NLs, so you may want to review the information.

Comments on survey: I received several constructive suggestions on what the survey form should have contained to be very valuable to a new builder. One such was, "It would be most helpful if builders would record what size gas lines are used, the AN no. of fittings, what kind of wheels and brakes used, whether brake cyls. have own reservoir, whether they used Nyloflow brake lines or the older type, what kind oil cooler used, where located, etc." I well understand new builders needing such info desperately as they approach each new area, but I'm not sure if most builders would take the time to fill out the survey. I guess one of the facts of life are that most people strongly dislike filling out forms of any kind and also have an aversion to writing. I had toyed with the idea of another survey this year, using one of the new STS radios in an incentive drawing again, but I rather doubt if the response would be worth the cost to our treasury. What do you think?

Perhaps many of you that are new builders and aren't familiar with all the specific information on such subjects that is contained in the Aircraft Spruce & Specialty catalogue (\$4 cost refundable). I'd recommend it. Also TONY BINGELIS' monthly article in SPORT AVIATION is also a veritable gold mine of such info. His two books are also worth their weight in gold to a builder. His monthly articles go back quite a few years. I sure wish he or EAA could put all that info in book form. It'd cost you a small fortune if you had all those articles Xeroxed to put in a handy-dandy shop manual. I just can't say enough in the way of praise for Tony's skill and dedication in writing all those things and for thousands of hours of research he's done on them.

In addition to all the hours above that Tony has spent making life a lot easier for his fellow man, he's also spent a lot of his time making designee inspections and as a chapter officer. I would like to inquire of you as to how many of you are Chapter Designees? I am in the process of preparing a short series of articles for the EAA magazines which will cover the history of the Designee program, its purposes, its deficiencies, its benefits, its total value to EAA members everywhere, and what is in the planning stage for its future. I have a 2 inch high stack of copies of letters sent to HQ in response to a questionnaire (there's that word again), and I'll be building the articles around those questionnaire replies. Worldwide, EAA has over 800 chapters more or less active. In theory at least, EAA's primary function is education of the new builder, with all other functions secondary, and an old story is a new or prospective builder joining EAA to get help and knowledge from experienced people in the building of his project. Many times he quietly drifts away because he does not find what he came for...and spent his money for. When we join EAA we take on an unwritten contract that says that in exchange for the help and experience we receive now that down the line we'll agree to repay that debt in kind, willing and not under compulsion, so let's not forget we have a debt.

FOR SALE: Pete Bashford, Rt 1, Box 152 E, Morrisville, NC, 27560 put his T-18 over on its back in a sandy field and slightly sprung the fuselage but not much else damaged. Has and IO-360 eng & C/S hartzell (undamaged) and will sell all for \$11,550 or might part out. No time to rebuild. his phone is 919/ 467/0725. Give him a call for further info.

STANDARD DISCLAIMER: As always, in past, present, & future newsletters, we would like to make you aware that information presented is only in the light of a clearing house of ideas, opinions, & personal experience acc'ts. Anyone using these ideas, opinions, etc. do so at their own discretion and risk. Therefore no responsibility or liability is expressed or implied and is without recourse against anyone.

DISCUSSION ON GEAR CRACKS - HEAT TREATING

Comments

TONY BINGELIS!

DESIGNEES CHAPTERS

DISCLAIMER

**WET WING PLANS:** Here's some good news that many of you have looked forward to for quite some time.... JOHN WALTON has finally completed the plans and manual for the integral wing fuel tank and it's GREAT! It has been proof read by several people and now is at the printers and will be available by the time you read this. It's about 25 pages of detailed how to do it, step by step, which includes several sheets of drawings. In case you haven't seen John's airplane at OSH the past couple of years, he has all the extra fuel in the outer wings in the leading edge 'D' section. He has tested it thoroughly for over two years now and has never had any problem with it. He carries an extra 12 gals each wing (24 gal.) and with the normal 28 gal. fuselage tank this gives him a 1000 mi. range with a 3/4 hr. reserve @ 8 gal./hr burn. In fact, John says this is more fuel than you really need, as he can go to either coast with only one fuel stop and 5 3/4 hrs. is longer than most people want to sit without a pit stop. He further says you had better have Temperfoam seat cushions, too. You can order from Ken Knowles or direct from John (5726 Boyce Springs Dr., Houston, TX, 77066) or call him nights at 713/440-8093. The cost is \$10 ppd. and John says anything over cost will go into the NL kitty. It would make a good investment to add to your plans even if you never use them. This particular writeup is on the CW, but it could easily be adapted in principle to the st'd T-18.

THANKS, JOHN.

**FOR SALE:** John Walton also told me that he still has a near perfect Sensenich metal prop that has been vibration tested by Santa Monica prop shop and has about 100 hrs on it and is in excellent shape. It is just about ideal for a 125-135 hp engine. On his 150 hp eng. it didn't have enough pitch to keep the engine from overturning. It is a 76EM-8-8-72 and is a 68 1/2" dia x 72" pitch (\$400). John also had a machine shop make up 4 sets of pin extractors that easily remove the main wing attach pins at the dihedral break. He has one set in his airplane and just sold another set, so has two left. It cost him \$49 per set and that's what he's asking for them. Has no plans to have more made after these gone. These extractors are not in the CW plans, so first come first served.

**TIP** John also told me a little trick he used to make the standard wing tips conform to the NEW airfoil shape. He makes a male plug of balsa (or foam easily shaped) to fit the airfoil at the tip and then puts the tip over the top of it and applies heat to it from a heavy duty hair dryer. This softens the fiberglass so that it can be stretched and reformed to fit the male mold. In case you didn't appreciate this fact before fiberglass is a thermo-plastic and by definition a thermoplastic will soften when it is heated. There is a limit to its movement, tho'. One way to do the above op'n is to protect the mold with Saran wrap and lay a 4" wide strip of glass cloth clear around the outer edge of the mold and wet it out with resin. The two halves of the old tip are split apart and laid on top of the wetted strip and taped in place. After curing the strip, which is now holding the two halves together, more glass and resin are added on the outside at the "Gap" to fill the depression and further bond the halves together, flush sanding the excess after cure. The foam can be left in the tip if desired for additional strength. Care should be taken when you install any wingtip in order to get both tips on at the same angle with the wing or else you will have an airplane that wants to roll.

**TIP** Here's a little tip from KEN BROCK that he showed me at his house: He takes a 10 or 12 ft. piece of heavy twine around with him to do a check on how well someone's T-18 flaps are mounted on their wing. Wrapping it around the wing from trailing edge to LE back to the TE, holding it very tightly at the back, a person out at the wing tip can sight the underside and topside (spanwise) and easily see if there is a gap or protrusion. Slick! THIS AN EXCELLENT WAY TO FIT YOUR FLAPS TO THE WING.

**PAUL KIRIK REPORT IN NL #61:** Several people have commented on the very excellent and professional report Paul Kirik did on his airplane in the last NL. I'd like to encourage you to also submit such a report on YOUR T-18. Incidentally, Paul's T-18 is now out of the test phase and on May 13th will fly into the paint shop at Maquoketa, IA, to get all duded up for its OSH debut. Watch for it.

**RUSSELL ROSS, Box 318A, RR 1, Sioux City, IA, 51108,** wants to know how many early 0-320 Lyc owners are still using 7/16" valves & if so with what results? Wants to use a C/S prop on his T-18, but is concerned about what blade dia. (smallest) that they have used, as he's concerned about ground clearance with the st'd gear. (Gear extensions are a big help). He also has the following **FOR SALE:**..... Rattray cowl, prop extension, spinner, 2 fiberglass seats, 2 SL4N-20 mags sell of trade. He wants 2 SLN-21 mags with gears and an oil cooler.

From HANK STEIGINGA: SOME FINE TIPS

Dear Dick,

Good talking to you a week or so ago. Thanks much for sending newsletter #59 so promptly. I am sure I am up to date on the newsletter dues, however, I am enclosing a check to ensure the possibility of winning the Radio. I wouldn't want to miss out on that.

On T-18 tailwheels, some fellows are using a Maule frame and a Lang wheel and tire. A spacer is needed to center the wheel. This lashup is considerably less costly than Scott. Rosenhan master cylinders work beautifully. Many builders use 1/8 inch NYLO flow tubing with Swage loc fittings. Some fellows think 1/8 inch tubing is too small, but believe me, this system works great. This system has proved entirely satisfactory on many T-18's for the past 10 years or more. Completely leak free and trouble free.

As for horizontal trim, I used the 67 Camero Rally Sport headlight motor recommended by Bob Dial. It's a simple bolt on unit, very dependable. Full travel is 15 seconds, which worked out beautifully on N512S. Limit switches were used to control full travel. A "nose up" trim lite was used which illuminated in the landing configuration. After landing, simply hold the trim switch "nose down" 6 or 7 seconds and you were in trim for your next take off. Another preflight trim check on N512S was 2 small gold diamond stick-ons placed on the fuselage skin at the point of full travel of the trim arms on each side. When the arms are nearly centered between the diamonds, take off trim is assured.

Thanks again, Dick, for a great job on the newsletters. We all appreciate them very much.

Sincerely,

*Hank Steiging*

Hank Steiging

THANKS AGAIN, HANK, FOR THOSE  
FINE TIPS. WE APPRECIATE.



## SOME FIRST FLIGHTS AND BUILDER EXPERIENCES:

**Fred Hartman:** "My left wing stalls a few mph before the right wing. I'm wondering if my giant "war surplus" heated pitot tube (about 10" long and over an inch in dia.) could trigger the stall earlier. Anyway I put a stall strip on the right wing to balance it out." Fred doesn't say whether or not it worked. Unless he was very lucky, probably not. Finding the exact location for the stall strip location takes a LOT of moving it around an eighth of an inch at a time up and down, as well as spanwise, to find the one and only spot to trigger flow separation at the proper time and rate. If any of you have found such a location plz measure it very accurately and let us know. A piece of alum angle with some pieces of 025 protruding out about an inch from each leg and riveted to each leg of the angle works well. The protruding alum sheet is to have enough area to apply duct tape to secure it to the wing for testing.

**DON DERBY FLIES HIS CW:** Quite a few of the CWs are now flying.

First Flight

T-18-CW

Plans S/N 1423 Registration No N444DD Date 1st Flight 8/14/83

Name Donald F. Derby Street 300 E. Tropicana Ave #10

City Las Vegas, Nevada 89109 Ph 702/ 736-3726

Engine Make Lycoming Model O-320 D2A Hp 160 Const Cost 30k pluss

Time 3 yrs 8 months Prop Hartzell Length 72" Constant Speed

Radios: King Silver Crown Fuel Cap: 30 Gal

Modifications: It was built exactly to plans except for different seats

Wheel pants: Yes Gear Cuffs: Yes

Flush Rivets: Yes

JIM HOCKENBROCK, in Dec. '84 said, "I now have over 100 trouble free hours on N22JH and have enjoyed every moment of it (isn't that what it's all about for all of us, Jim?)....I brought it home last week to paint and upholster it during the winter. I hope to have it finished by spring." Hope to see you at OSH this summer, Jim. When it approaches 1st flight time comes the eternal question, "Shall I fly it awhile before I paint and upholster it?" Most pro painters say you'll get a better paint job with less work in preparation. One can accumulate oil and oil vapor in a lot of places that also attract dirt and are harder to get at for a perfectly oil-free surface. A good scrubbing with Scotchbrite pads will get rid of the surface oxide and give better bonding. It would be interesting to learn how many of you have used what type of primer, whether you used Imron, Acrolid, or some other of the newer paints, how they came out, how hard to apply, how well they've held up (chalking), what kind of touch up will they take without being a 'sore thumb', how much weight the airplane gained after painting...and after upholstery

HOW ABOUT YOUR THOUGHTS ON ABOVE QUESTIONS?

(MY AIRPLANE GAINED 30 LBS WHEN PAINTED WITH S.W. ACROLID)

## DICK PENMAN FLIES: (copy of letter from Dick) (12/27/84)

Dear Dick, I had the pleasure of watching my T-18, serial # 981, fly for the first time in May 15, '84. I have spent the last nine years in building it. The airplane is completely stock, weighing in at 915 lbs. EW. It has a zero time O-320-D 160 hp, a 66 x 76 Sensenich prop, and a Thorp type cowl. The airplane is very clean and has a high cruise of 185 mph. The extra time I spent in wing and tail alignment paid off. The aircraft stalls straight and clean and requires no aileron or rudder trim tab. The only two problems that have showed up after the first flight were brake pedal and trim tab adjustments. (??)

Gary Copeland, a fellow T-18 pilot, made the first flight. It was very exciting and Gary made it look very easy. However, after watching Gary fly the aircraft it made me realize that if the builder has the slightest doubt about his flying skills, he should find someone qualified to make the initial flight. Altho' many amateurs get away with it some do not! (AMEN, Dick. They let foolish ego get in the way of good judgement) This absolutely is no time for people to be kidding themselves that they qualify as a test pilot.

I want to give special thanks to Gary Copeland for his time and energy in testing my plane and checking me out in it. Also, a thank you for my good friend, Bob Dial for all his expert help and advice. Also, a big thanks to you and Lu for producing the very informative T-18 newsletter... Sincerely, Dick Penman, 5918 Bordman Rd., Dryden, MI, 48428. P.S... This plane is equipped with Rozenhan brakes and a Ford alternator (60 amps) and has been performing very well."

Thank you, Dick, for a fine report and let me commend you for your superb good judgement you displayed. A competent test pilot pre-thinks of his alternatives and emergency procedures to cover every possible contingency from losing a spinner, an engine fire, a canopy flying off, a rudder pedal breaking in two, etc. ALL OF THOSE THINGS HAVE HAPPENED ON INITIAL TEST FLIGHTS. Here's another bad situation: An airplane with a badly twisted wing, a grossly inaccurate airspeed, and turning from base to final a poorly prepared test pilot could accidentally stall the airplane, which will begin a spin at an altitude too low to recover. With the same airplane and pilot, visualize an oil line break at the oil cooler, which quickly covers the windscreen with oil. He can't see ahead and knows the engine will soon freeze and in his preoccupation with those problems he forgets to fly the airplane, desperately calls the tower, and the airplane stalls with little or no warning (which many do)....Yes, Dick, you did the smart thing.

DON WARNER, 7 Gaylord Dr., Wilton, CT, 06397 called the turn when he said I was a better aircraft builder than a bookkeeper (I'm probably the world's worst, my wife says. I don't like it, don't have time for it, and won't take time for it, unless absolutely forced to). Don has a problem with what he says is the combination of a Rattray cowl and a Merle Jenkins horseshoe motor mount ring. He says the combination causes what makes the front end look like a swayback horse, with the firewall being 3/4" lower than a straight line drawn from the bottom of the windshield to the top of the cowl just behind the prop. He says he either has to live with it or buy another motor mount, as he doesn't know who still makes the "flat back" (non-dynafoal) motor mount these days (Does Leisure Aircraft make them?) Can anybody help him? I know that the Rattray cowl requires considerable blending and fairing in to get the flow lines right, but it seems quite a few come out okay.

## Price Of the

By Howard Henderson (EAA  
14 Byron  
Kirkwood, MO 63122  
and  
Peter Roemer (EAA 2613  
Manitouish Waters, WI 54

## INTRODUCTION

Everyone talks about performance. Everyone talks about performance time to measure it accurately. This is developing accurate performance characteristics and educational. And it's not a night think.

Recording full throttle airspeed is a sensitive way to measure improvement in cleanliness and is probably universal, but enthusiasts; however, the alternate nautical mile in this article have been used by protest engineers for years, and can be accurate cruise performance charts.

## CALIBRATION OF INSTRUMENTS

The fundamental sources of error in the indicator error due to imperfect installation itself, and 2° static pressure error due to imperfect installation of the aircraft static pressure probe. Ordinarily there are negligible errors in the indicator using a home-made plastic tubing as a pressure transducer, as long as it is clear of the probe. The fundamental sources of error in the indicator error due to imperfect installation itself, and 2° static pressure error due to imperfect installation of the aircraft static pressure probe. Ordinarily there are negligible errors in the indicator using a home-made plastic tubing as a pressure transducer, as long as it is clear of the probe.

 $\Delta P$   
inches of Water

1.2  
1.77  
2.42  
3.16  
3.98  
4.93  
6.00  
7.10  
8.35  
9.68  
11.15  
12.73  
14.4  
16.1  
18.02  
20.05  
22.1

manometer construction details are not critical. The "U" shape segment of clea plastic tubing should be filled with water (add food coloring for visibility). The pressure is then applied to one end of the "U" tube. The pitot input to the indicator through a "T" fitting. (The indicator should be built in the air stream.) Just apply the pressure to the airplane pitot tube.) A convenient pressure source is an empty soda pop bottle connected to a tubing segment and secured by a "C" clamp. Any leaks in the system must be corrected before taking data. The diffused hose in water is used so the tubing legs should be secured for each pressure/airspeed division in the range of expected operation.

[illegible]

FT AVIATION 17

## MEASURE

It is possible to average speed over a course at a constant indicated airspeed, but not to average ground speed for true airspeed to a calibrated airspeed. Figure 21 which is compared to speed. The problems are: finding landmarks of known position; mobile odometer to measure distance; landmarks on a sectional chart; up to five per cent.

NISTT was cross checked between an outer marker probe hold. Careful timing revealed discrepancy which was finally probe. This is unusual but it is heated probes are more sensitive than a straight tube cut off holes may be too large by mistake.

By all means, don't depend on store bought planes for accuracy. In our experience, the typical indicator should read: "slow". The price and age of the airports in accuracy, either. Then planes flying with indicators 50

Accurate power figures depend on a good rpm and manifold pressure reading. Both should have some calibration of the rpm and tachometer. Probably the best calibration can be obtained at an engine test cell, but this isn't always convenient. A good check can be made by using a fluorescent strobe light during a night "run." The propeller will appear "stopped" when the strobe is flicker on and off with the propeller speed. A good mobile speedometer shows can

are not critical  
plastic tubing  
spring for visu  
end of the "L"  
through a "T"  
let in the air  
airplane pito  
is an empty  
segment and  
system must  
face in water  
orded for each  
expected oper

static port is  
it is common  
instrumented  
to find a lo  
"ham" pressure  
few of us care  
is easier to ac  
all the known  
tower fly by  
one, trailing

JPLRT AVALIATION 82

It is possible to average speeds over, say, a six mile course at a constant indicated airspeed, use the average ground speed for true airspeed and convert back to a calibrated airspeed (multiply TAS by  $\sqrt{\rho/\rho_0}$  from Figure 2) which is compared to the observed indicated speed. The problems are: holding a constant IAS, and finding landmarks of known distance. Using an odometer to measure a freeway or measuring landmarks on a sectional chart can involve errors of up to five per cent.

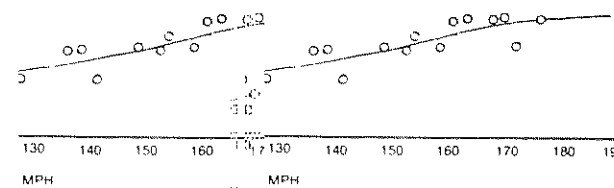
N18TT was cross checked on the surveyed distance between an outer marker antenna and a runway threshold. Careful timing revealed a three mile per hour discrepancy which was finally traced to the pitot ram probe. This is unusual but it is known that some "bulgy" heated probes are more sensitive to angle of attack than a straight tube cut off square. Also rain "bleed" holes may be too large by mistake on some probes.

By all means, don't depend on the indicators in store bought planes for accurate inflight comparison. In our experience, the typical light planes' airspeed indicator should read: "slow", "fast", and "Jackpot!". The price and age of the airplane don't seem to be factors in accuracy, either. There are new \$400,000 airplanes flying with indicators 5% off in cruise.

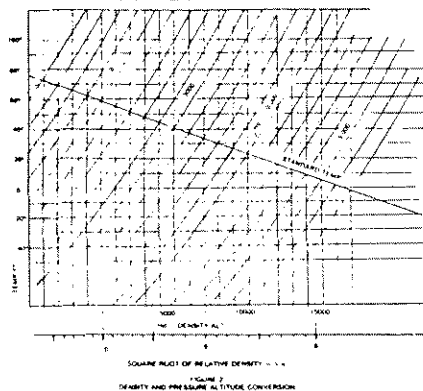
Accurate power figures depend critically on observed rpm and manifold pressure. Hence, it is best to have some calibration of the manifold pressure gauge and tachometer. Probably the most accurate calibration can be obtained at an instrument repair shop, but this isn't always convenient. The tachometer can be checked by using a fluorescent light as a poor man's strobe light during a night "run up." At 1600 rpm the propeller will appear "stopped" since fluorescent lights flicker on and off with the power line frequency. Automobile speedometer shops can also check a tach

WL 38  
DE ONLY

|     |     |     |     |     |     |     |       |
|-----|-----|-----|-----|-----|-----|-----|-------|
| 82  | 96  | 99  | 82  | 96  | 99  | 111 | 112.5 |
| 83  | 98  | 101 | 83  | 98  | 101 | 113 | 115   |
| 126 | 128 | 137 | 126 | 128 | 137 | 139 | 149   |
| 128 | 130 | 140 | 128 | 130 | 140 | 142 | 152   |
| 163 | 168 | 170 | 163 | 168 | 170 | 172 | 176   |
| 167 | 172 | 174 | 167 | 172 | 174 | 175 | 180   |



MPH MPH



quickly. The manifold pressure gauge can be roughly checked by noting the indicated pressure on the ground with the engine shut down. The reading should be equal to the current altimeter setting, less 1" hg for each 1000 ft. field elevation.

#### GETTING CRUISE PERFORMANCE DATA POINTS

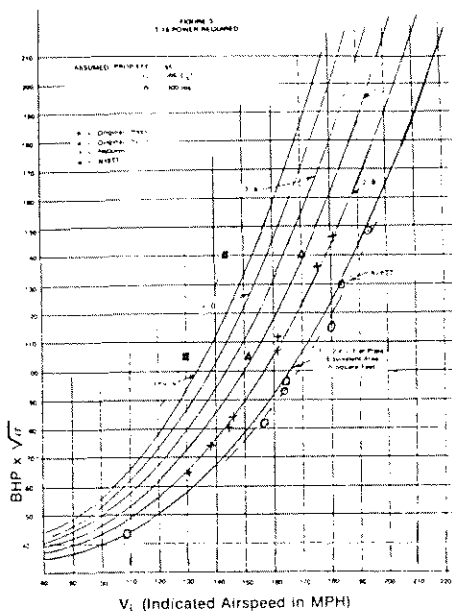
With airplane configuration noted in the log books and the prop and airplane cleaned up we are now ready to collect data. You would think the technique of flying straight and level would not require much discussion for an experienced pilot, but we feel obligated to bore you a little with the minute details in order to give you more confidence in your data. We will list the do's and don'ts in a column to make it easier.

1. Don't try to get data without a rate of climb instrument.
2. Do "tap" the rate of climb before flight to determine its actual zero point.
3. Do wait until engine is at normal temperature (cold oil consumes extra horsepower).
4. Do get all data in smooth air.
5. Do trim properly (ball centered).
6. Do allow several minutes for airspeed to stabilize at each power setting.
7. Record:
  - a. Pressure altitude (set 29.92 on the altimeter)
  - b. Outside air temperature
  - c. Manifold pressure
  - d. RPM
  - e. Indicated airspeed (last)
8. Do fly at a wide range of altitudes and power settings.
9. Don't leave test equipment on the airplane for cruise tests.
10. Do lean the engine properly at altitude.

We have found a tendency when trying to get data on an airplane to always be in a rush to get back down on the ground, but a few more minutes and a few more points permits you to "throw away" the real bad ones and gives you more confidence in the data.

#### T-18 PERFORMANCE COMPARISONS AND PLOTTING THE DATA

To begin, a set of theoretical drag curves on T-18s having equivalent flat plate areas from 2.4 sq. ft. to 4.4 sq. ft. are plotted as a reference for comparison. See Figure 3. (NOTE: Multiplying the BHP by  $\sqrt{\sigma}$  normalizes the curves for all altitudes).



Determining your own personal airplane drag polar is done by determining the actual true hp being used in stabilized cruise flight, multiplying by  $\sqrt{\sigma}$ , ( $\sqrt{\sigma}$  = density ratio for the altitude and temperature flown which can be obtained from Figure 2), and plotting against the corrected  $V_i$ .

Horsepower data can be obtained from the engine manufacturer (tabulated for different altitudes). An example of data on the 180 HP Lycoming is shown in Figure 5. This data can be plotted at various pressure altitudes (example, Figure 6) and the HP selected from the plot.

The "true HP" is the HP chart  $\times \sqrt{\frac{460 + T_s}{460 + T_a}}$  where  $T_s$  = Standard Temperature for that Altitude and  $T_a$  = The Actual "O.A.T.". Incidentally, this turns out to be almost a 1% reduction for every 10°F above normal.

The resulting data should give a reasonably smooth plot following one of the calculated lines, regardless of the altitude. Some variation might be attributable to changes in propeller efficiency.

Theoretically there should be a correction to HP and velocity for changes in weight, but this complicates things more than necessary. For airplanes having less than 10% weight change, it is much simpler to neglect it (at the higher cruise speeds the effect is negligible).

Superimposed on Figure 3 are data points of four different T-18s. The first one is the original published estimate of the "basic" T-18, without canopy or pressure cowling. The second "sport" airplane was John Thorp's estimate of the improvements expected by adding canopy and pressure cowl. N600HH and N18TT are also plotted and are described in Table II and the photographs.

SPORT AVIATION 19

TABLE II  
COMPARISON OF TWO T-18s

| ENGINE AND PROPELLER                          | N600HH<br>150 HP Lyc.<br>74DM cut & pitched<br>to 68-76     | N18TT<br>180 HP Lyc<br>76EM cut & pitched<br>to 68-81 |
|---|---|---|
| EXHAUST SYSTEM                                | Crossover with<br>2 small mufflers<br>and down facing pipes | Crossover with<br>aft facing pipes                    |
| AIR INTAKE SYSTEM                             | Conventional box &<br>filter inlet                          | Large carb filter with<br>rebuilt lower cowling       |
| L.G. FAIRINGS                                 | Yes   | Yes   |
| PAINT   | DuPont Iron   | Lacquer   |
| WHEEL PANTS & FAIRINGS                        | No  | Yes   |
| RIVETING                                      | Flush<br>(partially filled)                                 | Flush<br>(epoxy filled)                               |
| TOTAL TIME IN SERVICE                         | 100 HRS   | 600 HRS   |
| FLAT PLATE EQUIVALENT                         | 2.8 sq. ft.   | 2.35 sq. ft.  |
| AIR SPEED @ FULL<br>THROTTLE AT 9000 FT       | 177 mph (true)  | 208 mph (true)  |
| ABSOLUTE CEILING                              | >   | 26,100 ft. (See Note 2)                               |
| SPEED WITH 100 HP INPUT<br>AT SEA LEVEL       | 156 mph   | 168 mph   |
| MILES-GALLON AT 140 mph<br>INDICATED AIRSPEED | 20 m.p. gal   | 27 m.p. gal   |
| FUEL  | 28 Gal  | 34 Gal (See Note 3)                                   |

1. Theoretical, only partial throttle is used because of propeller type
2. Actual flight test using recording barograph
3. Roemer has built an enlarged tank which accounts for part of the good range

Figure 3 speaks volumes. Notice for instance, how with 100 HP input the original airplane cruised at 127 mph and N18TT will cruise at 168 mph. John Thorp has redlined the T-18 at 210 mph. As can be seen, a 180 hp T-18, like Roemer's (with a "free breathing" inlet giving the extra ram and possibly "over revving" to 2800 rpm, resulting in 190 HP), can easily fly red-line straight and level.

The differences between N600HH and N18TT (both modern versions of the craft) are worth careful scrutiny as a little study in the effects of cleanliness.

Each major improvement in N18TT was carefully flight tested by flying full throttle over a specified course, landing, putting on the new fairing and reflying the identical course within 30 minutes. The observed changes in IAS and RPM thus gave an accurate indication of speed changes, eliminating the effects of atmospheric variation.

Below is a list of improvements on N18TT which are all believed to contribute to the difference. (Note: to the uninitiated the absence of wheel pants on N600HH would appear to be the most obvious and important difference; however, these tests on N18TT have shown only 3 mph difference.)

#### SPECIAL POINTS OF IMPROVEMENT ON N18TT

- a. Canopy and windshield fit (particularly at roll bar)
- b. Wheel pants (3-4 mph, 25 rpm increase observed)
- c. L.G. Tube fairings (8-10 mph, 75 rpm) (also on 600HH)
- d. Tail wheel cover (3-4 mph, 25 rpm)
- e. Nose spinner fit

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- f. Gear tube — wheel pant junction fairings (2 mph, small rpm increase)
- g. Air intake
- h. Lower aileron gap covers (2 mph, small rpm increase)
- i. Flush wing tips
- j. Super finish on wing
- k. Exhaust stack outlet position and direction
- l. No external venturi
- m. No draggy ventilating scoops
- n. Faired con antenna

Both airplanes are flush riveted. Both have Henderson designed internal wing tip VOR antennas.

A range performance manual can be constructed from the flight data gathered for Figure 3. See typical curves, Figure 4. Notice MPG and range are constant for a given  $V_i$  regardless of altitude and can be derived easily from the chart. It is simply

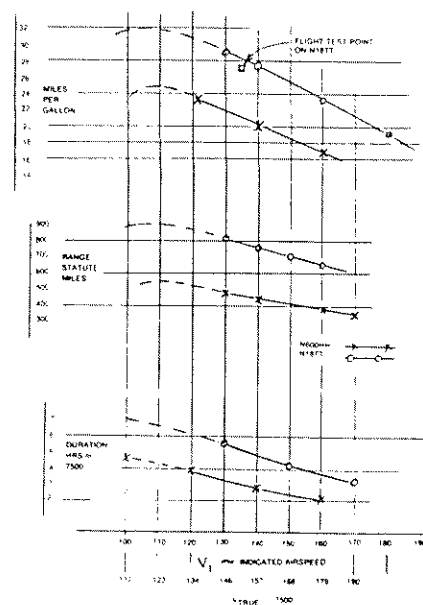
$$\text{MPG} = \frac{V_i \times \sqrt{6}}{(\text{s.f.c.} \times (\text{BHP} \times \sqrt{\sigma}))}$$

from chart (Fig. 3)

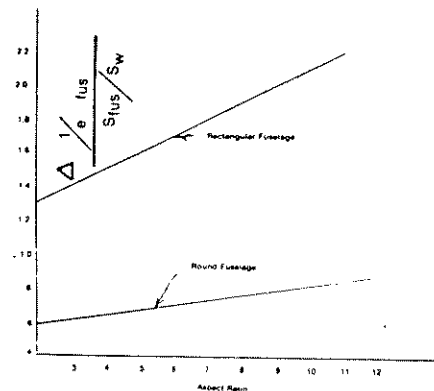
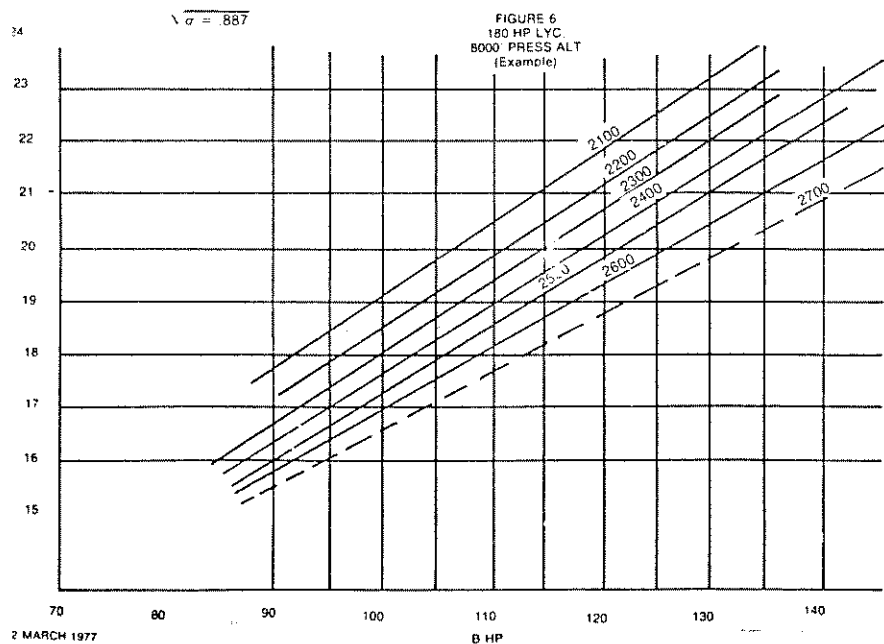
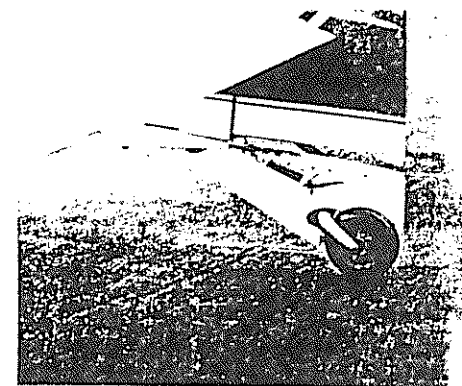
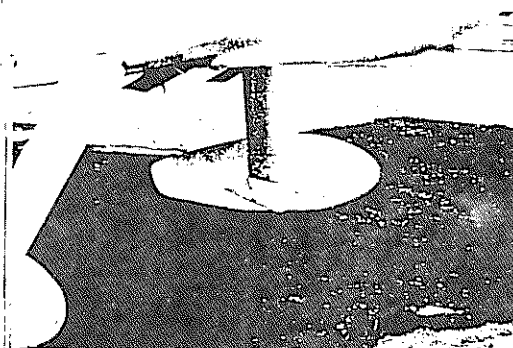
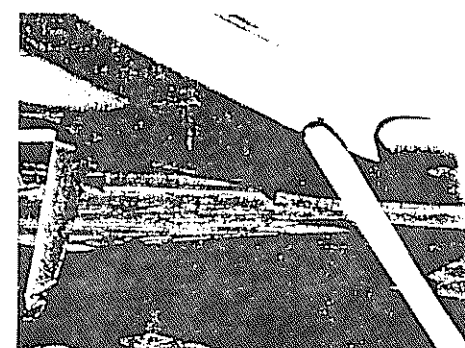
from chart (Fig. 2)

$$\text{Range} = \frac{V_i \times \text{Fuel Available} \times 6}{(\text{BHP} \times \sqrt{\sigma}) \times \text{s.f.c.}} = \text{MPG} \times \text{Fuel Available}$$

FIGURE 4  
T-18 CRUISE PERFORMANCE



| PRESS.<br>ALT.<br>1000<br>FEET | STD.<br>ALT.<br>TEMP.<br>°F | .47 LBS/BHP/HR<br>100 HP - 55% RATED<br>APPROX. FUEL 7.8 GAL/HR<br>RPM & MAN. PRESS. |      |      |      | .46 LBS/BHP/HR<br>117 HP - 65% RATED<br>APPROX. FUEL 9 GAL/HR<br>RPM & MAN. PRESS. |      |      |      | .47 LBS/BHP/HR<br>135 HP - 75% RATED<br>APPROX. FUEL 10.6 GAL/HR<br>RPM & MAN. PRESS. |      |      |
|--------------------------------|-----------------------------|--|------|------|------|--|------|------|------|---|------|------|
|                                |                             | 2100   | 2200 | 2300 | 2400 | 2100   | 2200 | 2300 | 2400 | 2200  | 2300 | 2400 |
|                                |                             | 2100   | 2200 | 2300 | 2400 | 2100   | 2200 | 2300 | 2400 | 2200  | 2300 | 2400 |
| SL                             | 59                          | 20.9   | 20.3 | 19.8 | 19.3 | 23.3   | 22.7 | 22.1 | 21.5 | 25.1  | 24.4 | 23.9 |
| 1                              | 55                          | 20.7   | 20.1 | 19.6 | 19.1 | 23.1   | 22.4 | 21.8 | 21.3 | 24.8  | 24.2 | 23.6 |
| 2                              | 52                          | 20.4   | 19.8 | 19.3 | 18.8 | 22.8   | 22.1 | 21.6 | 21.0 | 24.6  | 24.0 | 23.4 |
| 3                              | 48                          | 20.2   | 19.6 | 19.1 | 18.6 | 22.5   | 21.9 | 21.3 | 20.8 | 24.3  | 23.7 | 23.2 |
| 4                              | 45                          | 19.9   | 19.3 | 18.9 | 18.4 | 22.3   | 21.6 | 21.1 | 20.6 | 24.0  | 23.5 | 22.9 |
| 5                              | 41                          | 19.7   | 19.1 | 18.7 | 18.2 | 22.0   | 21.4 | 20.9 | 20.3 | 23.8  | 23.2 | 22.7 |
| 6                              | 38                          | 19.5   | 18.9 | 18.4 | 18.0 | 21.8   | 21.1 | 20.6 | 20.1 | FT  | 23.0 | 22.5 |
| 7                              | 34                          | 19.3   | 18.7 | 18.2 | 17.8 | 21.5   | 20.9 | 20.4 | 19.9 | --  | FT   | 22.2 |
| 8                              | 31                          | 19.0   | 18.4 | 18.0 | 17.6 | 21.3   | 20.7 | 20.2 | 19.7 | --  | --   | FT   |
| 9                              | 27                          | 18.8   | 18.2 | 17.8 | 17.4 | FT   | 20.4 | 20.0 | 19.5 |   |      |      |
| 10                             | 23                          | 18.6   | 18.0 | 17.6 | 17.2 | --   | FT   | 19.8 | 19.3 |   |      |      |
| 11                             | 19                          | 18.4   | 17.8 | 17.4 | 17.0 | --   | --   | 19.6 | 19.1 |   |      |      |
| 12                             | 16                          | 18.2   | 17.6 | 17.2 | 16.8 | --   | --   | 19.4 | 18.9 |   |      |      |
| 13                             | 12                          | FT   | 17.4 | 17.0 | 16.7 | TRUE H.P. = HP at std temp x $\sqrt{\frac{460 + T_s}{460 + T}}$                    |      |      |      |   |      |      |
| 14                             | 9                           | --   | FT   | 16.8 | 16.5 | $T_s$ = Std temp   |      |      |      |   |      |      |
| 15                             | 5                           | --   | --   | FT   | 16.3 | $T$ = Act temp   |      |      |      |   |      |      |

FIGURE 10  
CHART FOR ESTIMATING EFFECT  
OF FUSELAGE ON  $C_{Df}$ (Courtesy B. C. Roemer)  
Tailwheel fairing of N18TT. An example of the extreme effort by B. C. Roemer to lower the total drag coefficient of his T-18(Courtesy B. C. Roemer)  
Close-up showing the many fairings, backward slanting exhaust stacks, etc. that contribute to the high speed of B. C. Roemer's N18TT(Courtesy Howard Henderson)  
Close-up of landing gear leg fairings and exhaust pipe ends on Howard Henderson's N600HHAPPENDIX A  
DEFINITIONS

A = Aspect Ratio =  $b^2/S$   
 b = Wing Span  
 $C_L$  = Lift Coefficient =  $L/qS$   
 $C_{Dp}$  = Parasitic drag coefficient =  $\frac{f}{S}$   
 e = Induced drag efficiency factor for whole airplane  
 $e_w$  = Induced drag efficiency factor for wing  
 D = Airplane drag  
 f = Flat plate area equivalent to minimum drag of airplane  
 HP = Horsepower

BHP = Brake Horsepower  
 MPG = Miles per gallon  
 $S_w$  = Area of wing  
 $S_{fus}$  = (for this article) fuselage frontal area  
 $\mu$  = Efficiency (for this article propeller efficiency)  
 $\sigma$  = Air-density ratio  
 W = Aircraft weight = Lift  
 $V_t$  = Velocity, true =  $V_j \sqrt{\sigma}$

The large variation in MPG between the two airplanes is a direct combination of the 15% improvement in cleanliness plus the 10% improvement in fuel economy of the 180 HP engine (4.7 lbs./bhp-hr vs. 5.3 lbs. in Lycoming tests). The difference in fuel demand is probably mostly attributable to the higher compression ratio of the 180 HP engine.

Specific fuel consumption will vary somewhat with rpm, manifold pressure and altitude, however, as long as the power is reasonably high, this effect is minimal.

In any case, the accuracy of the MPG plots is impressive. N18TT has repeatedly demonstrated 27 MPG on two way trips with legs of 1 hour duration, by maintaining 135 IAS for climb, cruise, and descent. With careful leaning this performance has been remarkably consistent even including climbs to cruise above 12,000 feet.

For those builders with airplanes other than T-18s wishing to compute a family of theoretical curves similar to Figure 3, Appendix A is included at the close of the article giving the basic math and charts for any standard **monoplane**. Airplanes with variable incidence, canards, biplanes, etc., are beyond the scope of the simplified equations.

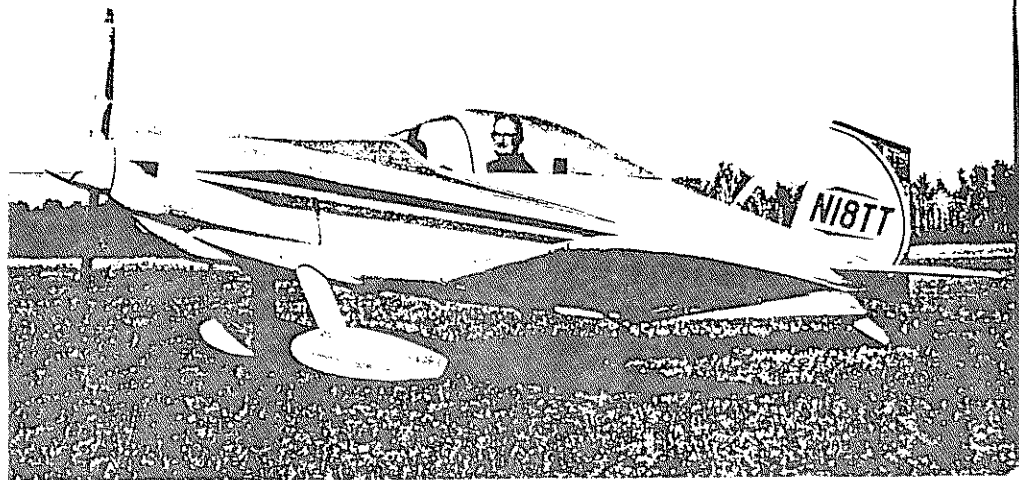
#### LIMITATIONS OF DATA

A. There are several pitfalls in trying to gather this type of data, the most important being propeller efficiency. For this article, a cruise propeller efficiency of 85% was assumed and since N600HH and N18TT both have fairly high pitched metal props, of the same diameter, even if the absolute efficiency is not exactly 85% we can guess that their difference is not very great. However, a wooden prop might be a little lower, by say 2-4%. Flight tests on N600HH have verified this flight loss in efficiency (see Figure 7).

B. Horsepower "Sensitivity" to Exhaust Configuration

(Courtesy B. C. Roemer)

B. C. Roemer in N18TT. One of the most proven and high performance homebuilts in existence.



Most Lycoming data is assumed to be taken with a crossover system and a large muffler. Flight tests on 600HH show some HP loss with the small muffler. A test was run comparing straight pipes to the small mufflers. Unfortunately, it was a gusty day and the data was skimpy but there is a minimum of 2-3% loss in horsepower (note, Figure 8). If one makes the analogy of a muffler to a simple RC filter in electronics it would appear one large muffler would be better than 2 small mufflers; i.e., the effective power loss is analogous to the IPR loss in the filters. Of course, a large muffler would be difficult to install in the T-18.

An improvement in effective horsepower can also be achieved by directing the exhaust gases aft, rather than down. This is due to the thrust available in the high velocity exhaust. Hopefully we can get around to modifying 600HH some day and quote some numbers on this.

#### C. Engine Condition

Ignition timing, compression and carburetion must be normal to make comparisons from one airplane to another (maybe not so important for comparisons on the same airplane).

#### D. Miscellaneous

Center of gravity variations can result in 2-6 mph changes in top speed for the T-18 (higher speeds for aft C.G.).

Airvent, oil cooler duct, and cowl flap settings all can change the data.

Bugs on leading edges could destroy any laminar flow present.

Trim tab settings also affect performance.

Engine accessories (fuel pumps, vac pumps, and generators) all use some engine horsepower.

In spite of the above anomalies the whole data gathering scheme works pretty well and much can be learned about small performance improvements particularly changes on the same airplane.

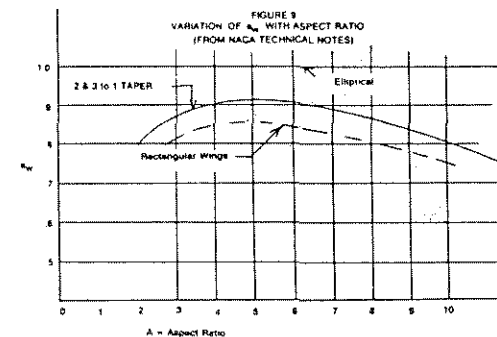
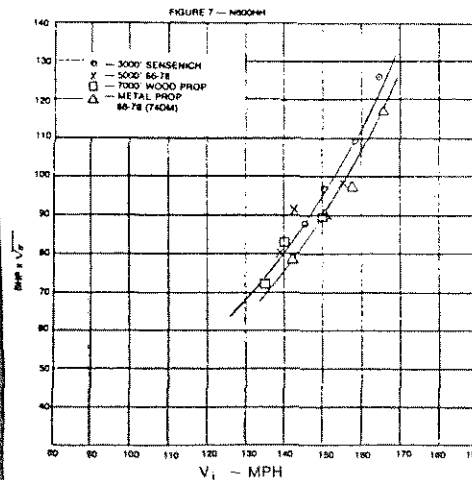
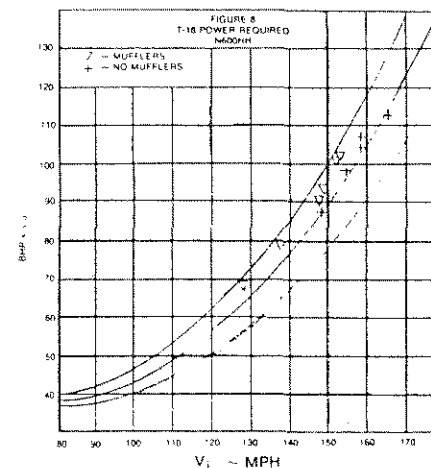
#### CONCLUSIONS

Relatively clean, modern versions of the T-18, such as Roemer's N18TT, will indicate better than 210 mph at sea level with 180 horsepower, while a good T-18 less some fairings, such as Henderson's N600HH, will indicate more than 195 mph. Under the same conditions, the original "basic" T-18 without pressure cowl or canopy would indicate 155 mph and the intermediate "sport" would indicate 188.

Our tests show that these performance differences can be accounted for by both streamlining and engine details. The canopy and pressure cowl add about 33 mph. Landing gear tube fairings raise the speed by 8-10 mph, and wheel pants, gear tube-wheel pant junction fairings, and the tail wheel spring fairing each account for 2-4 mph. The use of lower aileron gap covers adds about 3 mph and down pointing exhaust pipes cost 3 mph. The use of a wooden propeller also costs 3 or 4 mph.

Together the stated differences in 600HH and 18TT account for about 10-13 mph of a 15 mph plus difference in sea level top speed with 180 HP input. The remainder can be attributed to smaller details such as the canopy-windshield junction, epoxy filled rivets, etc.

In closing, we should point out that any small improvements in air frame streamlining have pronounced effects in fuel economy, and operating costs as well as on cruise speed. For the T-18 an increase of only 10 mph in top speed is the equivalent of nearly 25 extra horsepower — which doesn't have to be purchased, maintained, overhauled, carried by the airplane or fed 80¢ per gallon gasoline. Not a bad reward for investing in a few fairings and keeping it clean — or don't you think flying 1 hour free in every 10 is a good deal?



$V_i$  = Indicated velocity (corrected airspeed reading)  
 s.f.c. = Specific fuel consumption  
 = .47 lbs/BHP HR for 180 HP LYC  
 = .53 lbs/BHP/HR for 150 HP LYC

$$\text{BHP}_{\text{(reqd)}} = \frac{V_{\text{mph}} \times 88 \times D}{550 \times 60 \times \mu}$$

$$D = C_{D_t} \times S \times .00256 V_{\text{mph}}^2$$

$$C_{D_t} = C_{D_p} + C_{D_i}$$

$$C_{D_i} = \frac{1}{\pi A e} C_L^2$$

$$C_L = \frac{L}{0.00256 V^2 S}$$

$$L \approx W$$

$$C_{D_p} = \frac{f}{s}$$

CALCULATION OF  $\frac{1}{\pi A e}$  FOR T-18 from K.D. Woods.  
 Airplane Design, Vol. I, Page A119

$$\text{Wing aspect ratio} = \frac{(20.8)^2}{86} = 5.$$

From Figure 9,  $e_w = .85$  for rectangular wings

$$\therefore \frac{1}{e_w} = \frac{1}{.85} = 1.176$$

For the contribution of fuselage to induced drag, from Figure 10

$$\Delta \frac{1}{e_{\text{fus}}} = \frac{S_{\text{fus}}}{S_w} = 1.6$$

$$S_{\text{fus}} \approx 3 \times 3 = 9 \text{ sq ft}$$

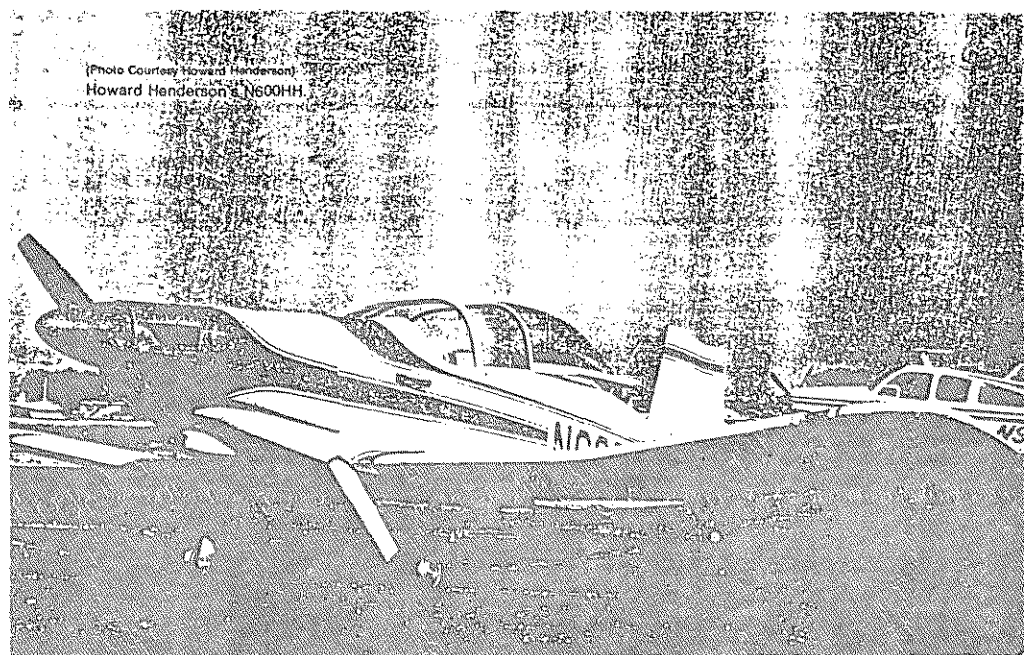
$$\Delta \frac{1}{e_{\text{fus}}} = 1.6 \times \frac{9}{86} = .167$$

$$\text{total } \frac{1}{e} = 1.176 + .167 = 1.343$$

$$e = \frac{1}{1.343} = .744$$

$$\frac{1}{\pi A e} = \frac{1}{\pi \times 5 \times .744} = .0855$$

From the above basic equations it is possible to substitute your own parameters of S, A, etc. and crank out a set of curves for values of f which you think might bracket your airplane.



(Photo Courtesy Howard Henderson)  
 Howard Henderson's T-18

The preceding 9 pages were from the March '77 issue of Sport Aviation and were a result of the joint efforts of two highly regarded T-18 builders. I think you will agree that this was an outstanding piece of work.

The past year I have had several new builders and owners of recently purchased T-18s ask me if there were any guidelines available to properly evaluate the T-18 performance with accuracy. This article is one you may want to separate from the rest of the NL and insert with other such articles in the operations manual. (Hopefully I'll be able to find time to get it together in the next few months).

One T-18 builder I talked with some time ago made a good suggestion about one of the things that would be most helpful to those just about to fly their airplane and that was to have a SPECIFIC program to follow in the required test period, with all data to be carefully recorded. When most are asked what all they did in their test period they'll give you a silly grin, which says they didn't do much except bore holes in the sky until they flew their time off. Maybe that's okay, as most T-18s won't have too many surprises, but just remember there's a good reason that factories pay good money for production test pilots, so don't assume every T-18 is just like the next one. Not so. Every T-18 is different from every other. Every T-18 will fly just a little differently from the rest and some will fly a whole lot differently. Just because the FAA has given you the final sign off, don't relax finding out all about your bird and say, "Well, now I'm gonna just enjoy what I've spent all those hours of labor on."

Another FOR SALE: One of our local builders, Ken Hamilton, died last fall and his only heir, his mother, asked me to be a go-between in disposing of his project. Ken's aim was to build the finest T-18 that had ever been built and had he lived he might have done just that. The fuselage is all riveted and on the gear. His stepfather, who worked for Douglas 30 years helped him rivet and I'll say I've never seen a more perfect job. All his parts came from Ken Knowles and everything is there to finish the airplane from the firewall aft. The main spar caps have been machined, but that is all that has been done on the wing. Everything has been inventoried and the cost was \$7100, which included plans (std, WB, & CW), dynafocal eng. mount, canopy & windshield, seats, controls, tank, Cleveland wheels and brakes, all controls, a transponder, in fact, just about everything except upholstery, engine, and cowling. They will consider any reasonable offer and might consider selling parts. If you are serious about it give me a call at 214/351-4604 and I'll fill you in on details and pass on your bid.

T-18 BUILDER'S LISTS: From time to time we get requests from builders for addresses of builders close to them, as some of them have never seen a T-18 in the flesh, a real live flying one that is. Also, some of them need a little hands on help getting started, so a kindred soul is greatly appreciated in those cases. Starting with this issue (NL #62) we are publishing a complete list of paid up T-18 Builders and Owners Association members that are computer sorted as to zip code. We are printing these pages full size for better readability. We do not have phone numbers for but a fraction of the membership, but later this year when you renew your membership it would be a kindness if you furnish your phone number for the 1985-86 listing. We will publish a supplement in the next NL of new members and later we'll publish a list of former members that have not renewed for one reason or another. I wish we could somehow get a complete list of all the FAA registered T-18s. Can any of you help???

(SEE PG 21.) SOMEBODY DID HELP!



Another Interruption: Since writing page #18 nearly two weeks has zipped by. I had to take time out to do two big articles for the July issue of Sport Aviation, a short article for Sport Aviation, and a couple for Lightplane World and make a May 10 deadline, so when I get these assignments I have to drop everything and go like gangbusters.

**FOR SALE:** Another local T-18 project just came open and it's such a good buy that it'll probably go locally before this gets to any of you. This (standard) T-18 is a complete airframe for all practical purposes. It was started by a Bell Helicopter employee and he has done professional type work. He has an unassembled, but overhauled, O-290G engine with it and a metal prop. There is an engine mount, too, ~~with~~ cowling. It has a tank (in), windshield (in), instrument panel with engine instruments and basic VFR flite inst'ts, seats (in) not upholstered, all flite controls (in), no upholstery or soundproofing, ~~canopy is fitted, but is older & piece type~~, landing gear standard length, wheels, brakes, tires, Maule tailwheel and steel spring, horizontal tail (modified per ADs), fin, rudder, electric flaps (partially installed). Aircraft was started here in late '60s, using my templates copied from Thorp's. Original builder went thru divorce which tied project up about 6 or 7 years. Later got Alzheimer's disease and sold locally a year ago. Present owner's business commitments too much to have time to complete (has another airplane and only flew it 12 hrs. last year). His asking price is \$5495. Wife threatening bodily harm if he doesn't sell. He's out of town much of time, so call me anytime after 9 am CST and I'll answer any other q's you might have, as I know it well. (214/351-4604).

**NEWSLETTERS 1 thru 44:** For newsletters in this range you need to send to LU SUNDERLAND, 5 Griffin Dr., Apalachin, NY, 13732 for them. He has a condensed package of them for \$15 ppd. Many of the new ones joining the T-18 Builders and Owners Association write about these and sometimes I don't seem to be able to find time to answer.

While in the LAX area in March a friend of Ollie Smith came by Ken Brock's house and said Ollie had decided to sell his T-18. I think his health was the reason. He has a fine T-18 that's well known there for several years. Don't know the price or other details. No address, either, as Ollie has never joined our group. Ken could probably tell you how to reach him.

Ken Brock was supposed to send me a really good method of very accurately aligning the main gear wheels, using a cord, a couple of chairs, protractor, and a hand held computer. Most everyone these days say that you should set your wheels with no toe in or out on a T-18. A little bit of mis-alignment will soon show up in tire wear. It will also tend to make the T-18 a little bit too frisky on the ground. CG will also play a part.

The following pages dealing with the bending of leading edge radius in wing skins and other brake bending of sheet metal is from DON WINCHESTER, who lives here in the Dallas area and is Foreman of the biggest manufacturer of stainless steel food machinery in the area. Don holds patents on a number of food machinery items and is an artist when it comes to metal. He is an A & P, a long time EAAer, and built an excellent T-18. I have learned a lot of little tricks with metal from him and the wing skin bit is one of them that's invaluable to know.

*(DON IS SR. VICE PRES. IN CHARGE OF PRODUCTION, NOT FOREMAN.)*

**BENDING THE LEADING EDGE RADIUS IN WING SKINS:** This is one of the most important things the builder can do that will determine how well the airplane flies. Make that radius too tight and the wing will not only stall at a higher speed, but also the stall onset will be sudden...even vicious. Quite a few builders report one wing stalling ahead of the other. The most likely answer is one of the wing skins has a slightly tighter LE. Bend the radius too softly and up goes the drag, altho' it will have a gentler stall on THAT wing. You should take the time to do it as perfect as you can. The LE radius MUST fit the airfoil contour. You may have purchased a pre-punched skin from a supplier or perhaps you've laid it out yourself, carefully trammelling it in all directions for squareness, but you still must take extreme care to make the bend of the LE fall in the right place with just the right amount of radius. Each of the 4 skins (6 on the CW) will require probably as many as five or six of the gradual crushing type bends as you progressively move the pressure point forward, dis-assemble and re-check the radius, re-assemble, bend, etc

When you are doing it all yourself, there are a couple of ways to go. We'll look at the easiest way first. FIRST, assemble the ribs and spars. Then shear out several pieces of scrap metal about 3-4" wide x about 5-6" longer than the wing chord. With small clamps clamp tightly to the upper flange of the rib. Let the forward end project out in front of the most forward part of the rib LE. The idea is to be able to locate the point where the strip is no longer in tangency with the rib flange, where it projects forward as a straight line. Where this begins is the AFT END OF THE LE RADIUS. Making the strip out of heavier gauge material (i. e. .040) makes it easier to determine this point. Mark this point carefully on both the strip and rib. Now mark the point where each spanwise rows of rivets will fall on the front and rear spars.

Now on the bottom side of the ribs you want to basically do the same thing, but now the airfoil shape must be temporarily changed to a SYMMETRICAL airfoil in order to get the LE radius bent in the exact point. Since it is flatter on the bottom than the top we have to add X amount to make the distances the same, top and bottom. This time we have to start at the front, at the AFT END OF THE LE RADIUS. Using the template for the top flange to get the proper distance from the LE radius point to the rear spar rivet line we find the point to locate a New line of spanwise rivet holes. This involves adding some extra length to the wing skins, with the excess later trimmed back to the typical .25" ED from the rear spar rivet line. After the skin is bent. This NEW line of rivet holes will match the ones above, so that when the two rows are clecoed together the LE radius will be in the proper place when the sheets are squeezed together in the classic method via 2 x 4 spanwise pressure.

To see this a little clearer, look at Dwg. #547 (Wing Profile). At the bottom of the ordinate table you'll see a figure for the LE radius, plus a 50% figure. You'll also see a # for the slope, which locates the center of a circle. Now take a compass or divider and set at this radius. Draw a circle and notice where the circle line intersects the wing profile lines and these are the points we need for using the above procedure.

Using still another piece of scrap (that will be about a 6" wide segment of a complete wing skin) lay out about 4 holes top and bottom and cleco together. Now gradually make the squeeze bend and test it for fit at the LE, using a strong light behind the rib as you eyeball it. A 6" wide strip will only offer a fraction of the resistance to bending a complete skin will, so GO EASY on the bend.

CONT'D ON PG. 21

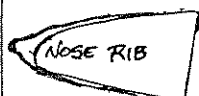
BENDING WING SKINS

You will find in bending a 4 ft. wide section of skin that the edges offer less resistance to bending than the central part. Some have found that adding a 1½ or 2 ft long 1 x 4 to the bottom of the 5 ft long 2 x 4 you use for bending will add enough extra pressure to the central part to make the bend more uniform along the entire 4 ft section. It's a good idea to add "stop" blocks on each end of the 2 x 4 to prevent accidental overbending.

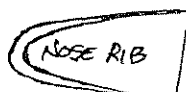
IF YOU OVERBEND THE LEADING EDGE YOU HAVE JUST CREATED AN EXPENSIVE PIECE OF SCRAP....YOU CANNOT UN-BEND THE RADIUS AND SAVE IT, SO GO SLOW. TAKE TIME TO TAKE IT APART AND CHECK HOW MUCH YOU HAVE FORMED IT AT EACH RIB STATION.

The following illustrations may help to visualize the results of either overbending or underbending:

(exaggerated for clarity)



overbent



underbent

In both cases the skin doesn't fit the contour of the rib's nose. Try this for yourself with a narrow strip of scrap. Overbent it will result in skin being too short to reach rear spar rivet line

The above series by Don to be continued in NL #63. We are out of space for this issue and also out of time (now in late May).

GLEN DALL, a builder who is also an accident investigator for the DOT Nat'l Safety Board, just sent me a computer print out on all accidents that a T-18 was involved in and also a print out of the FAA list of all civil aircraft that have the name Thorp as all or part of their identity. We'll start publishing these lists as space permits. I notice that quite a few of you have NOT updated your address as req'd by regs. Could cause you big trouble if you had a violation filed on you for some minor reason. Thanks, Glen, for the list. Now maybe we'll be able to contact some of the T-18 owners that apparently haven't heard of our Association.

LU SUNDERLAND was here last week. Now has all 177 drawings for the S-18 completed (\$185). Part no.s remain the same. S-18 is the WB & CW version of the T-18. Lu & I agreed we should reprint and update NLS 1-44, as the print quality is poor. We plan to make a book of ALL back NLS. Some of you could help if you would TYPE an index page of contents of ea.NL.

DAVE BLANTON is moving to new quarters at Augusta, KS. He will have one or two versions of his Ford engine Cessnas at OSH '85 and will be doing demos. Maybe he will let you fly one if you are seriously interested. NO definite info at the moment on that. Hard to really evaluate the V-6 eng, as he has too much pitch in prop and it doesn't get up to power until you hit 100-110 mph with it. I've tried several times to get him to try another prop with less pitch. STEVE HAWLEY has one of the "Almost constant speed" props on his T-18 now (story on that in #63) and maybe he ought to take a look at one of those. STEVE LIKES IT (SEE PIX)

Again, gents, sorry to be so late getting this out. Will try my best to get #63 out before OSH '85. Have to go to Houston to cover USA '85 next wk, then to Merced, then to LA again, plus a half dozen more stories to cover within 100 miles from DAL. I'm busy, yes, but it's a lot better than a rockin' chair, so I'm not complaining. (A DIRTY JOB, BUT SOMEONE

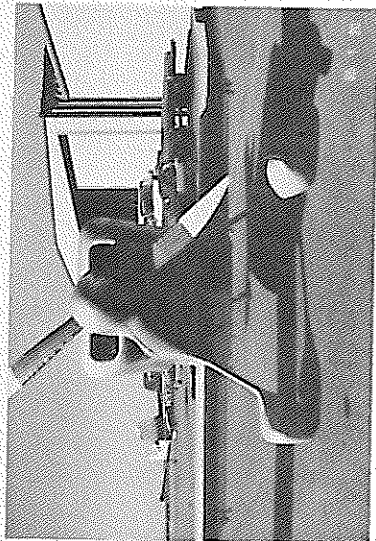
HAS TO DO IT.)

Rev ya,

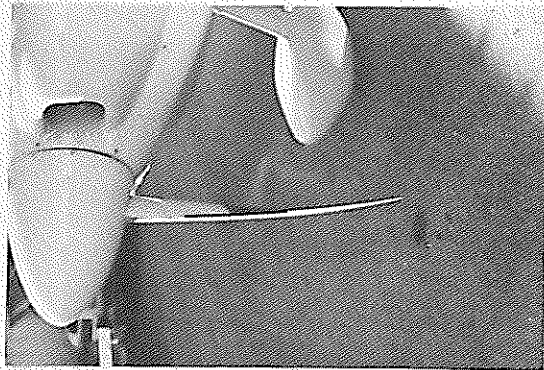
Dick





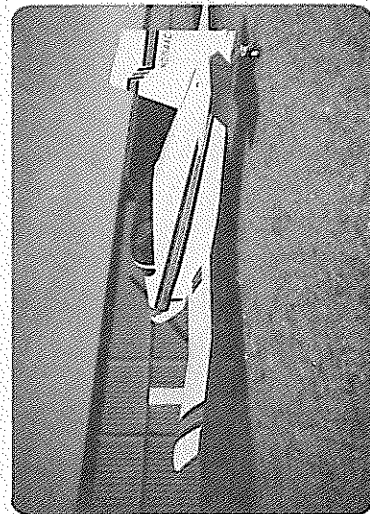


↑ STEVE HAWLEY'S  
"ALMOST CONSTANT SPEED PROP"  
(WARNKE)  
↓



GEAR  
FAIRINGS  
COMPLETE

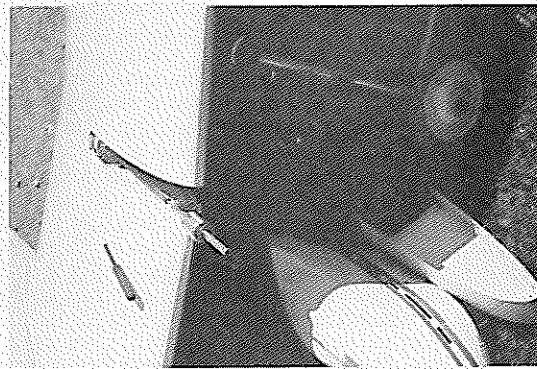
Wow! →



HARRY WHEELER



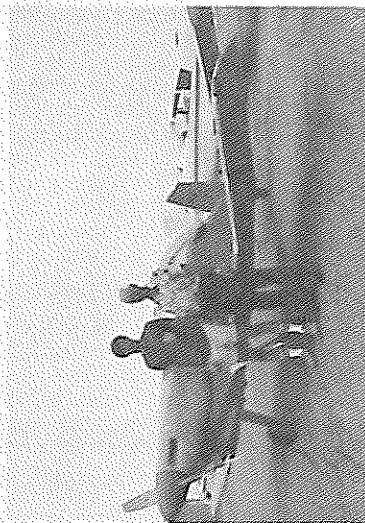
DICK PEARMAN



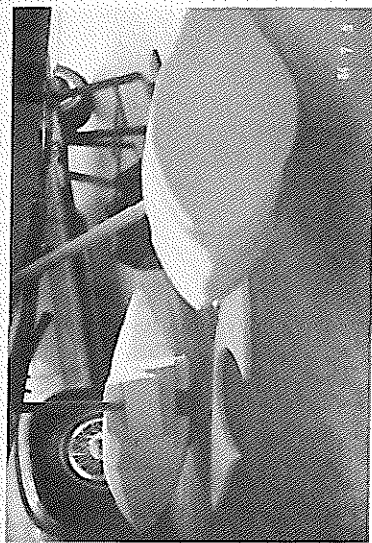
LV's  
PIN  
EXTRACTOR  
(A  
NECESSITY)  
IN  
POSITION



RICHARD CRIBE

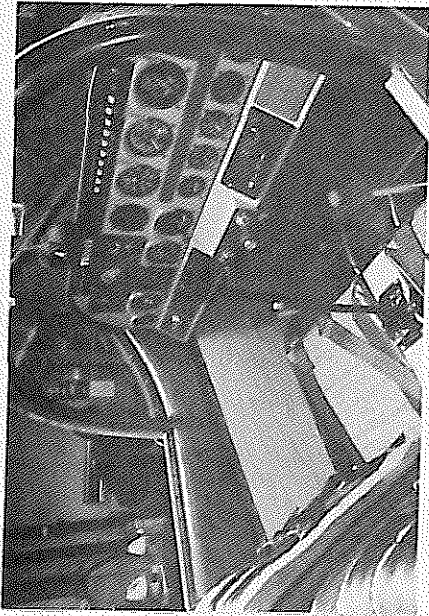


TOM KERN & LOU FALCONI JUST  
AFTER TOM TEST FLEW LOU'S T-8



STEVE HAWLEY'S NEW WHEEL  
AND AXLE FAIRINGS - (STAGE A)





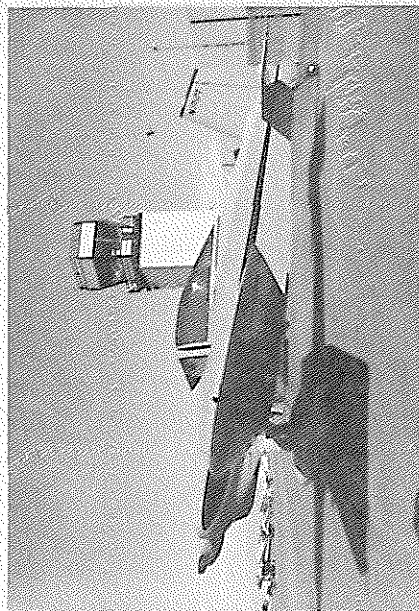
JIM PAINE



WAYNE IRWIN



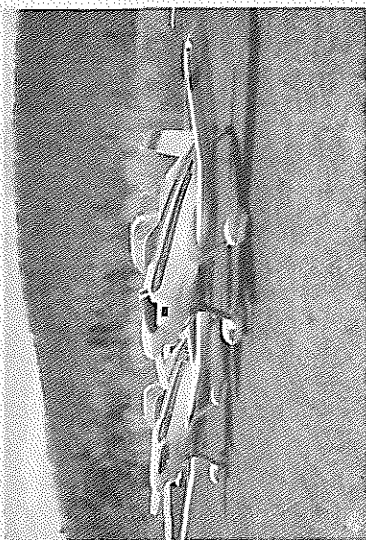
LU'S  
CW  
PIN  
EXTRACTOR  
TOOL  
AND  
CAP  
COVER →



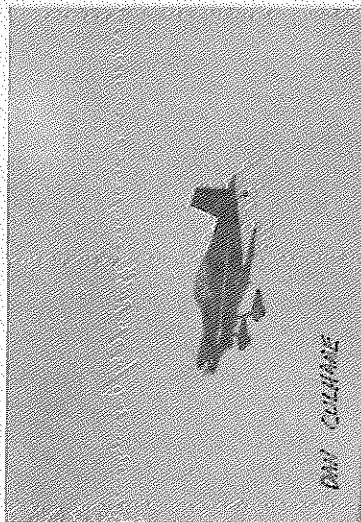
SYLVAN KEEBLER



SYLVAN KEEBLER



LU SPENDERLAND'S ORIGINAL & LATEST CW (1)  
(NOTE WINGS)



DAN COLLANE

DAN COLLANE'S #2 F-18



CHUCK SCHWARZ (CANADA)  
NOW FLYING

| FIRST NAME  | LAST NAME        | ADDRESS                     | CITY               | ST | SIP CODE | ADDITIONAL ADDRESS           |
|-------------|------------------|-----------------------------|--------------------|----|----------|------------------------------|
| John        | Burke            | 216 Tomswood Hill           | Hainault, Essex    |    |          | ENGLAND                      |
| Glen        | Hougestol        | RR2                         | Red Deer, Alberta  |    |          | CANADA                       |
| John        | Remington-Gurney | P.O.Box 23                  | Honiara            |    |          | Guadalcanal, SOLOMON ISLANDS |
| Philip      | Haer             | 6PO Box 2508                | Sydney, NSW        |    | 2001     | AUSTRALIA                    |
| John        | Warland          | 131 Blyth Street            | Altona, Victoria   |    | 3018     | AUSTRALIA                    |
| Brian       | Olney            | 28 Brian Ave.               | Mt. Pleasant, W.A. |    | 6153     | AUSTRALIA                    |
| Paul-Ernest | Levesque         | 140 Rue St. Germain Q'dest, | Rimouski, Quebec   |    | 651      | 4B5CANADA                    |
| Grant       | Neal             | 516 Lynda Lane              | Ancaster, Ontario  |    | L96      | 2P6CANADA                    |
| Fred        | Gindi            | 101 Broomfield Dr.          | Agincourt, Ontario |    | M15      | 2W3CANADA                    |
| Ron         | Miller           | 17 Orchard Mede             | Winchmore Hill     |    | N21      | 2D London, ENGLAND           |
| J. G.       | Smith            | 47 Silver Ridge Rise NW     | Calgary, Alberta   |    | T3B      | 4P6CANADA                    |
| Chuck       | Schwarz          | 503 Birch St.               | Campbell River     | BC | V9W      | 2S9CANADA                    |
| A. W.       | Fairbrother      | 17 Meadowbrook Rd.          | Auburn             | MA | 01501    |                              |
| Harry       | Wheeler          | 2 Marion Road               | Salem              | ME | 01970    |                              |
| John        | Cragin           | 160 Straford Road           | Needham            | MA | 02192    |                              |
| Dan         | Culhane          | 146 Hillside Dr. S.         | Windsor            | CT | 06074    |                              |
| Joe         | Gauthier         | 9 Kowal Drive               | Cromwell           | CT | 06416    |                              |
| Carl        | Jordon           | 119 Canterbury Drive        | Ramsey             | NJ | 07446    |                              |
| Joseph W.   | Layer            | 28 S. Hillside Pl.          | Ridgewood          | NJ | 07450    |                              |
| Robert      | Hartmaier        | 8 Holly Road                | Jamesburg          | NJ | 08831    |                              |
| Niarod      | Litvak           | 69-15 Queens Blvd.          | Woodside           | NY | 11377    | c/o Universe Motors          |
| Lu          | Sunderland       | 5 Griffin Drive             | Apalachin          | NY | 13732    |                              |
| Hank        | Beamer           | 3862 Lockport-Olcott Rd     | Lockport           | NY | 14904    |                              |
| Carl        | Fetch, Jr.       | 142 Greenridge Rd.          | Monongahela        | PA | 15063    |                              |
| Ed          | Burke            | 240 Franklin Dr.            | Pittsburg          | PA | 15241    |                              |
| Grover      | Rahiser, Jr.     | 517 Van Buren St.           | Evans City         | PA | 16033    |                              |
| James       | Strickenberger   | 4344 Gem Ct.                | Erie               | PA | 16504    |                              |
| John        | Buffington       | 3618 Lancaster Rd.          | Erie               | PA | 16506    |                              |
| James       | Hockenbrock      | R.D. 1, Box 361-A           | Reedsville         | PA | 17084    |                              |
| Edwin       | Layton           | HCR 80, Box 60              | Warfordsburg       | PA | 17267    |                              |
| Robert J.   | Derby            | RD 1, Box 331A              | Montrose           | PA | 18801    |                              |
| Don C.      | Thomsen          | 112 Station Ave.            | North Hills        | PA | 19038    |                              |
| Norbert     | Hesterberg       | Rt. 4, Box 705A             | Dover              | DE | 19901    |                              |
| Paul        | Shifflett        | 143 W. Farmington Rd.       | Accokeek           | MD | 20607    |                              |
| Leo         | Perlaky          | 6301 Somerset Rd.           | Riverdale          | MD | 20737    |                              |
| Samuel W.   | Carson           | 8513 Rose Marie Dr.         | Ft. Washington     | MD | 20744    |                              |
| David       | Johnson          | 2212 E. Admiral Drive       | Virginia Beach     | VA | 23451    |                              |
| Murant      | Karibian         | 621 Woodstock Road          | Virginia Beach     | VA | 23464    |                              |
| Bob         | Highley          | 18 Smith Street             | Poquoson           | VA | 23662    |                              |
| Robert      | Wall             | P.O.Box 7                   | Wellsburg          | WV | 26070    |                              |
| Carl        | Radcliffe        | Rt. 9, Box 238A             | Parkersburg        | WV | 26101    |                              |
| T. J.       | McCormick        | P.O.Box 105                 | Rowland            | NC | 28383    |                              |
| Ma. M.      | Johnson          | Rt 3, Box 248               | Leland             | NC | 28451    |                              |
| C. E.       | Graham           | 1133 Macon St. Drawer L     | Perry              | GA | 31069    |                              |
| Gerald      | Penberthy        | P.O.Box 1107                | Albany             | GA | 31702    |                              |
| Don         | Warner           | 118 Faulkner                | New Sayrna Beach   | FL | 32096    |                              |
| Fred        | Mahan            | 1415 Glen Haven Dr.         | Merritt Island     | FL | 32952    |                              |
| Joe         | Jingle           | 1340 Holt Drive             | Merritt Island     | FL | 32953    |                              |
| Richard     | Mozina           | 3400 S.W. 100th Ave.        | Miami              | FL | 33165    |                              |
| Fred        | Hartman          | 2665 N. Ocean Blvd.         | Delray Beach       | FL | 33444    |                              |
| Al          | Kasten           | 652 NW Sunset Dr.           | Stuart             | FL | 33494    |                              |
| Russ        | Riter            | Rt. 1                       | Frostproof         | FL | 33843    |                              |
| George T.   | Daniels          | 330 Ave. J                  | Winter Haven       | FL | 33880    |                              |
| Jerry       | Lindell          | Rt. 1, Box 6-B              | Pansel             | AL | 36370    |                              |
| T. A.       | Clayton          | Rt. 2, Box 650              | Millington         | TN | 38053    |                              |
| Roger       | Derby            | 3518 Kirby Lan              | Louisville         | KY | 40299    |                              |
| Allen       | Koch             | Rt. 2                       | Campbellsport      | WI | 43010    |                              |
| Harold      | Whipps           | 4179 Sunbury                | Columbus           | OH | 43219    |                              |
| Walt        | Giffin           | 4277 Kenmont Pl.            | Columbus           | OH | 43220    |                              |
| Dirk        | Turkenburg       | 5390 S. Ridge W.            | Madison            | OH | 44057    |                              |
| Lewis       | Avramovich       | 1962 13th St.               | Cuyahoga Falls     | OH | 44223    |                              |
| Clifton     | Redden           | 609 Wise Road               | Lynchburg          | OH | 45142    |                              |
| John R.     | Hicks            | 4011 Hillendale Dr.         | Greenwood          | IN | 46142    |                              |
| Ted         | Jarosak          | 2501 Sand St.               | Portage            | IN | 46368    |                              |
| Jack        | Herrli           | 2016 W. Indiana Ave         | Elkhart            | IN | 47514    |                              |
| Bob         | Dial             | 5175 Wing Lake Rd.          | Bloomfield Hills   | MI | 48013    |                              |
| Dick        | Amsden           | 16434 Concord               | Fraser             | MI | 48026    |                              |
| Bill        | Oliver           | 2369 Phillips               | Berkley            | MI | 48072    |                              |
| Jim         | Barber           | 3724 Pardee Street          | Dearborn           | MI | 48124    |                              |
| Al          | Bosonetto        | 32625 Benson Dr.            | Westland           | MI | 48185    |                              |
| Richard     | Penman           | 5918 Bordman Road           | Dryden             | MI | 48428    |                              |
| Nora        | Boldt            | 1804 David St.              | Lansing            | MI | 48912    |                              |
| Merlin      | Miller           | Rt 2, David Dr.             | Springport         | MI | 49284    |                              |
| Orville     | Green            | 34 W. Dale Ave              | Muskegon           | MI | 49441    |                              |
| Mike        | Wolfe            | 82 Croix St.                | Megauneek          | MI | 49866    |                              |
| Melvin      | Folkerts         | Rt 2, Box 18                | Rudd               | IA | 50471    |                              |
| F. E.       | Rogers           | 2512 S. Mulberry St.        | Sioux City         | IA | 51106    |                              |
| Russell     | Ross             | Box 411, RR#1               | Sioux City         | IA | 51108    |                              |

| FIRST NAME | LAST NAME       | ADDRESS                    | CITY              | ST | SIP CODE   | ADDITIONAL ADDRESS |
|------------|-----------------|----------------------------|-------------------|----|------------|--------------------|
| John       | Kowalski        | Rt. 3, Box 123             | Vinton            | IA | 52349      |                    |
| Gerald     | Czarniak        | 4536 W. Norwich Ave.       | Greenfield        | WI | 53220      |                    |
| B. C.      | Roehaer         |                            | Manitowish Waters | WI | 54545      |                    |
| James      | Borg            | 15800 Makah St.            | Anoka             | MN | 55303      |                    |
| James H.   | Renneker        | 8150 Nicollet Ave. S.      | Bloomington       | MN | 55420      |                    |
| John       | Holm            | 7017 35th Ave. N.          | Crystal           | MN | 55427      |                    |
| H. S.      | Streater        | P.O.Box 310                | Winona            | MN | 55987-0310 |                    |
| Curtis     | Kreps           | 921 Mary Avenue            | Willmar           | MN | 56201      |                    |
| Ed         | Ludtke          | 2301 Dartmoor              | Sioux Falls       | SD | 57106      |                    |
| Richard    | Brandiger       | RR 1, Box 121B             | Rapid City        | SD | 57701      |                    |
| Bernard D. | Scola           | 1823 Palm Dr.              | Mt. Prospect      | IL | 60056      |                    |
| Chuck      | Meyer           | 753 Kearsage               | Elmhurst          | IL | 60126      |                    |
| Paul E.    | Rivers          | 190 S. Craig St.           | Lombard           | IL | 60148      |                    |
| Bob        | Jaeger          | 2405 Melrose               | Melrose Park      | IL | 60164      |                    |
| Edwin      | Torbett         | 543 Center Ave.            | Sycamore          | IL | 60178      |                    |
| James R.   | Munsch          | Box 66576, A.M.F.          | O'Hare            | IL | 60666      |                    |
| Ron        | Sassman         | 931 N. 16th St.            | Rochelle          | IL | 61068      |                    |
| Wallace G. | Hunt            | 1658 Plaza Dr.             | Rockford          | IL | 61108      |                    |
| Paul       | Kirik           | 2921 28th Avenue A         | Moline            | IL | 61265      |                    |
| Ken        | Rhoads          | 175 Hickory Lane-Far Hills | East Peoria       | IL | 61611      |                    |
| Robert     | Young           | 512 S. Olmstead            | Oakwood           | IL | 61858      |                    |
| Kia        | Nack            | 5152 Auriesville Ln.       | Hazelwood         | MO | 63042      |                    |
| Ron        | Hoelting        | 913 Crescent Street        | St. Charles       | MO | 63301      |                    |
| Norman     | Pauk            | 15 Oak Park Drive          | St. Peters        | MO | 63376      |                    |
| Karl       | Lipscomb        | 100 Grand Avenue           | Lamar             | MO | 64759      |                    |
| Randle     | Woolaway        | Timberline Airpark         | Cassville         | MO | 65625      |                    |
| E. J.      | Laney           | 3361 Van Owen              | Springfield       | MO | 65807      |                    |
| Capt. Tom  | Baarsch         | 2332 S. 35th Ave.          | Omaha             | NE | 68105      |                    |
| David      | Petro           | Box 14                     | Benedict          | NE | 68316      |                    |
| Harlo      | McKinty         | 1310 Idylwild Dr.          | Lincoln           | NE | 68503      |                    |
| M. L.      | Eastman         | 416 W. 2nd St.             | Kimball           | NE | 69145      |                    |
| Larry      | Bulot           | 122 Lake Park Dr.          | Belle Chase       | LA | 70037      |                    |
| Steve      | Adams           | Rt. 1, Box 709             | Keatchie          | LA | 71046      |                    |
| Jerry      | Stallings       | Rt. 1, Box 19D             | Ferriday          | LA | 71334      |                    |
| John       | Hardy           | Route 1, Box 292K          | Natchitoches      | LA | 71457      |                    |
| Lloyd C.   | Toll            | P.O.Box 303                | Hazen             | AR | 72064      |                    |
| D. D.      | Sutterfield     | Route 73, Box 148          | Mountain View     | AR | 72560      |                    |
| Doug       | Frantz          | 1019 S. Meadow Lane        | Mustang           | OK | 73064      |                    |
| Hollis     | Thompson        | P.O.Box 961                | Edmond            | OK | 73083      |                    |
| ##         | Catlin Aviation | P.O.Box 599906             | Oklahoma City     | OK | 73144      |                    |
| Darrell    | Keck            | Rt. 1, Box 224-6           | Duncan            | OK | 73533      |                    |
| Leroy      | Holt            | Box 238                    | Savanna           | OK | 74565      |                    |
| John       | Crook           | 804 Leading Lane           | Allen             | TX | 75002      |                    |
| John       | Austin          | Rt. 1, Box 205A            | McKinney          | TX | 75069      |                    |
| Thomas B.  | Anderson        | 2000 Lincoln Plaza, 500 N. | Dallas            | TX | 75201      |                    |
| Robert     | Yeahey          | 9729 Bellewood             | Dallas            | TX | 75238      |                    |
| Ken        | Morgan          | 439 Lovella                | Hurst             | TX | 76053      |                    |
| Bob        | Miller          | 604 Swayne St.             | Fort Worth        | TX | 76111      |                    |
| Dave       | Eby             | 3206 Martin Blvd.          | Wichita Falls     | TX | 76308      |                    |
| John       | Walton          | 5726 Boyce Springs Rd.     | Houston           | TX | 77066      |                    |
| Maurice    | Brooks          | 1905 N. Fisher Ct.         | Pasadena          | TX | 77502      |                    |
| Bill       | Cox             | 417 Willow Lane            | Baytown           | TX | 77520      |                    |
| Bob        | Slagle          | 39 Robin Hood Ln.          | Clute             | TX | 77531      |                    |
| Parker     | Miller          | 15535 Edenvale             | Friendswood       | TX | 77546      |                    |
| Steve      | Holbert         | 17643 Heritage Bay Dr.     | Webster           | TX | 77598      |                    |
| Paul       | Natho           | P.O.Box 1563               | Kerrville         | TX | 78028      |                    |
| Kenneth E. | Smith           | 106 Laurel Ln.             | Universal City    | TX | 78148      |                    |
| Gary       | Green           | 1907 Buck Ridge            | San Antonio       | TX | 78232      |                    |
| Gordon     | Cronin          | 6823 Riverlet              | San Antonio       | TX | 78239      |                    |
| Wm. R.     | Gardner         | 1308 Madison St.           | Alice             | TX | 78332      |                    |
| Tony       | Bingelis        | 8509 Greenflint Ln.        | Austin            | TX | 78759      |                    |
| Bryant     | Rowland         | 1007 Shell                 | Midland           | TX | 79701      |                    |
| Dean       | Cochran         | 255 Hemlock St.            | Broomfield        | CO | 80020      |                    |
| Wm. Ray    | c/o Raviation   | 1410 Garfield Ct.          | Louisville        | CO | 80027      |                    |
| John K.    | Evans           | 1530 Valentine Way         | Lakewood          | CO | 80228      |                    |
| Hal        | Aavang          | 721 9th Avenue             | Longmont          | CO | 80501      |                    |
| Pete       | Gonzales        | 1318 Server Dr.            | Colorado Springs  | CO | 80910      |                    |
| Kendle     | Wilson          | 30643 E. Barnett Rd.       | Pueblo            | CO | 81006      |                    |
| Frank      | Lanier          | P.O.Box 195                | Colorado City     | CO | 81019      |                    |
| Paul F.    | Thompson        | 1620 S. Mesa               | Montrose          | CO | 81401      |                    |
| H. S.      | Hibbard         | P.O.Box 795                | Payette           | ID | 83661      |                    |
| Clyde      | Grafe           | Rt. 2, Box 40              | Weiser            | ID | 83672      |                    |
| Robert     | Clayton         | 1783 Harvard Ave.          | Salt Lake City    | UT | 84108      |                    |
| H. L.      | Andrews         | Box 195                    | Hunting           | UT | 84528      |                    |
| Edwin      | Poe             | 402 E. Breaburn            | Pheonix           | AZ | 85022      |                    |
| Robert     | Praker          | 6519 E. Aire Libre Ln.     | Scottsdale        | AZ | 85254      |                    |
| Steve      | Hawley          | 7300 N. San Anna Drive     | Tucson            | AZ | 85704      |                    |
| Louis      | Falconi         | Rt. 1, Box 233             | Roswell           | NM | 88201      |                    |

| FIRST NAME  | LAST NAME    | ADDRESS                    | CITY                | ST | SIP CODE   | ADDITIONAL ADDRESS |
|-------------|--------------|----------------------------|---------------------|----|------------|--------------------|
| Bruce       | Tharpe       | 5317 Redberry St. Apt C    | Las Vegas           | NV | 89108      |                    |
| Donald      | Derby        | #10, 300 E. Tropicana Ave. | Las Vegas           | NV | 89109      |                    |
| Ron         | Johnson      | 8760 Spearhead Way         | Reno                | NV | 89506      |                    |
| Edward      | Danielsen    | 4016 W. 168th St.          | Lawndale            | CA | 90260      |                    |
| Cris        | Fast         | 507 Almar                  | Pacific Palisades   | CA | 90272      |                    |
| Leonard     | Gaines       | 2327 Rue de Charlene       | Rancho Palos Verdes | CA | 90274      |                    |
| Grayson     | Harmon       | 14944 San Ardo Drive       | La Mirada           | CA | 90630      |                    |
| Donald      | Frazier      | 12712 Larwin Road          | Normal              | CA | 90650      |                    |
| Ken         | Brock        | 11852 Western Ave.         | Stanton             | CA | 90680      |                    |
| Paul        | Leonard      | 7449 Skyline Dr.           | Stanton             | CA | 90680      |                    |
| James R.    | Vail         | 16614 Monte Cristo Ave.    | Cerritos            | CA | 90701      |                    |
| Paul        | Scholten     | 6338 Candor St.            | Lakewood            | CA | 90713      |                    |
| Earl        | Ody          | 28903 Gunter Rd.           | San Pedro           | CA | 90732      |                    |
| Charles R.  | Patton       | 895 Palo Verde             | Long Beach          | CA | 90815      |                    |
| Gordon      | MacDonald    | 430 E. Randolph St.        | Glendale            | CA | 91207      |                    |
| Howard      | Culbertson   | 3408 Gerald Dr.            | Newbury Park        | CA | 91320      |                    |
| Dan         | Dudash       | 4641 Cartwright            | North Hollywood     | CA | 91602      |                    |
| Raymond J.  | Moore        | 533 Wayland Ct.            | Claremont           | CA | 91711      |                    |
| Ken         | Hansen       | 1207 Valebrook Place       | Glendora            | CA | 91740      |                    |
| Ken         | Knowles      | 5398 Trail St.             | Morco               | CA | 91760      |                    |
| Robert      | Hastings     | 7734 Jennings Road         | Modesto             | CA | 91773      |                    |
| Dan         | Heersema     | 225 E. Baseline Road       | San Dimas           | CA | 91773      |                    |
| E. C.       | Williamson   | 1530 Sunrise Circle        | Carlsbad            | CA | 92008      |                    |
| Dr. Brian   | Harney       | P.O.Box 964                | Fallbrook           | CA | 92028      |                    |
| Richard     | Brazell      | 9608 Framington Dr.        | Lakeside            | CA | 92040      |                    |
| Curtis      | Hopkins      | 11537 Jessica Lane         | Lakeside            | CA | 92040      |                    |
| Richard     | Keller       | 5446 Connecticut Ave.      | La Mesa             | CA | 92041      |                    |
| Bud         | Wight        | 7434 Golfcrest Dr.         | San Diego           | CA | 92119      |                    |
| Don         | Christensen  | 47-202 Jackson             | Indio               | CA | 92201      |                    |
| James       | Hunter       | P.O.Box 1704               | Big Bear City       | CA | 92314      |                    |
| Don         | Taylor       | 44455 Benton Rd.           | Hemet               | CA | 92343      |                    |
| Harley      | Feller       | 566 S. Lilac Ave.          | Rialto              | CA | 92376      |                    |
| Patrick     | Spaulding    | 1446 W. Mesa Drive         | Rialto              | CA | 92376      |                    |
| Ralph       | Milligan     | 4344 Artesia St.           | Fullerton           | CA | 92633      |                    |
| Mel         | Clark        | 6561 Halifax               | Huntington Beach    | CA | 92647      |                    |
| Dr. Stanley | Mill         | 3015-A State Street        | Santa Barbara       | CA | 93105      |                    |
| Allan       | Chivers      | 45108 N. 11th St. W.       | Lancaster           | CA | 93534      |                    |
| Ernest      | Estefan      | 1414 W. Jackman            | Lancaster           | CA | 93534      |                    |
| Lyle        | Fleming      | 46035 20th St. East        | Lancaster           | CA | 93534      |                    |
| Howard      | Ginn         | 44140 N. Gillan Ave.       | Lancaster           | CA | 93534      |                    |
| Alex G.     | Sim          | 44516 Lostwood             | Lancaster           | CA | 93534      |                    |
| Hank        | Steiginga    | 34428 New Tree             | Lancaster           | CA | 93534      |                    |
| Lyle        | Trusty       | 7500 W. Avenue A           | Lancaster           | CA | 93534      |                    |
| Phil        | Tucker       | 1237 E. Avenue J12         | Lancaster           | CA | 93535      |                    |
| Bill        | Jennings     | 246-B West Drummond        | Ridgecrest          | CA | 93555      |                    |
| Dick        | Wallace      | 1230 Pear Avenue           | Mountain View       | CA | 94043      |                    |
| Robert H.   | Davy         | 1827 Palmetto Ave.         | Pacific             | CA | 94044      |                    |
| Toa         | Hunter       | 8313 Mayhews Landing Rd.   | Newark              | CA | 94560      |                    |
| Grayson     | Nivi         | 16090 Biewfield Road       | Monte Semo          | CA | 95030      |                    |
| Jerry       | Taylor       | 8421 Pardini Place         | Linden              | CA | 95236      |                    |
| John        | Thorp        | Drawer 1                   | Lockeford           | CA | 95237      |                    |
| James       | Critchfield  | 1579 Sean Drive            | Placerville         | CA | 95667      |                    |
| Les         | Milberger    | 3202 Sankey Rd.            | Pleasant Grove      | CA | 95668      |                    |
| Bill        | Cordoza      | 3 Juniper Ct.              | Woodland            | CA | 95695      |                    |
| Norm        | Justus       | 2795 Sierra Blvd.          | Sacramento          | CA | 95825      |                    |
| A. H.       | Maxwell, Jr. | 1845 Mesa St.              | Redding             | CA | 96001      |                    |
| Jack        | Bigham       | P.O.Box 3975               | Redding             | CA | 96049      |                    |
| Frank       | Snedeker     | 45-504 Ha'amale Pl.        | Kaneohe             | HI | 96744      |                    |
| Greg        | Halverson    | 2533 NE 11th Ave.          | Portland            | OR | 97212      |                    |
| Denell D.   | Zander       | 13700 SW Hall Blvd.        | Tigard              | OR | 97223      |                    |
| Amos        | Ranck        | 4536 Poinsetta St. NE      | Salem               | OR | 97305      |                    |
| Sidney      | Ellis        | P.O.Box 562                | La Pine             | OR | 97739      |                    |
| James       | Fernandez    | 9520 S.E. Shoreland Dr.    | Bellevue            | WA | 98004      |                    |
| John        | Foy          | 3801 127th Ave. NE         | Bellevue            | WA | 98005      |                    |
| Wayne       | Meigel       | 23023 SE 37th Street       | Issaquah            | WA | 98027      |                    |
| James       | Black        | 24729 12th Ave. So.        | Kent                | WA | 98031      |                    |
| Lennart     | Edvinson     | 2202 Camas Circle SE.      | Renton              | WA | 98055      |                    |
| John        | Kenton       | 16611 126th Place, SE      | Renton,             | WA | 98055      |                    |
| James W.    | Evans        | Route 1, Box 107B          | Vashon              | WA | 98070      |                    |
| E. E.       | Bjornrud     | P.O.Box 246                | Redmond             | WA | 98073-0246 |                    |
| John        | O'Keefe      | 6717 Fauntleroy Way SW     | Seattle             | WA | 98136      |                    |
| Harold      | Weeks        | 20120 2nd SW               | Seattle             | WA | 98166      |                    |
| Cecil G.    | Hendricks    | P.O.Box 68097              | Seattle             | WA | 98188      |                    |
| Jean B.     | Livingston   | 3721 Harbel Dr.            | Bremerton           | WA | 98310      |                    |





Like Mark Twain once said, "The reports of my demise are greatly exaggerated" so if you thought I might be in that category because it had been so long since the last newsletter was mailed, surprise! Not that I haven't had the very best of intentions. 'Course with good intentions and a buck you can probably get a cup of coffee anywhere. If you are a reader of EAA's magazines you probably can guess why I am running behind. Most of the time since last December it has been a full time job, 8 hours a day and at least 6 days a week and has involved a considerable amount of out of town traveling. I have have cranked out some 50 stories in the past 11 months, not all of them published as yet. We have to stay well ahead of the game for those issues that need "fill" articles that aren't especially time sensitive.

If you are not already a subscriber to EAA's companion magazines, The Lightplane World and The Vintage Airplane, I would highly recommend you add one or both to your regular EAA membership. The Lightplane World was formerly EAA's Ultralight magazine, but with the flying lawn chairs rapidly fading out of the picture the coverage in turn is oriented toward proper little airplanes and soon will be featuring airplanes the size of the T-18. As a matter of fact, I'm preparing articles for a regular series that will be very similar to the "Tinbenders Corner" that was a monthly feature back in the '50s and early '60s. I'm also working on the story of the T-18, from its beginning in '62 up to the present time. It probably will be in Sport Aviation and will be several months down the line. This coming weekend I'll be going up to Snyder, OK, on an assignment on a radically new type of 2 cycle engine that MIGHT be the biggest aviation story in the past year. IT might be the best news we've had in aviation for decades. The prototype weighs only 44 lbs and puts out 85 hp and has a SFC of .35 lbs/hr, has far less moving parts than ordinary engines and is FAR cheaper to build. They are in the process of building a 300 hp one that will weight about 1/2 lb per hp. Stay tuned for this story!

The following story is from Peter Beck and is one that will get your full attention, I believe:

Dear Dick:

I promised I would provide a writeup on my inflight canopy incident.

First, T-18 102PB has been flying with its present canopy since 1980 - about 300 hours. Installation was standard, except that there were two pins screwed into the steel roll bar just above the canopy rails, that protruded backward, parallel to the rails, and inserted into holes in the canopy frame. These took all the vertical loads of the canopy and left no upward pull on the canopy rails. The latches were two, not very sophisticated over-center type locks mounted on the canopy frame, low on each side, and had a curved finger that extended around the roll bar to keep the canopy closed. The rear mounting was standard - rails mounted on the turtle deck per Thorp drawings.

I do not know how the canopy broke loose - whether one of the latches slipped, or what - but during letdown at about 6000 feet and 165 indicated, 15 miles out from the field, the canopy simply tore loose from the plane and disappeared. The separation was instantaneous - the canopy did not twist or hang on anything as it departed - accompanied by a muffled explosion from the sudden rush of air entering the cockpit. As soon as I realized what had happened, I was concerned for what the canopy may have hit on the tail as it ripped off. Apparently nothing, since the plane was totally under control. I slowed to 100 mph immediately - not hard to do with the new source of drag. At that speed, controllability felt good, although the plane was considerably less responsive to normal power inputs. The turbulence over the fin and the rudder were very noticeable through vibration in the rudder pedals, although

CANOPY TROUBLE

the vibration did not have the regularity or buzz of incipient flutter. There was no noticeable turbulence over the stabilizer. What was remarkable was that not a single map, piece of paper or anything else in the cockpit blew out or was lost. And as long as I stayed behind the windshield, still locked in the shoulder harness, I never had the feeling that either my headset or glasses were going to get snatched by the wind. Approach and landing were normal except for higher rate of sink.

Once parked on the ground, I was able to look over the entire ship. I found that the rear crossbar of the canopy frame, the bar that carries the rear set of rollers and rides on the canopy rails, was still attached. The ends of this piece had ripped from the rest of the canopy frame at a point about 1.5 inches outside the rails. Both ends showed evidence of a single violent twist and tear upwards. The canopy rails were not distorted in any way, and there was no buckling of the turtle deck. There were no marks anywhere on the airframe, indicating that the canopy went straight up and blew free of the tail. Good thing my ejection seat wasn't armed! The front canopy rails were distorted at the front end, where the canopy had pulled straight up on them - the roller bearings had escaped off the inside lip of the rails. The vertical load pins I mentioned were still in place. These are about half an inch long. Virtually no other damage was visible.

I never even tried to locate the canopy fluttering down. We were over the Shenandoah National Forest, and they do mean forest. Locating it from the ground even if I had seen where it landed would have been impossible.

At this point I am at a loss to explain the cause - no prior canopy problems have been encountered during the 500+ hours of operation on the plane. I am trying to get a new canopy finished by Oshkosh time. For sure this one will have a John Thorp standard latch. Having seen the distortion on the canopy side rails, I believe the pins that insert into the canopy frame are a sound idea. I am going to put longer ones in to assure positive engagement. These are basically 10-32 screws through a bushing, tapped into the base of the steel roll bar, with the heads filed off.

Having landed at the destination 100 miles from home, I opted to fly back to home base sans canopy rather than disassemble and trailer the plane. The prop noise, even wearing headset and EAR plugs is unimagineable. And 90 mph in a T-18 is no thrill. Otherwise, the trip was uneventful - afterall the canopy had already gone.

All the best,

*Pete*

Peter

Thanks, Pete, for that report. As far as I know, there has only been one other T-18 that lost his canopy in

flite and that was John Foy's, which was one of the first 10 T-18s to fly. He also had no problem flying the airplane without canopy. A couple of summers back Ken Hamilton flew Vern Peppard's T-18 several times locally with the canopy off, with no control or vibration problems. Have any of you ever had this problem, or known of another T-18 having this problem? I sure would appreciate hearing from you if so.

How many of you have flown with the canopy partially open? A couple of years



ago I flew all the way back from OSH with my canopy open about an inch or two and it didn't want to move either way. I had experimented with leaving it open that much several times before, with a C clamp mounted just aft of the roller as a stop...just in case. I quit using the clamp after a couple of hops with it. It did help to keep us cool, but it was a little noisier. Since my static vent was in the fuselage it gave me a plus 7 to 10 mph increase in indicated airspeed.

I would like to remind you that your T-18 could respond entirely differently, so proceed with caution. Also I know of several other T-18s that flew with their canopy off and had no particular problem, but anytime you do such things remember you are strictly on your own. It would be interesting to get your comments if you've had experience with the foregoing.

Pete also has his "old" wing for sale. It's a standard T-18 wing with 300 hours total time on it. It was removed for replacement with the T-18C folding wing. It is complete, in excellent shape, and is painted. He is asking \$2500 for it. At today's prices that's a real bargain. If your project has been dragging along, maybe you might want to consider this to get airborne faster. Pete's address is 8712 Queen Elizabeth Blvd, Annandale, VA, 22003.

Some have posed the question, "Is there a major problem fitting another person's wing to my fuselage?" Answer: No. If the 601 bulkhead is not riveted in it's a cinch. Replace the 601 and match the fittings and holes. One builder I know had his 601 riveted in, so he carefully drilled out the rivets and replaced the bulkhead. Here locally, Ron Bostic bought John Walton's original standard wing and had no trouble mating it to his wide body fuselage. It worked like a charm. All he really had to do was do some trimming of the center wing skin at the inboard side to fit the wider fuselage.

**BONDING OF ALUMINUM TO ALUMINUM:** Several of the newer builders have expressed interest in building much or all of their airplane using pop rivets, but due to comments made in earlier newsletters that pointed out the shortcomings of pops vs AN rivets, that they would like to have the convenience of pops, but were nervous about long term effects on structural integrity. They posed the question, "Can adhesive bonding be used to AUGMENT pop rivets, thus eliminating practically all shear loads that allow pop rivets to loosen?" They make the point that not having to invest in a compressor, air tools, bucking bars, etc., and the elimination of riveting noise were potent points of consideration. In addition, one of their chief concerns was having a qualified rivet buckler on hand when they had work periods available.

While all these are valid points, let's take a closer look at the entire picture: First of all, to properly pull a pop rivet it is desirable to use one of the air powered tools, so that requires a compressor. Secondly, the additional cost of pop-type rivets over ANs would probably pay for air tools and a compressor. Next, it is true that AUGMENTING the pop-type rivets with an adhesive in all probability WOULD eliminate shear effects IF the surface is properly prepared....and that's a big IF, as most homebuilders don't have the technical knowledge to do this properly. The EA 9410 epoxy (sold by Monnet) is expensive and messy to use.

In the Jan. '84 issue of Homebuilt Aircraft magazine there is a superb article on the process of bonding and it's an education on the subject, as slanted toward the homebuilder. Its title is "No more rivets" and is written by Otis Holt, who is building a Moni. He makes an important point

that you are bonding aluminum oxide to aluminum oxide, not parent metal to parent metal. The pre-preparation of those oxides is all important and the "scuff and wipe" method that many homebuilders use doesn't go far enough. He quotes tests by Boeing that showed that ALL EPOXIES ABSORB ATMOSPHERIC MOISTURE, thus greatly deteriorating bond strength...or even causing complete delamination with some epoxies. The Hysol EA 9410 that Dick Schred uses in the HP series of sailplanes has proven very satisfactory. The article is too long to summarize, so I suggest you get a copy from Homebuilt A/C mag if you are interested. If that doesn't work out send me a buck and I'll send you a photo copy. If you are considering a wing fuel set-up, be sure and only use the recommended tank sealant and also be certain its allowable shelf life is still valid.

For the past year I've had opportunity to watch a Cricket being built, which uses EA9410 to bond the skin to Klegecel foam ribs. The whole assembly (i.e. a fin or rudder) is wrapped in a sheet of polyethylene, taped, and a vacuum is pulled on it for about 6 hrs. The vacuum utilizes atmospheric pressure to hold the skin tightly to the foam ribs while curing. This builder also made metal ribs to add to the klegecel ones in a 1 to 4 ratio "just in case".

This same vacuum method has been used to bend the leading edge of wing skin. The builder of the LE-1, that I wrote about in the Oct. '85 issue of Sport Aviation, used such a method to bend his skins. It takes a strong vacuum cleaner, like a shop vac, to handle anything that big and it also takes a simple bleeder valve to modulate pressure, so that overbending doesn't take place. You must also allow extra length, (which is trimmed later) since the trailing edges are taped together. The bend then is at the 1/2 way point, but since it is longer over the top of an airfoil than on the bottom, you have to adjust after bending. The matched hole tooling method puts the bend where it belongs and (possibly) is more accurate.

I talked to a new builder the other day that is giving serious thought to using composite construction on his flaps, since so many have trouble in getting the skin bent properly. He asked my opinion and I said I didn't foresee any problem using that method if he had all the details worked out on the actuation system. I also suggested he give some thought to using the vacuum bag method to bend those skins. I've never tried it, but that just might be an answer.

**GUS GORDON FLIES:** I recently got the kind of letter I don't like to get. Gus told me of his T-18's first flight by Bill Warwick and his subsequent checkout in the airplane. They put in their forty hours on the airplane and he and his wife headed for OSH. When he got to Alamosa, CO, they had some hard luck landing. He says his unfamiliarity with high density altitude flying was a factor in their accident. He didn't say what led to the rather considerable damage to their T-18, whether it was a low stall, high bounce, or what, but outside of his wife's bruises from the shoulder harness (that did its job) they weren't hurt. They hauled it on a trailer back to their Calif. home in Granada Hills. He's already hard at work repairing the damage and hopes to be back flying in a few short months. It was truly a beauty, too, with red, white, and blue striping ending in three large stars on the cowl cheeks, with the rest of the ship sprayed a silver gray metallic (at least that was the way it looked in the picture he sent). We feel for you, Gus. That has to be a king size trauma to cream a bird you've poured so much of yourself into for so long. He was getting good performance out of it, too. At 9500 and 11,000 ft. he was trueing 160. The engine is an O-320 E2A and he was cruising it at 2400 rpm and burning just over 7 gal/hr. Prop a 68 x 78 McCauley.

**SHORT FLIGHT REVIEW:** This might be a good time to review a few simple little hints for making the landing in any taildragger easier and safer. When you first sit down in the airplane carefully note where the horizon cuts across the cowl. Take a mental picture. That's the absolute angle that the nose should EVER be raised on a landing, since that is very close to the stalling angle of the wing. Actually, if you stop just a tad short of that point you'll touch with the tail wheel almost on the ground and if the angle is not quite perfect the most you'll get out of it is a little skip.

It's extremely important to not START to flare until you are 2' or less. A too high flare habit will get you in trouble on a landing about as quick as anything you can do. Even tho' you're in ground effect a full stall from just one ft. high can cause you to hit hard enough to possibly damage your gear. If you keep your speed on final to an EXACT number each time you will get a good handle on how long to expect the airplane to float. Altho' an airplane will stall at the same INDICATED speed at high altitude, as it does lower, you will find the RATE of flare will be different and will require adjustment on the part of the pilot. Remember at high altitude cruise you must carry a higher angle of attack than you would at S.L., to compensate for the difference in density. (When you reach the absolute ceiling you have just about run out of angle of attack).

It's essential to get the airplane on the first 20-25% of the runway at altitude, as you'll often find wind blowing from three different directions at different places on the field. If you are floating past the aim point and pick up a tailwind at that point you might wind up going off the other end. Also remember that at altitude if you have to go around don't wait until you are almost out of airspeed and altitude. You can't depend on your engine to accelerate you out of trouble, because it is only developing a percentage of the power it would at S.L. In spite of what some fuzzy head people in a certain gov't agency try to tell new ones, angle of attack is airspeed and power is sink/climb control and momentary acceleration.

You should also find the horizon/windshield mark that will give you the proper airspeed on final approach. Put a piece of tape there until you have it cold. You'll find only slight difference in the angle of attack with one or two pilots. If your airspeed quits working you don't have any sweat. While you are at it take note of various rpms and angle of attack vs the airspeed for down wind base, entering steep turns, etc. That's a pretty healthy thing to do when you are flying off your time. Do the same thing in your climbs.

One more little thing: when you aim the airplane, use a spot directly ahead of you. Do NOT sight over the tip of the spinner, as you automatically are several degrees out of alignment with the centerline of the runway. If you do and touching down at an angle to the true line of motion in a tail dragger is a real no-no. If you are drifting L or R from the centerline imagine you have a hook on your wing tip and drop that hook to whatever bank angle it takes to keep that hook hooked on the edge of the runway. Then squeeze in enough opposite rudder to keep the nose straight down the center. Now you have a new "neutral" position for the stick and rudder and only small adjustments are necessary. Since your airspeed is deteriorating after landing the controls are less effective, so continue to add control, not relax them, as you might have the habit to do in a tri-gear.

All of that is elementary and you've probably heard it all dozens of times, but I've flown with pilots with several hundred hours that have gotten into one or more of the above and it's become a habit with them. Check yourself on these things and be your worst critic. Be honest!

## CORROSION AND ITS PROTECTION:

A number of you have written asking what they should do to protect their T-18 from corrosion. I've also had several letters and phone calls from new owners of already flying T-18s on the same subject. In these instances the new owners had just stripped off the old paint in preparation for an all new paint design and had seen some evidence of pitting under the old paint. Naturally they were concerned. One or two had crawled clear back in the fuselage for further close inspection and weren't too happy with what they found there.

Before we launch into a discussion of what corrosion really is and what causes it, let's take a look at factory built airplanes that you'll find on any airport and see what has happened to them over the years. Look for partially painted Cessnas that are around ten years old or older. If you can get the owner's permission, take a look inside, as Cessnas are not given corrosion protection at the factory and you can readily see what the combination of the elements and neglect will do, especially if the airplane has spent most of its time within about 100 miles from a sea coast. You've heard the old saw about wooden airplanes where the termites were holding hands to hold it together....well, you'll likely find some of these oldies, where the metal grains are in somewhat loose formation. Perhaps your little "field trip" will help you make up your mind as to whether you should take the time and trouble to corrosion protect the interior of your T-18 or not.

First of all, in these days of liability vulnerability, consider your position if an accident occurred as a result of structural failure that resulted from neglect of corrosion protection. Granted, such things are rare, but they DO occur and you could be wide open. Don't assume that just because you live far inland that your airplane is in no danger from corrosion. In these days of industrial air pollution, acid rain, etc. that your susceptibility could be even greater than one near the coast. Since corrosion is usually a slow process, it's probably human nature to downplay it, put it off, etc.

The cause of corrosion is simple...ELECTRICITY, in one of its most subtle forms! If you remember your physics or chem classes, do you remember how you suspended two different types of coins in a beaker of electrolytic solution, hooking the coins to a galvanometer? Remember, too, the lecture about how each specific metal type has a certain number of EXCESS electrons, which thus determined its electric POTENTIAL, and when dissimilar metals are brought close together IN THE PRESENCE OF AN ELECTROLYTE that there would be a current flow? And when this current flowed that you would have an actual migration of excess electrons (ions) from one to the other and that the result would be an eating away of the active (+) metal and an oxide deposit on the passive (-) metal? Remember, too, the chart list of metals in their descending order of active (anodic) or passive (cathodic) value? And the further apart were metals on the list, the greater their electric POTENTIAL? (Look at our chart at the end of this article and you can see why we use zinc battery plates or nickel-cadmium for batteries. The list doesn't cover the entire atomic spectrum, only common metals).

The more the amount of electric potential between metals, the more the rate and amount of corrosion that will take place. Perhaps you are already saying, "My airplane is all one metal, so I don't have to worry. WRONG! Metal is not a homogenous material. Aircraft aluminum is an alloy of several different metals and is made up of microscopic grains. These grains have been heated, squeezed, rolled, stretched, chilled, etc. until these tiny crystals are so tightly interlocked that it looks like a homogenous material unless it is examined under a microscope. So the POTENTIAL is there for a galvanic current

(Corrosion cont'd)

to flow between the grains. This is particularly true on the surface in the presence of an ELECTROLYTE. In fact there MUST be an electrolyte present for current to flow!

What constitutes an ELECTROLYTE? Typically it's a fluid with enough ions (atoms that have been stripped of electrons) that current flow is promoted. Surprisingly, water (non-distilled) is an excellent electrolyte. Rain water in salt air or certain industrial areas enhances its electrolytic quality, as it picks up sodium and other ions as it falls. Thus the geographical location, the metal alloys, time of exposure, PROXIMITY of dissimilar metals, the heat treatment of the alloy, and mass (thickness) of the metal are all potent factors that determine the type and amount of corrosion that could attack your airframe.

Basically, there are three types of corrosion that are considered the most prevalent and most worthy of our efforts to combat it: pitting, stress corrosion, and intergranular corrosion, with pitting the most common. Pitting is a highly localized metal attack, resulting in small HOLES in the metal's surface. Gravity affects them, so look for them on the top outside surface or the inside bottom surface first. Once it starts it becomes self-generating, thus accelerating the amount of surface affected. (Now would you EVER consider using a piece of "cheap" watermarked metal (corroded) in your ship?)

What is scary about pitting is that it forms a cavern under the tiny surface hole that is many diameters larger than the hole itself and are not detectable by ordinary surface observation. The white deposits on top of the hole are salts, fairly easily removed by abrasives, perhaps only slightly roughing the surface. CLEANING THE SURFACE DOES NOT STOP THE PITTING! It only removes the tell-tale evidence. A coat of zinc chromate here is an exercise in futility and will scarcely even delay the corrosion spread. Once it starts the only remedy is to replace the affected part, so bite the bullet and do it. More importantly, don't let it start! (More on that downline). It should be obvious that unchecked pitting can siphon off so much strength from a metal part that it can fail catastrophically. It has happened on factory built airplanes that supposedly were well maintained, so let's treat the subject with the respect it commands.

Stress corrosion is the result of a fine (sometimes almost invisible) type of cracking in the surface of the metal that permits the electrolyte to more readily penetrate to the grain boundaries, sometimes called "crazing". It can be caused by bending stresses generated when inadequate bend radius is used and it can also be caused by vibration, fatiguing the parent metal and weakening the bonding in grain boundaries. Like pitting, once stress corrosion begins the initial or continued stress or vibration will further tend to accelerate the corrosion. As the part weakens and more unexposed metal is now in close proximity to ongoing corrosion the entire part will soon fail, probably suddenly. Moral, watch for those tiny, spidery cracks.

The third type, intergranular corrosion, will occur along grain boundaries and is extremely difficult to detect. It occurs between the base metal (that makes up most of the alloy) and the "minority" metals it's alloyed with. The surface will blister in the advanced stages. Metal discoloration often is the only early stage clue and the only positive way to detect it is with the use of eddy current or ultrasound inspection methods. Fortunately, this type isn't often found, but remember that it, too, requires the presence of an electrolyte, even tho' the amount may be almost microscopic.

All of the above should highlight that the most important thing we can do about corrosion is to prevent it starting. This means keeping a potential

(Corrosion cont'd)

electrolyte (i. e. salt air, industrial fumes, dirt, etc.) in combination with either visible or invisible water, away from the vulnerable metal surface. Go back now to the definition of an electrolyte on page 7 and see the importance of the electrolyte to galvanic flow of ions.

Probably the most effective way to isolate aluminum from the bad guy electrolyte is to ANODIZE it. The anodizing process deposits aluminum oxide on the surface, making things tough on the corrosion process by reducing surface ions available for attack. Some experts say that to be safe in a salt air environment that you should spray zinc chromate on top of the anodized surface. There are several types of anodizing and it is a specialized subject unto itself. Many books on the subject are available in good technical libraries. Suffice to say that there is no compelling need for the homebuilder to arm himself with full knowledge on the subject.

From the homebuilder's standpoint, unless you live in one of the big metro areas where there are plating shops, you more likely will want to use an ALODINING process instead, following it with zinc chromate. Whereas the anodizing process is a reverse electrolytic process involving electric current flow, alodining is an acidic coating process, whereby a chromic acid compound (water diluted) is brushed or poured on the pre-cleaned alum! Alodine compounds are readily available from large paint stores and aviation parts houses. One of the average 1 liter size bottles will cover about 250 sq. ft., or about 5 sheets of aluminum on one side. You might also want to know that an alodined surface is an infinitely better base for paint adhesion than a bare aluminum surface (no matter how well it is cleaned and degreased), as paint adheres much better to an acetic rather than an alkaline surface. (Yes, bare alum is considered an alkaline surface).

That one fact alone might be worth all the other information about using alodine. Hopefully, it should be plain from the above info that everyone really should at least apply zinc chromate as a corrosion protection while building their airplane. It also is a protection against scratches and a mark on it is much more readily visible on it. (Of course you know that you should never use a lead pencil to mark on aluminum or use a graphite lube on aluminum, as it is highly corrosive, now that you know a little more about aluminum and its ions, etc.)

If you do alodine your parts, it's a good idea to wait until all parts are formed before doing so, including all holes drilled. You then can easily make a dip tank that will even hold a full sheet of metal, using polyethylene sheet and scrap lumber for some sort of a frame. Don't forget to make some provision for a drain, so that you don't get acid on you or your clothes. Also, rubber gloves are must in accordance with directions, apply the zinc chromate as soon as practical after alodining, too. Remember that zinc chromate is full of chromic acid and is very dangerous if inhaled, so ALWAYS wear a respirator and do your spraying out of doors. Use ONLY MIL SPEC zinc chromate. The other types that are called zinc chromate are nearly useless for corrosion protection. Mil spec zinc chromate is only available from an aircraft supply house, due to its toxicity. Remember, too, you don't need put zinc chromate on so thick that it hides everything below it. It just adds weight to do so and makes it more vulnerable to chipping. If you are about to paint a steel part, DON'T use zinc chromate for a primer. z/c is for al not steel. Use one of the good epoxy primers.

(Corrosion cont'd)

The subject of corrosion in metals is too complex a subject to thoroughly cover in detail, with all the ifs, ands, and buts, in the few paragraphs above, but perhaps some of the basics presented will be of help to some of you. If nothing else, perhaps you now understand why the Air Force stores their surplus airplanes in Tucson ... and maybe you've wondered why they used lead and zinc in batteries and why you should use distilled water in batteries, etc., so maybe the discussion has been worthwhile. I'm sure that most of you already knew all of the above, but if we assumed that each one of you knew all about all aircraft subjects there would be very little need for a newsletter, so please bear with me if we get too basic sometimes.

As a final word on the subject, in your occasional inspections of the T-18 interior if you see that the aft fuselage is showing signs of dirt, oil, etc. collecting, it's a pretty good sign you need to check what kind of drainage holes you have in low places. A good detergent and water bath is needed occasionally, followed by a fresh water flush. You should check and see that water does not stand in low places. Condensation of atmospheric moisture inside any sort of metal structure can be significant. To sum it all up, it's like they say in the NFL, "In case of doubt...punt!"

## ELECTRIC SERIES POTENTIAL CHART

|                                     | METAL  |
|-------------------------------------|--|
| Galvanic Flow from<br>top to bottom | Magnesium, Magnesium alloys                        |
|                                     | Zinc   |
|                                     | Aluminum (1100) "Pure" Aluminum                    |
|                                     | Aluminum 6061 T-6                                  |
|                                     | Aluminum 6063-T832                                 |
|                                     | Cadmium  |
|                                     | Aluminum 7075 T6                                   |
|                                     | Aluminum 2024 T3                                   |
|                                     | Steel; Iron, cast iron                             |
|                                     | Stainless Steel (Chromium type, active)            |
| ACTIVE (Anodic)                     | Ni-Resist iron                                     |
|                                     | 304 Stainless steel (active)                       |
|                                     | 316 Stainless steel (active)                       |
|                                     | Lead, Tin  |
|                                     | Nickel, Inconel (active)                           |
|                                     | Monel, Brass, Copper, Bronze, Copper-Nickel Alloys |
|                                     | Silver solder                                      |
|                                     | Nickel, Inconel (passive)                          |
|                                     | Chromium steel (passive)                           |
|                                     | 304 Stainless steel (passive)                      |
| PASSIVE (Cathodic)                  | 316 Stainless steel (passive)                      |
|                                     | Silver   |
|                                     | Titanium   |
|                                     | Graphite (lead pencil type)                        |
|                                     | Gold   |
|                                     | Platinum   |

(Note: Some metals above can be either active or passive)

The following is NOT the kind of T-18 subject I like to write about, but it seems this sort of thing is going to happen when people have a show off urge that they can't control. The sad thing is now that the T-18 will get another undeserved black eye. (More on this subject down stream).

From: Glenn Dail  
3134 Clarendon Dr.  
Annapolis, MD 21403

December 3, 1985

(Glenn is a T-18 builder and an investigator for the NTSB)

Dick Cavin  
10529 Somerton Dr.  
Dallas, TX 75229

(ANYONE KNOW ABOUT THIS AIRPLANE OR BUILDER)?  
19472

Re: Airplane Accident:

Thorp T-18, S/N = ( ? ), N471S, 11/17/85 at 1347L,  
Lubbock, TX, Pilot = Fatal, No Passengers.

Owner/Pilot = Leland Miller

Dick:

The above accident was delegated to the FAA. The GADO in Lubbock is investigating it. The Inspector is Richard (Dick) Martz at 806-762-0335 or FTS 738-7675. Their address is:

DOT/FAA GADO-7  
Lubbock Intn'l Airport  
Rt. #3 Box 51  
Lubbock, TX 79401

Seems, Miller purchased the airplane from Thomas W. Boughn, of Holstein, IN who flew with Miller for 1:25 min. in Dodge City, KS. Miller flew the airplane back to TX. Miller flew the airplane twice out of Level Land, TX, apparently where it was kept/hangared or tied down.

On the day of the accident three hunters identified an airplane of similar physical size/color, etc. doing acrobatics in pulling out low in a valley. They noise stopped and the hunters thought the airplane had crashed. They looked for the airplane for a short time and traveled about 2 miles with no results. I don't remember what time that was. The airplane crashed that afternoon in a residential area - about 2 blocks from Miller's girl friend's house, and not far from his home. The airplane altitude was about 75 to 80 plus degrees. Witnesses saw the airplane pass overhead about 800 feet AGL.

An autopsy was performed. Tissue samples were sent to CAMI in OKC. Tox samples/results are not back. Miller was not an M.D. or Phd. There were police reports concerning that subject - his title. He had left or been discharged from some college over that same subject.

That is all I know.

Sincerely,

Glenn Dail

THANKS, GLENN, FOR THE PRELIM REPORT.

T-18 ACCIDENT - PROBABLE CAUSE, LOW LEVEL ACROBATICS

KEN KNOWLES SPORT AIRCRAFT, INC.:

The following is a note from PHIL TUCKER re the above:

"Enjoyed" talking with you at OSH this year. It was quite an event for me and my grandson, but no more campground for me.

Enclosed is a brief note on the sale of Sport Aircraft, Inc. Jack Cox indicated he would run a copy in Hot Line. Perhaps you, too, may want to run it in the T-18 NL....Phil

Ken Knowles, well known and respected supplier of parts for the Thorp T-18 has sold his Company, Ken Knowles Sport Aircraft Inc. to Phil Tucker of Lancaster, Ca. All parts and supplies for the T-18 and S-18 will continue to be produced and sold.

Phil Tucker has been associated with aircraft fabrication for 35 years, most recently as Manager of Tube Fabrication and Development on the B1-B program for Rockwell in Palmdale. He built his own T-18 starting in Nov. 1975 and completing it in Mar. 1982.

After cancellation of the B1 in 1978 Phil spent close to a year building T-18 parts for Ken while on layoff from Rockwell, which provided additional knowledge and experience of the T-18's detail fabrication and assembly procedures.

The new mailing address is; Ken Knowles Sport Aircraft Inc.  
1237 E.Ave.J12, Lancaster, Ca. 93535, Phone (805) 945-2366.

In case you are wondering if Ken was forced to sell on account of a health problem, the answer is no. Ken is in good health. He went at building the T-18 parts and kits hammer and tongs for a good many years and I think he just got battle fatigue and wore his tread a little slick. Anyway, now he's spending as much time as he can playing golf and doing some of the other things you do when you are "retired". Geri has also kept him busy doing gardening chores, too.

There are a bunch of you guys out there that owe Ken a debt of gratitude. A good many of you wouldn't have a T-18 in the air today if it hadn't been for Ken. One thing I always appreciated about him was his promptness in filling an order. He always kept a stock on hand and most of the time the order was shipped the very next day and that's a most commendable trait. (Too bad the #1 aircraft parts house on the West Coast doesn't practice the same thing). In the beginning Ken made most T-18 parts himself, but down the line when he started getting swamped he farmed some of the items out. I don't know how many complete kits he put together, but it was a bunch. There are about 60-70 T-18s flying or being built in Australia and New Zealand and I'm sure that all but one or two came out of his shop.

I'm sure all of you join with me in wishing Ken and Geri the best of every thing in their golden years. If you should want to call them and say hello their new number is 714/734-3998. I think, too, you'll find Phil will break his back to please and uphold the high standards Ken did.

About 90% of the new builders these days are building the convertible wing, which admittedly is somewhat more difficult to build than the standard wing. Primarily, this is because of the aileron control system. In previous newsletters John Kleber, John Walton, and others have made excellent step by step writeups and John Walton has even made drawings and complete writeups available for those that want to add wing fuel for only \$10 to cover mail & printing costs. Incidentally, John W. still has a couple of pin extractors left (a necessity if you fold the wing) for his cost of \$49. He was able to get that cost by having several made at once, so won't have more made.

Here now is Chris Fast's step-by-step writeup for assembling the center wing for the folding wing, so now you have directions from three experienced, highly qualified builders, all of which have built at least one other T-18 wing before. Compare all the articles as you build and it should be a piece of cake for the newcomer.

### T-18 CENTER WING ASSEMBLY....by CHRIS FAST (FOLDING WING)

1. Make sure all ribs fair with spars, both top and bottom. Punch out all rib flange holes with a #40 nibbed Whitney punch.
2. Check that rib joggles fit the spar flanges. Adjust as necessary.
3. Attach the ribs to the spar webs with #40 clecos, but do not rivet at this time.  
NOTE: Make certain that the 213 -1 & -2 bellcrank brackets on the 210L and 210R ribs are NOT drilled for the bellcranks, as this must NOT be done until the outer wing is attached with the mating brackets. BELLCRANKS MUST HAVE A COMMON AXIS. VERY IMPORTANT!
4. Drill/punch all holes in skin with a #40 before forming the leading edge bend. DO NOT DRILL THE CENTER WING SPAR HOLES IN THE SKIN AT THIS TIME.
5. Cleco top and bottom skins together for forming. CAREFUL. Be SURE and use the proper index line or the LE bend will be wrong!
6. Using a 3/4" X 16" X 48" FLAT masonite board (or equivalent) CAREFULLY crush the skin down until it pretty closely fits the nose rib. Go slow! Check and re-check (It probably will take several attempts to get it right). Remember...if you get too sharp a bend in the LE skin it will adversely affect the stall characteristics. Also be sure the bend radius of the left wing skin is the same as the right one. Also remember that outer ends of the skin crush easier than in the middle, so keep your knee pressure in the middle. When checking fit, use a strong light behind the ribs to compare the gap size.
7. Remove clecos at TE and trim skins to the final dimension.
8. Attach skin to ribs and REAR spar (only) with #40 clecos, using an ice pick to draw holes into alignment.
9. Using a straight edge on the center spar location and another one on the rear spar...EYEBALL the two. They should be parallel. If not, remove the clecos from the top flange of the rear spar and using small clamps, shift the skin to spar position slightly until the straight edges are parallel. This procedure insures no wing twist.
10. Once you are satisfied with the alignment, drill out all the holes to 1/8" and install 1/8" clecos as you go. (Do not remove too many clecos (#40) at a time and run the risk of losing alignment. One at a time is much safer.
11. Check alignment one more time and then lay out main center spar holes top and bottom. Be sure and add a STAGGERED additional row of rivets between BL21.375 and BL41.375, top and bottom. This avoids having rivets get loose and working, as some have experienced. Also it is helpful to move FWD rivet line about 1/8" aft in the AREA OF THE STEEL ATTACH PLATES, TO AVOID INTERFERENCE WITH THE 1/4" ATTACH BOLTS. Makes riveting MUCH easier

(CONT'D)

(cont'd)

12. Drill spar holes and install clecos.
13. Fit step plates and support angles.
14. Now disassemble skin and ribs.
15. Beburrr all holes in skin and ribs. Dimple all holes EXCEPT the main spar holes. These will dimple as the rivets are driven, making a very tight wing. COUNTERSINK the main spar caps.
16. Zinc chromate spray ribs and inside surface of the skin. This is also the best time to rivet the step plates and -7 angles to the skin.
17. Re-install ribs to spars and rivet fore and aft flanges to the spars, EXCEPT do NOT rivet end ribs 210 and 201-3 at this time. They must be removed for access to some skin riveting, so install them temporarily with clecos for alignment purposes.
18. Re-install skin, using clecos in alternate holes at least.
19. Re-check alignment, as in Step 9 above before riveting.
20. Remove #201-3 nose ribs at inboard end and completely rivet the next outboard rib.
21. Re-install the 201-3 rib and complete riveting the nose section.
22. Remove clecos at the Top rear spar and a minimum number of clecos near the trailing edge to allow the top skin to be lifted enough for riveting of the main spar caps, top and bottom, between main ribs 533-1 and 534. Also rivet the BOTTOM flange of the REAR spar.
23. Re-install all trailing edge clecos.
24. Remove butt rib #210 and rivet #534 rib completely, also upper and lower spar caps.
25. Re-install #210 butt rib and complete all riveting.

And there you have it, gents. About the only additions I would make is that before drilling all the index and trailing edge rivet holes at the trailing edge that you leave every other one undrilled on the top skin. The idea is that if you do have to slightly shift the skin after the first alignment check only a few holes will be mismatched and you can then match drill the blank ones in with the spars. This may be hair splitting anyway, since the #40 holes will later be drilled out to 1/8" and most likely you won't have to move them that much anyway if you have been carefull to lay out the lines of rivet holes for the ribs in the flat skin. Those lines should be absolutely parallel!

You might also want to lay a couple of levels (long ones) up there like long straight edges to cross check your eyeball look. The whole assembly must be carefully leveled up beforehand for this to be valid. The eyeball method is very accurate if you do it carefully. You might want to switch straight edges if there is any doubt that they have all edges parallel.

You might also want to make a spar hole template out of a scrap piece of metal that's about 2" wide and as long as the wing skin is wide. You can position the template over the skin and prick punch the hole pattern thru the holes. This allows you to eyeball in at the ends to see that your line of rivet holes is in the proper fore and aft position over the spars. It also saves layout time and lets you have a nice straight line of holes.

Anyway, Chris, we are all very grateful for your taking the time and trouble for the writeup of this and other components on the T-18. You probably don't realize what a BIG help this is to a new builder. Again, Chris, thanks a million! You're a super-nice guy in my book.

Just talked to Chris and he says his health is reasonably good, even tho' they had to do a balloon angioplasty after his 2nd by-pass operation. He also said he is getting into some big R/C models and having fun with them.

(THE ABOVE DESCRIBES PRE-PANKEKED RIBS & SKINS FROM KEN KNOWLES)

The following addresses a problem of considerable interest.

FROM

Russell Ross  
 RR#1 Box 411  
 Sioux City, Iowa  
 51108

March 27, 1985

Mr. Dick Gavin  
 T-18 Mutual Aid Society  
 10529 Somerton  
 Dallas, Texas

Dear Dick,

Inclosed is a drawing for a locking gas cap on the T-18. I have a Ken Knowles aluminum tank with the cam operated expanding rubber seal. John Walton reported in one of the news letters that the cap would pop out when the tank was dropped on the grass from about three feet. I know he used a differant method to secure the cap. I used a piece of 2024-T3 -.187 by 1.5" by 3" which is the cap diameter. By sloting this plate and the original cap for an AN3 bolt this plate can be slid to one side allowing the cap to fit on the tank flange and then sliding the plate back to lock under the flange; when compressed by the cam it is securely locked in place and cannot come out. The original gasket is cut flush with the cap and the expansion plate is also retained as a seal. See drawing.

I have purchased a Sensenich A-76 metal propeller cut to 68" with 74" pitch for an O320. According to what information I have this prop meets vibration standards. I would like to know if anyone using this prop has had any problems. Would really appreciate any info on this in the newsletter. Hope to have my T-18 flying in about three months.

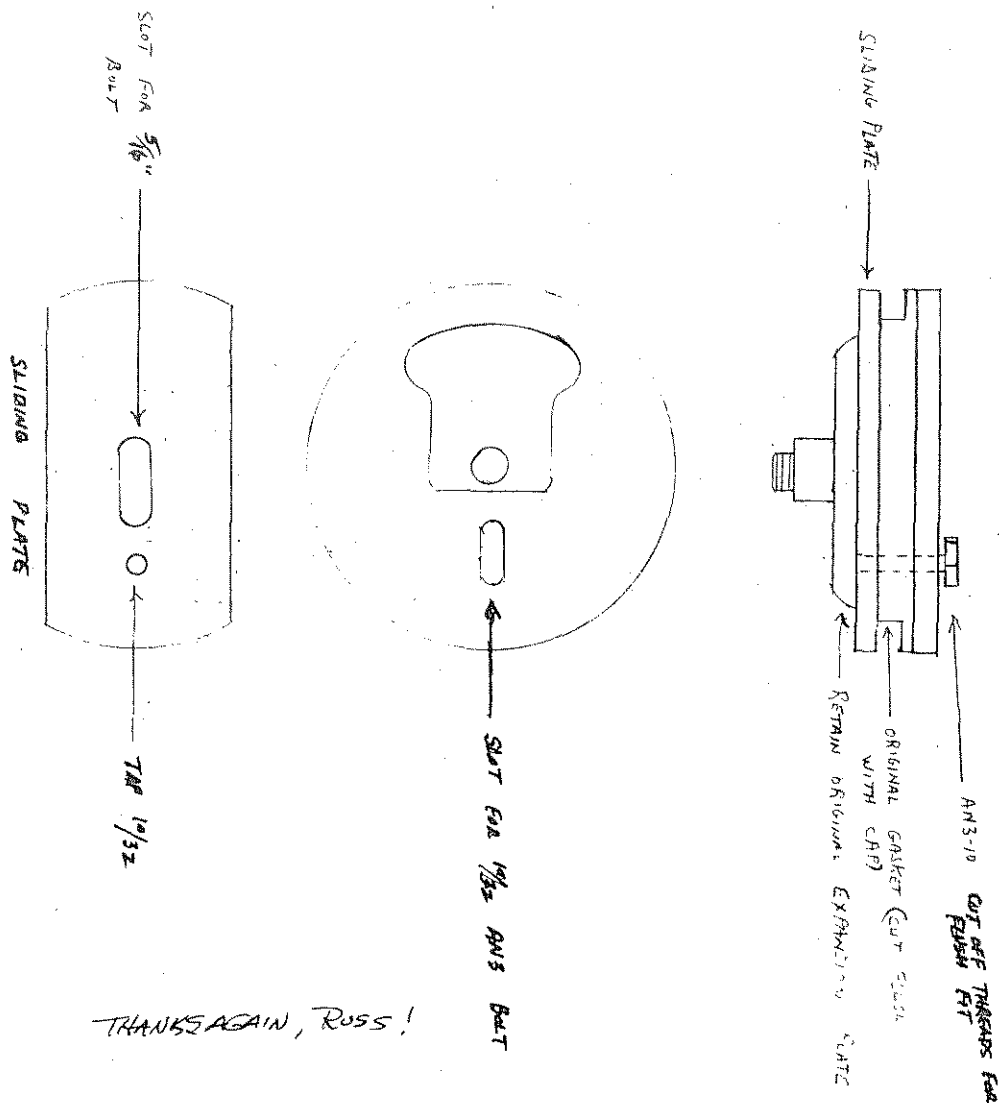
Best regards,

Russ Ross

Thanks, Russ, for the drawing and writeup. Looks like a good method. Good luck on your new bird.

ANY COMMENTS ON THE M-7C PROP?

RUSS ROSS' DRAWING  
OF GAS CAP LOCK



Dear Dick,

7-27-85

Copy of this letter is being sent to John Walton for his prior advice. I purchased a set of his plans for "Thorp T-18 Wet wing" from Ken Knowles. The plans are excellent and I am indebted to John for them. The rework of my wing is progressing very well and I feel very good about the direction and completeness of the plans.

A further MOD is necessary as my (folding) wing has a chordwise lap joint for the skin at the third (from left) .025 rib. This lap joint without additional strength would eventually leak with flexing.

These nose ribs have been replaced with .032 ribs per drawing. The MOD being made is to add a doubler using .032 mat'1 1 1/2" x 15 1/2" fitted into the top and bottom of ribs #3 and #10. (See Fig-1)

(Note) These ribs came from Ken Knowles with the wide spaced center punched hole locations. Drill and debur...all ribs and cleco in place. (This is remodel-not new construct). Draw a line through center of holes in wing. place additional holes midway. draw a second line parallel and centered over the doubler. Drill holes in the skin matching those just completed. This becomes a template for the holes for the doubler. Remove the ribs. Using AN-450-3 rivets and adhesive indicated in (Fig-1) attach the doubler to the rib spaced as needed to draw the parts together for curing.

A second MOD seemed desirable and has been made to four of the ribs...namely #1, #5, #8, and #10...tank end ribs. This gives me Fuel Quantity Indication, left and right and Low Fuel Quantity Warning by way of a light or buzzer next to the respective gauge...see Fig-2).

RIB DOUBLER FIG. 1

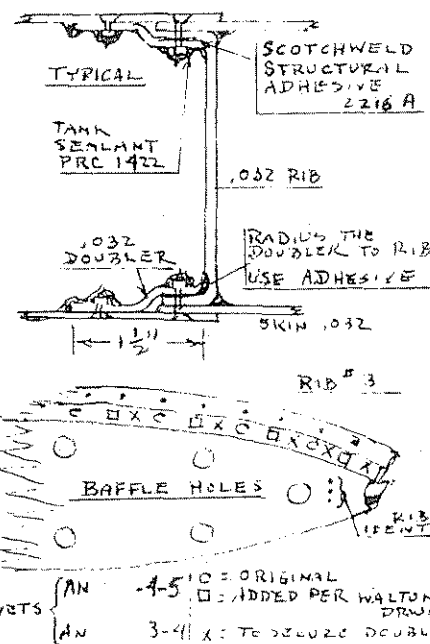
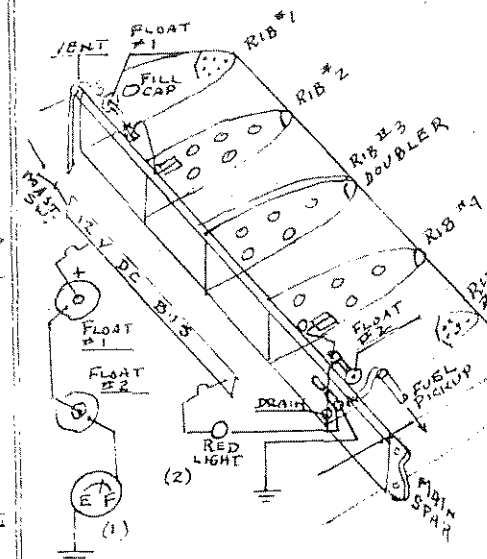


FIG. 2 (1) FUEL QUANTITY (2) LOW FUEL WARNING



FRANK SNEDDER  
HAWAII

VERY GOOD, FRANK. THANKS FOR THE TIPS

FROM John Foy

3801 127th N.E.  
Bellevue, WA 98005  
22 June 1985



Dear Dick and Lynn:

Just received your T-18 ~~HYATT REGENCY HONG KONG~~ could add a little even though my T-18 is long since a memory.

All the years I flew for the airlines, I never gave much thought to the effect of propeller performance on engine hp. Really dumb but you just shoved everything forward for takeoff, reduced some for climb and reduced more for cruise. Kind of simple (for simple guys) and designed that way.

Well today I am going to change all that for those of us who never gave it much thought.

When I purchased an aircraft engine, it came with a hp rating of 85 or 100 or 150 or whatever. I just bolted on the engine mount, jammed on a fixed pitch prop (they are much less expensive! But only if you buy just one) and figured that I got full hp with full throttle. How dumb can a guy be? My brother, Marty, finally forced me to start thinking about propellers when he insisted on using a constant speed prop on his airplane. So I dug out the operator's manual for the Lycoming O-320-D (160 hp) and started reading. That engine only develops 160 hp at 2700 rpm. Please note that the important phrase is rpm. The operators manual has some very interesting charts, one of which shows hp per rpm and that is the chart we want for this discussion. It's called "Sea Level Power Curve."

A fixed pitch prop is a compromise. So what does that mean? If your prop turns the O-320-D at 2400 rpm for takeoff you are only getting 112 hp for takeoff. If your prop turns 2450 for climb you develop 120 hp and 2500 rpm is only 126 hp. What happened to the 160 hp that I paid through the nose for? Well, it is still waiting for you to get the rpm up and it will be happy to oblige with full hp. What does that have to do with a fixed pitch prop? A fixed pitch prop will only let the rpm turn so much for a particular airspeed and will top out at a particular airspeed for your aircraft. It really boils down to maximum rpm in straight and level with wide open throttle. If you stay at 2700 rpm max, then your takeoff and climb rpm will be less than 2700 and you will never get full hp for takeoff and climb. WHICH IS WHERE WE NEED IT MOST. So what is the answer?

A constant speed or variable pitch prop. In both cases you select the engine rpm for the max hp desired. At that point you finally get the hp you paid so dearly for.

Every fixed pitch prop owner I have met has more than one prop and is always talking about his next miracle fixed pitch prop.

67 Nathan Road Kowloon Hong Kong B.C.C. Telephone 3-62421 Telex HX 73127 Cable Hyatt HongKong.

(Page 2 of letter from JOHN FOY)

HOTEL

**Miramar**  
HONG KONG

NATHAN ROAD KOWLOON HONG KONG TELE 3 44111 TELEX 74661 CABLE MIRAMAR  
AN ASSOCIATE OF HOTEL MIRAMAR HAWAII



Throw away the fixed pitch props!!!! Buy ONE constant speed or variable pitch prop and enjoy full advertised performance of the aircraft you have. Almost all of the performance figures on homebuilt aircraft with fixed pitch props were taken off two props-one for climb and another for cruise-but it's awfully hard to change props in flight.

Another hint for those of you who are debating the choice of engines between the Lycoming O-320 and the O-360. The same operator's manual show the O-360 to be a much more efficient engine at 65% rated power, i.e.; the O-360 will turn 2350 rpm giving 117 hp using 8.5 gallons per hour vs the O-320 turning the same 2350 rpm but putting out only 97 hp and using 8.8 gallons per hour. Just a hint.

Dick, I'm retired from MWA now. The long hours on the Trans Pac flights finally got to my back and I decided to retire three years early instead of major back surgery. I still hold a 1st class physical but can't take the long hours anymore.

After 20 years of reading and building parts from blueprints, I finally decided to go to school and learn the right way. The instructor says he will make a technical illustration of me yet! So far it is a fascinating course and I highly recommend a course in basic drafting for anyone who is not experienced in reading blueprints. I wish I had done it before I started all this!

I'm thinking of another homebuilt project (it's a fatal disease one never gets over, it just gets worse) but the 210 redline on the T-18 is giving me pause. The glassair is already over 260 and the Mustang 2 is 245.

I sure would like Lyle Trusty's wing on the wide body version with the 180hp and 5" longer fuselage, leading edge tanks and a constant speed prop. I'm not a fan of the folding wing aircraft and after "feeling" the difference in airframe friction between the standard and the folding wings, I vote for the standard. As I say, the 210 red line on the T-18 is preventing me from grabbing one of those unfinished projects!

We've enjoyed the articles you have been writing for EAA and others! Best of all I enjoy the T-18 newsletters. You have all of your irons in the fire\* at the same time and I don't know how you do it, but I sure am thankful! Just getting a letter out is an all day job for me.

By the way, I am enclosing a sketch of a gas cap that I stole from Jerry Van Gruenpen. Hope you can read it. Best from us all.

Represented by MILFORD INTERNATIONAL MARKETING SERVICES, INC.

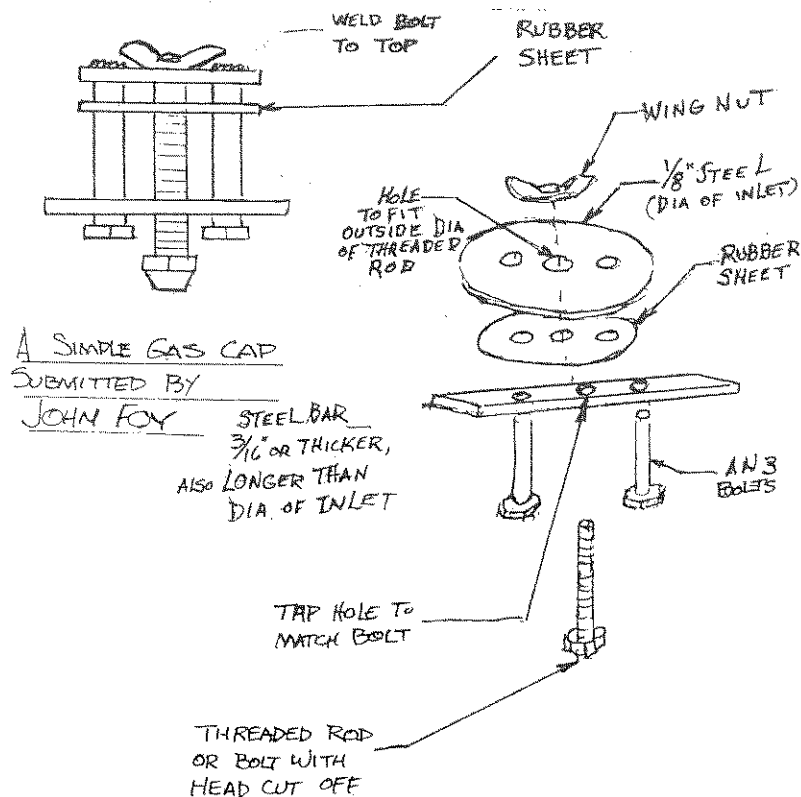
\* (YES, AND MY WIFE SAYS I LET A FEW OF THOSE IRONS GET COLD AND A THAW TOO)



(JOHN FOY cont'd)

Thanks a million, John, for the previous two pages. The true power output of an engine is a subject that seems to be widely misunderstood by so many people.

I'd like to take this time to pay tribute to John Foy as one of the most prolific homebuilders in EAA. I first met John in the pinfeather days of the T-18, when he lived in St. Paul. I was flying a MSP layover trip at the time and had a crew car available, so I went out to John's house to see his T-18 project. I later visited him in SEA, when he was based there. He had just finished building a Scamp, was starting on a P-51. He also had built a Varieze. He's now building the all metal Durand.



Note: Holes in steel bar a loose fit on AN-3 bolts; Weld AN3 bolts to steel top on assembly; Weld threaded rod to wing nut on ass'y; Tilt ass'y to insert in filler neck opening.

THANKS AGAIN, JOHN.

BRIAN P. HARNEY, M.D.

A MEDICAL CORPORATION  
POST OFFICE BOX 964  
FALLBROOK, CALIFORNIA 92028  
TELEPHONE (619) 723-1633

DIPLOMATE AMERICAN BOARD OF ANESTHESIOLOGY

November 21, 1985

Dick Cavin  
President, T-18 Builders and Owners Assoc.  
10529 Somerton  
Dallas, Texas

Dear Dick:

Persuant to our telephone conversation yesterday, I am enclosing some technical information and photos of my T-18, N2751, which is for sale at \$18,000. The airplane was put into service in 1976 and has 290 hours on the airframe and the overhaul of the engine. It is powered by a 180 h.p. Lycoming O-360.

The panel was redone about 5 years ago and is finished in black crinkle paint. Instruments and gauges on the top row are: airspeed, turn & bank, VSI, tach, EGT, oil pressure, amps and "q" meter. Those on the bottom row are: clock, space for D.G. and artificial horizon, altimeter, manifold pressure, cylinder temp, oil temp, fuel and suction. I have the artificial horizon and D.G., and they can easily be installed in the aircraft.

As you can see from the photos, the airplane is bright red and the paint is in good condition. It has been hangared all its life. A heater has been installed and the trim wheel has been repositioned for more ease of operation.

I trust that this information will be helpful to you in conveying specifications of the plane to potential buyers. Thank you for any help you can offer in this regard. I have also enclosed my check in the amount of \$10.00 for renewal on my membership.

Sincerely,

*Brian P. Harney*  
Brian P. Harney, MD

P.S.: The radio is an Edo RT553.

FOR SALE:  
(MAY NOW BE SOLD)

## MUFFLER TIP FROM DEAN COCHRAN:

"Bill Flarity, of the MUSTANG UNITS CO. of Davenport, IA, sent a set of mufflers to me in '84 to test for him. They are about 34" in diameter and about 8" long. They weigh 1 1/2 lbs. each. We've had them on the bird for over a year now and really do like 'em. They get rid of that high crack sound and give the exhaust a deeper, more mellow sound. They don't seem to hurt performance. I should have prices soon for the fellows".

Dean also wrote about winter interfering with flying in the Denver area, but that he had big plans for taking the bird over the Rockies to the Western slope and to Montana to do some fly fishing.

ENGINE FOR SALE: The following is from WALT GIFFIN, 4277 Kenmont Place, Columbus, OH, 43220:

Dear Dick:

I enjoyed our brief conversations at Oshkosh 85 and was pleased to see that you are again moving around in the middle of the sport aviation scene. As I mentioned to you then I am planning to switch engines in my T-18 just as soon as my new prop arrives. My current engine is still flying in the airplane but I hope to have the switch complete by early September. If you have space in the next newsletter I would appreciate it if you would insert the following for sale notice.

FOR SALE: LYCOMING O-290-D2 (135 HP). ENGINE REMOVED FROM T-18 FOR HIGHER HORSEPOWER INSTALLATION. 650 SMOH, 1800 TT, ACCESSORIES NEW AT TIME OF CHROME MAJOR. INCLUDES DUAL IMPULSE MAGS, CARB AND STARTER. \$3300  
WALT GIFFIN 4277 KENMONT PL. COLUMBUS, OHIO 43220 PH. 614-451 2126

Thanks for the help.

Best regards,

Walt Giffin  
N78WG ser. 865

(MAY ALREADY BE SOLD.  
BETTER CALL 1ST)

A REMINDER: If you need addresses of T-18 members, the last page of NL#62 has an up to date list of paid up members.

You asked for some c.g. calculations. My calculations, plus some loading charts I prepared are enclosed. Weighing was done on 3 platform scales at a certified aircraft repair station. I have an O-290-D2 engine with a Cassidy wood prop and battery behind the baggage compartment per plans. The c.g. is further aft than I would like it to be, although the only handling problem I have noted occurs with low fuel, a full passenger load and bags coupled with high cruise power setting. Then I run out of nose-down trim and must hold some forward stick pressure. The plane now has over 300 hours on it with no major squawks.... a real delight to fly and display.

The next three pages are from Walt on his airplane, N78WG. with all the other examples of CG calculation in the various NLs, you should have no trouble with yours, if you use these as a guide.

\*from WALT GIFFIN\*

C.G. CALCULATIONS FOR N78WG - THORP T-18 WING STA 53'

WING CHORD 50"

|                           | WEIGHT | x | STA    | = | MOMENT | % CHORD |
|---------------------------|--------|---|--------|---|--------|---------|
| MAIN WHEELS               | 863    | x | 53     | = | 45739  |         |
| TAIL WHEEL (BOLT)         | 75.5   | x | 192    | = | 14496  |         |
| WITH OIL C.G.             | 938.5  | x | 64.182 | = | 60235  | 18.36%  |
| OIL (8 QT)                | -15    | x | 28     | = | -420   |         |
| EMPTY C.G.                | 923.5  | x | 64.770 | = | 59815  | 19.54%  |
| 1 PASSENGER               | 170    | x | 85.6   | = | 14552  |         |
| OIL (8 QT.)               | 15     | x | 28     | = | 420    |         |
| FUEL (29 GAL)             | 174    | x | 48     | = | 8352   |         |
| MOST FORWARD C.G.         | 1282.5 | x | 64.826 | = | 83139  | 19.65%  |
| 2 <sup>ND</sup> PASSENGER | 170    | x | 85.6   | = | 14552  |         |
| BAGGAGE                   | 475    | x | 106    | = | 5035   |         |
| GROSS WGT C.G.            | 1500   | x | 68.484 | = | 102726 | 26.97%  |
| FUEL (EMPTY)              | -174   | x | 48     | = | -8352  |         |
| MOST AFT C.G.             | 1326   | x | 71.17  | = | 94374  | 32.34%  |

NOTE: THEORETICAL NEUTRAL STABILITY POINT IS AT 34% MAC

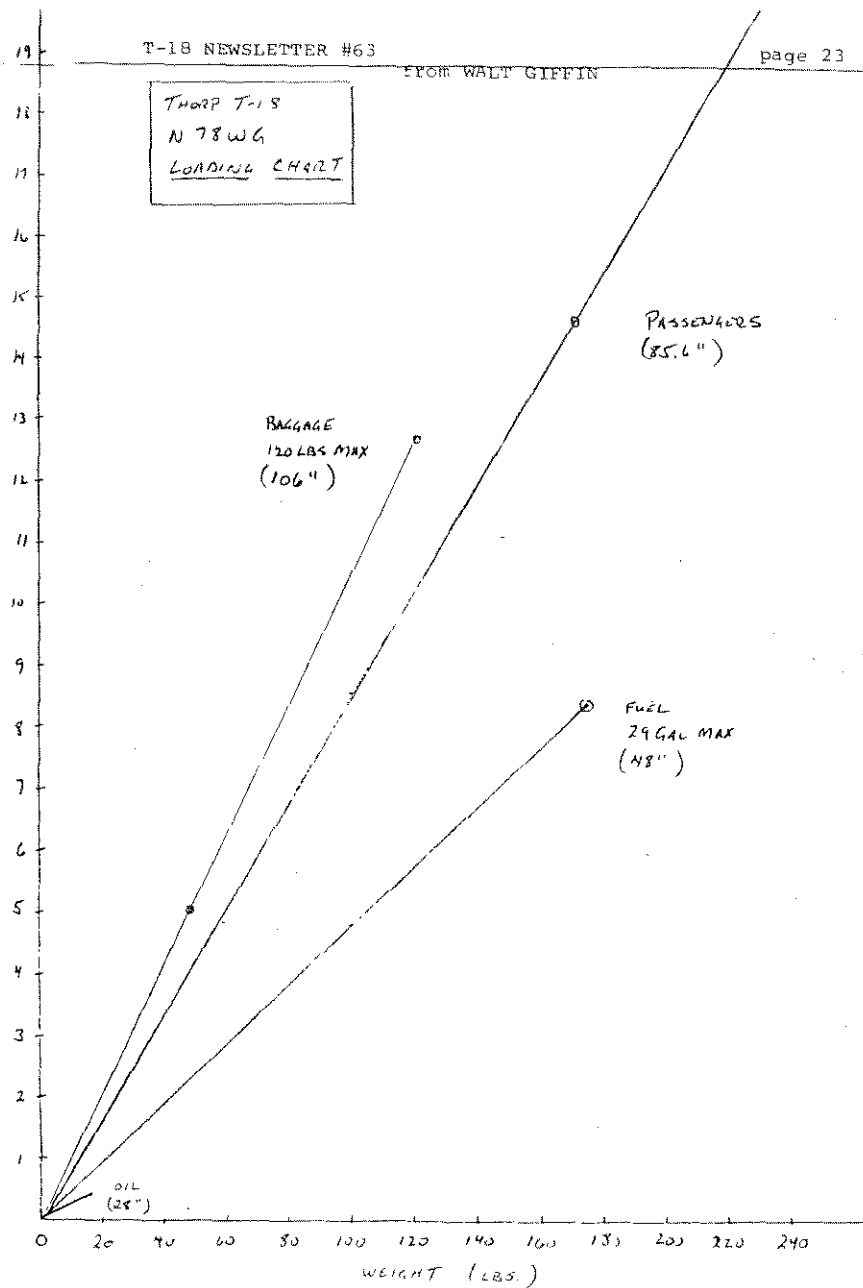
FORWARD C.G. LIMIT IS 15% MAC. REPORTED BY

JOHN THORP (DESIGNER) IN T-18 NEWSLETTER

NO 18 p1, AUG 22, 1966.

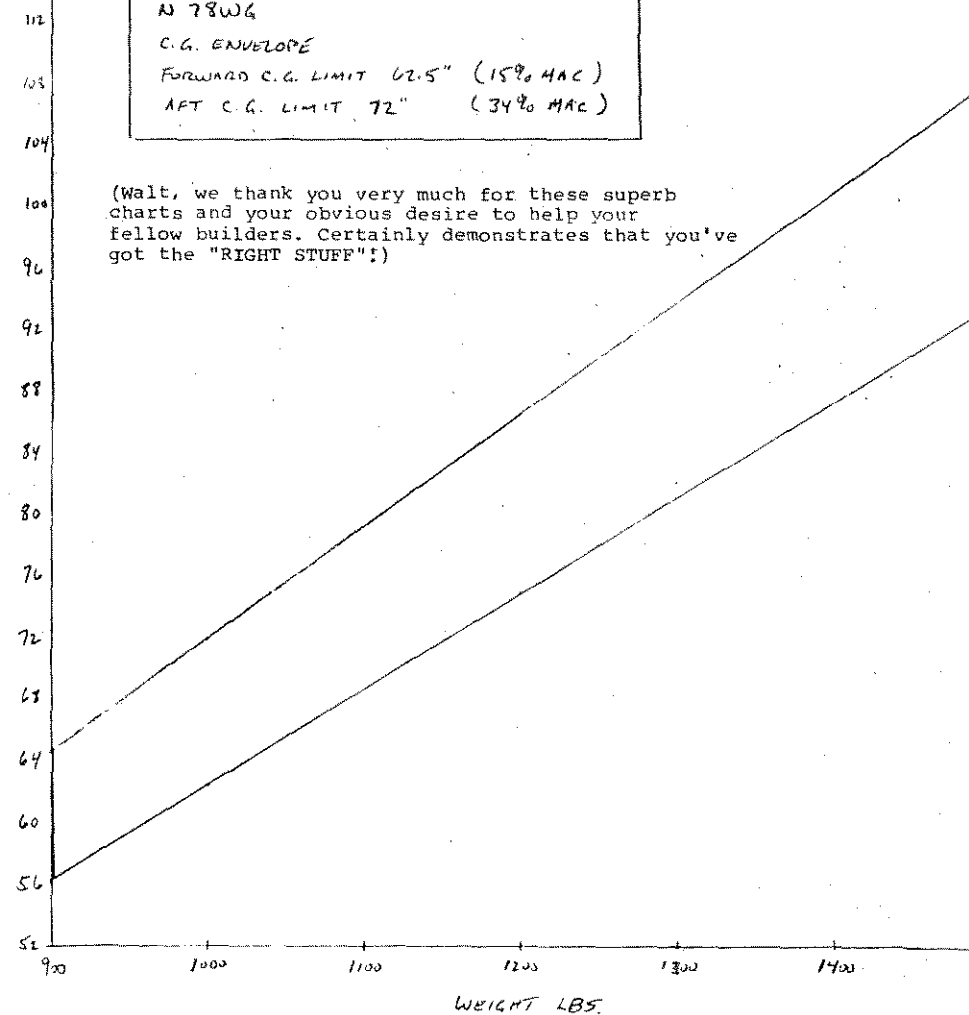
THORP T-18  
N 78WG  
LOADING CHART

MOMENT ÷ 1000 (IN LBS)



THORP T-18  
N 78WG  
C.G. ENVELOPE  
FORWARD C.G. LIMIT 62.5" (15% MAC)  
AFT C.G. LIMIT 72" (34% MAC)

MOMENT ÷ 1000 (IN LBS)



(Walt, we thank you very much for these superb charts and your obvious desire to help your fellow builders. Certainly demonstrates that you've got the "RIGHT STUFF"!)

STANDARD DISCLAIMER: Please be advised that since its beginnings in 1963 that the T-18 Newsletter is an information exchange between members of the T-18 Mutual Aid Society (now known as the T-18 Builders and Owners Association), a non-profit group. We would make you aware that the T-18 was, is, and will be in the future...a clearing house only for ideas, opinions, and personal experiences of both members and non-members on both building and flying the T-18. Anyone using the ideas, opinions, and experiences presented do so at their own discretion and risk, as no claim for their accuracy is made. Therefore, no responsibility or liability is either expressed or implied and is without recourse against anyone. All of the above refers to what is called The T-18 NEWSLETTER.

Sorry we have to take up space for that, gents, but in these days, etc.....

SOS...SOS...SOS...One of our Australian builders, (Martin W. Beck, of 44 Sheppard Rd., Emu plains, N.S.W. 2750, Australia), is gearing up to assemble a WIDE BODY T-18, the first to be constructed in Aus. and he's run into a snag with their Dept. of Aviation. Seems they can't approve the project until they have the names and addresses of at least 6 owner/builders of the wide body T-18 that have completed at least 100 hrs. of flying in it.

Martin has all parts on hand to assemble, but he's stuck until we can get some names and addresses to him. I know of Ken Knowle's bird and Karl and Mazie Lipscomb's WBs, but I'm at a loss to know who else of you is now flying a Wide Body. If YOU are one of those, please let me know pronto, even tho' you may not have 100 hrs. on it! If any of the rest of you know of someone besides Ken and Karl, it would be appreciated if you let me know. My records don't indicate whether or not it's a st'd or WB and it's the same with Lu Sunderland. I know I turned out several WB fuselages for people, but Karl's is the only one I know for sure that is flying.

FUTURE OF THE T-18 NEWSLETTER: As I have written so often in the past, the ONLY THING THAT KEEPS THE NEWSLETTERS GOING ARE THE ARTICLES, TIPS, and LETTERS FROM YOU, THE BUILDERS AND OWNERS.....The problem is that the well is close to running dry for material. I only have enough material on hand for maybe one more newsletter..... certainly no more than two. We have covered the construction of most every item on the airplane and some of them more than once. We have published quite a lot of performance information, comments on flying the T-18, and a variety of other subjects, including reports and articles on the social function side of things.

If I have your interest by now, please consider this point: Best estimates say that probably 500+ T-18s have been built. ALL of them have spinners, props, cowlings, baffles, oil coolers, fuel systems, wheels and brakes, wheel pants, gear fairings, throttles and mixture controls, engine inst'ts, rudder and brake pedals, brake cyl's, instrument panels full of a variety of instruments in a variety of arrangements. All of them have windshields, all have upholstery and seats, all have baggage compartments, radios, antennae, nav lites, flaps, trim systems, tail wheels, etc....you get the idea.

Now go back thru your NLs and make a note of how many articles you have seen on installing spinners (1), the proper way to install wood and metal props, or how to go about installing cowling (3 or 4 types available), & what about baffles? (Only two have offered to share their baffle patterns). Have you ever seen an article on the a step by step method to install wheel pants? or gear fairing? Or routing of brake lines and the AN h/w needed? Ditto a complete fuel system and a list of AN parts needed? How do you mount a throttle and mixture control and how do you route the flex cable and hook them up at the carb? Ditto the plumbing of engine instruments?

(cont'd from pg. 25)

Anyway, the point is that there are STILL quite a number of subjects that we need for the NL. I have had calls asking my opinion on all the above subjects and a good many others besides. I've been able to answer some of the stock questions and some I haven't. Tony Bingelis' two excellent books should be MUST reading for builders, even tho' a portion of his material isn't directly applicable to T-18 building. His monthly articles in Sport Aviation go clear back to Jan. '72....15 years worth, and there have only been a couple of months that his column wasn't carried! A fantastic record! I have been photo copying his articles a year at a time and now have an almost complete file of them. I realize some of you have only joined EAA in the past few years and probably don't have a collection of magazines like I do. Sorry I can't help you with copies, due to copyright laws.

I would like for ALL necessary info be in our NLs, but one person can only do so much and when that person is within a few weeks of being 70 and his time is already spread mighty thin, the prognosis for getting it all done is mighty poor. Our T-18 Owners Manual is still in limbo for the same reason....because YOU and YOU won't take the time to sit down and write a page or two for the NL. Almost all of you have said, "I really do appreciate the NLs and keep up the good work, etc.", but fully 90% of you haven't repaid the debt in benefits you received by contributing an article or tip! If you don't know WHAT to write about, look at the preceding list of subjects or look at every detail on your airplane. We don't have any problem with having enough subjects available...just a dearth of articles.

If you can send in an article, it would help me if you could type it on a st'd size sheet of paper, with st'd margins, but if you can't type it send it anyway and I'll type it. I often have to scissor and Scotch tape articles together to make space come out even. Illustrations come out better if you use a fine point black ink pen and regular block style lettering, but here again I can go over pencil drawings with a pen and make a paste-over lettering patch with the typewriter if necessary.

As to funds, I have enough left over in the kitty for a couple more issues the size of this one. I originally said in a previous NL that we would make our yearly renewal date coincide with OSH, but since my NL production has been so poor the past year, I'm sure some of you thought the NL had gone down the drain and so didn't renew. Some of you have renewed and I do appreciate your support.

That's all for this issue, amigos. It has just turned '86 and for all of you that sent season greetings, I'd like to wish all the best for you in the coming year, along with good health.

I hope to hear from all of you soon. In the meantime, GOOD FLYING. Dick

P.S. (Room for one more item):

FOR SALE: An IO 360 A1A engine. Overhaul to zero time specs, with or without a yellow tag on accessories. Will accept an O360 core trade in. Ken Morgan, 817/ 268-1834 (Ft. Worth). (Ken is an A & P and building a T-18.

Our deepest condolences to the family of Ford Hendricks, who recently passed away. An old friend, Ford was an ardent T-18er, an example of how we might approach and enjoy life when we get to the mid and high '70s. A fine and respected gentleman. We'll miss him.

Decided to add the following pages to #63, since I hadn't put out the usual number of NL the past year, so this'll be a BIG 'un. The following is from Fred Gindl, 101 Broomfield Dr., Agincourt, Ont, M1S 2W3 (416/293-9810):

Dear Mr. Cavin:

EVERYBODY IN THE "HOME-BUILT" MOVEMENT HAS A DREAM TO BRING HIS CREATION (IN MY CASE, MY THORP T-18) TO OSHKOSH. MY TURN WAS THE YEAR 1984.

I STARTED BUILDING MY T-18 ON AUGUST 11, 1972--MY FIRST FLIGHT WAS JUNE 11, 1983. "LONG TIME FOR A DREAM!"

ABOUT MYSELF: MY AGE IS 55. I WAS BORN IN VIENNA, AUSTRIA (GLIDDER COUNTRY--WHERE I STARTED SOARING AT THE AGE OF 14). I IMMIGRATED TO CANADA IN THE YEAR OF 1953. I MADE MY POWER FLYING LICENCE IN 1955 AND MY HELICOPTER LICENCE IN 1968. FOR THE PAST 22 YEARS I'VE OPERATED MY OWN SMALL BUSINESS (POLYURETHANE FOAM INSULATION AND SPECIAL COATINGS.)

I ALSO OWN AND OPERATE MY 1949 "NAVION E-225" WHICH IS UNDERGOING COMPLETE OVERHAUL AND PAINTING AT THIS TIME. I OWNED AND OPERATED A "ENSTROM 280" HELICOPTER FOR MY BUSINESS. I WAS FORCED TO SELL MY MACHINE DUE TO UNAFFORDABLE INSURANCE.

MY TOTAL FLYING EXPERIENCE IS 3,477 HOURS IN FIXED WING AND ROTO CRAFT.

ABOUT MY THORP T-18 SERIAL #558  
CANADA REGISTRATION: C-G FPB

MY T-18 IS ALL HOME-MADE EXCEPT FOR THE ENGING, LANDING GEAR, WHEELS, BRAKES, PROP, INSTRUMENTS AND RADIOS.

#### PERFORMANCE ON FIRST INSTALLED ENGINE

ENGINE: 150 HP. LYC.

PROP: BY SANTA MONICA PROP. 75EH 8-6-71 - PITCH: 71 - DIAM. 70"

A/C EMPTY WEIGHT: 1,074 LBS (I NEVER COULD FIGURE OUT HOW I GOT SO HEAVY!)

STATIC RPM 1,925 (LOWER THAN AVERAGE. TOO MUCH PITCH MAYBE?)

FULL POWER LEVEL FLIGHT 1,000 AGL ST. DAY 2,650 RPM-193 MPH INDIC.

CLIMB SOLO: 120 MPH 1,800' (150 HP 0.320 RATED @ 150 HP @ 2700 RPM)

CLIMB PASS: 120 MPH 1,450'

CRUISE: 2,450 RPM AT 7,500' - 142 MPH INDIC.

STALL CLEAN: 64 MPH

STALL FULL FLAPS: 60 MPH

AT FULL TANK, SOLO 90 MPH, A/C WILL PERFORM INSIDE LOOP

THEREFORE, SELECTED LANDING SPEED IS 80 MPH

(FRED GINDL, cont'd)

AFTER FLYING MY T-18 (45 HOURS) I DECIDED TO REMOVE THIS "BOG" OF AN ENGINE, AND REPLACE IT WITH A BRAND NEW "160 LYCOMING", THE PROP ALSO NEEDED TO BE RE-PITCHED. I REMOVED THE 150 HP ENGINE AND INSTALLED THE NEW 160 HP ENGINE ON OCTOBER 23, 1984.

#### PERFORMANCE ON 2ND INSTALLED ENGINE

ENGINE: 160 HP LYC.

PROP: SAME, EXCEPT RE-PITCHED TO 69" AND BALANCED

ALSO THE PROP WAS HARMONIC CHECKED (AVOID CONT. OPERATION BETWEEN 2,470-2,769) "JUST A PEACE OF MIND"

I ALSO REMOVED SOME WEIGHT FROM THE AIRFRAME.

A/C EMPTY WEIGHT: 1,054 LBS (-20 LBS)

STATIC RPM 2,250 (+325 RPM OF 150 HP ENG)

FULL POWER LEVEL FLIGHT 1,000' AGL ST. DAY 3,100 RPM 212 MPH INDIC.

CLIMB SOLO: 120 MPH 2,200' (0.320 160 HP DEVELOPS 160 HP @ 2700 RPM)

CLIMB PASS: 120 MPH 1,550'

CRUISE 7,500' AGL AT 2,375 AND 18.5 MAN. 162 MPH

STALL CLEAN: 64 MPH

STALL FULL FLAPS: 60 MPH

AT HIGH SPEED BY MYSELF AND FULL FUEL, SHE WILL STILL DO ACROBATICS WITH FULL FLAPS (?) I'M NOT CONCERNED WITH THAT, SINCE I KNOW WHAT SHE'S DOING. I JUST APPROACH SLOWER!

TOTAL TIME ON THE AIRCRAFT IS NOW 84:45 HOURS AND I LOVE EVERY BIT OF THE T-18.

SPECIAL THANKS TO MR. JOHN THORP, MR. LOU SUNDERLAND AND MR. BOB DIAL FOR HELPING - "MY DREAM COME TRUE"

SINCERELY,

THANKS, FRED, FOR THE  
EXCELLENT PERFORMANCE COMPARISON

FRED GINDL

P.S. MY MEMBERSHIP CHEQUE FOR 1986 IS ENCLOSED

IT WOULD HAVE BEEN INTERESTING TO SEE WHAT FRED'S AIRPLANE WOULD HAVE DONE ON THE 150 HP ENG. IF HE HAD FIRST REPITCHED THE PROP.

WE NEED MORE PERFORMANCE REPORTS - PLEASE!

150 HP PERFORMANCE

160 HP PERFORMANCE

As per usual, I'm slow getting the newsletter out. There just doesn't seem to be enough hours in the day to get everything done...or have you also noticed that? I don't think I take on any more projects than I did when I was younger, but I seem to take more time to get things done than I used to. By way of explanation to the new ones in our group, I took on an associated editor job for Sport Aviation, Lightplane World, and Vintage Airplane a little over a year and a half ago and my assignments have really kept me hopping since then. I've had good intentions about getting NL #64 out for several months, but since #63 it has been pretty hectic. I'm sure most of you have read some of the stories, so I won't comment, except to say that the Rotary Vee engine development is moving right along. The boys are now on Engine #3, which is a further development of #2 engine (the 115 lb. 300 hp eng.). They have turned it as high as 5700 rpm and done some dyno testing. So far the dyno showed 90 hp at 3000 rpm. In the process of these tests they found pistons, which were made from extruded round bar stock, were not perfectly round, as they had assumed. This caused leakage around the rings, costing considerable power loss. They also found the size, shape, and location of the intake valve needed some small changes. Because sculpturing the valve changes are very time consuming, they decided to make a totally new engine from scratch. They expect to freeze the design if #3 works out. They had hoped to make it to OSH with the engine, but it looks pretty iffy now.

The boys in Oklahoma were a little disappointed that #2 wasn't quite up to specs, but they have learned quite a number of very important things to date. The way I feel is that if they only get half of the 300 hp the design formulas indicated, they've still got a winner at the 115 lb. wt.

Another story you may be interested in will appear in Sport Aviation in a couple or three months from now is a more or less historical account of the T-13, the accomplishments of the builders, modifications, and the transition to the S-18 of today. The article also touches on the Matched Hole Tooling technique that John Thorp wrote about in 1962, when the design first came out, and that in terms of homebuilt designs, the T-13 qualifies as a Senior Citizen. We also made the point that to our knowledge there had never been an in-flight structural failure that was the fault of the design and it has only been careless, reckless, or inept piloting that has caused accidents.

I continue to get calls from non-builder owners that complain they are having real trouble landing their newly acquired T-18. I always ask them if they have the newsletters and if so, have they carefully read what has been written about flying the T-18? They usually haven't and little question or reveals they are starting their flare too high. This goes clear back to their primary instructor that permitted them to get into a dangerous habit of changing their angle of attack (flaring) at some other altitude than the correct one. Every time they pull on the stick they are reducing speed, increasing drag, and increasing sink rate. The important thing is that when all this happens it determines the RATE that one will have to complete the rest of the flare. He's trying to play catch-up now as the nose is starting to fall thru rapidly. If he realizes what's happening and stops to prevent a full stall, he'll probably wind up with a first class ricochet and too high a bounce to salvage it without power.

(cont'd)

If you stop to think about it, the RATE you pull back on the stick determines what kind of landing you'll make. (That's assuming you are pointed straight down the runway and have fully compensated for any crosswind component you may have). I guess just about everyone has done a little experimenting on landings when you've had an extra long runway to play with. You come in with an extra 10-15 mph over the fence and you get it down about a foot high in good ground effect and you think you'll just gradually wear out that extra speed at your leisure and just slick it on and stretch the main gear rubber clear back to the tail wheel, etc. Well, how many of those attempts have worked out the way you planned? 5%? 10%? That's about par for that course. What usually happens is the RATE of pulling that stick back was constantly changing, as it always does, but was almost imperceptible until that last second when it had to speed up radically. Then was when you dropped it in that last 3" or 4" -and it felt like two feet. Right?

To make a long story short, we can learn a lesson that's as old as when the first airplane flew. Remember the oft-repeated axiom of thousands of flight instructors, "A good landing is ALWAYS preceded by a GOOD APPROACH". A good approach is practically always followed by a GOOD LANDING". The part of the approach we are zeroing in on here is the absolute control of airspeed all the way to flare.

In airline operation the pilot flying is required to maintain his exact airspeed all the way to the threshold...with a tolerance of about two knots...a speed we call Vref. Thus the pilot knows where the A/C is going and he knows reasonably close to how RAPIDLY he pulls back on the yoke to get the same result time after time. If one concentrates and practices airspeed control on every approach they'll soon find that their landings are close to the same each time, too. I imagine all of you have heard this said many times, but when we are trying for precision we should always be our own worst critic. Right? The average T-18 with an average pitot/static system makes a good minimum float landing with an approach speed of 90 mph. I personally prefer to make the approach power off, but some of you will be more comfortable with a little power on all the way. The important thing, tho', is to do it the same way every time. You may want to review the NL where we talked about fixing the airplane's angle in the 3 point position firmly in your mind by referencing the point where the horizon cuts thru your cowl. That's the point you always stop a little short of on the flare. Now make a mental note on each landing of how rapidly you come back on the stick and you've just about brought the variables down to an irreducible minimum.

In case you hadn't already heard, we had an accident at the '86 Sun n' Fun affair. The T-18 involved was from Florida and there were two fatalities. Apparently (from eyewitness reports) the pilot attempted to turn back to the runway after a power loss shortly after departing the airport and the aircraft was too low to successfully make the 180 and was stalled in the turn, with a possible partial recovery. The airplane hit quite flat, indicating perhaps that the pilot was able to make a last moment change in the attitude of the airplane, but not able to halt the almost free falling descent rate. Both pilot and passenger had massive spinal injuries and died either enroute or at the hospital. Such injuries almost always indicate bodies being subject to loads of 40Gs or more. The sad part of this case was that the pilot had an adequate landing area straight ahead that he could have made easily. A prelim report said the engine was belching black smoke on the T/O and an unconfirmed report was that the primer was unlocked. More later on this.

*JIM BORG FLIES*

The following three pages are an excellent example of a first flight in a T-18, construction features, and performance report by JIM BORG, 15800 Makah St., Andover, Minn, 55304. Jim has also included a fine sketch and writeup on fitting the canopy on the WB fuselage. Several builders have complained about this very problem, so this is welcome news. If any more of you have come up with another solution (or even the same one) PLEASE give us your report and do it now while it is fresh in your mind. For some reason no one wants to write about what they learned while installing the canopy on either the T-18 or S-18, yet almost all agree that it is one of the most difficult and time consuming parts of building the airplane. How did you cut it, drill it, fit it to the frame, adjust it, secure it, trim it, make a skirt, etc? How did you ventilate it, how successfully, install locks, what kind, etc.? Ditto the windscreen.

Ser. 987 Flies

(rec'd Mar. '86)

Dear Dick:

I have now 64 hours on my T-18 and enjoying it more every-time that I fly it.

After reading your last newsletter, I thought it best that I write some information for the newsletter.

Construction started in the spring of 1976. I sure had the typical learning curve to overcome, but soon found sheet metal very enjoyable to work with.

In the early stages, I built all the ribs and bulk heads. Later, I started buying alot of pre-fab parts to save time. I was very happy with both price and quality and deliveries were quite fast. I bought most items from Ken Knowles, Sport Aircraft.

July 7, 1985 was the day that the first flight occurred. Although the flight was safe and ended without mishap, one event deserves some attention.

As I lifted off everything was normal. I had told the control tower that it was my first flight and they graciously kept a close eye on me.

About 30 seconds after lift off, tower told me in a very calm tone that I was trailing lots of black smoke. I wasn't really panicked yet because I could smell no smoke and all engine instruments showed in the green.

As I headed back for landing, my friend in the chase plane told me the smoking had quit just when I reduced power. Subsequent experimenting with mixture control proved that I could control it by leaning.

Flight lasted for close to one hour with no other mishaps.

*1st FLITE REPORT, CONT'D*

Page 2 - Jim Borg report.

Back on the ground and I started investigating what caused the smoking. After some mods to the carb air box, the second flight showed no sign of black smoke.

I'm still not sure what caused it. Might have been the air box or possibly some residual oil left in the cylinders from storage.

Anyway the problem hasn't resurfaced since and the engine runs strong.

The Airframe is the wide body fuselage and standard wing and airfoils.

Instrumentation is about as simple as one can get. No gyros, but have cluster of 3-1/8 inch instruments as follows:

Airspeed  
Altimeter  
Tach  
Electric Turn/Bank  
Rate of climb  
Manifold Pressure

Also a cluster of six 2-1/4 inch westach engine instruments.

Radio is Terra NAV/COM and has been working quite well. I still have plenty of room in the panel left if I want to add instruments later if I wish.

Some performance figures:

|               |                   |
|---------------|-------------------|
| Engine        | 0320 E2A 150 H.P. |
| Prop (wood)   | 69" x 76"         |
| Cruise        | 170 TAS 75%       |
| Full Throttle | 185 IAS 3000 Ft.  |
| Stall         | 65 IAS Clean      |
|               | 60 IAS flaps      |
| Rate/climb    | 1500 ft/min solo  |
| Empty weight  | 877 lbs.          |

I left the airplane all polished and painted the glass parts metallic blue.

The interior was done by my very talented and patient wife, Loretta.

The material is ultrasuede and is tough but very light in weight. The seats are done in diamond tuft with buttons. The inside of the airplane is my proudest part because of my wife's contribution.

When installing the canopy onto the wide body fuselage,

## Page 3 - Jim Borg report

I noticed a problem that other wide body builders have also had. Because, the wide body is two inches wider at all points, the Gee-Bee canopy doesn't fit the same way it does on the standard fuselage.

The canopy frame that I purchased is also two inches wider at all points and this is where the problem is.

The problem is in the aft rail. This can be resolved by removing approximately 1.500 inches from this rail (see figure 1). This allows the bubble to be positioned farther forward and also allows it to set farther down on the sides, so that the side rails can also be lowered. Probably the most exciting event of the entire project was turning final approach at Wittman Field at Oshkosh.

Being part of something that I had dreamed about for so long made the project all worth nine years.

Sincerely,

Jim Borg

THANKS JIM FOR AN EXCELLENT REPORT.

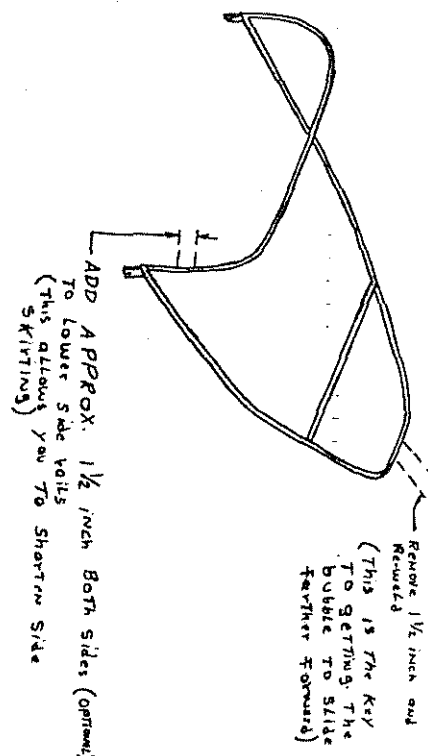
\*\*\*\*\*STANDARD DISCLAIMER: \*\*\*\*\* NOTICE:

In all past, present, and future newsletters of the T-18 and S-18 Builders and Owners Society (formerly known as the T-18 Mutual Aid Society) and Association, that from its beginning we would make you aware that these Newsletters are only presented as a clearing house for ideas, opinions, and personal experiences of both members and non-members in both building and flying the T-18 and S-18, and anyone using these ideas, opinions, and experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is either expressed or implied and it is without recourse against anyone.

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I had planned to include a page or two of T-18 photos this issue, but I ran out of time, (as usual). Hopefully, in the next issue I'll double up on photos. If you have a good sharp

Wide body Canopy Frame  
Modification BY JIM BORG



SEE LU SUNDERLAND'S REPORT ON A NEW WELDING ROD FOR ALUMINUM ON PAGE 12 THIS ISSUE. Here's an excellent place to use the new rod.



The following from Hank Steiging, Lancaster, CA. Thanks, Hank.

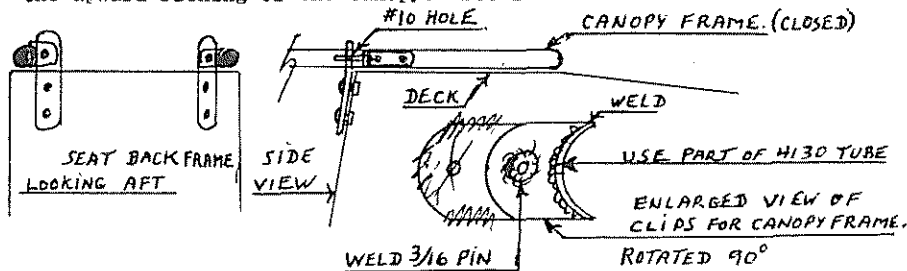
March 17, 1986

T-18 Mutual Aid Society  
10529 Somerton  
Dallas, TX 75229

Dear Dick,

Finally got in a flight with Dan Dudash in between rain storms here in sunny Southern California.

I'm wondering if Pete Beck has pinned down the cause of the loss of his canopy. His article was very well written. Some T-18 owners have experienced an upward flexing of their canopy frames during flight. This flexing is approximately midpoint of the canopy frame, that is just aft of the seat back. During flight, the canopy actually produces a lot of lift. On N512S, I installed a 1/8 x 3/4 x 2 inch clip on each side of the seat frame. Also, a clip with a 3/16 inch steel pin is pop riveted to each side of the canopy frame in such a manner as to engage the clips that are riveted to the seat back frame when the canopy is closed and latched. This system completely eliminated the upward flexing of the canopy. See sketch.



A simple suitcase latch was used at the top center of the canopy frame. During flight with the canopy unlatched, it would open 1/8 inch. To close and latch required slowing to 80 MPH.

I do miss N512S very much. To pass time, I've started a Star-Lite project, but honestly my heart is not in it.

Will be looking forward to the next newsletter. I enjoy them very much. Enclosed is a check for my "86" dues.

THANKS, HANK, FOR AN EXCELLENT  
TIP! WE APPRECIATE!

Sincerely,

*Hank Steiging*

By Henry Steiging

The following 3+ pages are from John Walton:

TO: T-18 MUTUAL AID NEWSLETTER

### SAFETY-OF-FLIGHT

It is extremely important when building a T-18 that the plans are carefully followed. If deviations occur, a suitable level of knowledge and judgement must accompany such decisions. But, when one gets into the engine installation and cockpit work we really have by then left the plans and are at our own peril. At this stage it is important to have access to the resources of knowledge and assistance necessary to enable the completion of these installation in a safe and air worthy manner.

We all share a responsibility in this. Please consider that anything which goes wrong with a T-18 reflects on all T-18's. Let's do everything possible to get or make available the necessary help to builders and maintain T-18's in a safe, airworthy condition. Use your local experts, newsletters, publications or any other possible good source.

I recently had occasion to extensively examine a T-18 which has been certified by the FAA as airworthy and had flown for approximately 100 hours. This particular aircraft was completed by an individual who was not the original builder of the airframe. He was neither an EAA member nor a T-18 Mutual Aid Society member. He had never built nor worked on airplanes prior to acquiring this airframe and engine. The resulting airplane was in my opinion, grossly unsafe.

I am listing below the items I found in looking over this aircraft which I felt were incorrect, unsafe or in some way contributory to a less than adequate aircraft. Hopefully, listing these, they may be reminders or helpful during your construction or annual inspections.

1. The fuel line from the gascolator to carburetor was an unrestrained automobile quality 3/8" hose on one-way slip over fitting(s): no clamp on one end.
2. The above fuel line passed very close to an exhaust cross-over pipe which passed behind the carburetor near the firewall. Under G loads it could contact the exhaust pipe!
3. Throttle and mixture controls were restrained with muffler clamps to the above exhaust pipe. The terminal ends on each was fitted with an AN3A bolt and fiberlock nut. (No pivot bushings.) The heat had relieved the elastic lock feature so both these control attachment fasteners were virtually finger-tight.

UNSAFE ITEMS FOUND ON INSPECTION

NOTE!

T-18 MUTUAL AID NEWSLETTER  
page 2

- UNSAFE ITEMS, CONT'D
4. The four carburetor air box bolts (1/4") attaching it to the bottom of the carburetor were not safety-wired (one was backed off 1/8"). !
  5. The air box was fabricated with 1/8" soft pop rivets. Mandrels were loose in the rivets. (Not punched out nor sealed.) !
  6. Wiring from the alternator was unrestrained. It could contact the forward exhaust cross-over pipe. !
  7. Brake Caliper drilled bolts (2) each side were not safety-wired.
  8. The constant-speed propeller governor oil line was wearing against the engine mount frame. !
  9. One of the engine baffling tie-bolts was wearing into one of the cylinder rockerarm aluminum oil return lines.
  10. The air box was wearing into the bottom of the cowling. !
  11. The alternator through bolt/nuts were in original auto configuration; not safetied nor converted to metal locking nuts. !
  12. Propeller governor control linkage. AN3 bolts were used for clevis pins on the control end. The cotterpin was bent in a double C. Could work out. !
  13. EGT Probe. Positive (ungrounded) leg not insulated. Could ground on nearby baffling.
  14. Fuel Pump. Attach bolts to the engine were not safety wired. !
  15. Rudder. Upper and lower pivot cap screws were loose on their fiber bushings. Both should turn with the rudder. Neither fastener was safety-wired. !!
  16. Rudder and tail wheel cables. Cable ends were not clevised. The builder used AN3A bolts and elastic stop nuts instead of castle nuts and cotterpins. No bushings. !
  17. Tail wheel springs were tension-type with open hooks. These had come off in service. Builder never converted to the compression type as frequently recommended in the newsletter. !

T-18 MUTUAL AID NEWSLETTER  
page 3

- UNSAFE ITEMS, CONT'D
18. The Maule tail wheel unit was attached with a single 5/16" nut/bolt in the non-standard steel spring; but was loose in the 3/8" hole in the Maule assembly. !
  19. Dynafocal Engine Mounts. All 4 bolts were too long. Thus, the nuts bottomed out before snugging up on the 2.1" spacers. The engine was loose on the mount. !
  20. Instrument panel. Many terminal and mounting screws were loose (no lock washers on most of them). The electric wires were routed in cobweb-fashion, frequently contacting other parts and structure. !
  21. Fuel tank. An external metal part wearing into the tank's skin. !
  22. Fuel tank strap supports (2). Turnbuckles (2) holding the tank in place were safety-wired. !
  23. Left main wheel axle shimmed for alignment with hardware store washers. No tapered shim, no relief from resultant hard spots. !
  24. Wing Spar. Outer wing panels (standard wing) Bolts were too long. Castle nuts were used over a stack of several washers. There were no cotter pins in any of the four bolts. 3 of the 4 nuts were loose. !

There may be some items I missed on my list; but the above should be example enough that we should not depend on just ourselves or the FAA to insure that our aircraft is safe.

Perhaps it would be good for us to switch off and examine each others aircraft at fly ins. Certainly, during the building stages; it is important to do all we can to encourage builders to get the necessary knowledge to execute properly.

Now, a story on myself. My T-18 was severely damaged in the tornadoes which just about wrecked David Wayne Hooks Airport in February. In tearing apart the T-18 to rebuild it I am executing a virtual O&R overhaul. I had prided myself that in all this work I had found nothing surprising which could have affected safety. Then I removed the gasoline tank. There, not hidden, but in plain view, was a deep wear cut caused by the braided metal shielding on a foot brake line -- through about .035" of the tank's .040" thickness! !

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page 4

CONT'D

When you do your annual or talk to someone about his project, go to the extra effort to play the devil's advocate. You may not like what you find or hear, but you could save someone's life -- perhaps even your own.

JOHN G. WALTON  
5726 BOYCE SPRINGS DR.  
HOUSTON, TEXAS 77066  
5/10/86

Thanks, John, for such an illuminating report. We need more articles like this. I well remember in the late '60s when a lot of people got fired up on the T-18 and jumped in and started building one without proper information on building. Some of the metal work was horrible, yet they were telling prospective buyers that it was built exactly to plans, etc. I've seen a couple in recent years that were licensed and flying and they were scary...truly an accident going someplace to happen. I worry about some of the new people that are buying T-18s, many of which are not too mechanically inclined. They need to find a GOOD A & P and go over every square inch of the airplane and the engine, not assuming that every thing is A-OK just because the airplane has flown with whatever is in question.

FOR SALE: A last minute note from John Walton...He has an "extra" T-18 and he can't fly but one at a time. The "extra" one is a standard T-18, st'd fuselage and wings (wings have integral fuel in the outer panel). The engine is a Lyc. 0-320, 150 hp, with Thorp cowl and Brock spinner. Prop is a Santa Monica tested prop. Engine has 640 hrs. SMOH of TLC. The aircraft is currently disassembled for rework of cockpit and the panel. Airframe has only 100 hrs. on it and John says the metal work on it is one of the best he's seen. (If John says that, you can believe it!) Also, you can bet that when he gets thru with this bird that it will be a creampuff in every way!) Give John a call (evenings) at 713/440-8093 if you are short a T-18. He'll give you the full run-down.

FOR SALE: Vern Peppard told me at OSH that he had sold his Citation jet and bought a turbo Bonanza and is having so much fun flying it that he can't find time to fly his T-18 much anymore, so he's decided to sell it (he thinks). I don't have all the dope on it, but you probably would recognize it as "Little Kong", as it's painted almost the same as Kong. He has an 0-320 in it, a new canopy, new upholstery, a constant speed prop, an aux tank (10 gal) behind the cockpit, and he has an autopilot, intercom, and just about everything you'd want in the way of radio and instruments. It's IFR certified and he often files IFR in it. If you are interested you can call him at his plant at 214/578-0571. If he isn't in you can leave your number with his secretary and he'll call you back. P.S. VERN ALSO HAS AN EXTRA LANDING GEAR (LONG) FOR SALE. CALL FOR DETAILS. PRICE DISCOUNTED.

The following from Lu sounds like something aviation has been waiting for for all these years. There are several areas on the T-18 that this product would be a great help on. I'm anxious to order some of it and give it a try. Would appreciate hearing from any of you that have the opportunity to try it out.....

CANOPY FRAMES (L. D. Sunderland): One of the most helpful things I learned at Oshkosh 1986 was a new way to fabricate aluminum assemblies. The Cascade 701 aluminum repair rod is the greatest new development since they invented wheels on roller skates. This fluxless rod melts at 728 degrees F and can be used to join any aluminum alloys. Aluminum melts at 1100 to 1200 degrees. Its tensile strength is 40,000 psi, so it is stronger than 6061 base metal. It is far easier to use than any soldering or brazing rod than I have ever tried.

You simply clean the base metal with a stainless steel brush, and heat it with a propane torch while rubbing the bare rod on the area to be "tinned." When the base metal heats the rod to 723 degrees, the will flow uniformly over the cleaned area. Once tinning is achieved, Cascade 701 will bond to itself very easily, and you can build up a fillet. Even sizeable holes can easily be bridged and filled.

We just made a butt joint from 3/4 inch x 0.035 inch 6061 canopy frame material, using 701 rod. When the joint was tested, the aluminum tubing broke outside the edge of the fillet. This certainly is an impressive fabricating material.

I also made a test sample joining a piece of 6061 with 0.025 2024-T3 alclad sheet with a butt joint. It worked beautifully. This means we can make aluminum heat muffs and solder hose nozzles to them made from aluminum sheet rather than fabricating separate hose-attachment-fittings from stainless and riveting them to the aluminum.

At an Oshkosh booth I bought 15 701 rods plus a stainless steel brush for \$22. At another booth we got 32 rods for \$20. You can contact Cascade Sales, 3316 East Smith Road, Bellingham, WA 98225 (206)592-5970.

08-28-86

Thanks, Lu, for those words of wisdom. Thank you also for your report on spin testing on page 13.

UNBENDING WING SKINS: A local builder, Roger Dengler, recently made a wrong bend on the center wing skin of his S-18 center wing, due to a misunderstanding on which line of holes to use to index the bend on a Ken Knowles skin. This put the leading edge bend in the wrong position, which ordinarily ruins the part. To try to save it Roger turned it wrong side out, clecoed it together and bent it this way, which straightened it out ok. Now he started all over and bent it right this time and he said it came out with a perfect fit on the rib nose. It feels and looks super smooth, so if one of you new builders makes this same mistake you no longer have to cry those big tears. Thanks, Roger, for letting us in on this little gem of info. (Wonder if this technique might work as a NORMAL SOP when bending wing skins?)

Pay close attention to the following from Lu:

**SPIN TESTING** (By L. D. Sunderland): Just had a visit with John Thorp and discussed a number of things including spin testing. At Oshkosh someone reported having done tests on a T-18 with a wide body during which he had to hold full nose down still and opposite rudder for some time to effect a recovery. His engine had quit during the spin. No data is available on the cent. of gravity location of the particular aircraft or whether it had a cut-down Ken Knowles rudder. (I just discovered that Ken Knowles has been selling T-18 rudders that are 1 1/2 inches narrower than the standard rudder. Neither John Thorp nor I approve of this modification.)

John Thorp advises that spin testing on any new aircraft is a serious business and should not be approached lightly. The spin characteristics of a particular airplane are affected by such things as cg location, wing twist, uniformity of leading edge bend, and control surface size. Spin characteristics of individual T-18s vary considerably. John says that it is possible to get the cg so far forward that the airplane will not even spin. The further aft the cg is moved, the airplane will spin in a nose-high attitude. Most of us have airplanes that will recover from a spin simply by neutralizing the controls but this does not mean that every airplane will have this characteristic.

Anyone who is knowledgeable in spin testing new aircraft will tell you that it should not be done without a parachute and provision to release the canopy quickly in case of an emergency. Each successive spin should be held only a half turn more than the previous ones, and any tendency for the nose to rise during the spin towards a flat attitude should be noted. Neither John Thorp nor I recommend that spins be done in the T-18 or the S-18 because of the complexity of the testing program required to insure quick recovery.

Again, Lu, we thank you for these two reports.

**OSHKOSH '86 REPORT:** As per usual, OSH was a mind boggling experience. It's like trying to see what's going on at a six ring circus, with all the rings going full blast at the same time. Our T-18 Forum was most ably conducted by John Walton and Lu Sunderland. One interesting little tidbit I remember came out of it. Ed Burke was reluctant to put all those nut plates around the forward floor (to make it easily removable), so he measured himself and found he could squeeze thru an opening 14" x his shoulder width. This allowed him reduce the number of nut plates by half and attach that section of the forward floor to the fore & aft anles. He will draw a sketch for us for the mod..soon. Anyone that's had to get down under that panel to work on brakes or fuel tank automatically gives three cheers for an easier way. Our annual T-18 Dinner on Tuesday nite was a sellout again and an evening thoroughly enjoyed by all. Our after

cont'd

dinner speaker again was Frank Kingston Smith, who held forth in his own inimitable way. As usual, Frank's witticisms held his audience spell-bound. He truly has a talent for captivating his audience with his stories and recollections. Lee Skillman again MC'd the event in his usual smooth manner until he made a Freudian slip while introducing Frank K. as Frank Kingsford Smith. He realized the slip when he made it, but he knew by then that Frank had him...and he did!

We had intended to list all the T-18 builders that brought their birds to OSH this year, but Lee didn't send me the list in time. I did remember one family that brought 2 T-18s to OSH...Cecil and Fanny Hendrix flew formation all the way from Seattle. Fanny flew the T-18 that Cecil's father, the late Ford Hendrix, had for several years. Cecil says she does a good job with it, too....I'll try to print the entire list in the next NL, if possible. We had about 25 T-18s there this year. This includes a couple that were parked down in the aircraft camping area. We also paid tribute to Gayle LeCount, who had brought his T-18 to OSH for 14 straight years! I also remember seeing Jim Alexandre's silver beauty there from Canada, as well as Bob Highley's.

This year I had very little free time to look in detail at the T-18s or talk to T-18 people, much to my chagrin. I was busy from early morn to dark time each day doing interviews, getting air to air photo hops set up, etc. This year I covered ultra lights, ARV homebuilts, and other homebuilts. Got a chance to go along on a foto hop in Pick Van Grunsven's latest, the RV-6, and to fly it some when fotos were done. It's a very nice flying airplane in most respects (see future story in Sport Aviation). Jack Cox gave me the supreme test as to whether I really was one of the worst of the die-hard "Tin Benders Forever" clan when he gave me a really tough assignment, to cover the Glasair that was adjudged Grand Champion of the Kit Builts! Seeing that I somehow got thru the interview without even once asking the builder what thickness metal he used, he then had me cover a four place Varieze (the Two Easy) and later a French couple that were honeymooning at OSH in their Varieze! Some of the staff thought he had lost his reason when he had me cover those birds, but he knew what he was doing. (He knew my "T-18 History" hadn't gone to the printers yet and he had me boxed). Casting all caution to the winds he even had me cover three more composites (the Legeti "Stratos", the Gambit, and the AMD-SIT), plus a little all-wood tandem two place twin engine, the "Culex". Later, seeing my weakened state, he said, "Well, okay, go on down there and cover Chris Heinz' little all-metal STOL". I also covered still another composite, the Sun Ray, and a very interesting little two place tandem that used the Rotax 532 liquid cooled engine (65 hp). It's about 95% the size of a J-3 and is called the RANS S-7 'Courier'. I guess all those stories are going to be my punishment for promoting the dissemination of metal building techniques in my monthly column in EAA's companion mag, Lightplane World (called "The Tin Bender's Corner"). The column takes it step by step thru the building of a mythical all metal, called the "Tin Pup" and a lot of the material will parallel material in the T-18 Newsletters, plus a lot of very primary info for rank beginners. In case you didn't know, you can add a Light Plane World subscription to your Sport Aviation tab for only \$15/yr. more. The mag is now transitioning to ARVs and 51% homebuilts, rather than ultralight coverage strictly.

Anyway, I guess you can see why I didn't have too many opportunities to visit with my T-18 buddies and ogle all those beautiful T-18s. Maybe next year.

The following is from Light Plane Maintenance magazine, the Aug. '86 issue:

#### EXHAUST SYSTEM INSPECTION GUIDELINES:

Exhaust systems, let's face it, give a lot of trouble in aviation. In high output engines installations, especially, exhaust systems are a constant threat. Something always pops, corrodes, leaks, cracks, vibrates loose, and/or disintegrates before the engine makes it to TBO. The trick is to catch it before it becomes a real problem.

If you read exhaust system ADs pertaining to turbocharged twins you'll note that they tend to require only VISUAL inspection of components, seldom dye penetrants or other methods, a point worth mentioning. Most life threatening exhaust system flaws can be spotted with the naked eye. So use your eyes. Open the cowl and look the system periodically (often) at least once between annuals or any time the cowl is off for other reasons. Light brown, grey, or greenish exhaust stains are a tip off to problems naturally, but not all exhaust cracks are leakers. Sometimes it takes a very sharp eye to spot the problem.

Stains, incidentally, are often remote from the actual leak site. Occasionally a jet of exhaust gasses will shoot past a clamp and stain an adjacent riser, or vice versa. A bad exhaust gasket will let a jet of gasses stain an adjacent stack clamp, etc. Look for the true source of the stain, not just the nearest culpable component.

In dealing with clamps, it is best to remove the clamp, shift it slightly, rotate it one way or other, and...starting with fresh nuts and bolts...reinstall it to the PROPER TORQUE. Merely over-tightening a leaking clamp or gasket may not get you anywhere.

Be alert for bulges in stacks or risers. Bulges usually conceal cracks (which may or not be leaking yet). Don't throw away bulged pieces, tho'. A good aircraft welder can work magic on defective exhaust components, even when compound curves are present. Repair of burned out areas usually costs \$25 to \$45, new flanges installed for \$31 ea., ball ends \$39-\$50, and new flame cones installed in mufflers about \$71 (at Custom Aircraft Parts, 619/276-6954 (DG)).

When components are accessible from the inside, get out a spray can of WD-40 and fog the inside of the component. The penetrant will leach to the outside of the metal wherever a crack is present, making cracks too small to be seen highly visible in a matter of minutes.

To check for larger leaks, with the exhaust system installed on the airplane, obtain a vacuum cleaner that will BLOW clean air and plug it into the outlet of the tailpipe (wrap rags around it as necessary to get an air tight seal). Remove one spark plug from a cylinder and rotate the prop until that cyl. exhaust valve is open (find the compression stroke the usual way with your thumb against the hole, then continue 180°). Insert a direct reading compression gauge in the spark plug hole. Then power up the vacuum cleaner and adjust the leakage until the system is pressurized to between 10 and 15 psi.

Next, get yourself a trigger spray bottle of soap and water and go over the entire exhaust system, starting with the exhaust ports of the cylinder and ending with the muffler or lowest stack. Any frothy areas, of course, indicate leakage.

Typical areas for cracks to form are any of the weld areas, around slip joints, and around flanges. Weld beads absorb a lot of heat and cracks sometimes begin forming around them from the outside first. These cracks often progress very slowly. Nevertheless, these should be attended to promptly. Again, this type of damage can generally be repaired by a good welder.

When exhaust flanges gaskets (at cyl. flanges) have been found leaking it is essential to effect a repair quickly, rather than continuing to operate the engine, since exhaust gasses are the hottest at this point and tends to erode the aluminum cylinder head material quickly! After removing the affected riser, examine the gasket seating surface on the cylinder. If metal is gone (leaving something less than a flat surface) the jug will certainly will have to be removed for weld repairs, if in fact it is even repairable at all. The exhaust pipe flange will also probably be warped, but this is an easy component to fix.

The balance of the article concerned mufflers. Since most T-18ers don't use mufflers, I'll defer the rest of the article until a future NL, or until some of you drop me a card requesting it. They make mention of Wag-Aero's muffler repair dept. and an exhaust system catalogue that they have for the asking (I think). Anyway, the above tips on inspection are something that affect each and every one of you that have airplanes that are flying. Some of my hangar pals laugh at me for frequently removing my entire cowl and going over everything with a bright light and often a big magnifying glass, but this paid off several times. I firmly believe that every new homebuilt should go thru this procedure about every 15 hours the first 100 hours and from then on every 25 hours. You well know what a welding torch will do to metal in a short time. Consider what a small hole in an exhaust pipe might do to adjacent parts, lines, and fluids, if the very hot gases direct a focused blast at them for say an hour or two. A very experienced mechanic I know and respect once told me backs exhaust system nuts off every few hours and then re-torques them on airplanes under his care. He also uses a mirror to inspect backsides of items not readily visible and he very seldom has any problems arise in between inspections as a result. He says the torque wrench is one of the best inspection tools you can have and that you must be certain you know how to use it in an approved manner! In May this past year EAA sent me to Canada to the Rotax engine distributor's five day clinic, which not only includes lectures, but also is a hands-on course in tear down, inspection, repair, and re-assembly of all five of their engine models that range in hp from 28 to 65, both air and liquid cooled. They devoted a significant amount of time teaching all of us to properly use torque wrenches...and all of us thought we knew how before, too. One important thing I can pass on is...Never hold the wrench with your other hand when pulling on the handle. Incidentally I was quite impressed with the quality of the Rotax engines and Ron Shettler's Kodiak Research operation. I'd now never worry about flying behind a properly installed, maintained, and operated Rotax engine, after going thru that clinic. (Ron is the distributor for North and S. America, Australia, and New Zealand for the Bombardier Corporation engines, the line includes a large number of other type engines m'd by this huge multi-factory, multi-type products, with their products ranging from locomotives to aerospace and electronics). The Rotax story will soon appear in either Sport Aviation or Lightplane World. Kodiak also produces thousands of the most beautiful wood props you've ever laid eyes on and we did a story on their operation in the August '86 issue of Lightplane World.

More FOR SALE: James Brayshaw, Jr., 635 South Michigan Blvd, East Pasadena, CA, 91107 (818/354-2746 business or 818/449-6487 home) has several T-18 parts for sale (not listed), but he has ONE standard size Thorp ALL-METAL cowl for sale. Was built in John Thorp's Sun Valley shop by Freddie....., his sheet metal craftsman. It has never been used. Assembles in four sections with cam locks, which are included. The lower section has never been cut to fit a carburetor or engine. The workmanship is immaculate. It's up for auction. Best offer over \$1000 takes it. Mop up the drool, gents.

JIM FRENCH, of Wimberly, TX, called the other day to tell me about an "incident" (that came close to being called an accident). Knowing he was getting a little low on fuel on the way back from OSH and observing scattered showers ahead, he decided to land at Georgetown, TX, and refuel. His home field at Wimberly was around 50 miles away, but he didn't want to get in a holding situation with fuel on the tight side. After refueling he taxied out and started the Takeoff. Just a moment or so after breaking ground he had an almost immediate flameout. He was able to stop in the remaining runway, but after roll out he tried to restart the engine with no luck. After they got the airplane up to the ramp he started checking the gascolator, thinking he had gotten a big slug of water in the gas. Not only was there no water, there was also no gas. He couldn't get gas to flow out of the tank at all!

He called a couple of days later to say that the gas line checked out ok, but something in the tank had blocked the outlet. They put air pressure to the line and got fuel to flow, so they drained the tank and looked inside. They found a couple of hunks of the silastic material (that had been used to make a scupper dam around the tank neck) in the bottom of the tank, but they still don't know how or when they got in the tank. Possibly the hose nozzle did it during refueling, maybe not.

After they got the pieces out of the tank they looked again and there was nothing in there....and that's the moral of this story!!!!...THERE WAS NO FINGER STRAINER IN THE TANK! This story could have had a tragic ending if the flameout had come a half minute or so later.

We haven't established who made the tank, but that isn't the real point. When a builder installs a new tank he has a responsibility to inspect the inside to see that there is no foreign matter in it, yes, but even more important....He should check to see if a finger strainer is in the tank. If not, it is a MUST that one be installed! If you are ordering a new tank from one of the suppliers it would be wise to specify that you want a FINGER STRAINER installed. It's little things like that that can get you killed. Rarely is it the big things.

Now I hope that ALL of you that have airplanes flying or under construction will immediately check your tank and I also hope that if you don't have a finger strainer that you will ground your airplane until you do have one. PLEASE don't try to rationalize and say, "why I've been flying my T-18 for three years and 350 hours and I've never had any trouble, etc". That's in the same DUMB class of remarks we used to hear from a few of the builders a few years back, that refused to make the mandatory mod to the horizontal tail. Then they would bray, "I NEVER go over 180, so I don't need to go to all that trouble and expense, ad nauseum". I sincerely hope this type hasn't sold his T-18 to some innocent unsuspecting buyer. All of us should seriously consider what might happen down the road. Any deliberate non-compliance with known and documented hazards could come

## FINGER STRAINERS, cont'd

come back to haunt you if it ever came to a court case and there was an issue of liability involved. If deaths are involved, there could be charges of criminal negligence brought if it is proven that someone sold an airplane with a known dangerous defect.

Just in case you don't have a finger strainer, they are available from supply houses, like Aircraft Spruce, etc. If your tank has a 1/4" outlet you'll have to bore and tap it to 3/8" for the strainer. It's a big job to remove the tank, but it CAN be done on the airplane if you are very careful. With the tank drained and dry, you can put several short strips of duct tape on the end of a stick (sticky side out) and use it to pick up any aluminum chips that come thru with the drill or tap. Have someone hold the stick in position as you drill. Flush and inspect before you put the finger strainer in....(Any comments on this item will be appreciated).

For Sale: Ron Bostick, Dallas, has had financial disaster hit him and is forced to make a distress sale of his project. It's a widebody, on the gear, with Cleveland wheels & brakes, Maule t/w, dynafocal eng. mt, tank in & plumbed, roll bar and canopy frame installed, Cessna seats installed, tail group complete, controls, no instrumenst. Wing is st'd wing, complete with tips, nav lites, paint (wing bought from John Walton for \$3000 & flew for 250 hrs). Over 11k invested, but can be bought for 5k if right away, otherwise will go in Chapt. 7 assets. Call him at 214/690-1620.

JOHN PHILLIPS, of McAllen, TX, has TWO T-18s that are surplus to him. One has been flying a couple or three years, the other is about 60-75% done. Prices on both are a bit below market, but I don't have the info at my finger tips at the moment. Call him at 512/ 682-9050 for details.

If any of you are seriously interested in buying a flying T-18 or an uncompleted project, give me a call any time after 9 am CST and I'll pass on any I hear of. I have some others, but now out of time & space.

In case you don't know, our good friend, Lu Sunderland, underwent colon cancer surgery just before OSH. At the time they thought all of the cancer had been removed, but a specific blood test later indicated a possible return of cancer. Going back to surgery verified the spread of the malignancy, so he's now undergoing chemotherapy. I am sure he would appreciate your get well cards or calls, but especially would appreciate your prayers for his full recovery. Lu is a fine Christian man, that has tirelessly given of himself in our behalf and has also been a national leader in the crusade to eradicate the monstrous unproven theory of evolution, giving hundreds of lectures and TV appearances to scientifically disprove the Big Lie of man's origin. He's an inspiration to all of us and we pray for his return to health.

One final reminder, amigos. WE CAN'T KEEP THE T-18 NEWSLETTER GOING MUCH LONGER IF WE DON'T HAVE MATERIAL TO WRITE ABOUT AND THAT MEANS IF YOU DON'T THINK THE NL IS OF MUCH VALUE YOU'LL JUST CONTINUE SITTING ON YOUR HANDS AND NOT SEND ARTICLES IN. Every T-18 is a story in itself, every project is also a story. Type it if you can, but if you can't, just write it and I'll get it types....(I'm really not exaggerating, gents. PLZ don't put it off...). THE INFO WELL IS ALMOST DRY, GENTS.

## J. W. FRENCH &amp; ASSOCIATES, INC.

CONSULTING ENGINEERS

3330 OAKWELL COURT, SUITE 110  
SAN ANTONIO, TEXAS 78218  
512-828-6899

52 WOODCREEK DRIVE  
WIMBERLEY, TEXAS 78676  
512-847-9723

February 25, 1986

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Here a relatively new owner sets down his thoughts on his T-18. It would be greatly appreciated if ALL you new owners would send us a report like this, even if you cover exactly the same things Jim did.

\*\*\*\*\*

Mr. Dick Cavin  
10529 Somerton Drive  
Dallas, Texas 75229

Dear Mr. Cavin:

Enclosed is a check for \$25.00 for membership in the Thorp T-18 Mutual Aid Society. I recently purchased a T-18 and the seller included all the newsletters from No. 1 thru No. 63, only No. 17 and 18 are missing. I would appreciate having copies of these two if they are available. I really couldn't find any recent reference as to the amount of your annual dues, please let me know if it is more. If it is less consider the extra as a donation to help support the newsletter. Believe me, the file of newsletters has been a very valuable aid in checking myself out in the airplane. The information in the newsletters was a big help in compiling the V speeds and writing a checklist for the airplane. I'll be glad to share the checklist with you as soon as I have finished familiarizing myself with the airplane.

The plane I bought is N2319C Serial No. 62 originally built by John Ferko in Whittier, California, and licensed in 1967. It started out with a Lycoming 0290 G. The plane was owned by Wil Neubert from October 1973 to October 1974. J.R. Michaels of Sandusky, Ohio bought the airplane in 1974 and installed a Lycoming 0320-E20 150 H.P. engine with a Sensenich 66 LM-72 wood prop. I purchased the plane from Steve Sawyer of Mount Vernon, Illinois who had owned it since August 1985. My check out consisted of the cross country flight home from Mount Vernon, Illinois to San Marcos, Texas in the right seat doing the navigating. This airplane was Steves first tailwheel airplane and he had only had about 25 hours in it. The trip home included a landing in Georgetown, Texas with a 20 knot crosswind. From the ride home I had the impression that the T-18 was a real handful on take off and landings. My first two trips to the airport consisted of long taxi runs starting with keeping the tailwheel firmly planted on the runway and increasing the speed to about 60 M.P.H. Next came getting the plane up on the main gear at about 75 M.P.H. The third day, Sunday February 23rd dawned clear and calm, and the drive from my home in Wimberley to the San Marcos airport 20 miles away gave me ample time to change my mind several times about whether to solo or wait for Monday when Harold Perdue had time in his schedule to ride with me. The weather was absolutely beautiful with a light wind right down runway 17 and not a cloud in the sky. N2319C and I took to the sky cautiously feeling each other out. I had my checklist and V speeds on index cards

Page Two

with me and I had rehearsed the take-off and landing procedures and speeds mentally over and over. Directional control in both take-off and landing was no problem what so ever, and I made a reasonably good three point landing the first time. What I was not prepared for was the acceleration, rate of climb, and steep attitude on climb out. None of my previous airplanes with the exception of a 1970 Money Ranger, even came close to the T-18. The rest of Sunday consisted of take-off and landings at San Marcos and then short trips to New Braunfels and Lockhart. At Lockhart I made the ramp turn off at 1000 feet without any heavy braking with plenty of room to spare. On take off from Lockhart my ground run was approximately 650 feet with 20 degrees of flaps.

My experience in tailwheel aircraft includes the Aeronca 7 A-C, Stinson Stationwagon 108-3, Citabria 7 ECA, Cessna 120, and Cessna 170 and totals approximately 1500 hours of tailwheel time. My observation has been that tailwheel airplanes are generally much easier to land in the three point attitude. This evening I tried my first wheel landings in the T-18 and to my delight I discovered it is much easier to do a nice wheel landing in the T-18 than any other tailwheel aircraft I've flown. I can't imagine an airplane which could be more enjoyable to fly.

As delighted with the T-18 as I am, I can see some room for improvements. The 72 pitch Sensenich will only let the engine turn 1950 to 2000 R.P.M. static. The 150 H.P. Lycoming should turn 2200 to 2300 R.P.M. static for optimum take off. I have talked to Bernard Warneke and the Great American Propeller Company this week and hope to have their recommendations for a different prop shortly. The airstrip where I live in Woodcreek Resort, Wimberley, Texas, is approximately 2000 feet long. While the present performance is adequate, I think I would appreciate a little more margin of safety for take-off performance.

I look forward to meeting some of the other T-18 owners at the EAA fly-ins in this part of the country. Please let me know if there are any T-18 functions.

Sincerely,

*James W. French, P.E.*  
James W. French, P.E.

Thank you, Jim, we appreciate it.

Arch Maxwell  
1845 Mesa St.  
Redding, Ca.  
96001

Vern Peppard  
Attention: T-18  
1100 Geomap Lane  
Plano, Tx 75704

Dear Vern,

Although I am a T-18 owner and pilot I have never built an airplane. Also, I am not sure what being a coordinator involves. I am not sure I qualify as a coordinator. However, as an owner who flies 150 to 250 hours a year I feel that the owner's or safety manual should become a reality. I therefore volunteer to be a coordinator for whatever section needed, if it should happen that you don't get better qualified volunteers.

I would like to pass along some alterations that I have made to my T-18:

Instrument hose was used as brake hose from cylinders to firewall. These had deteriorated on the inside to nearly total blockage. Replaced with proper brake hose.

Placed felt pads between throttle, etc. cables and fuel tank where they had rubbed half way through tank wall.

Placed stainless steel shims between aluminum canopy roller tangs and rail after finding them worn two thirds through.

Installed oil cooler on firewall after in flight failure of auto type cooler mounted on front of engine. Works fine and is isolated from engine vibration.

Installed Ken Knowles nav antenna in wingtip. Worked fine so installed com antenna in other wingtip and it works fine.

If I can be of any other assistance let me know.

Sincerely



Arch Maxwell

Thank you kindly for this report, Arch. It was forwarded to me by Vern. As always, we are indebted to Vern for doing the printing and collating of the newsletter. (In case you've wondered, his huge 55,000 sq. ft. plant supplies geological maps for oil companies all over the world).

Hope this NL will generate enuf nu mat'l for several more nls.

Dick





Yesterday I took Lu and Marilyn Sunderland out to DFW Airport for their return trip home. They had stopped over for a day in Dallas for Lu to appear as a guest on a radio show. They had been in L.A. before coming here, where Lu had appeared on two national TV shows. As you may know, Lu maintains a back breaking schedule in pursuit of his goal to get the courts and school boards to present creationism on an equal basis with the theory of evolution and he maintains the pace in spite of his bout with intestinal cancer. Apparently he's winning the battle, but has had some severe pains that don't appear to be related to the cancer.

He reports that there has been a big spurt in sales for S-18 plans since OSH and the T-18 article in Sport Aviation. I've had several letters from prospective builders asking my opinion as to whether they should build the S-18 or a RV-6, since I did a brief write up on the RV-6 for Sport Aviation. As an editor, it wouldn't be kosher for me to advise anyone either way. Especially so, since the RV-6 is in the prototype stage and any mention of deficiencies or shortcomings at this stage certainly would not be fair to Van Grunsven, who I have great regard for. Most of the inquirers were puzzled at the considerable difference in RV-6 kit prices and parts cost for the T-18 or S-18. Without comparing item for item between the two, it would be like comparing apples to oranges. Actually, there is no available "kit" for the T-18 or the S-18. I haven't had a chance to add up the total of all T-18 parts listed in Leisure Aircraft, Ken Brock, or Phil Tucker's catalogues, but I've been told that it adds up to around \$12,000 (vs \$6800 for the RV-6 kit).

I'm happy to report that JOHN WALTON's health problem seems to be better. John had a recurrence of his lymphoma (cancer) this past fall and has been undergoing chemotherapy and results look very good, as of this week. He's even been working on his two T-18s and hopes to be back in the air with his old 'un soon and he's looking forward to flying it with the O-360 engine and c/s prop (the eng. and prop he took out of the one he bought). He actually swapped everything forward of the firewall between the two birds, along with rectifying the damage to #1 that the tornado did to it. He has also replaced the Rattray cowl on #2 with a fiberglass Thorp type cowl he made in my molds. The top piece of this cowl is made of metal (.040), which is rolled in a sheet metal roller to match the 80% 2nd degree curves at the firewall corners. The front end is also rolled to match the semi-circular front piece.

If any of you want to go this rout it's fairly easy...if you can find a roller with a little more than 36" capacity. Otherwise you'll have to "shoe shine" the curves in by hand over the edge of a wooden work bench, which takes effort and patience. The front piece is flush riveted to the top piece. The whole thing matches out well with the skin over the top of the tank. The nose piece is made out of .040 2024 T-3 also and is formed over a form block, with bend relief cut-outs about every inch. This leaves tabs of about 1" in width and they easily form over the form block. Don't forget to drill the relief holes well clear of the bend area, or it may crack as you bend it!

GARY GREEN called the other evening and suggest we have another one of those great T-18 re-unions, like we had at Temple, TX, a couple of years back. His thought was to have every one meet at Texhoma Lodge on the 1st weekend in May and all have dinner at the Lodge dining room. It's a super nice facility, with a golf course across the street, a 3000' paved airstrip almost at the door, and Lake Texhoma a stone's throw away. (cont'd)

It's a very enjoyable place. I went in there in a Grumman Cheetah last year to an fly-in the American Yankee Ass'n held and later wrote a report on it for Sport Aviation. We can't call it a fly-in, because of the liability angle and we can't call it a drive-in, either, but Gary says he and Leroy Holt are going to be there to have dinner, maybe have a couple of cocktails, and talk airplanes and airplane people and if any of you would like to join them they'll set another place at the table. Why don't you give Gary a call at 405/233-3186 or write him at 2007 Ramona, Enid, OK, 73703. (Yes, Gary is back at Vance AFB, instruct'g in T-38s (tough duty) again.

LEROY HOLT, who lives at McAlester, OK, is flying his T-18 now and Gary says he's doing a good job with it, except for trying to flare it too high once in awhile. He says the airplane is so well behaved on the ground that you could almost land it with your feet on the floor. Leroy's airplane is a wide body, with folding wing and the new airfoil. It has a 180 hoss Lyc in it and a c/s prop. Gary test hopped it for him and has also checked Leroy out in it. Gary's T-18 has a 180 in it, too, but his has a fixed pitch prop and he is impressed with how quick Leroy's T-18 gets off and climbs, but cruise is about even. Landing roll on it is shorter, because of the braking action of the c/s prop in flat pitch. Gary says he can't tell a nickel's worth of difference on stall speed or stall characteristics (58 mph IAS on both) and no difference in stall warning. Maybe the new airfoil just cancels the extra weight of that heavy c/s prop, with its extra lift. IAS airspeed at the stalling angle of attack is well known to be unreliable in most pitot/static installations and certainly varies from airplane to airplane anyway and a lot of little things can affect stall speed. It would be interesting to evaluate a couple of dozen airplanes for comparison, wouldn't it? One thing I've learned down thru the years is that a lowered stalling speed and a higher top speed don't come easy. It takes a lot of effort on either end and you can depend on having to fight for even small gains. Anyway, we'll be looking forward to seeing Leroy's new bird and admiring it. It's been a long and rocky road to get there for him and we congratulate him for his perseverance. We'll also be looking forward to Leroy's story on his bird. He had more discouragements than you could shake a stick at, but stuck it out to the end. I think Leroy's airplane makes the 5th flying T-18 in Okla.

SPINNER TALK: I constantly hear complaints about the high cost of T-18 Spinners (about \$250 at last reading). I've seen enough made to know it's not easy and the reject rate is pretty high, too. However, I saw a slick little way to make a fiberglass spinner at a recent EAA meeting. A solid wooden male mold was made on a lathe and a length of tubing was insert on the aft end to hold it in a vise, with the male mold 3 or 4 inches above the vise. The mold was covered with what looked like silver colored duct tape. He then inflated a fairly large ordinary rubber balloon and tied it off with a rubber band. He said he put several plies of bi-directional glass cloth on over the mold, wetting each one out with epoxy as he went. Then to hold the fiberglass tightly to the mold he placed the inflated balloon at the upper tip of the mold and started gradually pressing it down as he gradually released the air out of the balloon. It went down so slick and easy and held the wetted glass tightly to the mold. He said he could have put another balloon directly on the mold instead of the tape (both of which would be sprayed with PVA mold release, of course). He then put a plastic garbage bag over all of it and pulled a vacuum on it to pull excess resin out. Said it balanced, too. (You'd need a big balloon for a T-18 Spinner)

(cont'd)

I had a fiberglass spinner on my RV-1 that had over 1000 hrs. on it when I finally sold it and it never gave any trouble. I also heard of a fellow that used an old phono turntable to centrifugally cast a fiberglass object, so that the centrifugal force would evenly distribute the resin for perfect balance. Might be something you would like to experiment with for fun. Let me know if you do, etc. You'd probably need to get up to .040 to .063 in thickness, I'd guess.

You might want to balance your prop and spinner separately as a unit, adding lead washers on the back plate flange if needed.

FOR SALE: I have a note from Lyle Fleming, 46035 20th St. E., Lancaster, CA, 93534, 805/942-2481 who says, "I have a standard T-18 landing gear and a standard fuselage that is a real good one except for the aft bulkhead, for the vertical tail needs some repair. I also have a set of T-18 blueprints to go with it. In addition, I am also thinking of selling my standard fuselage, folding wing T-18, with full IFR panel, including a Loran C, encoding transponder, and an O-360 engine, all 90% completed. Make offer for these." Lyle wrote the letter in late Oct. '86, so a telephone call might be in order as to current status. He gave no reason for selling. A picture of his #1 a/c is enclosed.

F.E. ROGERS: Formerly of Sioux City, IA, has moved to Phoenix, AZ, and he wrote the following: "Have completed move to AZ and in the process and in the process have left 7LED with the Sioux City Museum, a difficult decision after 10 years building and 8 years flying. The lure of our family and grandchildren prompted the move so we could spend more time with them."

The Thorp T-18 has shared our affection for many years and I still feel it is one of the finest, if not the finest of the homebuilts. It saddens me to see the trend toward assembly of kits, rather than the actual construction of the various parts from raw stock. Altho' I am no longer a T-18 owner I want to keep abreast of all the latest developments and information offered in the newsletter. My files contain all the newsletters and I frequently thumb thru them to refresh my memory of the enjoyment I had building and flying the T-18. Please keep up the good work on the newsletters. Our hope and prayers are with Lu for a speedy recovery from his current ailment." Sincerely, Ed.

Thanks a lot, Ed, for the kind remarks and good luck for your lifeahead in Phoenix. (I added this letter as food for thought for some of you that may be facing the same problem one of these days.

Under our present liability system in the courts the original builder of an aircraft can be held liable for mistakes, deficiencies, etc. that allegedly might cause an accident, even tho' there have been several other owners in the interim. This means you might want to discuss your alternatives with a competent lawyer before you sell. We'll go into this subject in depth in the next newsletter. In the meantime, if you have any thoughts (or possible solutions) on the problem, I would encourage you to write them down and send to me. If you have a lawyer friend you may want to discuss it with him and record his opinions on how best to escape liability. This is an extremely serious problem that ALL builders of an amateur built airplane must address when they or their heirs sell the airplane. It goes without saying that you should write to your lawmakers about the dilemma.

10202 N. 46th Ave  
Glendale, Az. 85302  
October 22, 1986

DEAR DICK,

I must apologize for not getting my cues in on time, but the time sometimes slips away when you're trying to get an airplane gone in two years. Enclosed is the \$10 of my cues. If I owe more please let me know.

At the present time I am in the process of getting my fuselage ready to rivet. By the time you get this I should be well on my way. I have my flaps, ailerons, fin, and rudder finished. I found the rudder to be the most difficult to make. The hints in the news letter was very helpful in doing everything so far. I must say though that there is some misquooed advice that must be sorted out and discarded by the individual before starting a particular task.

I made my own landing gear also. I welded it up with a DC arc welder. I talked to one of the "people" at Oshkosh before doing it and they said it should be as good as heliarc if done correctly. Personally I think it turned out very good. The worst part about making the whole thing was making the jig to hold everything in place.

When making my flaps, ailerons, and rudder I found the secret to making straight trailing edges is to "not" cut the trailing edge with tin snips, and squeeze the rivets. The way to cut the trailing edge is to either shear it or scrape it in half with a sharpened hacksaw blade, as described in a earlier news letter. The writer called it a poor man's sheet metal shear. Of course you must also hold the edge straight with a piece of angle on each side while riveting, which was also described in a earlier news letter. I guarantee you will be satisfied with the results. In all the fly-ins I have attended in the past two years I have not seen but one T-18 with trailing edges as straight as mine.

For a power plant I am using a Foro V6 with the Javlin conversion if I ever get conversion unit from Blanton. I have had it on order for 15 months, but he has had some production problems. I am using the 1.6 to 1 reduction which he has yet to test. According to the information I get from Blanton there are several others considering the Foro V6 for their T-18. If they are reading this news letter I would like to hear from them in regards to how they plan to mount the engine since it needs a four point mount. Also where are they going to mount the radiator, and how are they going to route intake and exhaust air to the radiator.

Yours truly,

*Monroe Maxhimer*  
Monroe Maxhimer  
serial # 612

Thanks, Monroe, for the tip on the trailing edge and the little shearing tool. Also, appreciate the comment on the Javelin engine. We need more letters like yours!

6 Oct 1986

Dear Dick,

Enclosed my dues with gratitude for every word in every newsletter. I started # 888, I think, in 1972 with a lot of on's and off's. I definitely have a T-18 in my garage. I'm getting ready to lock in place the horizontal tail tube. I started (using Ken's parts) by mating the center main wing section, on a good level surface with the 601 bulkhead and the 602 fittings. The main center beam was finished so I placed the attach bolts through the main beam fittings, the 601 bulkhead and 602 fittings, locked everything together, carefully marked the 602 fittings to the 601 bulkhead, took everything apart, drilled and riveted the 602 fittings to the bulkhead, placed the 601 in the fuselage and finished the job. I used the wrap around doubler on the 601 bulkhead, but since the 602 fittings were in place, the first row of rivets is impossible to buck, so I popped the first row and used an's for the second row. It seemed to work very well and everything is straight and level. Now to the horizontal tail tube. I intend to leave the main center wing beam in place and with the horizontal tail tube also in place, align the tail tube with the main wing beam using a Hewlett Packard digital transit. I have a great engineer operating the transit and I'll probably get more error in alignment by trying to drill the first holes in the lugs on the tail tube than I will in the initial alignment with the transit. My, this is wordy. I hope you won't consider this overkill, but it's going to be fun trying to make it perfect.

Thanks again for the newsletters.

Respectfully,

*Robert Clayton*  
Robert Clayton  
1783 Harvard Ave.  
SLC, UT 84108

Thanks a lot, Bob, for your report. Every new builder should know about those pesky rivets in the 601. Just remember to not rivet the fittings on 1st & there's no problem.

The next few pages are from our indomitable T-18 builder in the U.K., Jim Waller, and I know his account may likely increase your appreciation for the relative freedom from bureaucratic pomposity and xxxxx that we enjoy here.

Mid August 1986

Dear Luther,

Herewith flight test schedule for my T-18 G-BLIT. Perhaps you'd like to send them on to Dick Cavin for the Newsletter.

Thanks to your letter of 23rd Dec. things got moving again. However, not having heard anything by mid March I assumed our CAA was corresponding with you. Anyhow, I took a day off work and went to see the Engineering Officer of the Popular Flying Association (our equivalent of your EAA) and G-BLIT had its first flight that day, 17th March, remember I phoned you. Since I have only been flying the mandatory 5 hours required to keep my licence, apart from 3½ hours in a Chipmunk late last year, I got a friend, Barry Dyke, Chief Flying Instructor, Western Air Training to do the test flying although I flew it from the right hand seat from 24/5/86 and when we were doing the tests.

The first flight was traumatic. The canopy catch failed on takeoff and Barry flew G-BLIT with his knees whilst holding the canopy closed with one hand. Note the modified catch drawing which I have enclosed. Now the fun began in earnest since Barry Dyke fell out with Western Air Training and went to another airfield to start his own school. The Permit to Test stipulated that G-BLIT could only be flown from Thruxton with B. Dyke in command and he had moved to Old Sarum some 10 nm. away. What with the foregoing and continuous wet weather until the end of June to say nothing of Old Sarum being, despite its nominal 900 metres length, marginal, I only soloed G-BLIT for the first time on the 18th July. What with my having a week away in Scotland it was only last Sunday, the 10th, that I was able to get down to the serious business of starting to learn to fly it.

Old Sarum has a hospital to the north, the city of Salisbury which homebuilts are not permitted to overfly to the south and Old Sarum Roman fort dead in line with its E to W single runway. It is within the R.A.F. Boscombe Down Military Air Traffic Zone and a large Danger Zone (Army Range) lies due east. What a daft place to put an airfield. Not really. The airfield has been there for a very long time and just about everything apart from the Roman bit, seemingly always swarming with sightseers, just grew up around it. Old Sarum does have two other setbacks, though. There are three or four places where apparently ditches have been dug and filled across the runway and it is <sup>e</sup> shaped. There is no problem for aircraft with well sprung u/c's capable of a steep approach but the Thorp loses out on both these counts. Most of us here are used to short grass strips where you make a glide approach, high for safety, and sideslip off excess height

JIM WALLER'S REPORT

ALIGNING SPARS AND STABILIZER TUBE

A couple of sad things, though. Thanks to my misreading some wording on the Permit to Test we missed a chance to fly to the PFA Cranfield Rally, the biggest in Europe and equivalent of your Oshkosh, by one day. I know G-BLIT would have been a sensation there. The editor of our equivalent of Sport Aviation was hoping to do some air to air photography on us at another rally. Domestic arrangements fouled that one up. Last Sunday the anti-cyclone which should have developed instead turned thundery with very poor visibility so I lost out on another PFA rally. However it was almost a flat calm so I got in over two hours of circuits and am now confidently landing G-BLIT in well under half the length of Old Sarum without heavy braking or bouncing. Takeoff is no problem. Anticipating the swing and not overcontrolling is the answer. I ease the tail up as soon as the control column feels light at about 40 kts. indicated, nudge her off at about 55 kts. and hold her down until she indicates 80 kts at which speed at 65 to 70 ft. with two up she climbs at 900 ft/min and solo 1,200 ft/min. Old Sarum is just 300 ft. AMSL.

I have only calibrated my ASI by the manometer method given in the NL's and I have my pitot forward of the Sbd. wingtip (see photo of Vale of Pewsey) but there aint no way I'm going to be getting much more than 130 kt. fully laden. I'm using a wooden prop made by a friend. When I can afford it I'll have him make me another but I think I've dropped on lucky first time with the ideal combination for conditions here. He designed it 66" dia. x 76" pitch and my Lyc. O320 E20 of 150 h.p. swings it at 2700 rpm on takeoff.

Old Sarum's one advantage is its circuit height of 600' (so that R.A.F. machines can pass overhead on their eastward approach into Boscombe Down). When I first started flying approaches in G-BLIT it took me a long time to get used to the long flat approach needed. I put on the first click of flap at 80kt. and allow speed to decay to 60kt. over the fence after which I'm far too busy looking for a bump free spot to touch down and holding her tracking straight to know how fast she is travelling. Solo she seems to float for miles. I have only and will only ever use full flap with two up. Surprisingly it doesn't seem to make a lot of difference but gliders and non radio aircraft use the field. G-BLIT climbs happily with half flap on the overshoot without much change of trim. When landing there is a sharp pitch down when applying full flap. I suspect that a full flap overshoot could be interesting to say the least. I'm tempted to blank it off.

The radio aerial mounted centrally between u/c legs seems to work well and after many landings its rubber tip is still not scraped. The VOR with Ken Knowles wingtip mounted aerial also performs well. If I remember to take a camera I'll send some photos of what she looks like with the cowlings off. Oh, before I forget. First flights were not pleasant due to an intense whining. This I traced to a tiny paper-thin gap between canopy & windscreen. Now cured by addition of window seal foam strip.

Must stop. Thank John Thorp for a fine plane for me. Best, *Jim Waller*

## SUPPLEMENTARY FLIGHT TEST SCHEDULE.

## Engine and Fuel System.

NOTE: SPEEDS ARE IN KNOTS  
ADD 15% FOR MPH

(1) Engine cooling on climb - the aircraft should be climbed at full throttle for five minutes, or to 5,000 ft. above take off point, whichever is less, and the following data noted:-

| Time          | Ht.   | Cylinder head temp. | Oil Temp. | O.A.T. | T.A.S.  |
|---------------|-------|---------------------|-----------|--------|---------|
| 0             | 5 0 0 | 425 f.              | 100 f.    | 65 f.  | 80 kts. |
| 1 min. 1 4 00 |       | 430                 | 140       |        | 80      |
| 2 min. 2 3 00 |       | 445                 | 160       |        | 80      |
| 3 min. 3 2 00 |       | 450                 | 180       |        | 80      |
| 4 min. 4 0 00 |       | 445                 | 185       |        | 80      |
| 5 min. 4 8 00 |       | 445                 | 190       |        | 80      |

On completion of test the engine installation should be checked for any signs of overheating, abnormal discoloration of components, signs of chafing or rapid wear due to vibration. During climb any undue vibration that may be present should be noted.

Before commencing tests the Pitot/Static/ASI installation Remarks:- was checked for leaks and accuracy using a manometer. No leaks were present and the readings (over 30) were consistently within 5% of theoretical.

(2) Engine cooling at max. continuous power - the aircraft should be flown at Max. Continuous Cruise Power (or in the case of aircraft designed for air racing, at full throttle) for the maximum duration of the aircraft, less a reasonable reserve of fuel. The following data should be recorded:-

Time of flight. 3½ hrs.  
Max. Cyl. Head Temp. reached. 450 f.  
Max. oil temp. reached. 190 f.

Total oil consumption in flight. About 1 pint (?)

On completion of test the engine installation should be checked for any signs of overheating, abnormal discoloration of components, signs of chafing or rapid wear due to vibration. During the flight any undue vibration that may be present should be noted. This and all other tests were conducted with two 12½ st. occupants & full fuel - i.e. within 50 lb. of maximum permitted all up weight.

Remarks:-

## Stalling.

(1) Level Flight (in attaining stall the airspeed should decrease at not more than 1 mph/sec).

(a) Power Off V = 50 kt. I.A.S. clean. 1st stagg flap: 48 kt.  
Full (40°) flap: 45 kt.

Tendency of either wing to drop:- Slight left

Is there any natural warning of the stall? = Buffet

At what speed does this occur? = 55 kt.

What is the control effectiveness at stall?

(i) Ailerons = Still effective

(ii) Elevator = Good

(iii) Rudder = Good

Check that the throttle response is satisfactory = Yes, good pickup

Estimated loss of height during recovery = 100'

SEE OVER. →

(b) Power on  $V_s = 45$  kt. I.A.S.

Tendency of either wing to drop:- Right wing drop

Is there any natural warning of the stall? = Buffet  
At what speed does this occur? = 50 kt.

What is the control effectiveness at stall?

- (i) Ailerons = Good
- (ii) Elevator = Good
- (iii) Rudder = Good

Check that throttle response is satisfactory = Yes

Estimated loss of height during recovery = 100'

(2) Dynamic stalls - checks should be carried out at Full Throttle and intermediate power settings in both turning flight (60° bank) and in pull out conditions.

Speed and conditions at which stalls were carried out:-

(a) Power on. 50 kt.

(b) Power off. 55 kt.

Behaviour in stall:- Opposite wing drop

Recovery:- Immediate response to rudder & elevator

Is there any warning present? = Buffet

#### Rates of Descent.

(i) Measure rate of descent power off at 1.3  $V_s$  (65 kt.)

= 800 ft/min.

#### Sideslips.

(i) Power off at 1.3  $V_s$  65 kt.

(The aircraft should be sideslipped at the appropriate power setting and first the rudder should be released and then the stick should be released. These actions should be carried out independently of each other.)

Directional stability? - Does aircraft turn out of sideslip? Yes

Remarks:-

Lateral Stability - does wing tend to rise, stay steady or increase bank?

Stays steady

Remarks:-

(ii) Power on at 1.3  $V_s$  at 60% T.O. Power.

Directional stability? - does aircraft turn out of sideslip. Yes

Remarks:-

Lateral stability? - does aircraft wing tend to rise, stay steady or increase bank?

Remarks:- Stays steady

#### Max. Speed Tests $V_{ne}$

Aircraft should be dived to 'Never Exceed' Speed and the following points noted:-

$V_{ne} = 173$  kt. I.A.S.

Check aileron effectiveness:- Very sensitive

Tendency for control reversal? No

#### Stick Forces.

\* Measured using equipment borrowed from makers of the Edgley Optica observation aircraft.

\* Estimated stick forces in flight conditions.

|                                | Max. Speed. | At Overshoot. | At Cruise. |
|--------------------------------|-------------|---------------|------------|
| Estimated stick force per 'g'. |             |               |            |
| Aileron (lb.)                  | 2           | 2.5           | 2.5        |
| Elevator (lb. per g)           | 2           | 2.5           | 2.5        |
| Rudder (lb.)                   | 1           | 1             | 1          |

#### Simulated Forced Landing.

With aircraft trimmed power off at normal approach speed carry out simulated forced landing.

Note:-

Visibility from cockpit - can the approach be viewed without recourse to manoeuvres which cause undue loss of height? Yes

Is approach unduly flat so as to make entry into small fields hazardous? No (good flaps)

Can fuel cocks, ignition switches and canopy release be reached when tightly strapped in cockpit? Yes

#### Take Off.

Is there any tendency to swing? Slight left

Unstick speed? = 55 kt. I.A.S.

Very stiff w/c. Tends to bounce off rough ground.

Landing.

Landing at  $1.3 V_s = 55 \text{ kt.}$

Tendency to swing on touchdown? = No. Very controllable

Tendency to Float? = Yes but not excessive

Tendency to overturn when using brakes? No

Can an overshoot be made safely during all phases of the approach and landing without recourse to any trim change or unusual manoeuvre? Yes

Behaviour of Engine.

Tendency to overspeed in (i) Level Flight? No  
 (ii) In dive or  $\frac{1}{2}$  throttle? No  
 (iii) Overshoot? No

Longitudinal Stability.

Check stick free longitudinal stability - trim at normal cruise speed in level flight and measure stick force v I.A.S.  $2\frac{1}{2} \text{ lb.}$

General.Cockpit layout.

Can all instruments be read without difficulty? Yes

Can all engine and flight controls be operated without difficulty when properly strapped in? Yes

Visibility from cockpit - Remarks:-  
 In flight? Very good

Taxying? Good

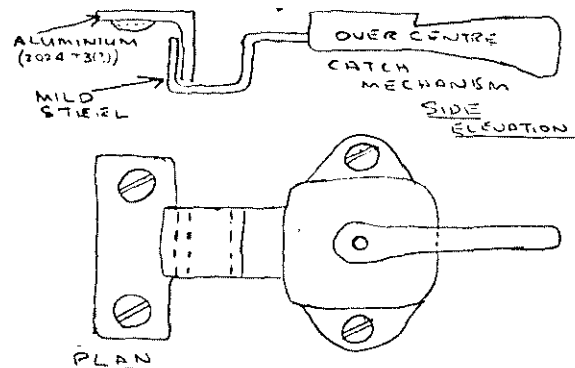
Any special features? Quite a marked nose down trim change when lowering second stage of flap at 80 kt. This will be placarded as limiting speed.

Stick force 1st stage:  $2\frac{1}{2} \text{ lb.}$

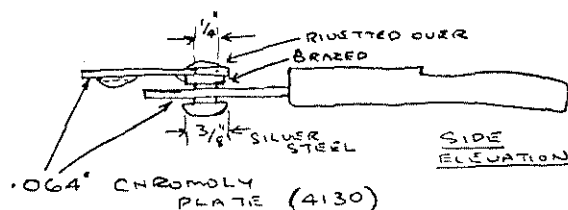
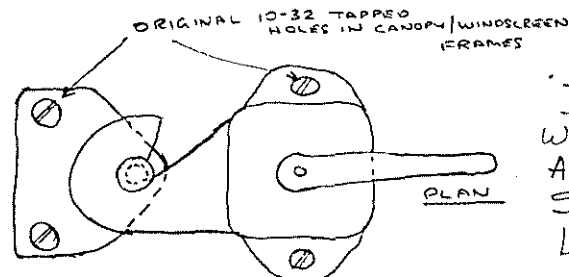
Full flap:  $5 \text{ lb.}$

Aircraft can be trimmed out if necessary.

(Signed) Barry Dyke X739  
 Chief Flying Instructor  
 Wiltshire Flying Club,  
 Old Sarum Airfield,  
 Salisbury.

CANOPY CATCH  
MODIFICATION

ORIGINAL CATCH  
 AS SUPPLIED BY  
 KEN KNOWLES SPORT  
 AIRCRAFT INC.  
 NORCO, CA.



NOT TO  
 SCALE!

I OFTEN FLEW MY T-18  
 WITH THE CANOPY OPEN  
 ABOUT 1" AND KNEW OF  
 SEVERAL OTHERS THAT DID  
 LIKEWISE WITH NO  
 PROBLEM EXCEPT A  
 HIGHER READING IAS (HIGHER)  
 IF STATIC SOURCE IN THE  
 COCKPIT. (ED)

We are indebted to Jim for an excellent and interesting report. If you carefully read the Air Registration Board Supplementary Flight Test report you can see that they aren't really such ogres after all. Their flight test syllabus is complete and well thought out. You would be well advised to copy the report for your own use in the future

1376 San Miguel Way  
Merced, California 95340  
December 5, 1986

T-18 Mutual Aid Society  
10529 Somerton  
Dallas, Texas 75229

Dear Dick,

Enclosed is \$20 to maintain the flow of newsletters. I had thought I was caught up on dues and that you had stopped publishing the newsletter. I am missing issues 61, 62 & 63. The arrival of issue 64 was a surprise.

About 18 months ago I sent a long letter about my experiences building and flying a T-18 for about 100 hours. No newsletter was received after that.

Were my observations that bad?? LETTER NEVER RECEIVED, WAYNE 5582

You were unable to attend the 1984 OSH meet the first year I completed the T-18. We met briefly in 1985 when I was director of the Merced Antique Fly-In. Time did not permit talking T-18. Your SPORT AVIATION article on the '85 Fly-In was greatly appreciated. Our 30th event in 1987 should be the largest ever. Last year I persuaded the judging people to give a greater proportion of prizes for homebuilts. We sent invitations to all the EAA chapters in the five western states and have had a significant increase in the homebuilts attending.

The T-18 forum at OSH this year was a disappointment. If I were a builder doing a Thorp the topics discussed would be of little value. For those with flying airplanes the content was of a little more interest. (The south Texans long account of learning to fly his newly purchased Thorp probably scared off some potential builders.)

I have had an unhappy experience with Bernie Warnke of Almost Constant Speed Propellers. The metal Sensenich cut and repitched to 68 x 73 by Santa Monica Prop is too fine a pitch for my O-320, 150 hp Lyc. I ordered a wood prop from Warnke asking for a 68" dia. and pitched to give me 170 TAS cruise at 7500' DA. The prop received was a 73" pitch and it still oversped to 12,000 DA and was no improvement over the metal prop. I sent it back on his promise to carve in more pitch. Upon return months later the prop was not noticeably different. It was sent back again and he promised to rework it again. It was promised for July 86 in May of 86. In a recent telcon he now is beginning work to repitch it. I have no confidence that it will be much better. He refuses to refund my money. (Just prior to departure for OSH I flew the bird to Bakersfield prop in CA. I removed the prop and carried it to the shop. It was repitched to 78" in an hour. I flew home that day and to OSH and back in the next two weeks. That pitch gives 170 TAS at 75%.)

You could perform a real service by publishing the insurance carriers who will insure T-18's for a reasonable premium. The first 1 1/2 years I was insured fully for \$950 by AIG West in Reno. They were touted by the EAA. Last April, four months into a second year, I was cancelled because I flew a homebuilt. The broker found another underwriter and I have been paying \$650/yr for 1M/100K for PL & PD only. Full coverage would have been \$2100/yr. Please ask the Thorp folks if anyone is getting good coverage at a reasonable premium.

My bird now has 215 hours and runs great on auto gas.

Sincerely,

Wayne Irwin

SORRY, WAYNE, I HAVE NO KNOWLEDGE OF AN INS. CO. THAT IS REASONABLE. DO SOME OF YOU OUT THERE?

December 16, 1986

Joe Brooks  
20913 Halldale Ave.  
Torrance, Calif. 90501  
213 320 1398

Dick Cavin  
T-18 Mutual Aid Society  
10529 Somerton  
Dallas, Texas 75229

Dick,

I purchased most of my parts from Ken Knowles in January, 1983. I received the parts by spring. Work started shortly thereafter. With the T-18 Newsletter and Sport Aviation, most subjects were well covered. To date, the plane is on the gear and 90% complete from spinner to tail wheel. The engine baffles are of my design. The engine is an O320 E2A with fresh chrome major. The prop is a Sensenich mod. 76EMB-68-74 which Santa Monica Propeller cut down, repitched, and had tested by Specialized Testing Service, 10758 Burbank Blvd., North Hollywood, Ca. 91601, (213) 877 7317. The C-W has its hang-ups for sure.

The canopy is one. There seemed no slick way to get the standard canopy under the widebody frame. Sliding the plexiglass fore or aft just left a mismatched look and poor fit. Finally I bit the bullet and cut out two triangular notches (6") from the rear corners and the bubble slid in place. The canopy skirt was raised to cover the notches.

?  
① BELIEVE JOE IS REFERRING TO FRONT END OF CANOPY.

JOE BROOKS LETTER  
FITTING CANOPY

PROP EXPERIENCES



\* EVEN A #40 DRILL (REGULAR) CAN GRAB. BETTER TO  
USE A #40 SHEET METAL GRIND.

● Cutting and drilling the plexiglass was a pleasure with the proper tools. Small tooling clamps were used to hold the canopy straight while the pilot holes were drilled in the plexy and frame with a #40 drill and then clecoed. A hole pattern was used for drilling these holes (skirt hole pattern). Trimming and drilling from then on was by grinding. A 5" cutoff wheel and a 3/8 "bullet" stone were used exclusively. No cracks have yet appeared.

● The baggage compartment is of my design. A spar was made to carry the load to the frame. Side pannels hang from the longeron to support the sides of the floor. The rear spar is supported from the frame and the rear bulkhead. The floor is two parts (split fore and aft). The rear bulkhead is in two parts also. The trick is that both the floor and rear bulkhead are held with camlocks to ease removal. With the battery behind and the electric flap motor under the baggage compartment, they will be removed more than enough to warrant the extra effort of camlocks. The baggage compartment weighs 10 lbs. Access to the tail is easy, even for me.

● Dual brakes were fitted simply by welding tabs on the right side like the left. Supports for the right cylinders mimic the left. A remote reservoir was mounted on the

BE BROOKS  
BAGGAGE COMPARTMENT - DRILLING PLEXIGLAS

(AIRCRAFT SPECIALTY CATALOGUE HAS GOOD LAYOUT  
DIAGRAMS FOR DUAL BRAKES).

firewall. The cylinders were from pipec (pn.95061). The bases were cut down to fit the brackets, and the shafts were turned down and threaded for clevises. A second set of rudder pedals were procured and the masts moved to align with the "right hand" side. Aeroquip 303-4 hose and 491-4 fittings were used as well as a fortunes worth of "AN" aluminum fittings. Stainless steel tube was used down the gear leg. More "AN" fittings and Aeroquip goodies finished the setup. (Mandrels for the 491 fittings were easily made from aluminum shaft turned down on a lathe and fitted in AN-816 fittings of the proper size.)

● The wheel pants were also fun. The pant was marked for center lines and raised to clear the wheel. A cutout pattern was made and centered on the side of the pant. The original brackets pulled the pant outboard too much.

A new bracket was made with offsets to hold the pant centered on the wheel. A outer bracket was bent up to finish the installation. (The pants add class to the plane just sitting there.) The cuffs are a poor fit at best.

● Under the hood, the oil cooler was mounted on the firewall. "AC" makes a remote oil filter bracket used on the Cessna 421 that is available in salvage yards. This was also mounted on the firewall. The gascolator was from

SEE PREV. NL ON MOUNTING OIL COOLER ON FIREWALL  
RE: NOISE TRANSMISSION TO COCKPIT

BE BROOKS - WHEEL PANTS - BRAKE SYSTEM

ENGINE (TEN'S  
\$

a Cessna 172. (I like the remote drain feature.) Fuel flow in mockup from a near empty tank was two quarts per minute. Fuel hoses, lines and fittings are all 3/8 inch. The fuel shut off valve is in front of the firewall and cable operated. No fuel pump or vacuum pump was used on the engine. The baffles are "pressure" type with tight fitting fin shrouds. These shrouds were stretch formed ala ribs from soft aluminum. Flat wraps were riveted to the skirts. Making up patterns for the baffles proved that it would have been cheaper to buy them. (But they wouldn't have fit so well.)

● Building the "C" wing has been enlightening. Matched hole tooling worked for most of the parts from Knowles.

The outer wings... not quite. The spars are fun if you like to see straight angles warp from cutting tapers in them only to find that the center wing ribs are joggled for untapered cap strips. The most fun was the "tennis-elbow" from riveting the spars by myself. (It took six months to shake off the pain.) Since the skins came pre-punched, the holes were drilled #40. The ribs were lined-up on the spar and drilled. All center ribs line up with the holes on the skins except for the fourth one out (where the skin splice is). The skin was clecoed to the center ribs and the fourth rib was drilled from the hole pattern of the skin. The spar was drilled after all else. The

(SEE N.L.  
WRITE-UPS  
THIS  
SUBJECT)

①  
RE: THE LINE OF SKIN RIVET HOLES ON TOP OF SPAR.  
(See N.L. write-up)

JOE BROOKS - BUILDING THE "C" WING

nose ribs were drilled for the spar after being fitted to it. With the skin clecoed to the center ribs and the wing jugged flat on the table, the nose ribs, one at a time were fit and drilled to the hole pattern of the skin. My nose ribs needed as much as 0.180 inch shims between the front of the spar and the rib. Oh yeah, the skin was bent before-hand as per all the good scoop in the Newsletter (and the procedure works!). The inner skin was riveted (3/32 soft flush) to the fourth rib. The outer skin was clecoed to the outer two center ribs. The last nose ribs were shimmed and drilled one at a time. The clecoed outer wing is straight as a die. With the wing in clecos, the inspection holes were cut as was the aileron pushrod slot. My pushrod hit the rear spar before full "up" aileron. This required a 1/4 inch shim under the mast (bellcrank). The mast needs about 1/4 inch more offset (hinge pin moved forward) to aid this problem. A piece of 1 inch angle was riveted inboard on the bellcrank rib to stop the outer bellcrank from going over center (even tho it may seem unnecessary). The wing is sitting in the garage collecting dust as I try to shrug off this cold that started last Sunday. (While I was trying to dope out a fairing to cover the humungus gap in the skin for the aileron push rod.)

A photo album of Polaroids (270 so far) has been kept

(EXCELLENT !)  
IDEA

of the progress and dates. Sometimes a picture is worth a thousand words.

I think that I'll kick back with a hot toddy and let the world turn for a while. Enclosed is a check for \$25.00 to keep the fund going.

K.T.F (Keep Thorps Flying)

Joe Brooks

Joe, I've gotta say that that was one of the very finest reports on T-18 building that I have ever read. About the only way it could have been improved on would be to have some sketches. In particular, you might have included a simple sketch of where and how you cut the 6" triangle cuts out of the canopy. The WB canopy seems to be a source of trouble for everyone and anyone that has any tips along this line I'd sure like to hear from 'em. Thanks, too, Joe for typing up the report. That saves me a lot of time, since I'm a two finger typist. Again, Joe, thanks a million.

To belabor a point I brought up in NL #64... WE DESPERATELY NEED COPY FOR THE NEWSLETTER! !! I've all but run dry on what to write about. We have covered almost everything at least once, but there are still a few items we haven't covered in any detail. Canopy installation can still use more write-ups, ditto wheel pant installation, gear fairing details, brake system installation, electrical system details, baffles, intake system, cowling installation, control rigging and measurement, fuel system details with wing tanks, upholstery inst'n, windshield inst'n, instrument panel layout and hook-up details, engine control routing and inst'n, instrument plumbing/wiring details, rudder and brake pedal inst'n, fitting and alignment of wingtips, tailtips, more info on electric stab trim, electric flap inst'n info, etc.... you get the idea. Just pick one of those subjects, take pen or typewriter in hand and go to it! Now if YOU keep putting it off there will be no more T-18 newsletter after #66! I've got just enough material on hand for one more NL, so amigos, IT'S UP TO YOU NOW... You all responded superbly when we sent out a call for dues in NL #64, some of you contributing more than the yearly dues, and we now have enough funds on hand for probably four more issues.... But in all that pile of replies I got only TWO stories! So, again guys, PLEASE help. Each of you owes a lot to the help you got from the newsletters when you started and now's your opportunity to show your appreciation in a way that really counts.... I want to keep the NL going from now on if possible, so now the ball is in YOUR court!

ALSO SEND PICTURES OF YOUR BIRD

NOTICE: WE SAID YOU — NOT "THEY"!

TONY BINGELIS' latest book, SPORTPLANE CONSTRUCTION TECHNIQUES, is really super. It's the third book in his series and is 366 pages of info that's really vital for anyone building an airplane. If you don't have all three of Tony's books and are building an airplane, you are depriving yourself of something that's worth its weight in gold. Much of the material first appeared in earlier issues of Sport Aviation (no longer available), updated for techniques and materials. We all owe a big debt to Tony for his writings, so I strongly urge you to add his latest book to the other two.

Incidentally, Tony is now building an RV-4, would you believe? After all those superb all-wood airplanes, he's having a go at an all-metal bird. Would you believe that he built FOUR trim tabs before he got one that suited his standards? As of this writing he has completed all tail group parts, plus his ailerons and flaps. You can rest assured that it'll be a cream puff. If he keeps up the present pace we just might see it at OSH in '87. TONY ALSO HAS A SET OF T-18 PLANS (SINCE 1965)

GREG HALVERSON, 2533 NE 11th St., Portland, OR, 97212, was one of those that answered my SOS in NL #64. Here's his letter:  
"Dear Dick: Just rec'd the recent NL and thought I'd add a few ideas I found helpful.

First, and I think most important is a comfortable work area. Ideally a large, well lit, and reasonably warm work area where entire assembly could take place. I have a full basement in my home, which makes it very convenient to "tinker" at any time I wish. It has really helped to speed up my project. Any money a person puts into a workspace and tools will be repaid over the course of the project.

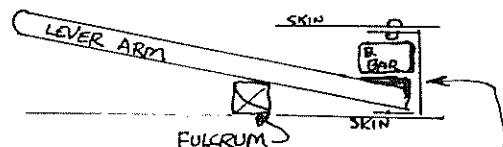
Another item I found helpful was using a many compartment fishing tackle box for rivets. I could segregate the rivets by type and size and carry the box around to where riveting was to take place.

In drilling the canopy I purchased a set of brad point or spur bits at a local tool supply store. In drilling the canopy holes I used a small 2 x 4 block as a backup block and drilled partially thru the plexi from one side and then used the pilot holes for a center and again using the back up block went in from the opposite side until completely thru. It worked nicely.

For getting at some tight riveting areas (in stab'r ribs, etc) I made a wood lever with a bucking bar at one end instead of trying to get my big hand in and holding the bucking bar."

That bucking bar tip was a real winner, Greg. (see sketch below). We all are very grateful for your tips and we thank you sincerely.

The wood spur bit Greg spoke of is almost identical to a sheet metal grind bit described in previous newsletters.



SPUR BIT -  
(CUTS DISK  
OUT) - WON'T  
GRAB

BE SURE BUCKING BAR SQUARE TO RIVETS!

STANDARD DISCLAIMER: NOTICE... In all past, present, and future newsletters of the T-18 and S-18 Builders and Owners Society (formerly known as the T-18 Mutual Aid Society) and Association, that from its beginning we would make you aware that these Newsletters are only presented as a Clearing House for ideas, opinions, and personal experiences of both members and non-members in both building and flying the T-18 and the S-18, and anyone using these ideas, opinions, and experiences, do so at their own discretion and risk. Therefore, no responsibility or liability for the accuracy of material presented is either implied or intended and is presented without recourse to anyone. (Editor).

P. O. Box 195  
Colorado City, CO 81019  
September 27, 1986

Mr. Dick Cavin  
10529 Sommerton  
Dallas, TX 75229

Dear Dick:

Sorry to take so long putting pen to paper, but six years and 14 moves leaves little time especially when you're not sure about most of the details of construction. N18FL is finally on gear and wired and the wing has been mated to the fuselage. Hope to get airborne in the next 4-6 weeks and I'll give details of engine and construction at that time.

Read about loose bolts in landing gear and would like to pass on a trick about opening up the gear A-frame 5/16 holes. The heat-treated 4130 will ream out if you use a cobalt drill or if you harden a carbon drill by heating the tip cherry red and dipping it in mercury--do this outside or with good ventilation as mercury is toxic! I was able to ream through the pad, short gear extension and wheel pants bracket and got a good tight fit. Also, followed your advice about not cutting threads on gear bolts--cutting the threads showed a lot of bad areas when examined under a magnifying glass.

\* No words can convey my gratitude to you and all the other builder-contributors to the newsletter--you're a great bunch and you've made these six years a real fun education.

Sincerely yours,

Frank J. Lanier  
(303) 676-3889

P.S. Anyone interested in any of the parts I've listed (see enclosure), please write even if you call--I'm always in the shop. (smile)

PARTS ARE: 781-3 COVER, 782 WELL, 751 SEAL (NEED 781-2-4, 781-1 SHELL & ASSOCIATED PARTS). FRANK ALSO HAS QUITE A NUMBER OF SURPLUS T-18 PARTS. DROP HIM A NOTE & A S/S ENVELOPE FOR LIST & PRICES.

\* BUT WORDS CAN! ALL OF YOU CAN EXPRESS YOUR GRATITUDE WITH AN ACCOUNT OF YOUR PROJECT.

(A re-run of the "new" airfoil coordinates) S-18 CW

## IDS-4-212 AIRFOIL COORDINATES

|    | X      | Z <sub>U</sub> | Z <sub>L</sub> |
|----|--------|----------------|----------------|
| 1  | 0.0    | .0661          | +.0661         |
| 2  | 0.100  | .4737          | -.2742         |
| 3  | 0.250  | .7290          | -.4377         |
| 4  | 0.625  | 1.1364         | -.6554         |
| 5  | 1.250  | 1.5750         | -.8641         |
| 6  | 1.875  | 1.8881         | -1.0125        |
| 7  | 2.500  | 2.1363         | -1.1340        |
| 8  | 3.750  | 2.5242         | -1.3305        |
| 9  | 5.000  | 2.8248         | -1.4860        |
| 10 | 6.250  | 3.0693         | -1.6130        |
| 11 | 7.500  | 3.270          | -1.7184        |
| 12 | 8.750  | 3.440          | -1.8060        |
| 13 | 10.000 | 3.583          | -1.872         |
| 14 | 12.500 | 3.800          | -1.968         |
| 15 | 15.00  | 3.938          | -1.995         |
| 16 | 17.440 | 4.016          | -1.9710        |
| 17 | 19.960 | 4.009          | -1.8950        |
| 18 | 22.480 | 3.940          | -1.7787        |
| 19 | 25.000 | 3.7871         | -1.6294        |
| 20 | 27.515 | 3.5635         | -1.4669        |
| 21 | 30.03  | 3.2814         | -1.2988        |
| 22 | 32.54  | 2.9503         | -1.1335        |
| 23 | 35.045 | 2.5793         | -.9710         |
| 24 | 37.525 | 2.1808         | -.8101         |
| 25 | 40.04  | 1.7539         | -.6497         |
| 26 | 42.535 | 1.3176         | -.4888         |
| 27 | 45.025 | .8792          | -.3268         |
| 28 | 47.51  | .4456          | -.1636         |
| 29 | 50.00  | .0             | -.0            |

NOTE: TO LAY OUT THE AIRFOIL, SCRIBE A STRAIGHT LINE 50 INCHES LONG ON A PIECE OF ALUMINUM SHEET. MARK OFF THE STATIONS GIVEN IN COLUMN X ALONG THIS LINE AND DRAW PERPENDICULAR LINES AT EACH STATION. Z(U) DIMENSIONS DESCRIBE THE UPPER SURFACE AND Z(L) THE LOWER. FOR CONVENIENCE, STATIONS FOR BOTH UPPER AND LOWER SURFACES ARE THE SAME. NOTE THAT THIS AIRFOIL EXACTLY FITS THE S-18 SPARS. RIB FORM BLOCKS MUST BE MADE SMALLER BY THE AMOUNT OF RIB THICKNESS.

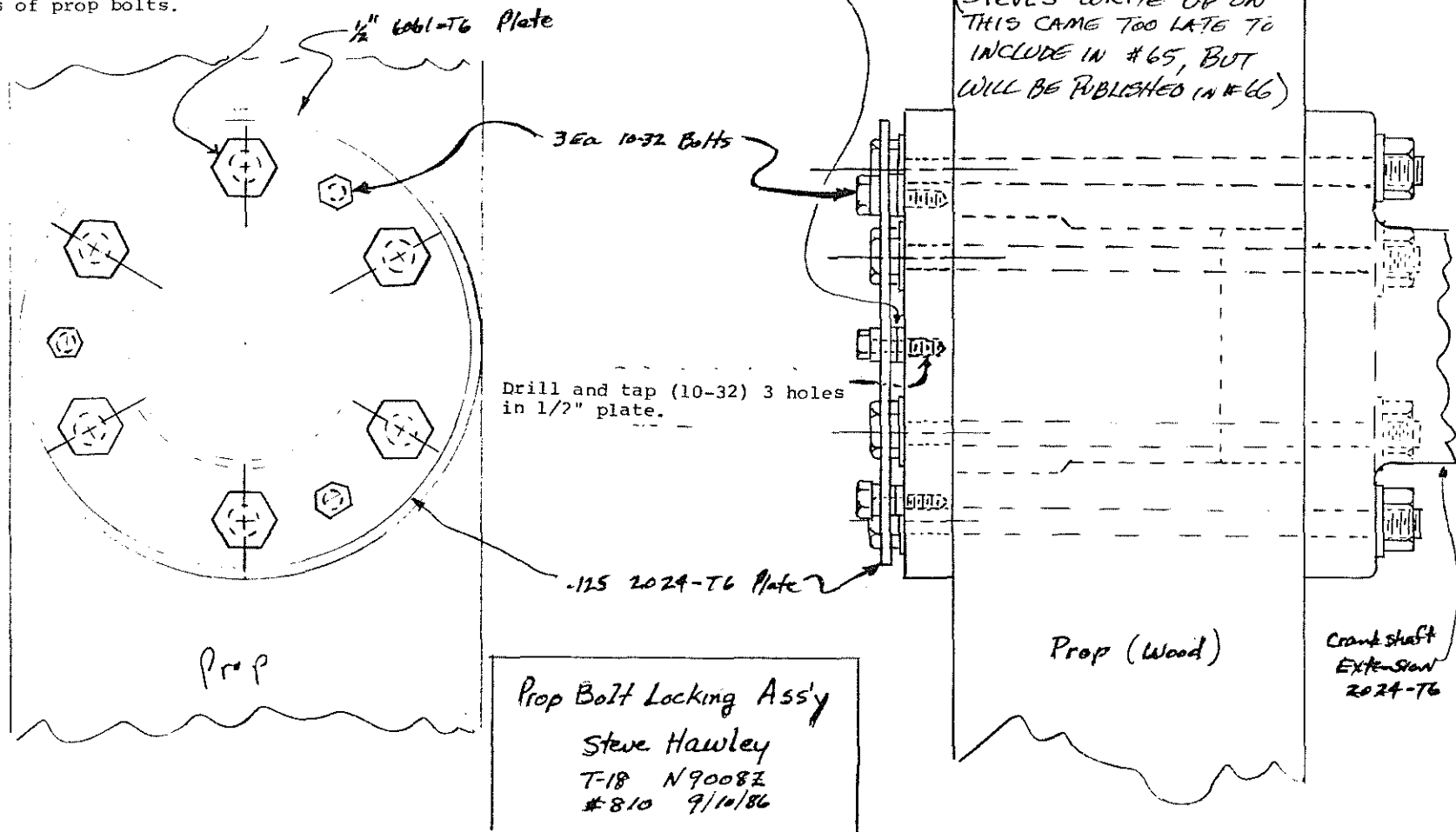
|                               |  |                                   |                |
|-------------------------------|--|-----------------------------------|----------------|
| SA                            |  | <b>Sunderland Aircraft</b>        |                |
|                               |  | 5 GRIFFIN DR. APALACHIN, NY 13732 |                |
| "NEW" AIRFOIL<br>WING PROFILE |  | DWN                               | Ed. Sunderland |
|                               |  | DATE                              | 11/2/86        |
|                               |  | SCALE                             |                |
|                               |  | NEXT ASSY                         |                |
|                               |  | MODEL                             | 108            |
|                               |  | S-18                              |                |

T-18 #65

PAGES 2-7 24

6 EA Holes drilled & CAREFULLY filed to fit heads of prop bolts.

Spacers washers to locate Lock plate in center of Prop Bolt Heads heads



Steve's letter of explanation WAS here all the time and I found it at the last minute, but DON'T disregard my remark about Steve sending in a write-up on the prop and some accounts of vapor lock problems he has had. If any of you have had engine stoppages because of fuel systems PLEASE send in immediately (If you don't want your name used, just advs.)

September, 16, 1986

Dick Cavin  
10529 Somerton  
Dallas Texas, 75229

Dear Dick,

Sorry to take so long between correspondence. Yes, I'm still around flying the T-18. I'm getting fantastic performance with the "Warnke" propeller.-- 200 mph. TAS at 2500 rpm at 2500 feet. I would guess that the top speed (2710 rpm) is around 216 mph if the air-speed is linear. I don't really care because I can't afford to buy the gas at 2710 rpm let alone at 2500. I have never had the tachometer calibrated so that may be off.

A friend asked me to draw a sketch of the prop bolt locking assembly I have installed on the T-18. It was rather time consuming to fabricate but is absolutely positive. If a wooden prop is used, it is absolutely essential that the torque be checked prior to flight. As the weather changes, and especially the humidity, the bolts will become loose and very bad things will happen in a hurry! It hasn't happened to me and I don't think it ever will.

To check the torque on the prop bolts, the head has to be restrained while the nut is checked. Unfortunately, we have all buried the heads of the prop bolts under a shiny spinner with about a jillion screws. I soon established the fact there had to be a better way, hence the locking device.

As ever,



Steve Hawley

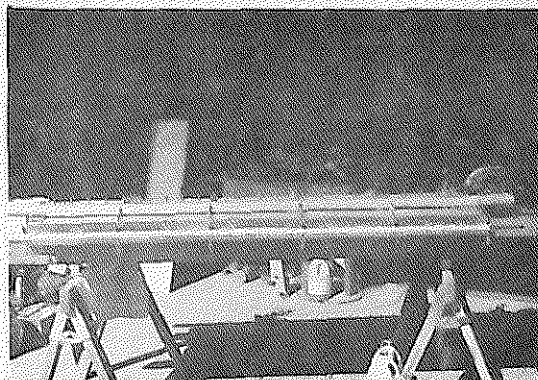
THAT'S IT FOR THIS ISSUE, GENTS. I HAD A PAGE OR TWO MORE OF MATERIAL (SOME OF IT FOR SALE ITEMS) BUT MY ELECTRIC TYPEWRITER CRATERED, SO IT'LL HAVE TO WAIT 'TILL #66. NOW IT'S OFF TO VERN PEPPARD'S PLANT TO GET #65 PRINTED UP AND IN THE MAIL.

DICK





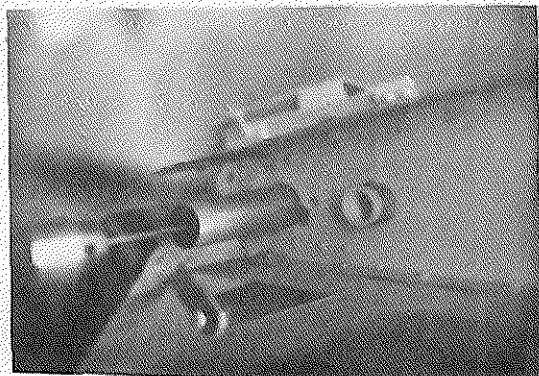
(above) LYLE TRUSTY's SUPER T-18  
note wing root strakes



Front view of the two tubes Lyle used,  
sighting the rear one over the front one  
to detect any wing twist.

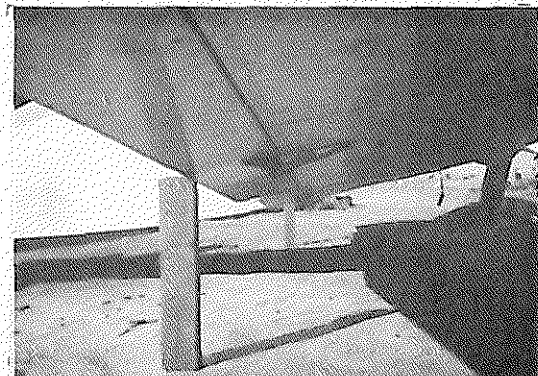


JIM WALLER's new T-18, the first English-built  
T-18 to fly (see story this newsletter).

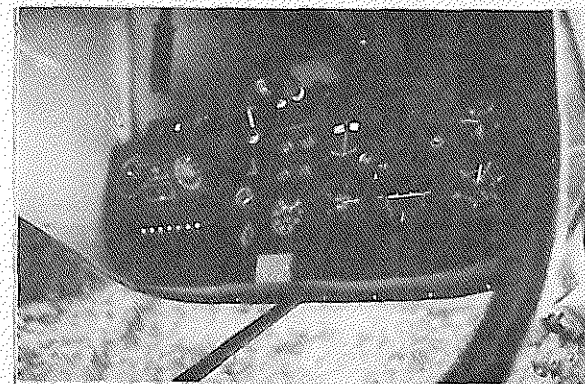
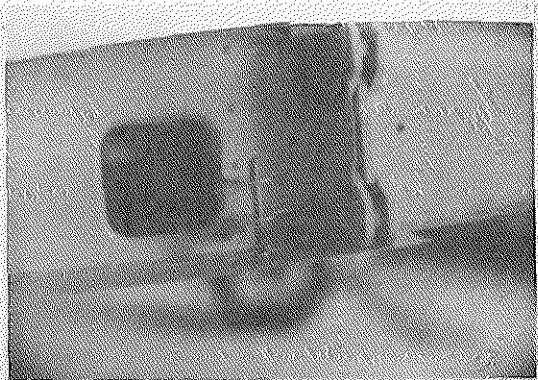


(above) Lyle's trick for drilling 3/16" pilot hole  
for 1" hole in inner rib. A 1" spot facer used to  
drill rib after pilot hole located. 1" alum pipe  
has wood plug in inb'd end, thru which 3/16"  
used to drill pilot hole

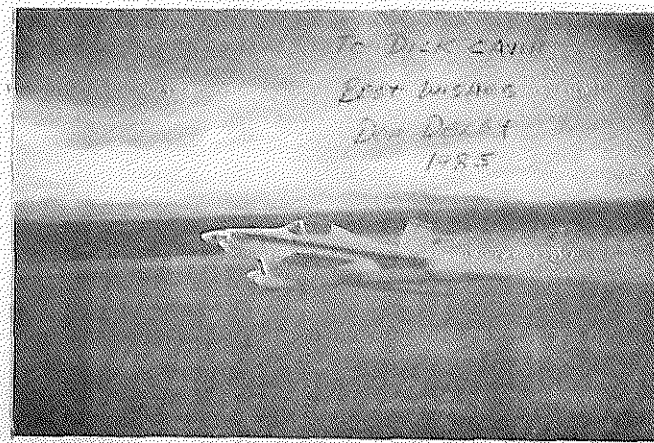
End view (below) of Lyle's method  
of using two lengths of tubing for  
eyeball alignment of wing, no twist



(above) note slight S bend Lyle had to put in  
aileron push rod to keep it from hitting rear  
spar. (below) showing alignment of Lyle's CW  
aileron hinge brackets, via pointed pin.



(above) Inverted flite view of G-BLIT's inst't  
panel. Note sensitive A/S indicator upper left.  
(below) DON DERBY's purty li'l bird.







Dateline 16 Apr. '87: This is indeed a sad day. Early this morning Lu Sunderland's wife, Marilyn, called me to say that Lu had died this morning at 3 AM. He passed away at home and his last few days hadn't been easy. He had been suffering from cancer for over a year and when there was no denying the end was near he took himself off all medication and treatment to hasten the end, saying there was no point to prolonging the inevitable.

It began with a routine colon examination, which found nothing. Just a few days later, tho', he began having pains. A more complete examination showed a small tumor in the colon that was malignant, altho' operable. He went into immediate surgery, with an optimistic prognosis. Several weeks went by with no symptoms, but a routine lab test showed cancer cells were still present and he submitted to exploratory surgery, which showed the cancer had indeed spread.

He went through the agony of chemotherapy and radiation treatments, with apparent good results. When he and Marilyn came through here the past January he had to lie down in the back seat of my car on the way to the motel, as he was having abdominal pain (that he thought was something else). The very next day he appeared as a guest lecturer on three syndicated radio shows. Only a couple of days before he had appeared on local TV in Los Angeles at the request of two LAX TV stations and also as a debater with a prominent evolutionist. His research and undeniable logic totally demolished his opponent, who had to publicly admit total defeat.

I first met Lu over 20 years ago when he knocked on my door one night and introduced himself as a brand new T-18 builder. He had read an article I had written for Air Progress about my first flight in Bill Warwick's T-18 and apparently my enthusiasm was highly contagious. Lu had previously built a gyrocopter and a Stits Skycoupe. We became fast friends from that point on.

The rest is T-18 history. I started the T-18 Newsletter and by the time #3 had been put out Lu had jumped in and helped get the next issue done. When I had to give it up because of my wife's heart attack he took over and singlehandedly put out the newsletters up thru #44. Somehow in between issues he found time to author over a dozen excellent technical articles for Sport Aviation, most of them dealing with some aspect of building or flying the T-18. By the time he had put out #44 he felt it was time to cease publishing the newsletters, as we had covered nearly every aspect of building and flying.

Lu was always an enthusiastic and willing worker at the Oshkosh sheet metal project workshops, instructing people on the building of a T-18. He also conducted most of the T-18 forums and was frequently the MC of our annual T-18 dinners.

Lu was an aerospace scientist for General Electric, a top flight designer of advanced autopilots and complex flight systems for both civilian and military aircraft. I well remember his delight when in the course of developing an integrated flight system for Boeing he got to fly a 747 in the air for a few minutes. He often came to DFW to confer with military contractors in this area. This gave us an opportunity to catch up on our visiting and T-18 talk.

## LU SUNDERLAND, cont'd.

Almost from the very beginning Lu recognized that a folding wing on the T-18 would greatly increase its appeal to potential builders and would enable many more people to be able to afford an airplane and its upkeep. After studying the subject for many months and discussing it with John Thorp he sat down and designed a simple, workable system. In the process he added steel wing fittings that raised the aerobatic gross weight allowable from the original 1200 lbs. to 1500 lbs. Lu also was instrumental in designing an advance technology airfoil for the T-18, which gave higher lift with essentially the same drag. He also made a considerable contribution to the comfort of pilots and passengers in the T-18 when he re-designed the T-18 fuselage for two more inches of width at the shoulders, again collaborating with Mr. Thorp. In order to maintain the proper shape and fineness ratio that Thorp originally had in the T-18, he added 5 in. to the length, as per Thorp's recommendation. Since Thorp's health made it advisable to discontinue plan sales, Lu got his approval to redraw all the T-18 plans, modernizing them as necessary and incorporating the wing folding and wide body features. Since the changes were considered major and it now was actually a different airplane it was mutually agreed to call it an S-18. If all this wasn't enough, Lu went back thru all the 1st 44 newsletters and updated them, reprinting them in a very readable bound volume form, also including building instructions for the S-18 in the book. From all these things it's easy to see that Lu's main creed was to give of himself to the utmost, so that his fellow man would have life easier.

Along this same line, I'm sure most of you didn't realize that Lu was an intensely religious man and for the past ten years or so he had carried on at a man-killing pace in a one man crusade to turn the spotlight of truth on Satan's greatest lie....the unproven theory of evolution. He utilized every possible spare hour and minute in this fight, writing books that scientifically blew the theory out of the water, putting together an audio-visual slide presentation that overwhelmingly exposed the Great Lie, lecturing to legislatures, government officials, (even the White House), tirelessly appearing on national and local TV, either debating with evolutionists, or expounding an eye opening string of facts that demolished the phony claims, one and all, exposing evolution as the greatest fraud ever perpetrated on mankind. He was tireless in his efforts to have Creation taught in schools. When one realizes that probably 98% of the people today believe in the totally unproven theory of evolution, with most of the scientific community lining up against him, one can readily see what kind of opposition he faced daily, but it never fazed him. He won a string of victories that you wouldn't believe.

I am sad that most of you never had the opportunity to know this great man, Luther Sunderland, as I did. If you had, your lives would have been much richer. He accomplished\*amount of things in his 57 years of life... all with the deep appreciation of knowing it's much better to give than to receive. Yes, we will indeed miss LU, all of us.

One of Lu's sons, Don, who lives in Phoenix, will get the T-18. He had just barely soloed it. His son-in-law will have the J-3 Cub, for now anyway. Marilyn feels she can continue to supply plans for the S-18, with others of us around the country acting as advisors for the new builders coming on line.

In the name of the T-18 Builders and Owners Association, we have made a donation the American Cancer Society in Lu's memory.

\* MY TYPING  
\* After proof reading the previous two pages I caught several typos, misspells, and omissions that I should have caught and corrected as I wrote. Sorry about that, gents, but I'm in a hurry to get this NL done and in your hands by the first few days of May. I'm not an accomplished typist and I'm always too busy to take time out to learn. (I even hand write my copy for Sport Aviation, Light Plane World, and Vintage Aircraft and the editorial staff type them up for me).

LOYD TOLL'S WIFE  
Before going on to our regular format for the NL we'd also like to extend our deepest sympathies to our old friend, Lloyd Toll, who lost his wife last fall. We but learned of it just the past few days Mrs. Toll had been quite ill for several years. Lloyd is another of those that give of themselves most generously. Each year he goes to OSH in May or June and does volunteer work for the convention, returning to his Hazen, Ark. home in Sept. Lloyd also runs the welding workshop at OSH each year. He rarely gets to take his T-18 anywhere, but says he hopes to come to our T-18 reunion in it at Lake Texoma Lodge on May 9th, if weather permits,

DISCLAIMERS  
It looks like we'll have a good turn out for the event. Gary Green and Leroy Holt report that they are expecting about 20-25 to arrive in their T-18s, the rest arriving via car or personal airplane. It's NOT a fly-in, but is a "T-18 Family Re-union" dinner on Sat. nite, 9 May. Because of liability concerns, no one is specifically invited. Green and Holt just say anyone that wants to join them for dinner and talk T-18s is welcome. How they get there and what they do after arriving is up to the individual and no liability is expressed or implied.

DISCLAIMERS  
DISCLAIMER: That's also true of our newsletter. NOTE: In all past, present, and future newsletters of the T-18 and S-18 Builders and Owners Ass'n (formerly known as the T-18 Mutual Aid Society), that from its beginning we would make you aware that these newsletters are only presented as a Clearing House for ideas, opinions, and personal experiences of both members or non-members in both building and flying the T-18 or S-18 and anyone using these ideas, opinions, and experiences, do so at their own discretion and risk. Therefore no responsibility or liability for the accuracy of material presented is either implied or intended and is present-ed without recourse to anyone. (Editor).

T-18 REUNION  
LAKE TEXOMA LODGE  
WHERE IS LAKE TEXOMA LODGE? It's almost at the extreme east end of Lake Texoma and is on the north shore. It's about 10 mi. west of Durant, OK, which is on highway 69/75, some 25 mi. north of Sherman & Denison, TX. It can also be reached by hi-way from Ardmore, OK, which is on I-35. Take hi-way 70 from there. There's a state park close by and is an ideal spot for a family picnic, etc. There's a nice golf course just across the street from the lodge, too, as well as the marina. Oh, yes, if you need to double up with a buddy, the lodge will have roll-aways available. I'm going to bring my camcorder and try to get the whole thing on tape, so if you've secretly longed to be a TV star, here's your chance. I want to interview and introduce everyone there and I want to have each airplane owner there to take us on a TV tour of his airplane, pointing out its features, its history, etc. For those that live too far away to make it we might have some copy tapes made if there is any interest. We might also have a tape to show at OSH at our cocktail hour at Anchor Inn if someone can bring a VCR and TV.

OSH FORUM  
Now's an excellent time to write in what you would like to see covered at the T-18 Forum at OSH. Don't put it off if it matters to you and don't wait until the last minute. These things take planning.

TV TAPES

More TV talk: Now that we are deep into the TV-VCR age it's time for us to begin thinking about a TV tape annex to our newsletters, a simple system where MEMBERS can rent, buy, or exchange tapes of all the aspects of building and flying T-18s that we've covered in our NLs. From past experience, I know there are a lot of people out there that have never even seen a T-18, much less had a ride in one. TV camcorders are getting thick as fleas out there now, they are light, easy to use, and their picture quality is pretty good. We can also show the social aspect of owning a T-18. If you don't have a camera yourself, you probably have a friend that does, so start doing some experimenting now. Tapes are cheap (\$4-\$5), so a member should be able to get a rental tape for a buck or two and whatever UPS charges, don'tcha think? Work on that idea and let's hear from you...by letter, or by phone if you hate letter writing like 99% of you apparently do.

Which reminds me....WHAT HAPPENED TO THAT LITTLE ARTICLE YOU WERE GOING TO WRITE FOR THE NEWSLETTER, HUH? THAT WAS THE ARTICLE WE TALKED ABOUT IN NL #65...REMEMBER???? THAT WAS WHEN I SAID OUR NL WOULD SOON BE A DEAD DODO IF you guys DIDN'T WRITE! You all were very quick and generous when it came to feeding the NL kitty and we have funds for the coming year, but amigos, out of the entire group of over 300 I received a grand total of 3 (THREE) letters and one of them was from the ever-faithful John Walton! That's about .01% response the way I figure it. Maybe I'm just not a very good motivator. Maybe we ought to do it like they do on the Q-2 NL. Unless a builder/subscriber contributes a tip letter he pays \$25 / yr. dues. If he contributes, he gets that year's NLs free by rebate!

SUN 'N FUN '89

I was in Canada at the Rotax engine nerve center while Sun N' Fun was going on, but John Walton did the T-18 Forum and said there was a good turnout for it. Five T-18s were there, but not all at the same time. I am devoting one of our picture pages to their pictures this month, but since I wasn't there I don't know who belonged to what T-18. I recognized Bill Cox's, Bob Highley's, and Jim Paine's, but I'm not sure about the other two. One was N3020, one of the Marietta, GA, group of modified T-18s. (You can always recognize them by the rounded corner on the bottom of the firewall).

FORMAT CHANGE

FORMAT CHANGE: In case you hadn't noticed, we have gone back to full size pages. We were doubling up to save postage and paper costs before, but since every one fed the kitty so well the past month or so we can now afford it. Several of you politely complained about the NLs being hard to read in the half size pages and I agree.

DUES NOTICE

ANNUAL DUES NOTICE: We are gradually getting everyone into the computer, which will record when and how much every one pays. The computer is being programmed to flag the address stickers list when a year elapses from the date of the last check. We'll then stamp "COMPLIMENTARY COPY" on the 1st page of the next NL to remind you. Okay? For those of you that sent in \$20 or more we won't do that. We'll just mark you paid up for another year, etc.

S-18 PLAN SALES

S-18 PLAN SALES: Since writing pages 1 & 2 I've again talked to Marilyn Sunderland and she has had second thoughts about handling the plan sales. She will be spending several weeks at a time with her children in other cities, as well as with relatives, so she doesn't want to be tied down. I have agreed to handle the #1 thru #44 newsletter book for her for the foreseeable future, which will be no great burden additionally. I called Phil Tucker (who now supplies nearly all the S-18 parts anyway) and he

CONT'D

CONT'D FROM PG. 4

was willing to take it on, he said. He and Marilyn will discuss the details tonite, so I am reasonably sure that they will arrive at an agreement on the details.

T-18 SUPPLIERS

For newcomers to our NL, you may want to know we have 3 main suppliers of T-18 (and S-18) parts; Sport Aircraft (which is Phil Tucker, a Northrop retiree), 104 East Ave. K, Unit G, Lancaster, CA, 93535. Shop phone is 805/949-2312, Home phone is 805/ 945-2366. Also we have Leisure Aircraft Products, 12120 Park Street, Cerritos, CA, 90701 (John Adams)....and Ken Brock Manufacturing, 11852 Western Ave., Stanton, CA, 90680. Phone is 714/ 898-4366. All have catalogues.

TONY'S BOOKS

I've said this before, but I'll say it again for the benefit of any new builder. "If you are building an airplane the smartest thing you can do is get yourself a set (three) of Tony Bingelis' books on sportplane construction (Sportplane Builder, the Firewall Forward, and his latest, Sportplane Construction Techniques). All three books cover almost every subject you will encounter in amateur built aircraft, over 1000 pages of drawings and explicitly clear descriptions of all aspects of building. Look for his ad in Sport Aviation. All three books are about \$50. They'll pay for themselves over and over again. What's more, you'll KNOW how to do it RIGHT!"

DAVE EBY'S NEW T-18

NEW T-18: By the time you read this a new T-18 will have flown...and it's going to be a good 'un. DAVE EBY, a retired USAF Col. has been on his project for four or five years and at one time had two of 'em going, but a year or so back he sold one of 'em to John Mihaila, who isn't too far behind Dave, maybe six months. They've built both of them side by side in a hangar on Wichita Valley Airport, just NW of Wichita Falls, TX. Dave has done crop spraying ever since he retired. His bird is a standard T-18 and has a brand new 160 hp Lyc 0-320 in it. If no glitches show up in his flight test period he plans to attend the Lake Texoma reunion, so maybe we'll all get to see it at the same time.

Dave and John have a number of parts left over, a set of pre-punched wing and stab'r skins, wing ribs to match, manual trim parts, a Thorp-type fiberglass cowl and engine baffles, plus a number of other misc. parts, all at bargain prices. Call Dave at 817/ 766-2523 for details.

FOR SALE

DON LANKFORD, whose T-18 flew 12 or 14 years ago, will be another at the reunion and he will have the shortest distance to fly, about 15 Or so miles from Sherman, TX. Don also has an extra dynafoal engine mount that came from Ken Brock and will sell it for \$200. Call Don at 214/892-1943 (days) or write him at 217 E Park St. Sherman, TX, 75090.

KEN MORGAN

Ken Morgan, a local builder recently came over to my hangar the other day and cleaned me out of my stock of 0-290 G parts. He is putting one of the 4 engines he bought from me in his T-18 and will wind up with a whole bunch of left over parts. (See his letter this issue).

The rest of this issue will be letters from various builders.

TO: All T/S - 18ers

FROM: John G. Walton

Subject: T/S - 18 Forum and Banquet.

The annual T/S - 18 Forum and Banquet are scheduled for Tuesday, August 4th, during the EAA convention and Fly-in at Oshkosh.

The Forum will be at 2:30 pm and is scheduled to last until 4:00 pm.

However, there is no activity in that tent following our Forum, so it WILL be available for a longer time, if needed.

The traditional T/S - 18 Builders and Owners Association Banquet will again be at Butch's Anchor Inn, as in past years. This is our tenth annual association get-together during the convention. At the present time, a Master of Ceremonies and feature speaker have not been signed, and your suggestions are invited.

On this subject, I want to mention that I have literally taken it upon myself to schedule the Forum and arrange the Banquet in recent years. This has evolved perhaps from back the the 70's when I lived in the Oshkosh area and a site for the Annual Banquet was not as established as now. Although I have no reluctance in assuming these responsibilities; at the same time I DO NOT wish to frustrate or pre-empt anyone else in our Association who would like to be involved, or take on some (or all) of these chores. These activities belong to all of us, and in the absence of the formality of having Association officers to appoint (or cajole) "Volunteers", this less formal arrangement seems to work. I have no big ego problems as far as these events are concerned, and I openly invite involvement and participation by any of you so inclined. My phone number evening and weekends in Houston is (713) 440-8093.

As a postscript, let me report that the Sun 'N' Fun T/S-18 Forum in March was very well attended. We focused much of the discussions toward the new or prospective builder(s), of which there were many in the group. The S-18 (T-18CW) designation was explained as well as the sources of plans. (T-18, used market; S-18 Lu Sunderland). The current major parts suppliers were mentioned, with Ken Brock and John Adams (Leisure Aircraft) being in attendance. Oh yes; a Forum would not be complete without a few "Testimonials". In addition, John Starr explained why his T-18 wasn't finished. [ He's making progress, but is also spending alot of time working on the Sun 'N' Fun year 'round committee; as well as being Chief Custom Built Judge for the Fly-in ].

THANKS, JOHN, FOR  
YOUR DEDICATION OVER  
THE PAST 10 YEARS!

Good Flying!

John G. Walton  
#46 & #52

DON'T FORGET TO  
SIGN UP FOR THE  
BANQUET BEFORE TUES. EVE

Here's a classic example of a builder report for the NL. Note the wings for sale at a really good price. Here's a way to get your T-18 into the air many months quicker. Don't look down your nose at the original standard wing airfoil, either, just because the newer airfoil is a wee bit better. It's only fractionally better from a practical standpoint.

2/9/87

Mr. Dick Cavin  
T-18 Mutual Aid  
10529 Somerton  
Dallas, Tx 75229

Dear Dick,

For Sale: (1) set of standard T-18 wings. Original Airfoil. Complete with flaps, airleons, tips with flush position lights, internal VOR, walking beam, control sticks. Built in John's shop. Has .032 center skins. Unpainted. Also, has roll trim in right airleon per Lyle Trusty. Reason for selling: Building new wing per Lyle Trusty's design...wet wing, flaps as drag brakes, etc. Price on wing \$2,500.00

The 2nd bit of information for the Newslettter is that original T-18 metal cowls are available thru the efforts of Gary Strele (T-18 builder) and John Thorp. Thru Gary's efforts, Mr. Jim Logan, ex Lockheed sheet metal wiz was contracted to produce duplicate tooling. John Thorp co-operated by lending his original cowl tooling for a period of 1 year. I played a small roll...I lent my metal T-18 cowl as a sample. The first cowl has been completed and it looks exactly like the original. Certainly the cost is higher than a fiberglass copy. To obtain a quote call Jim Logan at: 408-734-8842 or 415-961-5883.

SEE  
PHOTOS

Update on the Hunter T-18 project. Hopefully this will be the year. Installed a thicker windshield (obtain from gee-Bee) and am fitting canopy. Canopy is as everyone says tedious. Suggestions: Where forward stainless rails attach to roll bar, make attach tabs long enough for two screws, Run these 2 screws thru the roll bar and put nut on them. Reason for this suggestion: when you get in and out of the aircraft there is much stress on these single screws and the rails and side skins can easily flex.

In order to get a perfect allignment all the way around the roll bar and the front canOPY bow we fabricated tapered al. shims about 6 in. long and tapering from about .025 at the thick end. Additional canopy mods include a locking pin just above the forward wheels...the pin engages in the roll bar when you slide the canopy shut. This accomplishes two things: first, it insures that the relative position of the bow to the roll bar is always the same so that your canopy seal can be effective; second, it insures that the canopy bow can not lift off the rails (if this happened you run the risk of the canopy being "pealed" off the plane.) Mr. Logan is assisting in the canopy install. At Lockheed he installed canopies on T-33's for a short assignment.

There are 4 very active T-18 projects here in the San Francisco Bay area and we would be pleased to talk with any T-18 builders who might pass thru the area.

Tom Hunter, 8313 Mayhews Lndg. Rd.  
Newark, Ca. 94560 415-793-1940

THANKS, TOM, FOR AN EXCELLENT  
REPORT (AND FOR SETTING A GOOD EXAMPLE)

GOOD NEWS! METAL COWLS AGAIN AVAILABLE!



Dear Dick,

Thanks for the copy of #65. Finally finished the bird (after 10 years) in August '85. After a year and a half of flying (including 2 trips to Miami and one to Oshkosh) and maintenance most of the bugs have been ironed out - and now I am an EXPERT. So let me comment on a few items in the latest news letter.

SPINNERS

P2, Spinner Talk: I made a glass spinner over a male mold on a hand spun "lathe". I made it fairly thick, probably around  $\frac{1}{4}$ " at the back, so I could counter sink the screws and so it would be "STRONG". Bulkheads were aluminum. On a full throttle run during test a separate piece behind the prop cut-out departed (with a bang). This was replaced, riveted to the bulkhead, and screwed to the spinner. On the way back from Miami one of these pieces and a sizeable hunk of the spinner departed with a hell of a noise and continuous vibration. After "calmly" noting engine instruments in the green we rattled into Meridian, Mi, trashed the spinner, and continued on our way. Once home, Robbie Grove, designer/builder of Whisper aircraft let me build a new spinner in his female mold - under his supervision. Some of these kids are pretty smart. Three layers of glass are strong enough. Keep it light. Weight and centrifical force don't mix. The new bulkheads are also made of glass. So far so good.

LIABILITY

P4 Liability: I haven't gone back to look, but some of the info you passed out with the "T-18 Manual" issue a couple of years ago contained a story of someone's problems following sale of a homebuilt. There was a copy of a sales agreement therein that was supposed to be fairly protective.

40° FLAPS

P7 Full Flap Pitch-down: When I started on my project (early in this century) there was much concern here with the pitch down problem. The solution was to block off the full flap position. I cut the full flap notch out. About the time I was finishing up, you had a letter from a young Aero. Eng. from McDonald/Douglas. He had closed off the bottom of the wing root fairing exposed when flaps are lowered. So I did that and I don't get any pitch down with full flaps. Of course, if I want full flaps, I have to hold the handle in position.

DRILLING  
FLEXI

P5 Drilling Flexiglas: We found using regular <sup>\*</sup>paddle type <sup>2</sup>bits worked just fine.

I ASSUME THAT "PADDLE TYPE" BITS LOOK LIKE THIS:

(MORE LATER ON THIS)

-CONT'D-



- CONT'D FROM PG-8 -

DUAL BRAKES

P5 Dual Brakes: We put dual brakes on our bird and plumbed according to the Spruce catalog. The master cylinders are on the pilot's side and, originally, were some I got from Ken Knowles in '03. Whenever the pilot's brakes failed (every other flight) I could always move to the right side and continue the trip. Eventually I replaced the masters with Cleveland cylinders. No more trouble. Be sure to use proper fittings and hoses, preferably aircraft quality.

OIL LEAKS

In addition to the brake problem we had persistent oil problems - high consumption, front seal leak, and leaks in general. We ~~have~~ the Lyc 160HP that you (Dick) sold to Rick Keller. We overhauled it. We did some replumbing and stopped the major leak, but we were still using too much oil. We hooked the breather hose to an oil separator, and I forced myself to not baby the engine, to use more RPM in order to set the piston rings. There was still evidence of oil leaks. Finally I made a good size oil separator (fiber glass) into which I run both the engine breather hose and a hose from the wet vacuum pump (into separate tubes). The oil returns to the engine through a single hose, and the air pressure releases through a stand pipe in the separator. Now oil consumption is minimal and there are no leaks. I think the front seal was leaking because of back pressure into the case by the wet vacuum pump feeding into too small an oil separator.

I am planning to make a tow bar in two pieces, one of which will double as a control lock.

I love my bird.

THANKS, BUD, FOR YOUR COMMENTS  
AND CONGRATS ON GETTING YOUR  
BIRD AIRBORNE.

Sincerely,

Bud

Carroll H. Wight

#### USING MOGAS?

If you are, one of your real concerns is whether or not your fuel contains alcohol, so how can you know for sure?

Get yourself a graduated beaker and pour it 10% full with water. Now fill up the remaining 90% with your gas, hold your thumb over the end and shake it up. Now let it settle for a few minutes and read the new water content level. Since alcohol has a strong affinity for water the reading will be GREATER than 10% if you have alcohol present in the fuel. If there is significant change, DON'T USE IT! Drain it out and put it in your car perhaps, but don't gamble on it in your airplane!

If any of you have used auto gas (by itself or in combination with avgas) how about a report on your findings for the NL?

GUS GORDON REPORT #1

THROTTLE STUCK

After 15 months of rebuilding, N633GG is flying again. My 2nd "1st flight" was on Nov. 1, '86 at Camarillo Apt. Everything went fine...well, almost. For some reason my throttle got stuck and I couldn't push it back in! My CFI, Joe Biviono, was with me and with his experience we got it back down. We were doing some stalls and approach glides when the throttle stuck at about 2200 rpm. We tried to push it in..NO GOOD...then very carefully we pulled a bit and lost about 100 rpm and left it alone till we had the runway made. Taxied back to the hangar, took the cowlings off, but couldn't find any problem. By then it was working okay. The next day I went back and took off the carb, checked the throttle, etc. and oiled everything that moved, and re-assembled it all. I still didn't find anything wrong and so far the problem hasn't re-occurred. Sure wish I knew why it happened.

FLARING TOO HIGH

Anyway, after a few more hours of dual with Joe, he cut me loose again. On one particular approach and landing I found myself flaring with the nose too high and my landing at Alamosa flashed before my eyes. A go around solved that. What I had done in Alamosa (CO) was hold the nose too high, the tailwheel hit first and slammed the mains down hard. I bounced, stalled, and the rest is history. I found a reference point on the windshield and if the end of the runway drops below that point, I'm too high and I do a go-around. It was sure a hard lesson to learn.

ELECTRIC TRIM (SEE P. 18)

Enclosing some pictures of my electric trim. The window is an '84 Mustang window motor and the relays are VW. There are up and down limit switches back on the trim torque tube, that interrupt the ground to the relays, eliminating a runaway trim. It works good, except it's a bit touchy, too fast, so I'm going to put in a resistor. I tried a 3 ohm 10 watt one, but that's too much and the motor has no power. I think a 1 ohm or 1/2 ohm will be just fine. The VW part # is 171 959 143 or 171-959-143a. Either one will work. Just a slight change in wiring and what's nice is that VW put a wiring diagram on the case of the relay. I made a bushing, drilled out 1/4" for the trim tubing & slipped it over the gear pin on the motor and tack welded the bushing to the gear. A split pin thru the bushing and tubing (safety wired, of course) & that's all there is to it. Next thing will be to make some sort of indicator for T/O trim position.

FOURING WHAT

I have about 80 hrs. total on it now and I'm having a helluva good time. I get a lot of compliments that sure help to fatten my ego. It's especially gratifying when I tow to and from the airport. It sure draws a lot of looks. Guess people aren't used to seeing an airplane being towed on a trailer by a '80 Scirocco. Set up time 20-25 min. Ditto putting on trailer.

I averaged 6.5 gal/hr at 2400 rpm, giving me about 155 cruise. Having too much fun flying to come up with specific numbers in performance. Later maybe.

Here's a few bucks for the NL kitty. Keep up the good work. I especially enjoyed your T-18 article in Sport Aviation.

Gus Gordon

A super report, Gus, and I appreciate! Your paint scheme is a knockout. One of the very best I've seen.....I will make some comments on your letter on pg. #17 where there is some "spare" room.

GUS GORDON REPORT #2

11312 Haskell Ave.  
Granada Hills, Cal. 91344  
March 27, 1987

T-18 MAS

Hi Dick,

Just a line or two to let you know what's going on.

GEAR ALIGNMENT

I'm in the process of doing my first 100 hour inspection. The first problem I encountered was excessive toe-out. There was 3 degrees on the left and 1 degree on the right. I dropped plumb lines from the center-line of the fuselage for reference, took off the tires and reinstalled the wheels and with a good long straight edge, marked the floor and used string to lay out the lines and a protractor. Nothing to it.

AUXONICS

I'm also installing a blind encoder. What with all the rule changes for group II TCA's and all that. Plus, I figure it's like having another light on to be seen with.

I've updated my Loran to the 612B. I feel I can find the needle in the haystack with this unit. Just keep the bearing and track angle the same and you can't miss.



I went to my first fly-in Jan 11, 87. Got first place for Best Custom at Cable Air Show, Just outside of Upland, Cal.

SEE PIX PAGE

I'm enclosing some pictures of N633GG, showing the T-18 on its trailer. It's about a 10 minute drive to Whiteman Airpark from my house. It takes bout 25 minutes to load or unload. I plan on doing some Modifications to the wing cradles on the trailer and that might cut some time off the process.

Keep up the good work on the newsletters. Building my T-18 would have been much more difficult without all the information I got out of all the newsletters.

THANKS A MILLION FOR  
ANOTHER EXCELLENT REPORT, GUS!

T-18's Rule,

Gus Gordon

REPORT FROM STEVE HAWLEY, 7300 N. San Anna Dr., Tucson, AZ, 85704

February 24, 1987

Dear Dick:

It was good to talk to you again last week. As promised, here is the story of what I think was vapor lock, what caused it, and what was done to prevent it from reoccurring.

The engine is a Lycoming O-360-A3A, 180 HP, with a homemade induction system. The carburetor is an HA-6 horizontally mounted. The details of the installation have been printed in the T-18 news letter several issues back. The incident happened on a very hot day a year ago last August. It was about 90 degrees Fahrenheit when my wife and I left Eloy, Arizona and flew down to Douglas, a distance of about 150 miles. The flight down was normal in all respects. We visited with friends who are missionaries with Tribal Air, the aviation arm of New Tribes Mission, a world-wide Christian Evangelical organization. After lunch, we climbed in and cranked up, taxied out and took off. It was so hot that the metal buckle parts of the seat belt/shoulder harness would burn the bare skin. I would guess that it was around 105 degrees Fahrenheit. The takeoff was normal and we headed home across the desert. About 7 miles northwest of the Douglas airport, as we were climbing through 7,500 feet, the engine quit. Perhaps a better description is that it lost power. At this point, we were about 3,500 feet above the ground. I turned back toward the airport and the little used state highway that runs between Willcox and Douglas. I knew we would have no trouble reaching the highway. During the decent, the engine gave about two one-second bursts of power. We made it back to the runway with about 100 feet of altitude to spare. The engine ran fine at 600 RPM, so we taxied back to our friends hangar. I thought perhaps the electric boost pump had malfunctioned, so we rigged up a bypass, using only the mechanical pump. I attempted to take off again (by myself) after a successful run-up and the engine quit cold just as I became airborne. I pushed it off the runway (plenty long) by hand, then cranked up again and taxied back to the hangar. A young man from Phoenix was down and agreed to give us a ride back to Eloy. I removed the carburetor and all fuel lines and away we went for home. The T-18 was left in Tribal Air's hangar.

The carburetor was taken to a certified shop where it was checked and found to be in good working order. All along I had suspected vapor lock. Shrouds were fabricated for the gascolater, mechanical fuel pump, and the electric boost pump. One inch cool air blast tubes were fed to each from the top rear baffle. Radiant head shields of aluminum were fitted to the exhaust tail pipes shielding about 120 degrees of arc along both pipes for about 14 inches each. The shields were kept one inch off the tail pipes with stainless steel supports and attached with stainless steel hose clamps. All fuel lines in the engine compartment were checked for obstructions and then fitted with fire resistant sleeves.

VAPOR LOCK = ENGINE FAILURE?

CONT'D FROM PG#12

When the loss of power was experienced, I had about 390 hours on the airplane. Since then, I have logged about another 25 trouble free hours.

It would have been nice if I had found something wrong and could fix it. As it is, I can only surmise that the problem has been solved. I now have two fuel pressure gauges, one electric and one mechanical. I want to be sure!

The biggest problem I have now is convincing my wife that it is safe to fly in the T-18. She flew up to Sedona for lunch with me the other day so she is slowly coming around.

I guess a logical conclusion is that given the right combination of circumstances, vapor lock can happen even after many years of successful flying!

Keep up the good work - we all appreciate it!

Steve Hawley

*Steve Hawley*  
N9008Z SN.# 810

Another really great report from Steve and some real food for thought, too. All of truly appreciate your sharing this experience with us. It just might save another T-18er's neck one of these days. Appreciated your thoughts on road landing. The T-18's 21 ft. span makes it possible to use most roads for emergency landings without hooking a wing tip on poles, etc. Have to eagle eye for wires, tho'. Wheel landings probably best. (for directional control on roll out on gravel roads). Thanks again, Steve.

TAIL WHEEL SPRINGS: PROPER TENSION on tailwheel springs VERY important. I recently heard of a check out situation that resulted in loss of directional control on landing roll out that culminated in a full ground loop, causing damage to the outer wing panel and rolling the tailwheel tire off the wheel. In describing the situation later he said that you could not taxi his airplane using ONLY rudder pedals. He had to use brakes to maintain control. This strongly indicates the tailwheel springs have been stretched to the point that there was too much delay in following the rudder cable position. I don't know whether the springs sre the double action type, but I strongly recommend that no other type be used.

I had personal experience with this situation a few years ago and I wrote an account of it in one of the NLs of about 4 years back. Mine got so bad that I could just barely taxi crosswind in a 35 kt. wind. Changing to the double action springs made a tremendous difference. I then was able to taxi out without ever touching the brakes!

As someone once said, "It's the little things that causer accidents... things that you don't put in the same category as water in the gas, etc." A real truism. Sometimes it's a combination of a couple of those little things that bite you when you least expect it.

Anyway, make it a regular feature of your walk around, ok?

STEVE HAWLEY STORY

WALT GIFFIN'S COMPARISON OF O-290 AND O-320 PERFORMANCE

Dear Dick,

Thank you for your prompt response to my plea for the missing newsletter. My \$10 contribution to keep us in business is enclosed. We need this communication device and I hope the T-18 crowd will come forth with enough material to fill many more issues.

I have nothing earth-shaking to report but thought I might relate some of my experiences in changing engines in 78WG. I went from a 135hp O-290-D2 with a Facesetter 68x63 prop to a 160hp O-320-B2A with a Facesetter 68x69 prop. The mechanical installation was not difficult but I did have some problems with the induction system. I had a Grumman-American AA-5 air box with a standard foam filter on the O-290 which I reinstalled on the O-320. The new engine ran very rich and required aggressive leaning tactics to even develop smooth running take-off power. Much experimentation with filter (and no filter) types led me to believe that the engine simply was not getting enough air. I subsequently designed and installed a Thorp-type banjo box with a Purolator AF 3137 oval shaped automobile air filter. The oval shape and unique box design were required to fit under my Rattray cowling. Carb heat was initially provided by a simple trap door on the nose extension of the box which closed off the ram air and admitted ambient air from inside the cowl when activated. Since that provided virtually no drop in RPM I later modified the box by building a chimney over the trap door extending to near the crossover pipes. That new air source was supplemented by attaching scat tubing between an opening in the side of the chimney to a heat muff on the exhaust pipe. This final installation works very well having cured both my rich mixture problems and the carb heat deficiencies. I particularly like it because both ram and heated air are filtered.

Some numerical comparisons follow: (Aircraft has approx. 850 hrs tt.)

|  | O-290    | O-320    |
|--|----------|----------|
| Aircraft empty weight  | 927      | 941      |
| Aircraft gross weight  | 1500     | 1550     |
| Empty c.g.   | 64.69    | 64.12    |
| Top speed measured on 4.69 mile course, 2000ft msl, 1350 lbs.      | 185 mph  | 191 mph  |
| Flight plan cruise 4500 ft, 2450 rpm                               | 160 mph  | 170 mph  |
| Average fuel consumption - mixed operations                        | 7.2 gph  | 8.0 gph  |
| Measured ROC 2000 to 3000 ft. at 1350 lbs. and 76 to 80 degrees F. | 1063 fpm | 1220 fpm |
| Extrapolated S.L. ROC at 1350 lbs.                                 | 1500 fpm | 1700 fpm |

I do not have accurately measured takeoff distances for the O-320 yet but my perception is that they are much shorter than for the O-290. I leave to the reader's judgement whether or not the performance differences justify the cost.

Walt Giffin, N7BWG

Walt

3-20-1987

Dear Dick:

Happy First Day of Spring!!!! It's not been a bad winter but just bad enough to keep me from flying as much as I would like.

Find enclosed my check for a \$20 contribution to the Society. Sorry that it's been so long.

I have had some brake problems. Someone told me that it OK to use automobile brake fluid instead of aircraft fluid. After I had a fitting fail on my left brake assembly, I replaced it and added automobile fluid. Worked OK for a bit then one day after runup the brake would not release. I don't have parking brakes. Upon disassembly I found that the O rings were softened and had to be replaced. Now I use aircraft brake fluid.

I have purchased a Cleveland 199-93 Conversion Kit. This upgrades my 40-78/30-9 Series wheel and brakes to 40-230/30-181 Series. This kit provides thicker brake discs, heavy-duty lining and necessary hardware to modiby my 5" weels and brakes. I will install them with my annual this spring. I haven't been completely satisfied with my old ones. I had a hard time finding anyone to sell me a kit, but finally got it from Aircraft Spruce fo \$128.75. I would recommend that this heavier duty Series be purchased initially for those who have not already purchased wheels and brakes.

Your stories in SA are great. Your style is very readable, entertaining and informative. This is no surprise to those of use who have been reading your newsletters for so long. Thanks for both.

We plan to join Green and Holt at Lake Texoma in May. Hope to see everyone there too.

Nate Eastman  
416 West 2nd St  
Kimball, NE 69145



KEN C. MORGAN  
439 LOVELLA DR. W.  
HURST, TEXAS 76053

April 5, 1987

Mr. Dick Cavin  
T-18 Builders/Owners Association  
10529 Somerton  
Dallas, Texas 75229

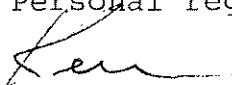
Dear Dick,

GPU PARTS  
I have enjoyed spending the time with you during the past few weeks. I am particularly pleased to have the 0290G engine parts and will make good use of them in building an engine for my T-18. I have always had confidence in the GPU having experience with this engine in my Starduster SA-100, two place. I have inventoried the parts and will have several complete cases with cylinders if other builders have an interest in going with the 0290G. I plan to use the 0320 sump and the MA-4SPA Model 10-2356. This is a very old model carb used on the Lyc 0435-1 engine. I'm not sure parts are still available for this particular unit. Perhaps others could enlighten me on this. This is the carb that works very well with the GPU, according to Mr. Thorp.

KEN MORGAN LETTER  
There are several parts I need for my project. These include lord mounts for flat back GPU, spinner and wooden prop, if someone had converted to larger engine or has these parts surplus to their needs. My project has suffered during the past few years as I have gotten involved in other production aircraft rebuilding/maintenance. However, I have made a vow to concentrate on my project with no other aircraft taking my time. My fuselage is on gear and partially riveted. Am working on the fuel tank, rudder cables(to outside), and have the instrument panel blank ready to punch. The tail group is complete except for assembly of horizontal tail components. Folding wing main spar has been fabricated and is ready to rivet. Am working on steel wing fittings and other folding wing components.

I have been going over old newsletters and am most grateful for the wealth of information contained therein. Hopefully, in the very near future, I will have more to report regarding my project and building experiences. I am eagerly looking forward to the May 9, visit to Texoma Lodge. My wife J'nene, is great in her support of my T-18 project; however, she has not had the opportunity to see numbers of this beautiful aircraft. See you at Texoma, May 9.

Personal regards,

  
Ken C. Morgan, 817-268-1834

THANKS, KEN,  
FOR YOUR LETTER.

Earl Ody  
28903 Gunter Rd.  
San Pedro, CA, 90732

Dear Dick:

I received N.L.#65 with "complimentary copy" stamped on it, so I guess I assumed you weren't doing it anymore and noticed that I had missed #64. At any rate I'm glad you're continuing and enclosed you will find my check.

My co-pilot, Pat Condon, and I are continuing work on our new T-18. All structures are finished, the 180 h.p. is mounted and baffled, and we just finished the instrument panel and baggage compartment. Since we are flying a T-18 and have other interests, we aren't as dedicated as we might be.

Our T-18, N8952, has turned 1925 hours and will be 16 years old in July. It has taken us all around the U.S., Canada, and Mexico and has been a delight to fly and own.

We have lost a couple of our many T-18s at Torrance Airport. Oliver Smith sold his T-18 to a man in San Diego and has given up flying. Doug Kelly has moved his to El Monte to be closer to home. Bill Warwick has retired and moved to Arizona. The big push around here now is compost airplanes. We have two 300 mph Glasairs being built, both by experienced builders, and several Lancairs under construction.

George Leider is finishing his THIRD T-18, in addition to the beautiful Pitts S-1 he built. I don't know how he does it, since he works long hours and sails a 30 ft. Newporter sail boat.

Thanks for remembering me, Dick, and my apologies for being too lax.

Best wishes,

EARL D. ODY

Re Gus Gordon's letter about flying his airplane and over-flaring: At the risk of being repetitious, me made a point in a previous NL about using a point on the windshield as a bench mark reference on the maximum angle of attack to use on a landing. Each time you get in the airplane (any airplane) take careful note where the horizon cuts across your windshield. In the 3 point position this angle is only a little less than the stalling angle of attack, but it is a high drag, high sink angle, one that will rapidly decrease speed, so you should make certain that you are within 1-2 ft. of the runway (preferably 6") before you allow the airplane to be in that attitude. In case of doubt, do what Gus did, punt! Go around, do it again. Make a habit of always using your full (30°) flaps. Don't come dragging this airplane in on a flat approach. Make a steep approach and control your airspeed within 2mph from 500 ft. up on final. You may also want to make another mark on the center tube of the roll bar for this angle (one that will give you about 90 mph av. It could come in mighty handy if your airspeed indicator was kaput, etc. You may also want to put a piece of tape on the front and rear of your cowl, like a front and rear gun sight to cross check what you are really pointed at. Some new ones on the airplane seem to have a tendency to use the spinner as their front "sight", landing the airplane in a slight crab. I know all of you know these things, but some times it's helpful to refresh one's memory from time to time.

EARL ODY'S LETTER

SOME TIPS ON FLYING THE T-18

T-18 Mutual Aid Society  
10529 Somerton  
Dallas, Texas 75229

Dear Dick,

Enclosed is my dues for an excellent newsletter, keep up the good work. For years I have been intending to contribute something, so here goes, on canopy latches:

I have seen and flown in several T-18's that require at least two hands and too much time to get the canopy locked or unlocked, this could be hazardous if an emergency exit was required.

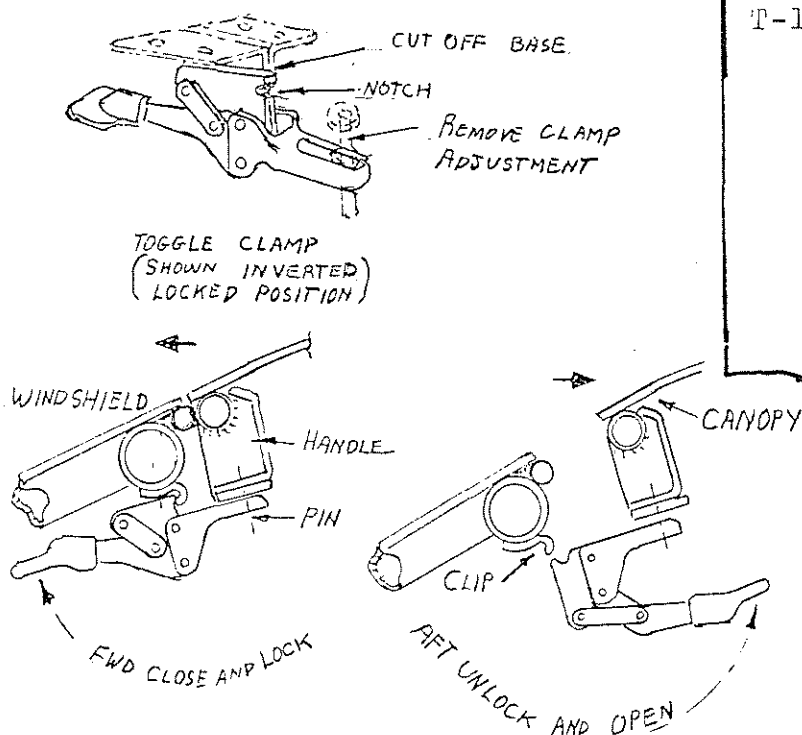
The enclosed sketch shows the latch that has served me well for over eleven years. It is made from a miniature overcenter locking toggle clamp, available, off the shelf, from many tooling component supply houses.

It is small, rugged, neat and requires a single forward motion to close and lock the canopy and an aft motion to unlock and open, all without having to look at what you are doing.

I routinely "pop" the canopy open in flight for increased ventilation, it will open about  $\frac{1}{2}$  inch and stay there until locked closed.

For a ground security lock, I use a modified showcase sliding glass panel key lock, available from most local hardware stores, carried as loose equipment, it hooks into the aft turtledeck structure under the aft canopy fairing and stops the canopy from opening when the lock is in place.

Sincerely,  
*Al Chivers*  
Al Chivers  
T-18 N18AL SN 287



HEY, AL, THANKS FOR THE  
GOODIE. I REMEMBER SEEING THIS  
ON YOUR AIRPLANE AND THINKING  
IT WAS A SIMPLE SICK WAY TO DO  
IT.

I, TOO, FLEW MY T-18 OFTEN  
WITH THE CANOPY OPEN AN  
INCH - ONCE ALL THE WAY BACK  
FROM OSH.

SEE YOU HAVE A NEW  
ADDRESS, TOO.

Doug Frantz  
1019 S. Meadow Lane  
Mustang, Okla. 73064  
(405) 376-4492

T-18 Mutual Aid Society  
10529 Somerton  
Dallas, Texas 75229

Dear Dick,

Enclosed is my check for \$25.00 which I think should get me paid up through 1987. I sent a check for 1985 dues on 12-19-84, according to my records. If this does not agree with your records, please let me know.

REHAB WORK  
I've enclosed a couple of pictures of N58K for your collection. I had it torn down for a year and a half for engine overhaul and a lot of other assorted work. This included painting the wings, building a new fin tip from fiberglass which incorporates a small Grimes position light originally used on the Stearman PT's. I also installed a cabin heating system (manifold type) and a lot of other small jobs that didn't seem like much, but took forever to complete.

PIPER BLADE TYPE PITOTS  
One interesting thing I discovered was that Piper pitot static heads are apparently made to work in different speed ranges. You may have noticed that the static port is located so that the airstream holds a back pressure on the static side. The amount of this pressure is regulated by a bleed hole drilled in from the back of the unit. The airspeed indicator in my aircraft always seemed to read too low. So, I rigged an alternate static source to the inside of the cockpit, and discovered an 8-10 mph differential at cruise. The bleed hole in my pitot static was smaller than a #60, so I started drilling this hole out one size at a time until I got no differential with the alternate source open. The hole size wound up being a #52. Since then, I've looked at some other Piper aircraft, and the faster ones (Arrows) seem to have a different angle cut on them. Anyway, the indicated cruise speed is now about what it should be, about 160 mph at 3000' and 2400 rpm using a 76 inch pitch prop.

Sorry about the dues delay. Keep up the good work on the newsletter! I've learned a lot about the breed from reading it.

Sincerely,

*Doug Frantz*  
Doug Frantz

DOUG, WE DO APPRECIATE YOUR COMMENTS  
ON THE PIPER PART. YOU SEEM TO HAVE  
NEATLY SOLVED A FAIRLY COMMON  
PROBLEM, AGAIN, THANKS,

FROM JOHN &amp; KAY THORP

Dear Dick Cavin:

I'm sending you a copy of Dick Cottingham's last two Christmas notes in case you had not heard of his T-18 statistics. I guess 3700 hours is quite a lot. He writes interesting little notes, to say the least.

I read the newsletters to John and actually find some of the "news" interesting. He takes in every word. We received a beautiful water color of Don Taylor flying over the North Pole. That big bleak place actually looks pretty.

We thought your story re John (and me) in SPORT AVIATION a while back was very good - also the recent one about Edna Gardner. She is some lady! That old picture of us was pretty bad, tho. Some people didn't know that John had been married before I showed up on the scene. That old thing was taken in 1977..... before I had white hair.

Love and best wishes to you and Lyn,

Kay

Dec '85  
"Finally have 299V back in the air after replacing right wing section after goose collision last year. Near 3600 hours on her and she needs paint, wheel pants, and gear leg fairing. I'll probably wear out before she does. I'm nearing 9000 hrs. and only half deaf from the noise (?). Hope you enjoy a super 1986"

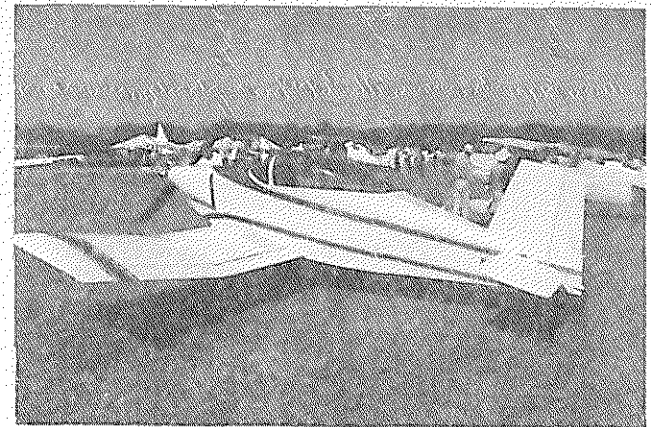
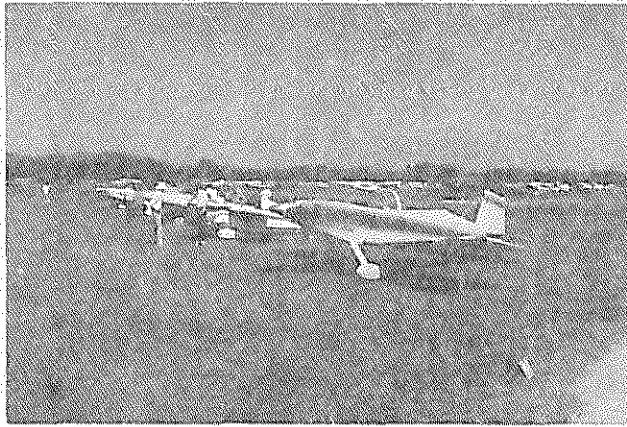
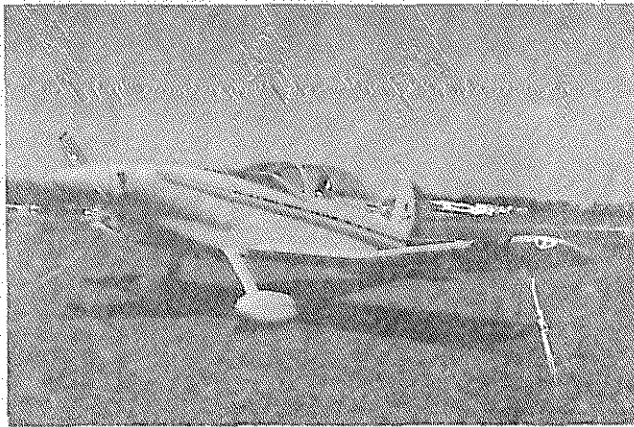
Dec. 86  
" I guess this is a musical card. Don't know why there are no pretty cards with airplanes on them, but I keep looking. 299V still flying. 3700 total hours on her now. She was grounded for four months this year. Crack showed up in gear leg. I already had another cracked gear in garage. Got both X-rayed by an industrial unit in Milford Trade School (E. Neb.). Inner tube is tough to see, even in these films, but looked okay. Finally found a large enough heat treat oven in Minneapolis. Ken Brock's man, Paul Green, supplied me the heat treat process data. Minneapolis folks had the gear 2½ months. I had to guarantee that I would not hold them liable if the heat treat was inadequate. Finally got both gears back and has done fine in 25 hrs. since. Liability insurance doubled this year to nearly \$600...and me with over 9000 hrs. and no accidents. Nobody can accept any risk anymore. My children are thriving. Ex wife has advanced breast cancer. Had surgery, chemotherapy, and radiation this past 9 months and hoping for the best. Hope you both have a good '87. I'll get to Calif. again one of these years.  
Sincerely, Dr. Cottingham

3700 hours total time, as of Dec. 1986! Fantastic! I'm sure the total is up to nearly 4000 hrs. by now, as Doc really uses that bird..hard. Doc is a radiologist and he uses the T-18 to commute to a number of small towns in rural Nebraska that he serves on a scheduled basis. I don't recall all the details, but most of the towns have only very rudimentary sod strips, probably quite rough, too, so you can well imagine what a beating the T-18 takes..and takes..and takes. Can you also imagine the variety of rough weather that has pounded 299V, also? A tremendous tribute to the T-18! He once brought it to CA for John to tear down and inspect after 2000 hrs. Incredibly, nothing of significance was found!

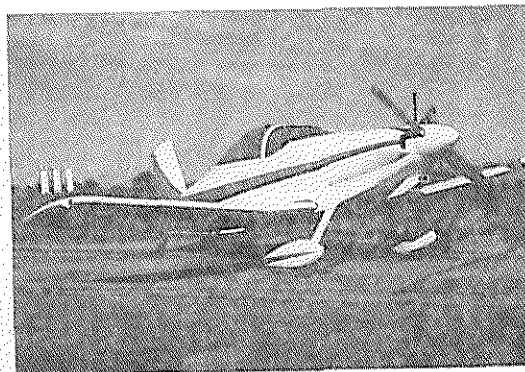
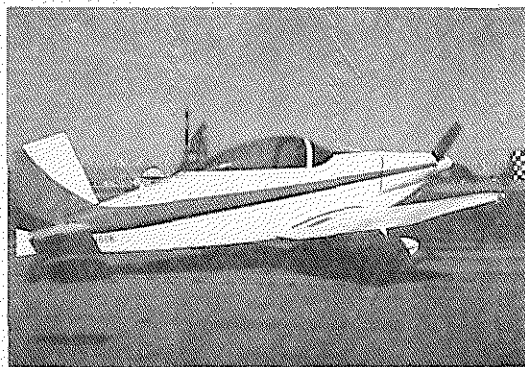
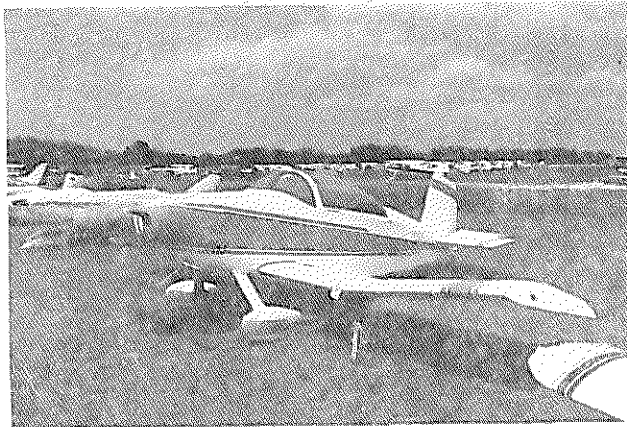
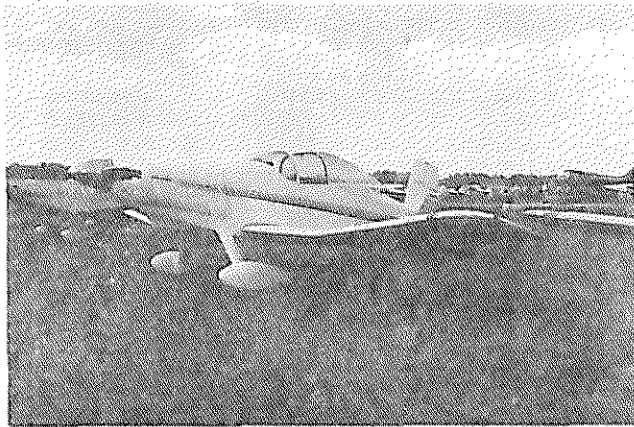
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NOW ENJOY THE PICTURE PAGES.

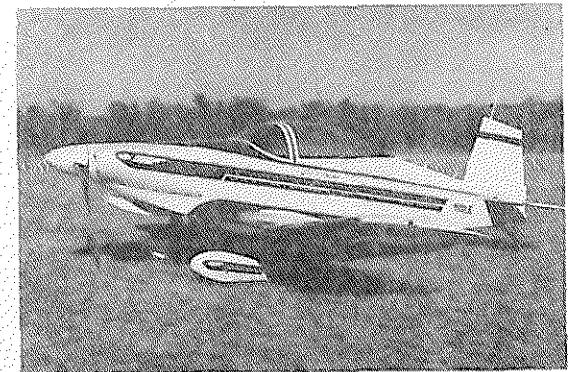
SUN N FUN PHOTOS COURTESY JOHN WALTON



THESE TWO ROWS (ABOVE AND BELOW) ARE T-18s THAT WERE AT SUN 'N FUN



THESE TWO VIEWS ARE OF DOUG FRANTZ'S PROUD BEAUTY  
FROM MUSTANG, OK

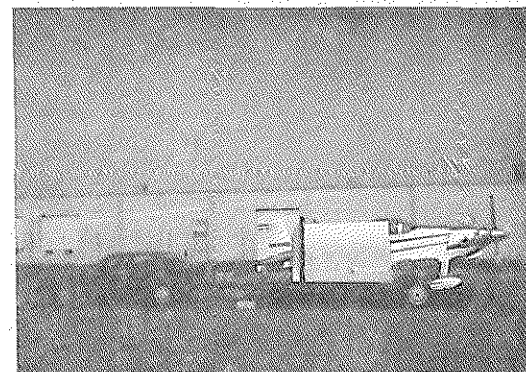


LEE REILLY, WAGGONER, OK AND HIS YELLOW AND RED VERSION OF LU  
SUNDERLAND'S ORIGINAL PAINT SCHEME. NOTE MATCHING STRIPING.

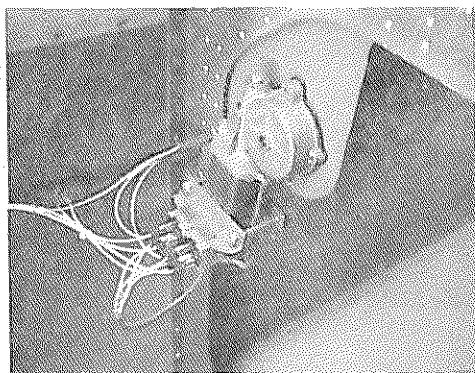




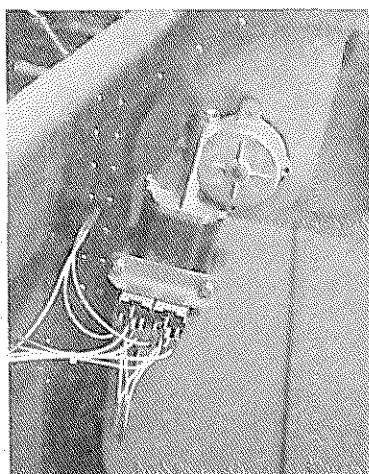
THESE THREE SHOTS ARE OF GUS GORDON'S BEAUTIFUL BIRD SITTING ON ITS CUSTOMIZED TRAILER. NOTE SIZE OF VW SCIROCCO THAT PULLS IT.



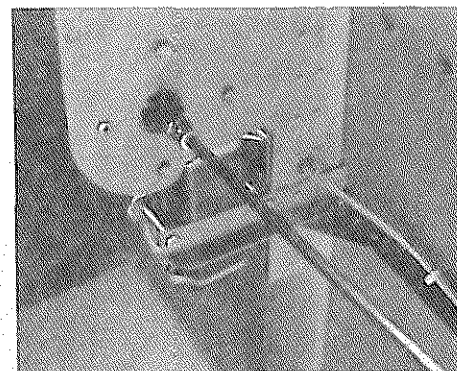
AN OUTSTANDING EXAMPLE OF A SIMPLE BUT SUPERB PAINT SCHEME OF RED, WHITE, AND BLUE STRIPES FEEDING INTO MATCHING COLOR STARS ON THE COWL. NOTE TASTEFUL MATCHING MINI-STRIPES ON FIN AND WHEEL FANTS.



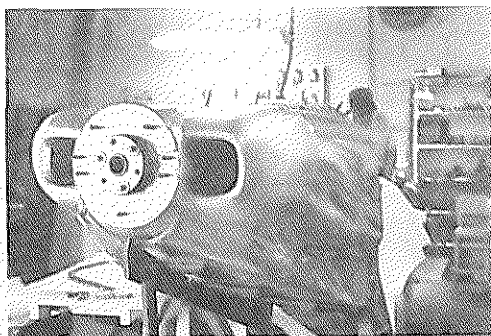
GUS' ELECTRIC TRIM MOTOR ON SHEET OF .063 RIVETED TO BULKHEAD (LOOKING AFT).



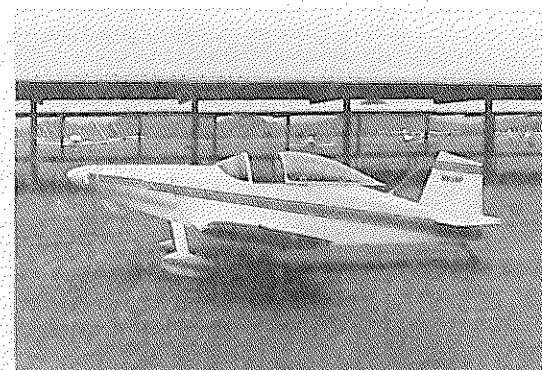
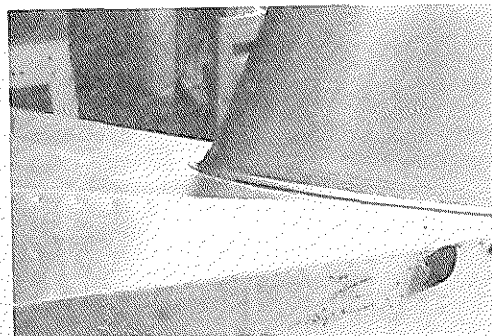
CLOSE UP VIEW FROM SAME ANGLE. (SEE STORY THIS ISSUE)



VIEW LOOKING FORWARD. NOTE ANGLES, GUSSET BRACING, WIRING TO LIMIT SWITCHES.



TWO PIX FROM TOM HUNTER (SEE STORY) SHOW OFF METAL WORKING EXPERTISE OF MR. LOGAN, A RETIREE FROM LOCKHEED.



ED FOE (PHOENIX, AZ) DISPLAYS ANOTHER NEWLY COMPLETED BEAUTY AND ANOTHER SIMPLE BUT BEAUTIFUL PAINT SCHEME THAT SAYS "SPEED"







## 2nd ANNUAL T-18 REUNION:

To those of you that couldn't make our T-18 "Family" Re-union that was held at Lake Texhoma Lodge on last May 9th, I can say, "We missed ya!" Yes, we missed you....and you missed a super T-18 get-together. The only thing that could have made it any better would have been to have more of you there to enjoy it like we did. As it was, we had 17 beautiful T-18s and we would have had as many as 7 more if we hadn't held our little bash on Mother's Day weekend. (A gross error on our part, we admit. To actually confront all those suffering wives with their #1 competitor for their hubby's affection on HER day was a gross oversight on our part and we hasten to ask for forgiveness).

In case you've forgotten where Texhoma Lodge is located, it's at almost the eastern end of the lake, on the Madill arm. The lodge is located on the southern edge of Catfish Bay. It is reached by road from Durant, OK, (12 mi. east) or from Ardmore, OK, to the west about 30 mi. It's almost due north from Sherman and Denison, TX, , with about 40 mi. of open water in between.

The lodge is one of a half dozen such recreational installations with their own paved airport nearby and all offer quite a variety of activities for vacationing guests, with something to please everyone's tastes. The lodges offer first class air conditioned rooms and suites at modest prices, with excellent dining and banquet facilities, able to accomodate several at the same time. Texhoma Lodge is located in a dry county, so they have a nice private cork club on the 2nd floor and new memberships are available for a nominal fee ( and members may bring guests).

We arrived via car (boring) early Sat. morning and there were three T-18s that had come in on Friday awaiting the arrival of the rest. Greeting us was Dean Cochran, of Broomfield, CO; Bob Highley, of Brandon, FL; and Nicky Buchanan, of Winston Salem, NC. (At least I think those were the first three there. Sometimes I think my Alzheimer's gets active at fly-ins when I try to recall all the details, etc.). Anyway, the rest of the birds began showing up in rapid fire order. By 11:00 AM we had 15 of the 17 aboard and the last two made it by noon. We had 11 states represented with T-18s. We had one from Florida, one from North Carolina, 1 from Ohio, 1 from Michigan, 1 from Colorado, 1 from Arizona, 1 from Nebraska, 1 from Kansas, two from Missouri, three from Texas, and four from Oklahoma. Not bad! We had several members that drove 1000 miles by car and several more that had come 500 mi. or so by airline to the nearest airline terminal.

Was it all worth it? You bet!! It was pure laid back pleasure of the first water. It would have been hard to find a more congenial group anywhere. When someone asked some questions about engine installation it wasn't anytime before five or six guys obligingly peeled their cowlings off , so that builders could look at the way they did it and take pictures. That was just one aspect of the airplane that was discussed in detail. If your T-18 is flying, you've probably forgotten 99% of the problems that arose and how you solved them, as construction gradually and sometimes painfully progressed. Perhaps you can remember how grateful you would have been if you could have had some experienced one explain how to solve the problem that was bugging you at that moment. This was the type of gathering that 99% of those attending were T-18 builders, owners, or enthusiasts. It is made to order for the new builder, whether his questions are on the spinner or the tail wheel, or somewhere in between.



## TEXHOMA REPORT, cont'd

When lunch time arrived it was a time to renew old friendships over the coffee cup and make new ones, too. There was a lot of talk going the rounds about different makes of Loran Cs, but it was unanimous that Loran C is the greatest thing since sliced bread. Nearly three fourths of those there with T-18s had Loran and all I talked to were high in their praise of how accurate it was in both course and cross track. I remember one of those telling me his "Miles to go" cranked down to zero in the middle of the airport upon landing! Texhoma Lodge has no nav radio facility that is nearby, other than an ADF homing beacon on Durant Airport to the east a few miles. The weather was almost perfect. Skies were cloudless, but haze aloft somewhat restricted visibility. Wind was light southerly, right down the runway. There is good turf on both sides of the runway (18-36) and can be used for taxiing if traffic gets heavy. It did on Sunday morning, too. It was beginning to look like Chicago O'Hare for awhile, as a dozen or so transients showed up. Texhoma's only drawback is no fuel service available, but it's only a 5 minute flight over to Durant to refuel, but some of the bunch used that as an opportunity to give some buddy rides.

There was a lot of flying on both Saturday afternoon and also on Sunday morning before everyone started home. Gary Holt nearly wore his T-18 out while he was there. It was in the air at least 75% of the time. His dad, Leroy Holt, had his S-18 airborne pretty often, too. Leroy's bird was so new that it was still in zinc chromate. For you folding wing guys, Leroy has made a gap cover for the folding wing that most all present said was more practical than the outboard wing skin tightly overlapping the center wing skins (as per plans). He has xeroxed some sketches of it, so if you are building send him a S/SA envelope for a copy. It does away with the snap-in section at the leading edge, too. Leroy's address is Box 238, Savanna, OK, 74565. He planned to paint it in time for OSH, but I guess he didn't quite make it. Hopefully we'll get to see the two Holt family airplanes at Kerrville in Sept. (18-19-20). Incidentally, if you didn't get to make Texhoma with your T-18, (or OSH, either) maybe you'd like to give the SW Regional EAA fly in at Kerrville a whirl. It's big enough to be interesting and small enough to get to know most everyone, too.

Texhoma is a photographers delight. The foto backgrounds are great in nearly every direction. There was some formation flying in groups of three and four and the fly-by passes drove Kodak stock up several points. The 1500 ft. of turf in the approach zone for 18 made it easy to shoot as many as 5 or 6 shots of a T-18 before touchdown. We did lots of video, too. John Crook and I did interviews on video with our respective cameras and after we got back to Dallas we combined our tapes to make a 30 min. master of almost all of the proceedings, including the Saturday evening buffet/ banquet. We shot builders by their airplanes, recording their accounts of building, flying, and owning the T-18s; we zoomed in on as many individual items on each airplane as we could. We had the builder point out features on his panel and cockpit as we scoped it all in color. We got close-ups of engine installations, the great variety of air cleaners, oil cooler location, props and spinners, fuel systems, wheel and axle fairings, canopy treatments, tail wheels, antennae, paint schemes, and of course we got every detail of the cockpits, upholstery, radios, etc. With 17 beautifully built and painted T-18s there one had to look hard to find points of commonality. It was a classic example of what the Custom Built classification means. Each one is an expression of the builder's techniques and personality. Even those who bought their airplanes and



didn't build them had done their share of modifications and were really studying the others for ideas for future changes in cockpits, paint schemes, etc. All three types of T-18 cowlings were there, too. Another point was the difference in size and shape of carb air scoops.

Dick Amsden, of Fraser, MI, was on deck with his immaculately painted T-18. He had a buddy with him and they were headed for South Texas on a visit and the Texhoma event was right on their way at the right time. They were having a ball, too. Dean Cochran, of Broomfield, CO, was parked next to him. He had been mousetrapped by weather up at Gage, OK, for several days. His wife had gotten tired waiting, so went on back home, but finally it got flyable for him to make it. Dean said he had to back off from making the crossover exhausts and kits. Too bad. He is really a pro at that job. Next in line was Karl and Mazie Lipscomb's superb wide body creation from

Lamar, MO. It carried the T-18 banner at Dayton a couple of years back. A few years before that he had taken a Starduster Too to the Wright Bros. celebration, also. Now they are building a Lancair, but Karl complained that the project was moving much slower than he had anticipated. Gary and Maxine Green's lemon yellow standard T-18 from Enid, OK, Gary and Maxine were the co-instigators of our Texhoma gathering, along with Leroy and Mary Holt. Gary is really a major in the USAF and is a training instructor on the Northrop T-38 (That's an airplane I could like almost as much as a T-18)...Next in line was the apple of Randle Woolaway's eye from Cassville, MO. Randle is 76 years young and still flies fire patrol out of his Timberline Airpark, an airport that would scare most people to death. The south half of his runway slopes upward about 30°, so you land south and take off north, unless the wind is about 30 mph. Even then there's some BIG pine trees to clear! Next to Randle was another former Wright Bros. attendee from Kimball, NE, Nate Eastman's remedy against a dull old age. Nate was a former USAF hump pilot in WWII and a fighter pilot in the Korean fracas and he has as much fun in his T-18 as he did in a P-51, I think. Jim Paine, from Dayton, OH, was last year's T-18 rep at the Wright Bros. event and is the only one to come to Dayton from Dayton, so far. Next to him was Bob Highley, of Brandon, FL, and he, too, is a Lt. Col. in the USAF, flying F-16s out of McDill AFB. Folks didn't get to inspect Bob's bird, except at night, as he was in the air with it about 75% of the time and obviously hugely enjoying himself. The parking spot next to Bob was Gary Holt's, from Tulsa, OK, but he, too, was in the air about 90% of the time. Also in the lineup was one of the very early T-18s that Nicky Buchanan brought over from Winston-Salem, NC. His was built by the late Bob Goodwin and has the low cut windshield that was on the original plans. On the other line of parked T-18s was Walt Boener's, from Wichita, KS. Walt was a former ME-109 pilot in the Luftwaffe and later flew with the Free French and USAF, winding up with a combat tour in Vietnam. Walt was our after dinner speaker and he held everyone spell-bound with stories of his earlier exploits. (He should write a book). Still another T-18 rep at the Wright Bros. event was a brand new one from Wichita Falls, TX, by Dave Eby, a retired AF Col. Dave's airplane was so new that he had to fly an extra 2 hours that morning before coming to Texhoma in order to be legal on his hours restrictions. It was so new, in fact, that he hadn't had time to put the upholstery in. He, too, is about to wear it out. He flew it to Pennsylvania and back before heading for Dayton. Next was a trip to OSH, then a trip to Fla., to Beaumont, TX, and a trip to Denver and back. At the end of August he had put 135 hours on it. Another T-18 from Texas was Bryant Rowland's beauty from Wichita Falls, also. He has been flying his several years, but it still looks like brand new. The other Texas T-18 there was Jim French's, from Wimberly, TX, which is back in the hill country between



Austin and San Antonio. Jim Lee was the last to arrive and he brought John Walton with him, since John's T-18 was still down for mods. We expect to see Jim and the other Texas T-18s at Kerrville this year, too. In addition to the two Holt T-18s and Gary Green's, there was still another Oklahoma T-18 present. Lee and Edwina Reilly whistled down from Wagoner, OK, and as I remember they all arrived more or less in a group. Lee is an airline retiree and he had just installed a new Loran C the day before our re-union and he was truly delighted with it. Steve Hawley, from Tucson, AZ, also arrived with the Okla. group, as he had been visiting in the Tulsa area, where he was formerly based. Steve's T-18 always gets a lot of quick double takes as people walk by and see his "almost constant speed" Warnke wooden prop. The way the tips are turned and twisted blows your mind. Since he lives close to Warnke this prop was an out and out research project. So far it hasn't produced anything sensational in the way of extra performance, altho' it is a good prop. Steve takes a lot of kidding from yardbirds that ask him if he left it out in the rain, etc., or did he go too fast and bend the tips back? Steve built his own wheel pants, that also beautifully fair in the axle/brake area and DO add mphs.

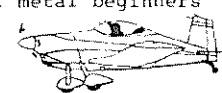
All in all, we had 17 slick T-18s there and a lot of people that had a super good time (which is what it's all about, they say). Everyone said, "Hey, let's do this again!"....so maybe that's the real test of how well the bash was enjoyed. I just talked to Gary Green and he said Leroy Holt had painted his airplane this summer and that it looks really great. He said Leroy had to pull his engine and rebuild it, as his engine builder put some bum parts in it at first. Anyway, they are talking about possibly doing it again for the Oct. 31-Nov. 1 weekend. They will be comparing notes and if it looks good they'll get a letter out to the clan with all the details. Again, remember, it's a gathering of good friends, a re-union, where we all gather to have dinner, visit, talk T-18s, etc...but it's NOT a FLY-IN! It's not organized, there are no events, everyone is strictly on their own as to how they get there and what they do after they arrive. This time we were talking about renting two large cottages where we'll have a bar and have a catered barbeque dinner brought in from Durant or Sherman.

By the way, we have a pretty good video tape we put together from ones that John Crook and I took, so if any of you would like a copy (VHS only) send us a tape plus a little for postage and we'll get you a copy. Go to the Post Office and get one of the padded 7" x 9" mailer envelopes and they are just the right size for a video tape. We'd appreciate your comment: and suggestions for improving, too. We tried to capture the flavor of the event and introduce the people and their airplanes, their story of building etc., plus as many construction details as possible, too. We really need one or two more "camera men" to thoroughly cover all the people there, those about to fly, those just starting, those who just bought one. We also might take a camera aloft for some unique air shots, too. Last year Dean Cochran rigged a VCR camera up on his fin and flew back in the Rockies and did some takeoffs and landings, etc. and the result was great. All it needed was a running voice commentary to make it super interesting. The VCR video has some exciting possibilities.

#### --- BUILDING A WING PANEL ---

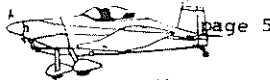
I recently had an occasion to build an outer wing panel for a standard T-18 from scratch and we followed every step with black and white photos, that will soon appear in one of the "Tin Bender" articles that I've been doing in EAA's "EXPERIMENTER" magazine (see Light Plane World) for the last 16 mo. We also did a video tape and if you're interested I'll have some copies run off (same deal as the Texhoma tape). I had two sheet metal beginners do most of the work, with me coaching them and

CONT'D



MORE ON TEXHOMA

MORE TEXHOMA TALK



we wound up with about 50-60 man/hours in it (estimated). We used pre-punched ribs and skin that once came from Ken Knowles. The wing panel came from a local area T-18 that had been ground looped, damaging the skin, two ribs, the wing tip, and the aileron. We were able to save the aileron, as its damage was minimal, but we spent a LOT of time fitting hinges to the old holes in the aileron spar and adjusting it for freedom of motion. We could have easily built a new aileron from scratch in less than half the time we spent. We got a beautiful fit on the skin at the leading edge and came out with good, tight skin between ribs, too. We also used the old fittings, which again took extra time to get a perfect dimensional match with center wing fittings. We also took extra time to get the panel flat and perfectly square (without twist) using levels laid on the front spar and parallel to it at other locations. This was a pretty good test of the learning curves of beginner builders, as they had to be taught riveting, bucking, etc. as we went. I don't believe we could have built a composite wing of comparable size any quicker. It had been about three years since I'd built a T-18 wing panel, so I was plenty rusty, too. Admittedly, the center wing or outer wing for the S-18 take much longer because of the wing folding hardware and also because of the additional complexity of the main spars, but the same matched hole tooling principles are still applicable..

'87 OSH REPORT: Each year it gets more and more of more and more. It gets hard to believe. I'm sorry to say that I have very little time available to look over the T-18s and talk with those bringing them in. I have to hit the whole day in high gear to cover all my assignments and interviews for Sport Aviation and the Experimenter. It's always a hassle to schedule the aircraft for photo sessions on the turf out in front of the flight line and also the air to air shots. Anyway I did get to take in a few minutes of the T-18 Forum and the Tuesday nite T-18 dinner. As always, the dinner was a sellout and was thoroughly enjoyed by all. Lee Skillman did his usual good job as the M.C. and Frank Kingston Smith anecdotes and witticisms kept everyone well entertained, too. The number of T-18s at OSH seems to dwindle down a little each year. We only counted 15 this year, which included one over in the aircraft camping area. We again had some superbly done T-18s to look at and admire. Gus Gordon, from Buena Park, CA, finally made it to OSH with his fantastically crafted folding wing S-18 and it was voted the best T-18-S-18. The Lu Sunderland Memorial Craftsmanship award went to Gene Sloan, of Murfreesboro, TN. Gene's blood-red T-18 was immaculately done, but he also qualified for the unofficial Hard Luck award. As he got close to OSH he began developing an engine problem that made him want to get it on the airport without delay. He was following a Cub, who apparently dawdled on the runway after landing and since Gene was already on the deck quite close behind him, so he had the option of trying to go around on a sick engine or take to the grass to avoid overrunning the Cub. He chose the latter. Only trouble, there was a runway light in the way and it dented the right outer panel leading edge almost back to the spar and messing up his right gear fairing, too. All this was told to me second hand, but I think the account is reasonably accurate. Gene wound up having to trailer his bird all the way back to TN. Maybe next year, Gene! Better yet, maybe you'll have time to get it back in A-1 shape for Kerrville, or Texhoma (if there is an Oct. gathering).

Right now I'm looking for the list of all those present at OSH with their airplanes and so far I've sifted thru about a three foot stack of papers on my desk and no luck yet. Maybe I'll find it (and I just did).



There were five T-18s at OSH '87 that were there for the first time. They were: Gus Gordon, of Granada Hills, CA, in N633GG

Tom Kerns, of Eden Prairie (Minneapolis) MN in N10TK

Dave Eby, of Wichita Falls, TX, in N53PD

Gene Sloan, of Murfreesboro, TN, in N805GS

Don Skeele, of Santa Ana, CA, in N927AS

In addition to those five I remember seeing Tom Kern's bird for the first time since it was painted. Tom formerly lived here and I watched his test flight one morning several years back. Tom was an engineer for LTV thne. A few months later local builder Lou Falconi retired from LTV and moved to his new home in Roswell, NM, leaving his T-18 in DAL. My first flight in it was to ferry it to Lou, with Tom flying wing on me. Later that day I rode back with him in his T-18, which flew quite well. Tom soon moved to Ohio, then to Minneapolis, his present Home. Another familiar one I saw was Paul Kirik's, from Moline, IL, and this, too, was a first to see it painted. Both T-18s were outstanding in their paint and detail.

Going back thru my slides of T-18s at OSH and RFD in previous years and comparing them to recent years, it was obvious that overall the paint schemes and finish details have improved tremendously...but even the older ones still looked great to me. There have been some really original paint schemes that some have characterized as being on the wild side, but yet they were tastefully done. I remember Oats Tokles' OSH debut. It had a certain Savatore Dali-like quality in the bold use of color like had never been seen on airplanes before, but it was fantastic! Oh, yes, Bill Warwick's tiger painted down the side was another super original. And then there was the Debut of Kong! Someday, I'd like to publish a book on just T-18s I've seen or heard about, with color pictures, etc., and little side bar stories about the builders. Guess it would cost far far too much to produce and probably wouldn't appeal to a very wide circle of readers. Most T-18 ers would eat something like that up, tho'.

### ATTENTION!!

Our '87 OSH showing was actually less than our Texhoma showing, but I hope it will be different in '88. I sincerely hope each and every one of you with flying T-18s will make the supreme effort to bring your T-18 to OSH in '88. Here's why: 1988 WILL BE THE SILVER ANNIVERSARY YEAR FOR THE T-18!!! We would like to put 45-50 T-18s in the air in trail formation fly-by in the prime airshow...the flying showcase. We want to bring them in from every point of the compass, from near and far, and they don't have to be super slick showplanes....Just T-18s! This year was the Fly Baby's 25th year and tho' they tried to get a gang, it fell a little flat. Coming from Calif. in an open cockpit at 80 mph gives them a pretty fair excuse, but at T-18 cruise speed it's no big deal to make a LAX-OSH flite in one day. Why not make DEFINITE plans NOW? It's only 10 1/2 months away, you know. Plan it so your airplane won't be half apart or out of license at that time. Get it in the pink by June 1...and then keep it that way. Leave a day or so early and maybe smell the daisies along the way. We'll never have an opportunity like this again, a chance to show the world that the T-18 was and is the best of the best, the Mercedes of the homebuilt. The plastic "compost" type airplane has already outnumbered us, at least at OSH, and it won't be all that long before the RV-3s, RV-4s, & 6s will be barking at our heels, too.

A familiar T-18, N5GL, was again at OSH this year. It's 17th STRAIGHT YEAR! That's Gayle LeCount's pride and joy, from Georgetown, IL. I seriously



doubt that there is any airplane (T-18 or no) that's an match that record. Gayle certainly deserves our acclaim. We especially hope Gayle will be able to be there in '88, too. He will certainly deserve to lead the T-18 parade on its Silver Anniversary. We also hope Bill Warwick, Doc Cottingham, and all the other high time T-18s will make a special effort to be on deck for the event. We will never have such an opportunity again, so I hope all of you will be there.

The other T-18s at OSH besides the ones that were mentioned previously are: N11DC, Dean Cochran, Broomfield, CO; N711SH, Bob Highley, Brandon, FL; Gary Green's N18GG, Enid, OK; Jim Paine's N747JP, Dayton, OH; C-GEMP, Jim Alexandre, Hamilton, Ont.; N89RB, Mike Wolfe, Negaunee, MI; Jerry Stallings' round back, N1308B, Ferriday, LA; N78SEL, Ed Ludtke, Sioux Falls, SD; N31BD, Chas. Raymond, Shelton, CN. There were 152 people at the T-18 dinner this year (SRO).

We received a note from Gene and Thelma Sloan, thanking us for the '87 award. She also said that the damage was non-structural, all sheet metal and was almost completely repaired by then.

As John Walton always says at the end of OSH, "Only 360 more days until OSH". It's a whole lot less now, too, amigos, so, again, let's ALL make '88 OSH the very best yet in numbers there. With that big a bunch of T-18s there the crowd won't have time to notice whether your T-18 is a 10 or a 4! Just BE there with it guys. Let's show our appreciation to John Thorp by making the T-18 Silver Anniversary a real tribute to a fine design. Above all, let's don't let it fizzle out as a dud!

The '87 Kerrville SW Regional Fly-in is just over and guess who and what was the winner of the "Best Plans Built Low Wing Award"? Dave and Bat Eby's super slick new T-18, that's what! Bad weather cut the number of T-18s there to three, Dave's, Jim French's, and Bill Cox's. Congrats all over again you guys.

Back to future events: Back on page 4 we remarked that if all looked good for another Re-union on the Oct. 31-Nov. 1 weekend that they would send out a letter to members like before, etc. Since that time I talked to both Gary and Mary Holt and it was their opinion that we should all again gather at Texhoma for another non-organized, informal get-together on the above weekend (Halloween), with everyone making their own room reservations by calling Texhoma Lodge (405/ 564-2311). They also suggested we have an outdoor cookout (weiners, hamburgers, barbeque, etc). It's too late in the year to have a catered meal delivered from a nearby city, but the plan was to have one of us bring in all the fixin's and enjoy an evening around the campfire. The two adjacent cottages have been rented and a wet bar will be set up in one of them. We will have a kitty to cover the bar costs for the happy hour and another for the cookout. If some of the group prefer to have dinner more conventionally, the restaurant is available, but it was decided to dispense with the more or less formal, catered dinner for the sake of economy and to let more people have the opportunity to get better acquainted with others.

(NOTE!)

Since time is rather short, it was decided to post the notice in the newsletter. We do need a definite show of hands as to who will be there, so if you plan to come, please call Gary of Maxine Green at 405/233-3186 or Mary and Leroy Holt at 918/548-3412 and advise them of your intentions. They can also answer specific questions. This is not an invitation to a Fly-in. There are no scheduled events, and what transportation method you use to get there is your business only.



"SOLD"  
Last weekend was a pretty sad day for me. I ran an ad in Sport Aviation on my T-18 and the very first day it came out I could have sold it a dozen times, at least. I had it priced below the market, so I could be sure it would have a good home. Jim Hidalgo, an almost next door neighbor of Jim French, of Wimberly, TX, is the new owner. Wimberly is one of those very picturesque spots in the Texas hill country between Austin and San Antonio and they have their own airstrip that bisects several homesites. Jim and I are looking forward to a lot of hours of happy T-18ing in the days ahead. It's not so far down there that I can't go down there once in awhile to pet the old gal a little. You can look for this pair to be at OSH '88, too.

"FOR SALE"  
Also in the DFW area another builder, Roger Dengler, is having to put his S-18 project on the market. Like me, Roger has given up on ever getting his medical back. It's a real buy for someone, too, at \$11,500, which includes an O-320 150 hp engine with only 100 hrs. since NEW, and everything needed to complete. The fuselage is complete, except for canopy installation, even to wheel and gear fairings installed. Engine completely installed, hooked up, baffled, oil cooler in, st. steel X-over exhaust, Pacemaker prop, Brock spinner, Thorp FG cowl all complete. All new instruments (IFR) in, upholstery done in blue suede, controls all in except ailerons. Elect flaps, trim, Fuel and brake systems complete, lighted in and out. Has two new nav-comms and a II Morrow Loran that will sell for \$2500 extra, or sell separately. Has all ribs and skins pre-punched for wing, skins formed, main spars done, plus all other wing, aileron, flaps parts on hand. If you've priced a S-18 "kit" you know this is a steal...and the workmanship is superb (Roger is a tool & die maker/ machinist by trade). You can call him at 817/ 261-6910 for other details. His address is 1811 Hilltop, Arlington, TX, 76013.

Another FOR SALE: If you live in the western U.S. Greg Halverson also has a T-18 project he recently acquired to keep company with his own T-18 project. Details are here below:

Dear Dick,

As per our recent phone conversation, here are the details on the additional T-18 project I recently acquired locally.

Entire airframe is flush riveted with very good workmanship. It has the standard body on the longer gear with 15' side skins. Engine is an overhauled O-290-G with Otime on the new rebuild. It has a Dix crossover, Bendix mags and new harness, Corvair alternator, fuel pump, and dry vacuum pump. It has a Thorp fiberglass cowl, prop extension, and a Ted Hendrickson 68x68 prop. Wings are standard with standard airfoil and include fiberglass tips. Canopy, wheel pants, tires, brakes, and tailwheel are included. Uninstalled instruments include a new Escort 110 nav/com, all basic instruments, and an older DG and artificial horizon.

As I previously stated, the entire project will be available for about 9500 dollars to an interested builder otherwise I plan to finish it and sell after it is flyable. My project is currently nearing completion and first flight is tentatively scheduled for spring. I'll keep you informed of its status.



Greg Halverson  
NE 11  
Por  
503 287-4823

▲ LYC 0-320 H" About a year ago Lee Skillman sold his airplane to a Don Perry, of Concord NH (not a MAS member). Lee called the other day to give me an account of the new owner's account of what he felt to be problems never experienced by Lee during his ownership). Lee has an H model 160 hp Lyc, the one used in Cessnas a few years back and recalled for mods by Lyc. (Cessna called it a Cessna engine, he said). Perry said Lyc. told him it had wrong valves & springs, too small a fuel line, and shouldn't have a metal prop, Lee said. Said it should have 1/2" fuel lines, plus other things hard to believe. He cut off Lee's vent line for tank, said it over-pressurized tank and caused fuel in cockpit, etc. Vent was cut to 45° below FW, but Lee didn't know which direction, whether it now sucked or blew. Anyway, if any of you have the H engine and want to talk it over with Lee, his address is 623 Southern Way, Spanish Fort, AL, 36527 (That's Mobile, AL) Don't have his number.

Disclaimers STANDARD DISCLAIMER NOTICE: In all past, present, and future Newsletters of the T-18 and S-18 Mutual Aid Society (now known as the T-18/ S-18 Builders and Owners Association), that from its beginning we would make you aware that these newsletters are only presented as a Clearing House for ideas, opinions, and personal experiences of both members and non-members in both building and flying the T-18 and S-18, and anyone using these ideas, opinion and experiences do so at their own discretion or risk. Therefore, no responsibility or liability for the accuracy of material presented is either implied or intended and is presented without recourse to anyone. (Editor).

FOR SALE ANOTHER FOR SALE: Long time MAS member Warren Spencer, 1512 North Ave, Crystal Lake, IL, 60014 (Chicago area) has his T-18 project for sale in a distress situation. The slip he gave me with details has vanished and I'm sorry I don't know the price or the current state of the project, but as my memory serves me the price was a bargain and the project is quite far along. Anyway, any of you Upper Midwest guys, here's a chance for one of you to get a long leg up on your T-18. The last phone # I had for Warren is 815/ 459-2578, but I can't guarantee it.

INVERTED LANDING - TRAPPED! FOOD FOR THOUGHT DEPT.: Had a long chat with Loren Houston, who lives in the Indianapolis area. Loren had a purchased T-18 that he flew some 600 hours before putting it over on its back in a field totally saturated with water below the turf and invisible from above (on clearing pass at 3 ft). When the wheels touched they dug UNDER the turf, instantly bringing the wheels to an absolute halt, throwing the a/c inverted, in the air and going backward some 250 ft. before coming to a stop. Most of the airframe wasn't hurt too badly, but the roll bar was shoved down 2.5" and the canopy also squeezed down and cracked badly, pinning him in, while gas and oil ran out. His scalp was cut badly and bled profusely...and he was stuck there for almost an hour....upside down, hanging from his belt and shoulder harness (the latest approved FAA type) which WOULD NOT RELEASE BECAUSE OF HIS WEIGHT AGAINST THE BUCKLES. THE PRESS TO RELEASE WON'T WORK WITH MUCH TENSION ON THEM! Help never came and he had no way to knock the canopy out. After a long and desperate struggle he finally got the harness loose and somehow squeezed out. After a lot of plastic surgery he's okay and wants another T-18. He's going to have an aft roll bar, too, if he gets one and would put some sort of an escape hatch in the canopy, so vivid is his experience. He was expecting something to ignite the fuel any second and be burned alive....and he was lucky it didn't happen.

Think about this subject carefully and please send me your thoughts on ways to prevent such a tragedy from happening. After the OSH accident we warned against the thermos bottle cap fuel cap and how it will easily pop



(cont'd)

"TRAPPED - INVERTED CONT'D" out on a fairly small force inverted. A couple of our members came up with solutions...like a pivoting bar over the cap to act as a stop (see back NLs) and apparently that solves a potentially lethal problem as long as the tank itself remains intact. Now what do we do about the new type safety belt and shoulder harness? One solution might be to have a sharp hunting knife close at hand to saw thru the belts...or perhaps YOU may have some other suggestion??? I have always carried some sort of a canopy smasher with me when I did initial test hops, a short, heavy ball pein hammer or equivalent that you could use to beat your way out with. Even then it might not be easy....How about your idea on this subject, too????

Please don't think, "It can't happen to me. It CAN". I know personally of four T-18s that went over on their backs (like Rick Keller losing a wheel on landing at a wilderness strip in Idaho, etc). An engine failure at the wrong time and place could do it, or an unseen ditch, etc. Any number of things COULD do it to you. ANY low wing with a canopy is vulnerable. Maybe we need to take a long look at our canopy frames, possibly making them of laminated Kevlar/ epoxy, with a fore and aft center bow and a crossbar frame just aft of the pilot's head that would tie in with a crossbar at deck level. Bubble canopies are super for looks sake, true, but common sense tells us there isn't much in protection there in an overturn. We also know that even tri-gear airplanes wind up on their back, too. Please, gents, let's not dismiss this subject as one of those freak things that can't or won't happen again, so please give it some thought and send me your comments.

Here's another subject that deserves your attention: TOE IN OR TOE OUT? Dave Eby (Wichita Falls, TX) sends this note:

"CROWFEET OR PIGEON TOES?"

TOE IN OR TOE OUT Serial # 1202 first took to the air in late April '87 and has now flown close to 150 hours since then until late Sept. I fly various agricultural aircraft from narrow single lane dirt roads on a daily basis in my work and think nothing of it. I also fly Pitts off narrow runways frequently, so I am used to having to work at directional control. I have let a number of experienced tail dragger pilots fly my bird with me in there, too, and all of them have found my T-18 to be a bear on the ground..a real squirrel. All of them were back and forth across the runway on landings and T/Os.

I took two yardsticks to measure the problem after I found 1/2 of the tread gone off the inside of the tires after 120 hours. To check toe in/toe out I hoisted the wheels off the ground and then gently lowered them back down, not rolling the A/C forward or backward after that. With sticks on each side of the wheel I drew a line on the floor about 30" out f'w'd on each side of the wheels, doing the same thing to the rear. Measuring from a C/L plumb bob mark on the floor to each of these points on the lines showed I had about 1° toe out. Cross checking the comparative distances on the front and rear marks confirmed this, so I ordered a 1° shim from Aircraft Spruce & Specialty (part #0441157-3) and installed them. Wheels are now toed IN about one-half degree each. The aircraft is now MUCH easier to control on the ground. I now feel that I can check Pat out in it without worrying about it getting away from her on roll out.

We printed an article by the late Dr. Shinn in a previous NL, but we always favored either zero toe in/out or a slight toe in, personally. How do you feel on this subject? What's YOUR experience???Again, PLEASE comment!



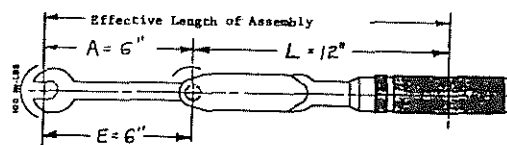
## STEERING CHAIN REPLACEMENT:

For an unknown length of time, and for reasons known only to God, we have not been supplying a sufficient length of sash chain to complete both sides of the tail wheel steering system. The correct length supplied should have been 17" which is more than enough for the approx. 8" needed on each the right and left sides. Should you have cut in half the 13" length sent, neither piece will be long enough. If so, let us know and we will send you whatever length you need. Or, if it is more convenient, you can probably get it (#40 Sash Chain [plated]) from your local hardware store.

## PROPELLER BOLT FAILURES (Revisited):

In the Dec. '86 RVator I talked about a prop bolt failure I had experienced on the RV-6. From numerous conversations I have had since, it is obvious that either I didn't explain very well or many didn't read very well. Yes, I think that I have figured out what the problem was. Over the service life of subject prop, prop bolts had not been checked and re-torqued at regular intervals. I am still confident that wood props, correctly torqued through a three-step sequence upon initial installation, and then re-torqued at 50 hour or three month intervals thereafter, will provide trouble free service.

In the Dec. article, I mentioned a Rube Goldberg method suggested by one RV-4 builder for checking the torque since conventional torque wrenches cannot be used on the nut end of the prop bolts. As a result, several informed builders sent in information about commercially available torque wrench extenders. Following are excerpts from this:



When using an extension on a torque wrench, the torque applied to the end of the ext. is not the same as the torque set on the wrench. The formula below applies.

$$T_w = T_a \left( \frac{L}{L+A} \right)$$

$T_a$  = Torque applied to nut  
 $T_w$  = Torque setting of wrench  
 $L$  = Length of wrench (center of handle to center of drive)  
 $A$  = Length of extension parallel to handle of wrench.

Example:

$$T_w = T_a(25) \frac{L(12)}{L(12) + A(5)}$$

$$T_w = 25(12/17) = 17.64 = 18 \text{ ft/lb.}$$

In the above example, we used the wrench with the extension set at an angle to the handle. For simplicity, we suggest keeping the wrench handle and extension parallel so that the "A" dimension will not need to be measured or calculated. Also, since we are normally using lock nuts on the prop bolts, the torque value needed to overcome the friction of the lock nut should be added to " $T_a$ " before doing the calculation.

As a result of the attention brought to the prop attach issue, PACESETTER PROPS have developed an optional prop extension intended primarily for the 180 HP engine/wood prop combination. The basic difference is that the prop bolt holes are 1/2" dia. and the drive bushings have an outside dia. of 3/4" with a protruding length of 3/4". This contrasts with 5/8" dia. and 5/8" protrusion for standard extension. While we do not at this time feel it necessary, this optional extension could be used with 0-320 Lyc. engines as well. For more information, call or write PACESETTER PROPELLER WORKS, LTD., P.O. Box 1245 Hillsboro, OR 97123. (503)628-2797

## "SEVEN COMMON BATTERY CARE MISTAKES" (from Light Plane Maintenance)

You wouldn't think something that's as heavy as lead, gives off highly corrosive fumes, vents explosive gases, and has the potential to make sparks, would ever be allowed in an airplane. But wet-cell, lead acid batteries (combining all of the above traits) have been with us for years—and likely will continue to be, until something better (i.e., less expensive) comes along.

Meanwhile, getting maximum value for your battery dollar is largely a matter of taking battery maintenance into your own hands. (Neglect is the almost certain alternative.) Doing your own battery servicing isn't difficult. But whatever you do, don't be caught committing one of the following blunders.

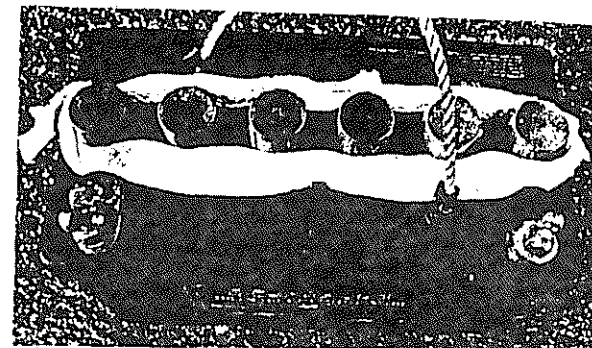
## 1. Boost-Charging

Someday when you're in a hurry to get going and your battery is dead, somebody will try to talk you into a boost charge (i.e., a high amperage charge for 10 or 15 minutes). Don't do it. First ask yourself how the battery got into such a state that you think it needs a boost charge to begin with. If the battery is elderly (specific gravity varies more than .050 between cells) and badly sulfated, you won't accomplish anything with a boost charge except, possibly, to overheat one or more plates and spall the grids. (As the plates heat and warp, small bits of active material will shed from the grids, further deteriorating the battery.)

There's no harm in boosting a battery whose cells are in perfect condition, containing clean, fresh electrolyte—i.e., a new battery. (Even here, though, it's not wise to go much above 10 amps for 10 to 20 minutes.) The best remedy for a sulfated battery—short of replacing it—is to put it on a trickle-charger and slowly bring it up to snuff with an amp or less of current for 48 to 72 hours. If that doesn't revive it, nothing will.

## 2. Acid Bridging

Take a look inside your battery box. See that damp stuff on top of the battery? That's electrolyte (concentrated sulfuric acid). And when the damp stuff reaches from one battery cap to another, that's called an acid bridge.



A baking-soda-treated paper towel wrapped around vent caps will neutralize corrosive overspills. If towel becomes saturated, however, acid bridging could result.



Hydrometer for aircraft use should have small fluid chamber (for working with small samples) and give a numeric reading of specific gravity.

It means your cells are shorting out, and you're on the way to buying a new battery.

Any time you see wetness on the top of a lead-acid battery, you should stop to ask why. Batteries do fizz a lot (especially in hot weather), and if you don't inspect the battery compartment often—at least once a month—you're apt to get some buildup. If the buildup is persistent and excessive, it's either because someone has been flying aerobatics (no, the "no-spill" caps aren't perfect), or—more likely—somebody has been overfilling the battery with water. Or, the plane's voltage regulator is set too

high and the battery is overcharging. (Or a combination of the above.) Find out the cause, and fix it.

Meantime, wipe up any wetness with a paper towel. Baking soda will neutralize the acid and make it safe to touch with fingers, but will not make it electrically neutral. Dryness, not soda, is the key to preventing bridges.

## 3. Failure to Inspect More Often in Hot Weather

All batteries should be inspected more often in summer. Inactive batteries go dead faster in hot-weather storage; likewise, active batteries tend to outgas more freely in warmer



FROM THE RV-4 NEWSLETTER 'RVATOR'

RVator - RV-4 NL.



weather. The reason is simple. Chemical reactions of all types tend to speed up exponentially with increases in temperature. Since batteries are actually miniature chemical factories, it's not surprising that everything a battery does happens a little faster in hot weather—and as a result, more maintenance is indicated.

First, be sure the battery is getting enough water. Twice a month is not too often to check the cells in hot weather. Keep a log of how much water the battery is using between checks (and the time between checks), and you'll practically be able to predict when the battery will next need watering.

Second, make sure the battery is not being overcharged. If the top of the battery is constantly wet and the cells while you're at it, check the specific gravity of the fluid in each cell, and compare readings. All cells should be within .050 of each other; if the average reading is 1.225 or less, take the battery out of the plane and charge it at a rate equal to approximately 10 percent of the ampere-hour rating of the battery. (Example: Charge a 35-amp-hour battery at 3 to 4 amps.) Discontinue charging when the cell gravity reaches 1.265 to 1.270 (add .004 for every 10 degrees F above 80 F), or when three consecutive hydrometer readings taken an hour apart show no change in gravity—or any time the battery temperature exceeds 120 degrees Fahrenheit (very warm to the touch).

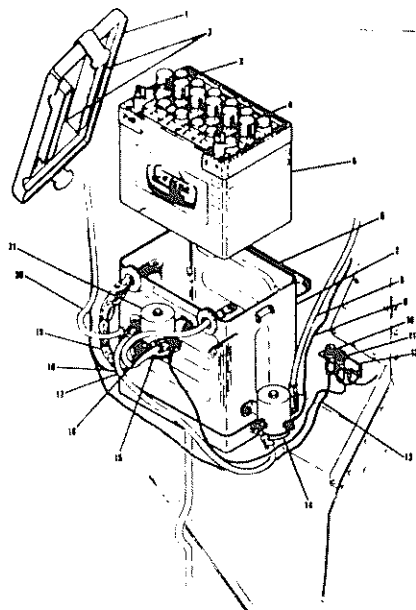
#### 4. Overfilling

While it's true you do not want to let cells go dry (sulfate forms on plates at the air/fluid interface), you also do not want to overfill the battery—which is a common problem (at least as common as overfilling the engine with oil). Look inside the mouth of each cell and you'll notice that the polypropylene filler neck does quite deep down inside the cell, then terminates in a slotted or "split ring" opening. Remember these two rules of thumb: (1) If you can see dry plate-tops, the cell needs water. (2) If the fluid level reaches above the split ring, the cell has been overfilled. (Remove excess fluid with a syringe or eyedropper—but make sure no one uses the eyedropper as an eyedropper any time soon!)

#### 5. Overcharging

The rules for bench-charging have already been cited (above). If your battery is constantly going dry and

Typical Firewall Battery Installation



- |                     |                                  |                                    |
|---------------------|----------------------------------|------------------------------------|
| 1. Battery Box Lid  | 6. External Power Connector Line | 15. Positive Battery Lead          |
| 2. Insulator        | 8. Connector Control Wire        | 16. Transient Suppression Diode    |
| 3. Wing Nut         | 10. Clock Pump                   | 17. Power Lead                     |
| 4. Filler Cap       | 11. External Power Fuse          | 18. Battery Connector Control Lead |
| 5. Battery          | 12. Diode                        | 19. Negative Battery Lead          |
| 6. Mounting Bracket | 13. Clock Wire                   | 20. Aircraft Bus Lead              |
| 7. Battery Box      | 14. External Power Connector     | 21. Battery Connector              |

leaving wet residue on top of the polypropylene case, check the system voltage with a voltmeter (or Volt-xcator) plugged into the cigaret lighter (engine running at 1,200 rpm or more). At 80 degrees F ambient temperature, the system charging voltage should be no more than 14.8 volts for 12-volt systems (28.9 volts for 24-volt systems). Have your mechanic adjust your voltage regulator if system voltage is excessive.

#### 6. Poor Connections

Battery and cable terminals should be cleaned up with a wire brush periodically to ensure good conductivity.

(Copper cable ends will corrode in normal service.) Remove the terminal wing nuts and visually check things out yourself. When everything is shiny, twist the wing nuts back on as tight as you can get them with your fingers; don't overtighten.

#### 7. Failure to Keep a Log

Quick: How old is your present battery? Who installed it? What was the specific gravity of the original acid put in it? How much water (in ounces or cups) did the battery use last July? And: If you're not keeping good enough log records to enable you to answer these questions, why?

Harry Paine  
477 Printz Rd.  
Arroyo Grande, Cal 93420

May 1987

T-18 Mutual Aid Society

Dear Fellow T-18ers; -

Since Dick is so hard up for news I thought I would give him about One Years worth!

In November of 86 after ruining my 3rd 577 hinge plate on my project and realizing I was not going to make my finish date of 1-1-87, I decided to quit my project and start looking for one to buy. There were some good reasons for quitting and perhaps my sharing them will prevent someone else from giving up.

1. Premature move from garage to hangar. Do not move to hangar until you're ready to start taxi testing! I could have moved back to a garage but then I would have been put on a 2 year waiting list to get another hangar.

2. The urge to fly is very strong and I was not satisfied during the building process. During the 5 years I spent on the project I was only able to get one T-18 ride! In an area with at least 10-20 T-18's in a 50 mile radius I thought that was not too cool. So you T-18 flyers who know a T-18 builder, give the poor bugger a ride every now and then to give him some inspiration to get finished!

After about 3 months worth of looking and checking I finally bought 8613A, from Rich Oribe in Apple Valley, Ca. This is the one built by Rudy Adler. Chuck Borden checked me out in about 2hrs and I proceeded to really learn about the airplane. I love it! It has a O-290G converted by John Thorpe. The Specs are as Follows:

|           |   |   |
|-----------|---|---|
| Empty wt. | 830lbs?   | (This airplane needs to be weighted again because the weight and balance sheet is all messed up)        |
| Gross wt. | 1500lbs   |   |
| Engine    | O-290 135 HP  |   |
| Top Speed | 195mph Ind  | (not verified as of yet)  |
| Cruise    | 160-165   | verified over 1300 mi. two way trip   |
| Stall     | not sure the tail mounted pitot goes wacko about 85 mph and as the angle of attack increased so does the indicated speed! |   |
| Prop      | 68 x 66 Great American Propeller  | Way too much pitch for the motor. I only get 2100 Static and 2500 max at 50 ft above the Pacific Ocean! |

One of the things I have done since I bought it is to install some offset control stick fittings. These can be bought from Ken Brock but they are not in the catalog

(CONT'D)



## PG 2 OF HARRY PAINE LETTER

While checking out the airplanes performance I found out a rather startling characteristic! I was doing some engine out practice landings (something all pilots should do every so often) was on final at about 300 ft and 90mph ind with 2 notches 30 degrees of flaps. I pulled what I thot was the 2nd notch and was immediately looking straight at the airport ILS antenna system without having to look down at it! It took about 1/4 second to register in my brain that I had done something seriously wrong and was about to die and go to heaven unless I took corrective action immediately.

I took off the last notch of flap and put in the throttle and landed just about where I had originally intended. Well after a trip to my laundry to have my pants cleaned I remembered something in one of the newsletters about this problem with T-18's that are in the full forward CG position which is where I was at that day. After reading the article in Newsletter #59 by Tom Kerns on this problem I put some duct tape on the gap in the flap well underneath the wing to fuselage fairing and took off. This time I went to 7,000 ft and did all sorts of things to try and get 86A to do the first part of a square outside loop but to no avail! So during the annual I just had Chuck Borden make me a little "floor" out of 032" and it works great. It also got rid of most of a burling stick oscillation action with flaps that happened at 100 mph or less during decent to landing. Many thanks to Mr. Kerns for his advice!

The annual I pulled revealed some things that should have been previously FIXED but were not.

1. Engine mixture cable not properly fastened allowed entire cable to slip
2. # 10 screw holes in firewall not plugged.
3. AD on Bendix mags to check impulse couplings at 500 hrs not done (engine & airframe have 650 hrs)! It turned out the right mag was bad (THIS AD IS ON ALL BENDIX SL4 SL6 Models
4. Excessive slop in rudder hinge micarta bushing allowing rudder play of approx 3/32"
5. Fuel overflow vent hose worn clear through at junction of forward tunnel over the rudder cables. (A new hose cured my fuel fumes in the cockpit problem!)
6. Tail wheel bolt stop nuts kept coming loose, inspection of the bolt revealed that someone had used a die to cut more threads on the bolt!! **THIS SHOULD NEVER BE DONE TO AN BOLTS AS CUTTING THREADS WILL COMPROMISE THE STRENGTH OF THE BOLT**

My next project will be to install electric elevator trim. The one I have now works bad. An outfit called M.A.C. 1537 Foothill dr. Vista, Cal 92084 is selling a complete package of servo's with position indicators, switch and wiring for \$89.00 to \$109.00. This unit is very compact and lightweight.

CONTINUED ON PAGE 16



## PG. 3 OF HARRY PAINE LETTER

I have been using auto gas (Chevron) for about 4 months and Rich Orbe said he had been using it for 2 years. By the way Rich lived in Las Vegas where it gets to 105 -110 degrees F in the shade! during the summer, with no vapor lock problem. The engine is strickly gravity feed no fuel pump!

If you have any Lycoming eng questions there are two Lycoming engine reps more than happy to answer all engine related questions Their names are Bob Omis and Jim Brown at 717-327-7076 or 717-327-7094.

Keep Em Flying  
Harry Paine

**FOR SALE STANDARD T-18 Airframe**, 90% complete, cleveland brakes, all flush riveted with solid rivets, Primered with 2 part epoxy primer. See Photo ! Has most everthing needed to complete. Engine 0290 Lyc 135 HP 660 Hrs since reman. \$11,000 OBO call Harry Paine 805-481-2524.

As a preface to the above letter, Harry wrote, "You might have another John Walton on your hands for your newsletter material writers. (Boy, can I ever use 'em!) I had to cut down about one-half of what I had in the word processor to get it down to 2 pages! Well. I will write some more if you are happy with this one. (Harry, we ARE happy, so write more. You did a super job on this one. Ed.).

Just got back from the Merced fly-in. Had about 6-8 T-18s there. I am finally getting my new dry cleaning business started, so I won't make OSH in '87. Maybe next year.....Sincerely, Harry Paine

Harry, you've left us a model for a letter to the T-18 Editor. We truly do appreciate it. If I could just impress on the rest of the guys how desperate we are for material...how the newsletter is going to go down the tube if more of you don't get busy and get YOUR story in. If you can't type, spell, etc. just sit down and write the story of your T-18 from the very beginning until now, what kind of performance it gets and other stats (EW, CG, etc). your experiences checking out in it, the trips you've taken in it, what kind of airports you fly out of, the things you love about the T-18, and the things you don't like about it, what kind of insurance you carry and the \$ it costs, what kind of avionics you have in it, and, oh yes, send us a good sharp picture.

As another example of something you can write on is your pitot/static system, a detailed description of your brake system, how YOU installed your canopy, any comments on your tail wheel, how the airplane trims up in flight, what kind of fuel filler cap you have, where you mount your tie downs, how you lock the canopy, how you went about mounting your spinner and what kind is it. What is your normal engine maintenance routine? Servicing your brakes, how do you bleed them? How often do you pull your cowling completely off, wash the engine compartment down, re-check the various bolt torques, REALLY look for oil or exhaust leaks? What about your engine controls? Are they safetied and not wearing on another part? How often do you inspect and service your air cleaner? What type is it? Do you often wipe your exhaust pipe ends with a tissue to check for richness, oil use, mixture? Does your spinner have a front bulkhead in it and is it fastened to the shell? ETC,



IDEAS ON STORIES FOR YOU TO WRITE

(continued from page 16.)

I could go on and on on illuminating subjects for you to write about. How did you check your wheels for toe in or out? (Or did you) What has been your experience with tire wear? What type tires do you use? 4 ply or 6 ply? What air pressure do you use in them? Where did you mount your whiskey compass and how? Where did you mount your heel scuff plates and what size are they? (That's a not insignificant question, either. Flying Dave Eby's T-18 recently I kept getting my heels caught on the rug. I wear a size 12 and with jogging shoes on it can be a problem for me). Do you have trouble with your feet interfering with the tank? Do you have to be cautious about making a tight right turn when the brake pedal hits the tank brace? What kind of seats do you have? What kind of upholstery and how do you attach it? Where did you mount your battery box and what kind is it? What size wire do you run from the battery to the starter? How did you route it? Exactly how did you align and install your wheel pants. How did you rig the up/down motion of your ailerons, Stabilator? Flaps? How many degrees of travel do you get with each? How did you go about fitting the canopy and its frame to match the windshield? Do you have a quick drain installed for the oil? Do you kerosene or varsol flush the crankcase when you change oil? Do you regularly use an oil analysis service? What kind of spark plugs do you use? How often do you service and how?....Now that should give you a few subjects to report on, so how about YOU taking the next step right now while it's fresh on your mind?

Dear Dick,

Finally getting settled after a third move since starting to build the T-18 and still trying to relocate parts. In the meantime I have met a lot of wonderful people in the Seattle EAA Chapter and it is really a creative atmosphere. For the first time I really feel inspired and am making progress. Some things get a little ahead of the basic program but I have just completed a set of simulated strobe lights and feel that it warrants sending on to you.

Cecil Hendricks had brought some scrap ends of Delrin plastic from his machine shop to our Chapter meeting. Something had to be made with them. Cecil also had made a set of lights for his T-18 using projector bulbs, 12 volts, 100 watt and 150 hours life...and a truck flasher unit for the light pulsing.

I have enclosed a drawing of the unit I have made so that the lenses can be positioned more accurately out of the wing tip. Nut plates allow the unit to be completely removed. The "O" Ring allows the bulb to be removed by pulling the outer shell from the outside. We worked together at Cecil's machine lathe to develop the final hole sizes and placement of the "O" Ring.

It is necessary to preform the male connectors over a wire so they can be gently slipped over the bulb stems and soldered. These, then, are secured into the plastic plug... (A) The female (B) receptacle is made up and 'press fitted' from the back of the Delrin fitting. The bulb I located is the same as Cecil's but it has a 2000 hr. life. If it last only a half life it will be considerable. To replace the bulb new male contacts have to be soldered on the new bulb.

I would like next year to fly my T-18 to Oshkosh. This year we plan to fly there in our AA5-A Cheeta in a circular type formation around Cecil in his Storey. Hope to see you there.

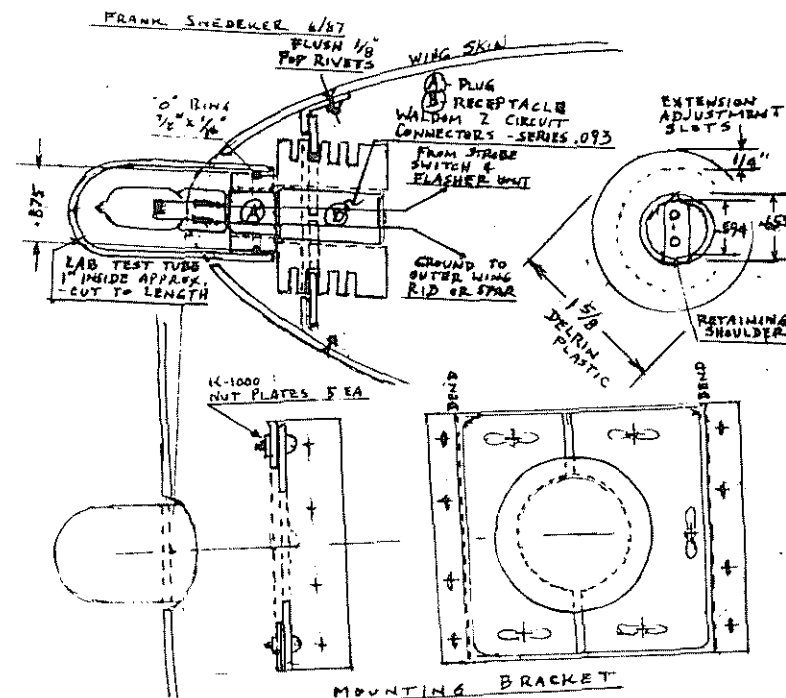
Frank  
Frank Sneider (Speed)

P.S. Now that I can be more active I shall send you more information for the Newsletter...in a form you won't have to redo.

Also, about Cecil and his Storey flight to Oshkosh - THAT'S ANOTHER STORY THAT ONLY YOU COULD TELL, DICK.

Frank

SIMULATED STROBES (CONT'D)



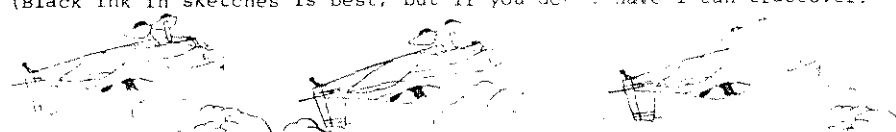
- ① WALDOM - 2 CIRCUIT CONNECTORS  
3 SETS PER PACKAGE,  
A) PREFORM MALE TERM AND  
SOLDER TO HALOGEN STEMS.  
B) NEVER TOUCH HALOGEN LENS  
WITH BARE FINGERS.  
C) USE AIRCRAFT WIRE WHEN  
MAKING FEMALE RECEPTACLES  
PIC TAILS,

- ② USE "OSRAM" HALO STAR  
PROJECTION LENS 64458  
12V / 100 W - 2000 HRS.
- ③ USE HEAVY DUTY - 3 PRONG  
FLASHER # 550 12 VOLT,  
AUTO PARTS STORE.
- ④ 13 TO 15 AMP CIRCUIT BREAKER  
OR FUSE

This is a good example of a simple sketch that we can easily use in the NL. We simply scissor it down to size and scotch tape it our blank piece of paper and the printer does the rest.

If you send in material it would help if you use a letter size sheet 8 1/2 x 11", leaving about a 1 to 1 1/2" margin on the left side. (This is so that the pages can be three-hole punched for keep in a 3 ring notebook.

Anyway, Frank, we DO appreciate your efforts. We have had a lot of good comment on your method to hinge the instrument panel in a prev. NL. (Black ink in sketches is best, but if you don't have I can traceover.



IDEAS FOR N.L. ARTICLES

SIMULATED STROBE LIGHTS

AND NOW FOR STILL  
ANOTHER FINE REPORT  
FROM ONE OF OUR  
REGULAR CONTRIBUTORS,  
FRANK SNEDEKER,  
FORMERLY OF HAWAII  
NOW RESIDING  
AT:

Frank Sneider  
5528 231 Ave. S.E.  
Issaquah, WA. 98027

SEE HIS SKETCH  
ON WING TIP FLASHERS  
ON PAGE 18.



Dear Dick,

Since I received the dreaded red check mark in my last newsletter, I must be behind in my dues. Enclosed is \$30.00 for my delinquent dues plus this years. If that's too much consider the rest a donation. When I talked to you at OSH this year you said that, even more than the dues, you needed material for the newsletter. I indicated that I would write a note on canopy installation for the wide body, however that job is not complete yet due to my moving. By the way my new address is:

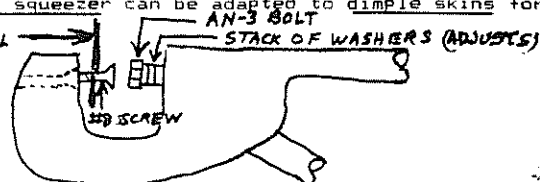
Harvey P. Mickelsen  
1007 Persimmon Ave.  
Sunnyvale, Ca.  
94087

I do have some small items I have been guilty of squirreling away:

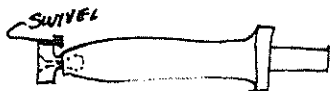
1. "Sandbox" sponge sanders are great for finishing off the edges of sheetmetal. File first, then use the Sandbox. (Don't step on the cat!)

2. My son just gave me an air nibbler for my birthday. (\$50.00 at the local Pay and Pack hardware store distributed by Trade Associates, Kent, Wa. 98031, Model #AF1008). It cuts aluminum like butter. Unless you want to develop your right forearm for tennis it's worth it. I wish I had one when I was cutting my fuselage skins.

3. A rivet squeezer can be adapted to dimple skins for #8 and #10 screws:



4. A rivet gun can be used to dimple by getting a rivet set with a swiveling female dimpling die on the end:



One could probably fabricate a non-swiveling one and be careful to keep it vertical. The procedure is to lay a long flat

HARVEY'S LETTER CONTINUED ON PAGE 20

steel plate on the floor, insert stainless steel rivets in the holes of your piece, securing them with masking tape over the heads. Then lay your piece on the steel and back rivet your line of rivets. Quick, and nice dimples.

5. Tap Plastics skylight material (.040 acrylic plastic stock # 088619) is better than cardboard for making fairing patterns. It is flexible and cuts easily with tin snips.

6. Use high-tech optical alignment techniques for your wheel fairings and gear leg fairings. Prop up the tail till WL 0.0 is level, then grab your binoculars and walk across the street to your neighbors front yard. Line up the vertical fin and the roll bar brace and mark your position (a penny?). Move left and right the proper distance while you have a helper twist the leg fairings and wheel pants. (I'll bet that most of you do not know that your gear leg fairings are flying at a negative angle of attack.)

7. To position nut plates cut the head off of the bolt and screw it into the nut plate. Insert it into the hole and drill the rivet holes through the nut plate holes. Use lots of nut plates.

An article on the wide body canopy installation is coming I promise, Dick, meanwhile the two articles in the N.L. #64 are very good.

Does anyone have information on a Hartzel C/S prop for a Lycoming AE10360B1G6 at less than an arm and a leg? *HARVEY*

Okay, amigos, that's it for this NL. I'm all out of material, so if we have a #68 NL is up to you. It's a well known fact that if we wait for good ole George to do it, we wait....and we wait...and we wait, etc. In the previous NL I begged...yes, begged...for material. I got 1000 long letters on every conceivable T-18 subject, a veritable snowstorm of mail. (Signed, Joe Isuzu) ..and you have my word on it!

In the meantime, feast your eyes on the next two pages of T-18 pictures.

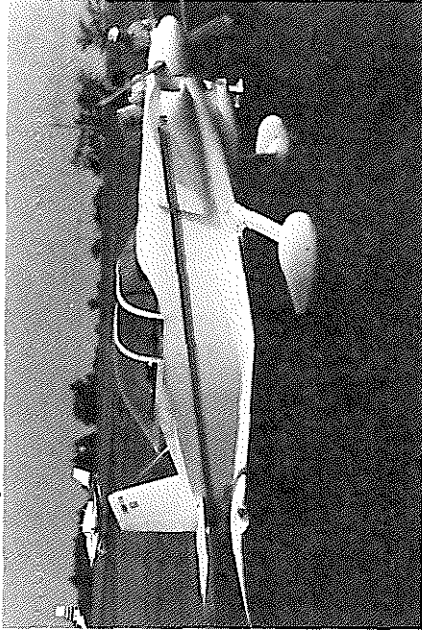
In closing, if any of you want the bound volume of Newsletters 1-44 that Lu did, we're down to about 50 and we couldn't have them re-printed unless we ordered a minimum of 100. To do that we'd have to have firm orders for at least 35 to 50 and I'm sure there would be quite a delay. They are a bargain at \$25 ea. ppd. \*Proceeds go to Mrs. Sunderland. Between it and Tony Bingelis' 3 books you can build a metal airplane and do it well.

*Hope to see you at Texhoma Oct 31 - Nov 1.*

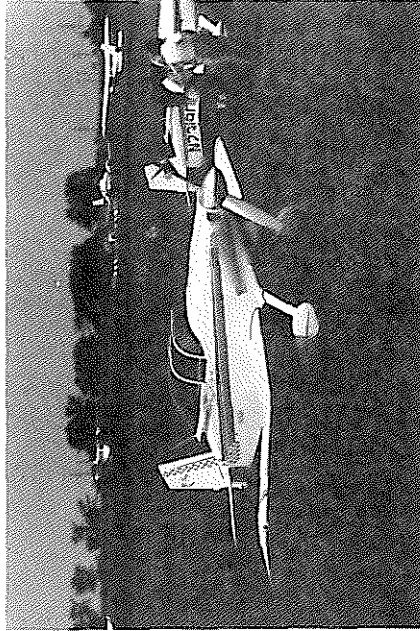
*Dick*

\* ORDER FROM ME OR MRS. SUNDERLAND.

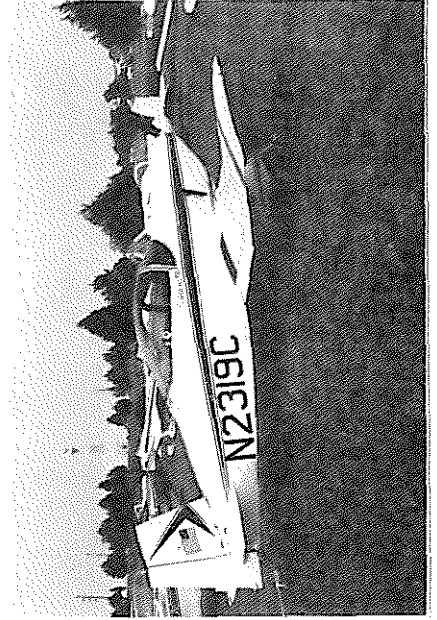
TEXHOMA ATTENDEES



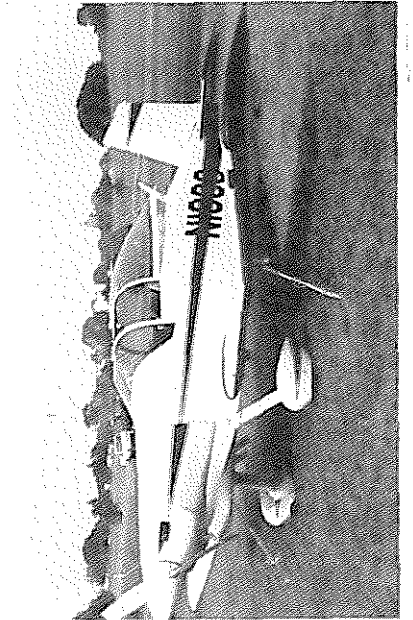
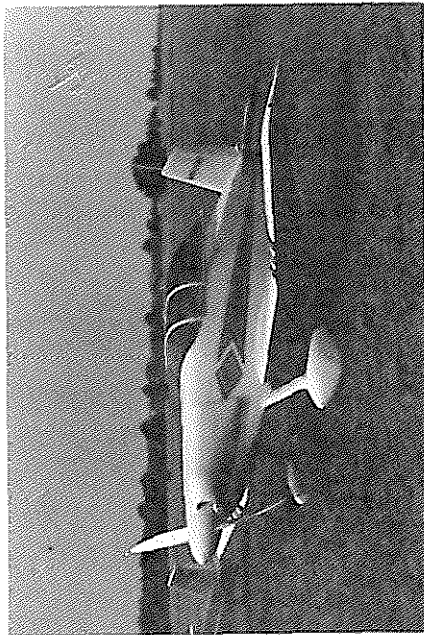
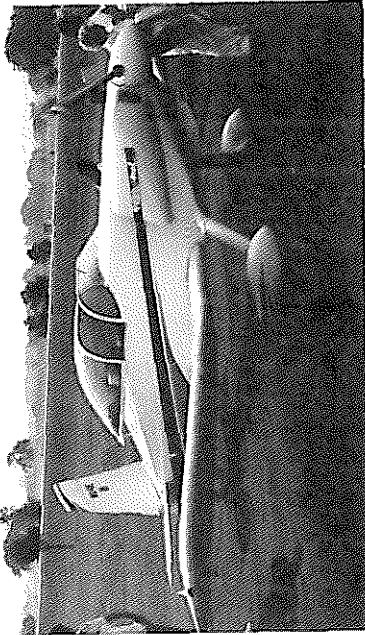
Left to Right this row: NATE EASTMAN, GARY GREEN, WALT BOUNER



Left to Right this row: STEVE HAWLEY, BRYANT ROWLAND, KARI LIPSCOMB

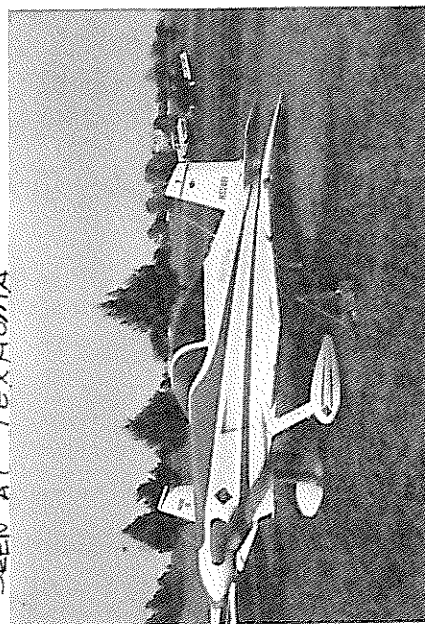
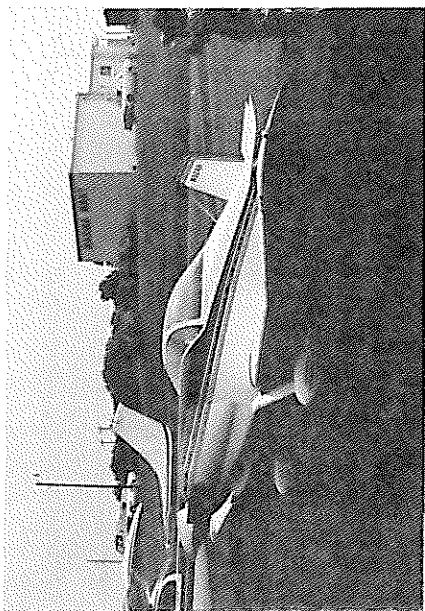


Left to Right this row: NICKY BUCHANAN, JIM FRENCH, BOB HIGGLEY

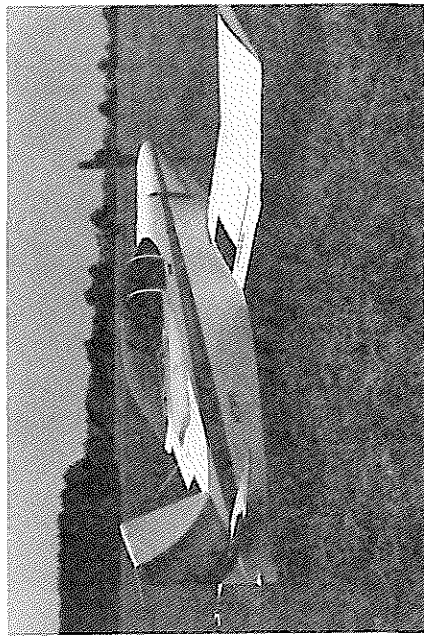
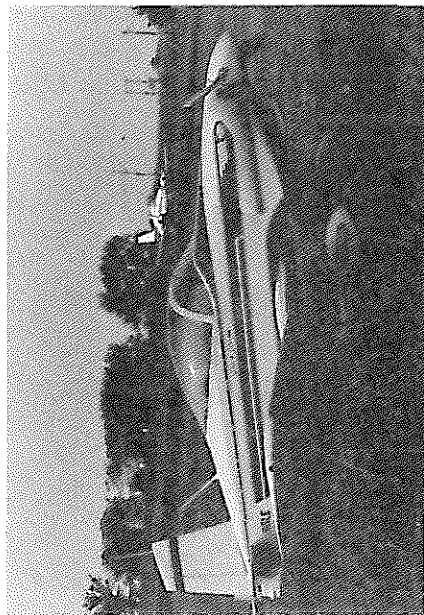




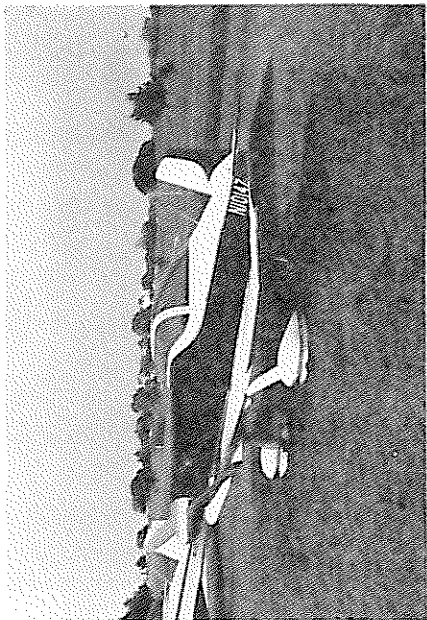
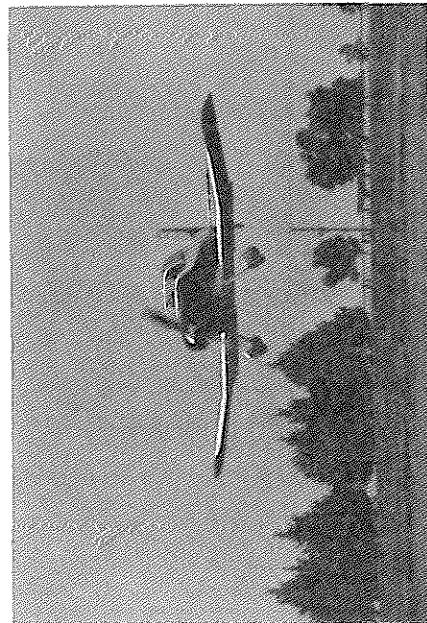
# SEEN AT TEXHOMA



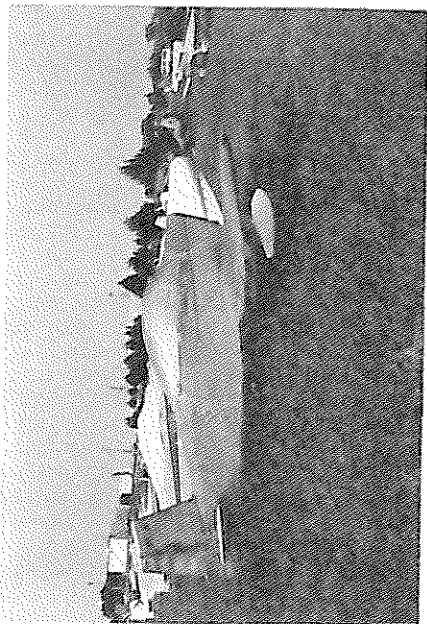
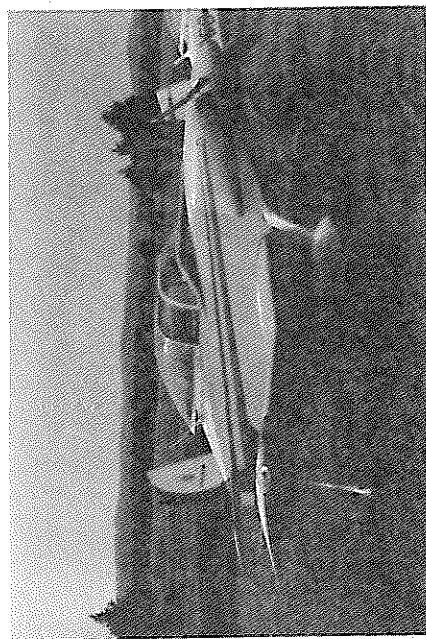
Left to Right this row: DICK AMSDEN, RANDLE WOOLAWAY, JIM PAINE



Left to Right this row: LEE REILLY, DAVE EBY, DEAN COCHRAN



Left to Right this row: GARY HOLT (on final), GARY HOLT, LEROY HOLT







If you've been wondering what happened to the T-18 newsletter that should have been out last fall, it gets to be a long story.....but I'll make it brief. My wife and I took a long delayed vacation trip to Honolulu in October, but after a week there we cut it short. It was so hot and humid that we couldn't take it and I got where I could scarcely walk a half block without having to stop and rest. (It's pretty discouraging to have diabetes and peripheral artery disease, too). In late Nov. I went back to Wichita to do an update story on the Prescott Pusher and I got chilled and came down with pneumonia. It wasn't responding to antibiotics because of the diabetes, so my doctor hospitalized me and put me on insulin and I was able to come home after two weeks. Since then I've been going thru a program of careful diet control, exercise, etc. to get my blood sugar stabilized. It's a pain in the neck to go thru all this and it takes up about 3/4ths of my waking hours to do it, but I have no choice. I was also running way behind on my writing for EAA mags and I somehow managed to crank out five stories for them in what free time I had. I had to put the NL one notch below in priority. I apologize for the delay and hope not to be so long getting the next one out.

JAVELIN V-6 ENGINE: You will read this a little later in Sport Aviation, but you might be interested to know that Prescott Aeronautical now has a used Cessna Skymaster that they will be using as an in-flight lab to test their new prop and also to flight test the Javelin V-6 engine conversion. They will first do a test program on their new prop, that is pitch controlled by a solid state electrical unit. They will mount it on the present rear engine in the Skymaster and fly it with the front prop feathered, using the front engine only for takeoff and initial climb and as an emergency standby. This will enable them to make very accurate readings on the thrust efficiency of this new prop and also to do a complete range of vibration measurements throughout its complete rpm range. All these readings can then be compared to original equipment readings.

When the program on the prop is complete they will then remove the factory engine and install the V-6 and go thru a complete program with it, too. and the resultant airspeed readings they get will be compared with the ones on the factory engine. As some of you may know, there have been several people in the aviation field that have said they don't believe the HP claims Dave Blanton has published for the engine. Dave says the dyno shows it will develop 260 hp, while others say it is much less than that. I do know that Dave has done more experimenting with converting auto engines for aircraft use than anyone else in the business and I firmly believe that the cog belt rpm reduction unit that he uses is a proven system. It is light, rugged, and is extremely smooth. I also know that Dave has found out the hard way on the things NOT to do, as well as the things you MUST do and much to his credit, he doesn't try to hide the fact that he has made mistakes and that he doesn't try to sweep them under the rug.

Perhaps you may think the engine doesn't figure in your future if you now have a T-18 that's currently flying on a Lycoming engine. It well may be in your future if your engine is anywhere near to a major. The big business boys seem to be determined to price the recreational pilot and plane owner out of the air. If you doubt that statement, here's an example that might shock you: The Marvel-Schebler carburetor people are under new ownership and as a result you can no longer as an individual go to a supply house and buy parts. You buy a kit if you want a new gasket, and the kit costs you \$400!!!! An overhaul kit for the carb will cost you \$2100....and you can't do it yourself. You have to take it to a designated M-S overhaul shop! I think a lot of you are aware that the cost of engine parts has simply skyrocketed in the past couple of years. Price a new 180 hp Lyc if you want a REAL shock.

Comments on Editorials



## ENGINE TALK CONT'D:

ENGINES

Supposedly the villain in the piece is PRODUCT LIABILITY. Actually the real cause is a combination of HUMAN GREED AND STUPIDITY. Greed on the part of the legal "profession", that make the Mafia look like pikers, and stupidity on the part of juries that award ridiculously high amounts and idiotic findings against manufacturers, suppliers, and other commercial concerns. The lawyers always see to it that the juries are made up of people that are failures and want to revenge themselves against Big Business or anyone or anything that accomplishes anything worthwhile. Our society is far from perfect, but it's pretty great anyway, but we are now witnessing its ruin.

LATE FALL '87 REUNION AT TEXHOMA

LATE FALL '87 T-18 REUNION: Our second '87 get together at TEXHOMA was another memorable time. While our turnout wasn't as big as the one in May, it was every bit as enjoyable. Five of our original 17 returned. Dave Eby, from Wichita Falls, Tx, had been to the big Dayton Air Fair in the interim and was the T-18 rep there this year. Leroy Holt (Savanna, OK) was again there with his 180 hp S-18, resplendent with a new paint job, his son, Gary Holt (Tulsa) was again there and again nearly wore his T-18 out while there. It was Halloween weekend and when Gary and Maxine arrived from Enid Maxine was costumed for the holiday, disguised as a tramp and wearing a flight suit, helmet, and goggles. Jim French, of Wimberly, TX, brought his bird again and this time he hauled me in and out. Paul Shifflet, drove down from his home near Des Moines, IA, and brought his removable instrument panel for all to see and study. (See photos). He also brought in an extra push-pull tube for Don Warner, who drove in from his home in Florida for the get together. We also had buddy rides going all day and I believe that every one that drove in got at least one T-18 ride and most had two or three. This gave them a chance to see how one T-18 compares with another and it also gave them a chance to feel for themselves how a T-18 flies. I got to fly Leroy's S-18, with its 180 Lyc and constant speed prop and about all I can say is that it really gave me a thrill to fly it. It just flew great! (Don't they all?)

Everything was very informal and everybody loved it. When the day's flying was over at sundown we all retired to one of the large cottages that two of the couples had rented and we had a cookout around the outdoor barbeque pit, where hot dogs and sausage was cooked, with chili, chips, dips, etc. on the dining room table inside, where it was 'fix your own'. All of this, plus coffee, beer, etc. was brought in and everyone chipped in to split the cost of everything. Truly, everyone loved the arrangement.

MORE ON REUNIONS

After we all pigged out on hot dogs we brought chairs outside and had our own T-18 forum and general Bravo Sierra, exchanging ideas, experiences, and plans for future gatherings, while the women stayed inside telling lies about knitting and such.

It's hard to beat such a gathering to make new friends, to get to know each other well, and to get to know a whole lot more of the various ways to build the T-18. The real key is the size of the gathering and the location on an uncontrolled airport well out of a TCA. Not only can the flying be as frequent as we want, but it can be the type of flying that we particularly enjoy. It can be low passes formation, spot landings, etc. I hope more of you that are in the process of building will bring some example of your work i.e. like Paul Shifflet's fold-down instrument panel. Bring them to Sun 'N Fun, to Osh, or to anyplace we have a forum, whether it is formal or informal. An aileron or flap or rudder that would-be builders can examine would be a big help. You get the idea.

ENGINE MOUNT FABRICATION: The following from my old friend, STEVE HAWLEY, is a simple and clear description that new builders will appreciate:

Dear Dick,

In response to your request for articles on how different assemblies were fabricated and problems overcome, I thought I would describe the procedure by which the engine mount was fabricated. Engine mounts can be purchased but they are expensive. Using the following procedure, the fabrication is easy, economical, fun, and foolproof.

Fabricate a well braced table on castors so that it can be rolled around the shop. It should measure about 2'x 2'x 3' high. Rough 2x4's and 5/8" plywood was used along with bed type castors.

Support the fuselage on solid supports such as well braced saw-horses so the reference line (WL42) is level. The tires should clear the floor by a half an inch or so. Stretch a piece of steel safety wire tightly from wall to wall above the fuselage keeping it high enough for comfortable head room. Locate two points at B.L."0", one near the tail and one near the firewall. Use a fine pointed pencil and mark  $\mathcal{Q}$  on a piece of masking tape at each location. Hang two plumb bobs from the overhead wire and position the fuselage exactly under the bobs.

Place engine on previously fabricated table using three small hydraulic or screw type jacks as supports. Extreme care must be taken to assure that the engine won't slip off the jacks! This gives infinite vertical adjustment and the table on castors give infinite horizontal adjustment. Level the engine using a surveyors level and a 6 inch rule graduated in 100th of an inch. I used the top of the outer four push rod housings at the point where they enter the cylinder heads as check points. Using the three jacks it is a simple task to raise the engine to the proper height relative to W.L.42 and at the same time keep it level.

Using the "split" line of the engine case as reference, locate two points equidistant from the  $\mathcal{Q}$  of the engine as far apart as possible. I believe I used 14 inches. Scribe lines at these two points in the engine paint. Hang two plumb bobs from the overhead wire attached so they can be moved on the wire. Position the leveled engine in front of the firewall the exact distance from the firewall as shown on the plans and directly under the two bobs at the points previously marked on the  $\mathcal{Q}$  of the engine.

The  $\mathcal{Q}$  of the engine should now be precisely in line with B.L."0" and resting in a horizontal plane, the elevation of which was previously determined from the drawings. You are now ready to "cock" the engine downward and to the right.

The engine is pivoted in the horizontal dimension about the center of the engine (a point midway between the two marks on the split line) until the proper deflection angle is obtained. This is determined by calculating the offset from split line to the point of each plumb bob using the desired angle, the known distance between two points (7") and the trigonometric relationship. The rotation in the vertical dimension is similar using the distance between push-rod housings, and the deviation from the horizontal plane determined with the surveyors level and the six inch rule. In both cases the engine should be rotated about the center of the center main bearing of the engine.

ENGINE MOUNT FABRICATION BY STEVE HAWLEY

## ENGINE MOUNT FABRICATION, cont'd.

STEVE HAWLEY

The engine mount rubber shock assemblies should be installed in the engine and squeezed to the proper torque. Carefully measure the assembly and fabricate some bushings of wood to simulate the rubber when crushed to the final dimension. You are now ready to cut and tack weld the engine mount assembly. I protected the paint on the engine and the firewall of the fuselage with wet rags, asbestos sheet, and scrap aluminum. After each piece was tacked in three or more places, the mount was carefully removed and welded solid. When reinstalled, it fit like a dream.

The above procedure sounds very involved and tedious but it really isn't. From start to finish the engine mount was only a weeks work in the evenings. The total cost of materials was in the neighborhood of \$35.00. No jigs of any kind were required. This method will work whether the engine is "dynafocal" mount or straight.

Sincerely,

Steve Hawley

Steve Hawley

Excellentlly written article, Steve. Thanks again We'll be looking forward to your account of the Warneke "Almost constant speed" prop on your T-18.

YOUR ARTICLE ON

I would like to call attention to the TYPE of the above article. It's a HOW TO DO IT article, which is the type article a lot of us are eager to see and I'd like to encourage all of you (note the words ALL and YOU) to write a simple description of some operation in the building of your airplane. Exactly how did you do your brake system? Exactly how did you install the wheel pants? How did you set the stabilator angle for zero stick position? How did you rig your ailerons and check their travel? Etc, etc, etc, etc, It's time for you to pay back some of the info you got in the NLs when you first subscribed, you know. It's a little past time, as a matter of fact, gents. As I've told you in previous NLs, I can see the final end of the T-18 NEWSLETTER if the members aren't interested enough to send in an article....and it doesn't have to be something that we haven't covered before, either. It's always good to see how someone else does things.

RV NEWS

Later in this NL I've included several pages on constant speed props from Dick Van Grunsven's RV newsletter, which is one of the best in the business. As you may know, I owned the RV-1 (the prototype of the RV-3) for quite a few years and still have a soft spot in my heart for the RV airplanes and I have the greatest admiration for Dick as a fine designer and a man whose word you can depend on 100%. We've also included some info on items that he has for sale that you might be interested in. His address is Van's Aircraft, P.O.Box 160, North Plains, OR, 97133.

DISCLAIMER

STANDARD DISCLAIMER: In all past, present, and future newsletters of the T-18 and S-18 Builders and Owners Ass'n (formerly known as the T-18 Mutual Aid Society) that from its beginning we would make you aware that these newsletters are ONLY presented as a clearing house for ideas, opinions, and personal experiences of both members and non-members in both building and flying the T-18 or S-18 and anyone using these ideas, opinions, & experiences do so at their own discretion and risk.

Here is the first part of the material from the RV NL and because so many of you indulge in formation flying occasionally, it's pertinent information.

### FORMATION FLYING:

As mentioned in the March RVator, we received formation flying materials from several builders with military flying background. We chose to print the following which was written by Jim Pohoski, 24214 Northcrest, Spring, TX 77389. Jim has instructed in the T-38, F-5, F-101, and currently in the F-4. He is also a First Officer with Delta Airlines.

While some of this presentation may repeat what we have said before, it is more thorough and comprehensive.

"The military uses various formations to move many aircraft as one, deliver air to ground ordinance, as fighter escort, for area defense, air superiority, and so forth. Although we as RV-4 pilots will not be tasked to do these things, all of the basic principles of formation flight apply equally to the RV-4 as the F-4. Flying formation is fun and can become as second nature as a trip around the traffic pattern. However, two or more aircraft flying within a couple feet of each other present quite a potential for a midair collision. There is no room for carelessness, a lack of knowledge or a lack of proficiency.

Ideally, formation should be taught as other phases of flight-by dual instruction. Since there are few qualified formation instructors in our ranks, I will try to offer some information on formation flight using the building block approach. We'll start with something familiar-straight and level flight-and work our way toward more advanced maneuvers using what we've learned previously. I'm not trying to insult anyone's intelligence or flying skills. Trying to teach yourself formation is comparable to teaching yourself to fly instruments; it can be done, but must be approached slowly and carefully.

There is more to formation flying than just two aircraft together in flight. Just as being a fighter pilot is an attitude not an occupation, flying good formation requires the right frame of mind. You're not out there by yourself; both lead and wing must work together for formation to be safe and look good. As lead you are responsible for the conduct of the flight and anything that goes wrong. As a wingman, you are responsible to stay in position, do as lead directs, and be safe.

A formation flight will only go as well as it is briefed. Both pilots should be satisfied they understand what, when where and how maneuvers will be accomplished. A few minutes spent briefing the flight will be well worth it. Here are a few things to think about:

CALL SIGN--What are you going to call yourself, i.e. RV Flight, N4RV Flight, etc.

WORKING FREQUENCY--If radio equipped.

VISUAL SIGNALS

TAXI

TAKEOFF--Single ship, formation, trail

FORMATION FLYING - PG 1

## FORMATION FLYING cont'd (page 2)

REJOINS--Straight ahead, turning, airspeed lead will hold

RENDEZVOUS--Place to meet if separate takeoffs were made, altitude deconfliction until tally (gaining sight of the other aircraft).

MANUEVERS TO BE FLOWN--Minimum/maximum airspeeds, altitudes, G's, abort criteria.

RECOVERY/LANDING--Single ship, overhead pattern, formation.

LOST WINGMAN--How will you insure separation if lead inadvertently flys you into a cloud and you lose sight.

BREAKOUT--How will you insure separation if you have to rapidly leave formation.

EMERGENCIES--Will you stay with the other aircraft or recover separately.

I am gearing this article to those of you who have never flown formation, and must teach yourselves. If you feel I'm being too basic, bear with me. I'm not the only word on the topic of formation; I'm only offering techniques which have worked for me and my past students. Although flying on the wing is more demanding "stick and rudder wise", leading a formation is more demanding mentally. Military pilots fly as wingmen for a couple of years before being allowed to upgrade to flight lead. First a few generalities before we start with flying specifics. As lead, you must think far enough ahead of the aircraft so as not to be abrupt. It is difficult to stay on the wing of lead who is always making large corrections. If as lead you have over-flown your level off, it would be better to overshoot slightly and correct smoothly than to do a 4-G pullout (assuming you have the room). Try to be consistent in your roll rate into and out of turns. Don't over tax your wingman nor yourself. Don't fly to the edges of the flight envelope--too slow/fast, excessive G's, etc. Do not attempt a maneuver for which either of you may not be prepared. Be smooth, positive, and think well ahead. Always give your wingman a performance or power advantage-e.g. don't use full power or idle power, don't pull up with 6 G's if he is limited to 4, etc.

As wing, trust your lead (you wouldn't be flying on his wing if you had doubts, would you?). Try to relax; a death grip on the stick is no way to be smooth. Attempt to fly an exact position--it is as easy to fly in position as it is to fly slightly out of position. Make correction back into position as soon as it becomes apparent that you are out of position. It is easier to make a small correction than a large one.

Let's fly! Line up on the runway 20-30 degrees aft of lead, with 2-3 feet clearance between wingtips. Find some visual references for this position and remember them - this is fingertip formation. Sight a line from leads wingtip to a point on his cowl. Extend another line 90 degrees from your head to a point on leads empennage. This triangulation will define the fingertip position. See Fig. 1. Route formation is an extension of this position. Route is flown 2-3 shipwidths away from lead from 20-30 degrees back to line abreast. Since this position is further away from lead it requires less concentration. It is used to accomplish checks, clear for other aircraft or just relax. See Fig. 2. We will begin in route, and move in toward fingertip as our proficiency increases.

Since it would be foolish to try and take off in fingertip on our first formation flight, we'll do an extended trail departure. Lead scribes a circle at the top of the canopy with his finger as the signal to run up. When wing is ready, he gives

FORMATION FLYING TIPS PG 2

## FORMATION FLYING cont'd (page 3)

lead a big headnod. Lead takes off; wing delays 10 seconds and takes off behind lead. Stay 100-200 yards behind lead. Try to maintain a constant spacing and fly slightly to the side of lead so that he can easily see you. When lead turns, let him drift 20-30 degrees to the side before you begin a turn to match his bank and heading. This will keep you from "cutting him off". See Fig. 3.

Once away from the airport, lead can signal a rejoin by rocking his wings, or calling for the rejoin over the radio. As wing, accelerate to 20-30 knots above the briefed rejoin airspeed and drive forward toward route position. Always rejoin to route, this will give you room to pass lead safely if you have a flightpath or airspeed overshoot. Begin to decelerate to match leads airspeed so as not to pass lead. If you are in idle and still can't stop, slip the aircraft to kill a little more speed. If you overshoot lead slightly, stabilize and move back into route position. If you overshoot a great deal (to the point of having to fly looking backwards) stop at the rejoin airspeed and let lead join you. Never fly formation looking backwards, ALWAYS BE SURE SOMEONE IS LEADING. Just as there have been accidents with two pilots in the same aircraft thinking "I thought you had it", there have been accidents in formation by both pilots thinking "I thought you were leading".

As lead, allow your wingman to settle down into a steady route position, then do a few gentle turns, climbs and descents. As wing gains proficiency, increase the turns and pitch changes to the point of doing shallow lazy 8's. Be careful about max/min airspeeds, altitudes, etc. Occasionally allow your wingman to relax. To move him into fingertip, the signal is a wingrock; yawing the aircraft is the signal to move back out to route.

On the wing, hold the references you saw on the ground for fingertip/route formation. Small heading changes (aileron) will move your aircraft in toward lead or out away from him. Power changes will move your aircraft forward/aft of lead. Pitch changes will move you up/down. Anticipate pitch becoming more sensitive as airspeed increases. In a low wing aircraft do not get high on lead. This could result in losing sight of lead under your wing. If this should happen, don't hope for the best, BREAK OUT OF FORMATION. Move your aircraft away from the last known position of lead. Lead will then tell you to roll out and direct a rejoin. A little forward trim seems to smooth things out a little in pitch (as opposed to flying in perfectly neutral trim). As lead rolls into and out of the turn. Also, if you are on the inside of a turn, anticipate the need to reduce power, as you will be flying a smaller diameter turn; the opposite holds true for turns on the outside of lead. when you can hold a steady position in route, move in toward fingertip. Don't fly any closer than is comfortable. NEVER overlap wingtips. Consider yourself proficient in wingwork if you can hold a steady position in fingertip through large bank, pitch, airspeed and G changes on either side of lead.

Lead signals wing to move to the other side by dipping his wing toward the side on which he wants the wingman.

Return to base individually or in trail. A pitchout signal is the same as a run up signal, except it is given at altitude. Wing acknowledges this signal, as all others, with a head nod. Lead will do a 180 degree turn; wing delays 5-10 seconds and turns behind lead. This puts you back in trail to practice more rejoins or return to the airport.

Future topics I can cover: Turning rejoins, echelon, close trail, formation take-offs, formation approaches and landings, 3 and 4 ship formations, overhead traffic

(pg 3)  
FORMATION FLYING TIPS

patterns, and IFR formation considerations. If there is any interest, I could also get into BFM (Basic Fighter Maneuvers) for you "Top Guns" out there.

Fly safe."

Ed. Our decision whether or not to ask Mr. Pohoski to write additional articles on formation flying will depend on the requests we get from readers. We rarely get feedback on anything printed which leaves us guessing about directions to take on editorial policy. So readers, speak up please.

#### ELECTRONICS INTERNATIONAL- DIGITAL EGT/CHT INSTRUMENTS:

In the Mar. '87 RVator we mentioned the dilemma encountered while trying to determine accurate cylinder head temps (engine cooling verification) during the testing of the RV-6. As you may recall, our solution was the installation of what we felt to be an unquestionably accurate CHT, one manufactured by ELECTRONICS INTERNATIONAL INC., a small company located in Hillsboro, OR. Talking with EII personnel including the president/designer convinced us that they had a good product. They calibrate all instruments they manufacture to 1/2 of 1 percent error. This would mean that a 400 deg. CHT reading would be no more than 2 deg. inaccurate. They have designed these instruments so that the length of conductor (lead) does not affect the reading as it did in most of the older instruments. Plus, the leads and thermocouples are of substantially better construction than those of a commonly used inexpensive line of similar purpose aircraft instruments. One gets the feeling that they will last for quite a while.

Our experience thus far is limited to the 4 position CHT which we have installed in the RV-6. It is consistent in its readings and we have no reason to question its accuracy. Since the digital read out is to the degree, you can read the temperature even when the engine is cold and is of value even to determine amount of priming necessary for cold weather starts. We have checked the respective cylinder temperatures with the aircraft parked with a cold (outside air temp.) engine. We can usually see a temp. difference from one side of the engine to the other depending on the position of the sun. In our book, that's accuracy.

One nearby RV-4 builder installed an EII EGT in his RV-4 because he had previously damaged the engine because of improper leaning. With the EII instrument he gets a more instantaneous reading and one he is more confident of.

EII manufactures instruments which read up to 12 positions (for 6 cyl. twins), but for our airplanes we will most likely be most interested in a maximum of 4 to 6 positions. One interesting feature of these temperature gauges is that can read a variety of different temperature functions on the same instrument, given the correct thermocouples. This means that you could, for example, read CHT, EGT, OAT, CAT, and Oil Temp. on the same instrument. For an airplane with its flight testing completed and the need for four position CHT and/or EGT minimized, some of the positions could be converted to other functions like OAT and CAT. This could be a real space saver on small instrument panels.

If you haven't guessed by now, we have become dealers for EII instruments. These are fairly expensive instruments. For example, an E-4 (4 channel EGT) lists for \$465 with probes and 6' cables. However, discount houses such as SAN-VAL sell them for \$376, which is only a small mark-up over dealer price. So, our prices will have to be essentially the same as you could get from the discount suppliers. We might be

NEW INSTRUMENTS BY VAN

(Here's Dick Van G's article on constant speed props. Would appreciate an article from some of you on the subject, also)

CONSTANT SPEED PROPS:

(page 1)

As most of you now know, I have been flying the RV-6 prototype with a Hartzell constant speed prop installed since June. No doubt that many of you feel, as I have already been reminded by many, that this represents a contradiction to my long held philosophy. Not really. If you had carefully read my pro/con comments on the subject you would find that I had said that constant speed props were not a necessity for good performance on the RVs, not that they were an overall detriment. On occasion, while summarizing, I stated that "we do not recommend" or "do not encourage the use of" constant speed props. My intent in such instances was simply that of saying that the extra work, weight, and expense of a constant speed prop was not a necessity for the RVs, and that they flew very well without. It was meant to encourage RV builders to take the path of least resistance; to build their RVs in a minimum time at a minimum cost.

Several factors combined to prompt me to further investigate constant speed props. First: the fact that a number of RV-4 builders were installing them, was slowly altering my awareness of the changing financial and utilization status of many builders. In other words, while we had always strived to keep the RVs as inexpensive as possible and assumed that all builders operated on tight budgets, many builders in fact could afford and desired to add extra cost features. And, a high percentage of RVs were being used almost exclusively for X/C with little emphasis on aerobatics and sport flying. Second: I wanted to enhance the RV-6's competitive position in the CAFE competition, and the constant speed prop promised to do this.

Lacking a complete knowledge of all constant speed props which may be available, I started by looking for a "Compact Hub" Hartzell prop. Most if not all of the constant speed props (metal) being used on RV-4s were of this type, and it is also the prop specified for the Stodard Hamilton Glasair. We found that there are as many different models of the "compact hub Hartzell Props" as there are different series of Lyc. 0-320 engines. The following model designation list should be of interest to all who have been using the term "constant speed prop" in a generic sense. Our main concern is finding a hub suited to our engine (crank shaft flange) and cowling, and blades which are both matched to the engine and to our ground clearance requirements.

First, we need an extended hub to replace the 4" prop shaft extension used with fixed pitch props around which the cowl was designed. While it would seem that we just need to select a hub with a 4" extension, this is not the case because the dimensional relationship of the mounting flange and prop blades are different on this constant speed prop than they are on a fixed pitch prop. The sketch below illustrates this, and we found that the "M" hub was best suited for an RV-3, 4 or 6 installation. The next variable in the hub designation is the number of blades. I don't believe we have any choice here, at least if we are shopping on the used market. Two blades. Similarly, the "Y" designator for the blade shank apparently is fixed for this series of props. The fourth symbol is important in that it refers to the mounting flange which must be compatible with the crankshaft flange of our engine. For the SAE No. 2 flange on Lyc. 0-320s, the "L" flange is best suited and for the Lyc. 0-360 the "R" flange is correct.

For the prop blade, the "Design basic number" is "63" for the 0-320 and 0-360 blades. This is not necessarily the only blade design useable, but is the one most commonly used and best suited for this discussion. The "Basic diameter" refers to the diameter for which this blade was originally designed and manufactured. In some instances, blades are shortened by the factory before delivery, and blades can also be shortened by prop repair shops as in damage repair situations. The "63" blade has a design diameter of 76" and a minimum approved field service diameter of 70". Thus,



a 7663 prop which has been shortened to 70" would be designated "7663-6", or 6" shorter than original.

So, for my purposes a HC-M2YL-7663-6 prop would seem the best choice for my Lyc. 0-320 engine. There is one big obstacle though; it is nearly nonexistent on the used market. Few production 0-320 powered airplanes used constant speed props, and even less, if any, used this specific model. There were several limited production models which used an M2YR hub for Lyc. 0-360 engines, but even these are scarce on the used market. They are available new from Hartzell and retail at something over \$5,000. Stodard Hamilton purchases these props and sells them to Glasair customers only (terms of agreement with Hartzell) for \$3400 and \$3900 respectively for standard and aerobatic models. When they can be found on the used market, expect to pay between \$2,000 and \$3,000 for a re-conditioned example.

I found a M2YR-7663-4 which I purchased for installation on the RV-6 prototype. Though the diameter was 72" as opposed to the 68" dia. wood prop it was to replace, the RV-6 has a bit more prop ground clearance than the RV-4, so I deemed this to be OK, at least for test purposes. Actually, I didn't realize until after I had purchased it that its flange mounting holes were too large for my 0-320 crankshaft. So, we had to machine some rather intricate bushings to adapt it. Also, the drive lugs used in the crankshaft flange are different for fixed and constant speed props, so we had to purchase new ones. \$76 discounted cost.

Constant speed props with standard (non-extended) hubs are much more common on the used market. Then why not just bolt this onto the front of the 4" spool type extension used with fixed pitch props? First, Hartzell says "absolutely not". It's possible that product liability is a factor in this admonition, but we must also consider the very real consequences of bolting a 50 lb. prop on the end of an aluminum spool and expecting it to stay put through whatever gyration we may subject our sportplane. And aside from these considerations, the extension would have to be machined to take an O-ring seal for the oil which operates its pitch change mechanism. And then, referring again to the sketch of the extended hub, we can see that a 4" extension is really too much to locate the prop blades in the same position as a fixed pitch blade would be. A 1 3/4" or 2" extension would be more nearly correct, and as such would have to be a solid block extension rather than a spool type using two separate mounting flanges. While we know of instances of constant speed props being used with separate extensions, we don't know enough about them at this time to comment further, so will exclude them from this discussion.

The simplistic question I continue to receive since installing the constant speed prop is, "do you recommend them now". I don't feel that simplistic answers are acceptable in this business. So, if you want a simplistic "yes" or "no" answer, fill in the blanks yourself. If you are willing to evaluate a more comprehensive, qualified answer, then you can either read what I had written years ago or the following update of same. When I am forced to give a one word or even one sentence answer, I must generalize and therefore am misunderstood more often than not. This generalization has usually favored the fixed pitch wood prop, because, everything considered, I honestly think them to be the best choice for the typical builder as I perceived him to be.

Yes, I also recommend CS props, if you are prepared to pay the price to get one. This includes the price, either monetary or logistic, to obtain one suited to your aircraft's particular needs. Also, be prepared to locate a suitable engine for it, and a governor and governor adapter drive as well. Then be prepared to compensate for the resulting C.G. shift by another alteration such as relocating the battery, and probably altering the firewall for governor installation. (depending on governor and engine model) Then for the 5-10% of you who manage to break a prop during early

CONSTANT SPEED PROPS PAGE 2

## (CONSTANT SPEED PROPS, page 3)

testing, be prepared for an expensive prop (and possibly crankshaft) repair or replacement. Wood props are inexpensive to replace and rarely cause damage to crankshafts.

What you get in return for this "price" is a prop which can be flown through rain at high RPM with little concern for damage, and one which will idle smoother at low RPM. It will also require more throttle to taxi and maintain speed on landing approach, but will permit steeper landing approaches and tend to limit speed in reduced power aerobatic down-lines. It will shorten take-off rolls by about 25% and improve climb rates by 10 to 20% depending on forward speed. It will improve cruise efficiency, not necessarily cruise speed, by reducing fuel consumption by 1/2 to 1 GPH while offering lower cabin noise through reduced RPM. It permits full throttle cruise at a much wider choice of altitudes and engine RPM than does a fixed pitch prop. (for a fuller understanding of the benefits of full throttle operation, please read "HORSES THAT EAT BUT DON'T PULL" in the August 1985 issue of SPORT AVIATION. Then read it over again until you understand every word, its an excellent article.

I also recommend fixed pitch wood props; for those with a modest budget who are willing to accept the particular compromises associated with it. Neither gets an exclusive recommendation; every evaluation must be qualified by surrounding circumstances. It all depends on what you want, need, think you need, or can afford or want to afford.

## Model Designation-Compact Hub Propellers

### A HUB MODEL

**BHC - C2YF - 2RUALF**

- Blade Knob Size
- Left Hand
- Minor Modification
- Feathering Spring Assist
- Large Cylinder
- Denotes specific features, as:
  - 1. Non-feathering (no counterweight)
  - 2. Feathering
  - 4. Non-feathering (with counterweight)
  - 7. Non-feathering (reversing)
- Shaft Mounting
  - F, Flange, 4" bolt circle
  - L, Flange, SAE No. 2, 7/16 bolts
  - K, Flange, SAE No. 2, 1/2 bolts, 4 drive bushings
  - R, Flange, SAE No. 2, 1/2 bolts, 5 drive bushings
  - N, Flange, 4 1/4" bolt circle, 8 bolts, 9/16 dia.
- Blade Shank
  - C, No shaft extension
  - F, 3 inch shaft extension
  - E, 5 inch shaft extension
  - G, 1 inch shaft extension
  - H, 4 1/4 inch shaft extension
  - J, 3 1/4 inch shaft extension
  - L, 1/2 inch shaft extension
  - M, 2 1/8 inch shaft extension
  - I, 2 inch solid metal extension
- Number of Blades
- Basic design, designation
- Hartzell controllable
- Dowel Pin location for "F" flange

### B BLADE MODEL

**FCL - 8468( ) B - 4R**

- Rounded tips
- Diameter reduced 4 inches
- Anti-icing boots installed
- Modified Blade
- Design basic number
- \*Basic diameter for 2 blade before reduction
- J, Left hand, tractor
- L, Left hand, pusher
- Counterweight installed
- Blade Knob size
- \* Add 2 inches to diameter for 3 blade

Thank you, Dick, for this very timely information. We also appreciate your allowing us to use this material in our newsletter.

CONSTANT SPEED PROPS PG 3

Note that the latest in new airfoil shapes bears a remarkable resemblance to the S-18 airfoil, that Lu Sunderland developed several years ago. This news release was sent me by ??????? (Please identify)

## Airplane Wings for Faster Climbing and Slower Landing

Reshaped airfoils improve performance.

Ames Research Center,  
Moffett Field, California

The performances of general-aviation airplanes can be improved by modifying airfoil shapes. An equation is used to determine a new contour for each type of wing. The calculations are straightforward enough to be done on a hand calculator; a computer is not necessary.

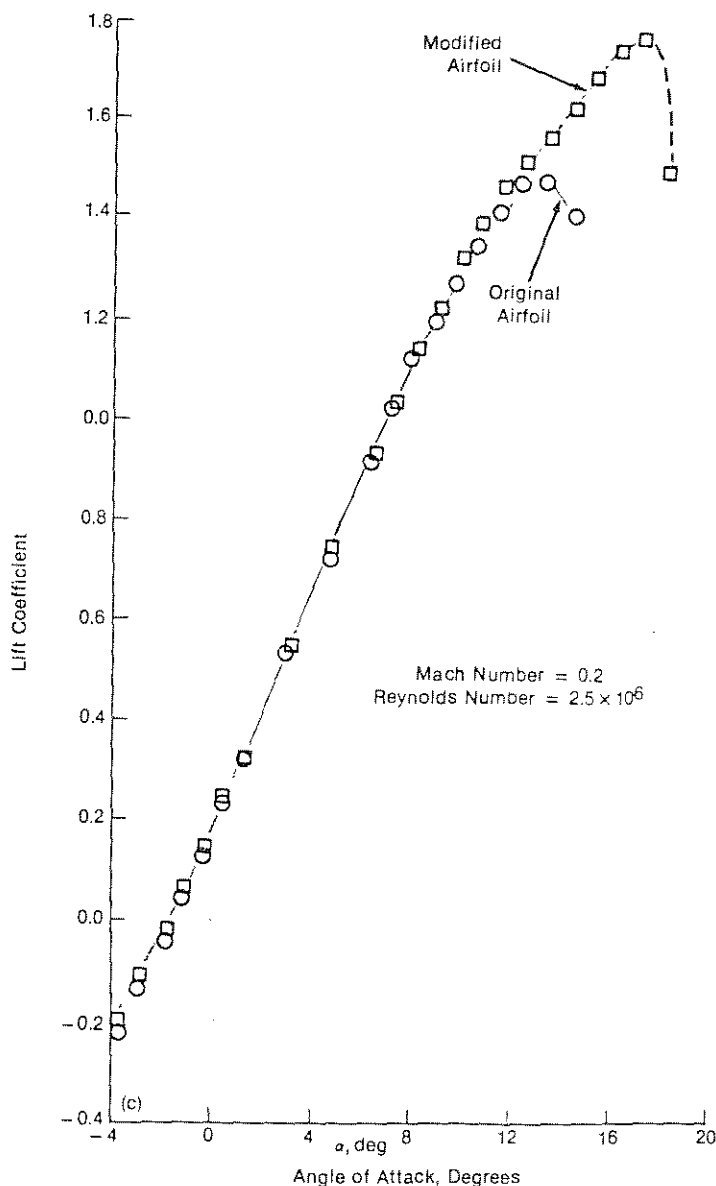
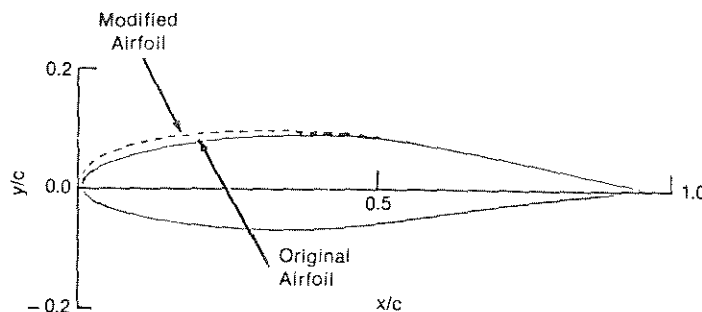
The equation applies to National Advisory Committee for Aeronautics (NACA) 63-, 64-, and 65-series airfoils with lift coefficients between 0 and 1 and maximum thickness-to-chord ratios between 0.06 and 0.18. These airfoils are used on a variety of general-aviation aircraft, including single-engine, propeller-driven airplanes and small passenger jet airplanes. The calculations determine new shapes for the upper surfaces of cambered airfoils or for both surfaces of uncambered airfoils.

The modification of an airfoil increases the bluntness of the leading edge and adds forward camber. It does so without introducing discontinuities in curvature anywhere, not even in the region where the modified shape blends with the original shape.

The increase in the forward thickness of the airfoil reduces the adverse pressure gradient near the leading edge of the upper surface at high angles of attack and results in a larger maximum coefficient of lift. Stalling characteristics are thereby improved, shorter and slower landings are possible, and the rate of climb is increased.

When it was used to modify a NACA 63-215 airfoil shape (see figure), the equation yielded a shape that gives approximately a 20-percent increase in the maximum lift coefficient. It also substantially increased the allowable angle of attack. The equation can be used to design new high-performance airfoils and to modify existing designs.

This work was done by Susan Cliff-Hovey of Ames Research Center. No fur-



The New Shape of a NACA 63-215 airfoil (above) increases the maximum coefficient of lift and angle of attack (below). The ratios  $y/c$  and  $x/c$  represent the thickness and chordwise dimensions, respectively, of a wing normalized to the chord,  $c$ .

An up-to-date report from Mr. Temperfoam himself, Harlo McKinty, Lincoln, NE.  
 on a long neglected subject. Thanks again, Harlo. We  
 January 28, 1988 really do appreciate your prompt response!

Dear Dick:

You said that there was very little in the newsletter in regard to upholstery. I don't know that I have any great words of wisdom, but I can tell you some of the things the professional upholsterer for Duncan Aviation told me.

I had used the aluminum backed foam (Y-370) (sticky on the one side, thin aluminum on the other--much cheaper than it used to be) for sound deadening on all the floor and side panels in the cockpit, firewall, and up over the fuel tank. I used Scott aphonic foam in the baggage area because it is cheaper and lighter weight. I stuck the Scott aphonic foam up with 3M 08080, but I understand you can get it sticky on one side, too.

The FAA recommends cotton/wool fabric combinations for fire retardancy, but you can spray fire retardant on any of the other more combustible materials. After you decide the pattern and combination of naugahyde/cloth, sew it up to cover .016 aluminum panels that come close to fitting the area to be covered (allow peripheral edge distance for fabric wrap around). I fastened the covered panels up with 3/4 X 3/4 angle clips pop riveted to the WL42 longeron and the #5 Longeron on the lower area, with Nutzerts and #8 counter sunk screws and upholstery washers in several places. A layer of cheesecloth glued over 1/8" foam under the naugahyde/cloth exterior covering makes a smoother looking job.

On the floor, I remember the Sunderland's advice in the N.L. and used the Scott aphonic foam over the Y-370, and 1/8" plywood over that to build up even with the 3/4 floor stiffeners to lay the floor mat on. I used Velcro to fasten down the front side panels and the floor mat to the plywood, and the #8 Nutzerts in three places for the upper part.

I used 1" of Sunmate for the backrest, fastened in place with Velcro, and 3" of the laminated Temperfoam for the seat bottoms. I sweat a lot, so I don't think that any unbreathable fabric should be anywhere next to the body. It's a crime to put naugahyde over Temperfoam.

If you have John's seats with the 025 on the back of the tubular frame, you can glue in lumber yard dense styrofoam to build out even with the frame and then just use 1" of Sunmate, if height and legroom to the rudder pedals is a consideration. Shorter people can use regular dense polyfoam for economy and thickness. 1" of Sunmate (84) is as good for comfort as 4" of polyfoam for the backrest, but I think 3" of Temperfoam is the best for long-term sitting for the bottom; naturally, I'm a bit prejudiced. Our supplier said that they were raising the price again, and its terrible now.

Wherever I used Velcro, I used the sticky backed, sewed in place, or stapled to wood. I followed Paul Kirik's advice with holes in the glare shield for panel ventilation, covered in back with cloth screen. I also made fiberglass defroster vents, but they may not be necessary; time will tell.

I'm sure that there are many ways to skin the cat; I've seen a lot easier methods that looked good, too. A Veri-Eze I saw last summer had a sprayed in flocked paint that looked very nice, but that was on fiberglass.

Thanks again for all your work on the N.L., Dick; I hope you get that physical back.

Best regards, Harlo

HARLO'S UPHOLSTERY STORY

TEXHOMA VIDEO TAPES

**MORE FROM TEXHOMA GATHERING:** One of the things PAUL SHIFFLETT brought along to display to the troops was a new manual/ electric trim system he designed and built. He also had a tilt-down instrument panel there and a very different bucking bar for the horizontal tail tube spar. He showed great originality and design expertise on all three items and a high degree of craftsmanship as well. Paul is a graduate E.E. and worked in the Naval Research Laboratory until his recent retirement. He has graciously sent us a complete written report on the trim system, plus a schematic wiring diagram of the unit, that we reproduce on subsequent pages.

If you are seriously interested in the unit, his instrument panel, or the fancy bucking bar, you need to get a copy of the VHS tape on Texhoma, in which Paul explains the unit and its components, as viewed from several angles. (Instead of sending us a blank tape and postage, just send us about \$6 and that should cover the costs). In addition to some flying shots the tape allows you to sit in on our informal forum on flying the T-18. We now have both the May and October gatherings, as well as the building of an outer wing panel on the ~~same~~ tape. Allow us a couple of weeks for getting them in the mail, as John Crook can only do a couple during his working day. (If you didn't get the same tape back that you sent us we apologize, as John's secretary got some of them mixed up. If you only got the May event on your tape and would like to get it all on your tape, just send ~~your tape back to us and we'll update it. Allow about \$1.25 for postage and padded envelope~~). SEE NOTE:

88 TEXHOMA

Both of the T-18 re-unions were so successful and so much fun for everyone that it has been decided to do it again this coming May. Last year we inadvertantly chose the Mother's Day weeked of 9th and 10th, so this year we made it a week later, the weekend of the 14th and 15th...I would encourage you to make plans to be there, whether you are building or flying the T-18. If you are reasonably sure of coming it would be a BIG help if you would let us know NOW (or as soon as possible). It will be necessary for everyone to make their own room reservations. Again, don't delay. The lodge is a popular place. Call **TEXHOMA LODGE**, 405/ 564-2311.

MORE ON VIDEO

We have received so much good comment from those viewing the tapes that we plan to expand the coverage, doing detailed interviews on the people and airplanes that attend, covering as much info on building and flying as we can with two or three cameras. We already have people on both coasts that have said they will be there for sure, plus a half dozen others in between. You can cover 1000 miles in a day's flying in a T-18 without breathing hard and maybe half that if you drive. If you've got a component of your bird like Paul brought in, bring it along (maybe a seat, an inst't panel, a flap, an aileron, rudder, etc. If it's too bulky to carry, how about making a VCR tape of your project, with full commentary? If you can't come, send us the tape and we'll make a copy, maybe putting several on the same tape if they are fairly short. Include pictures of yourself and wife, as getting to know other T-18ers well is part of the reason for having our organization.

With the widespread popularity of TV cameras and VCRs I can foresee that much of our future communication will be with that medium. I WELL KNOW that the great majority of people nowadays have an overwhelming aversion to writing a letter (oh, how well I know!). I have great hopes that they will be more comfortable with the TV camera. Incidentally, if you have items that you would like to see covered in interviews on tape, please let us know...by letter or phone (214/ 351-4604)

One of the things I'd like to see a tape made on would be the building of a rudder, either from scratch or from kitted parts. Who'd like to volunteer?

4618 BURNET RD.  
AUSTIN, TEXAS 78756

TELEPHONE 512-452-9751

BUD PAYNE, Owner

BUILDING AILERONS: The following from Bud Payne. Bud was a WWII military pilot and now is an M.D. Thanks a lot, Bud.

November 9, 1987

Dear Dick,

Scanning the newsletters for information on building Ailerons gave me no help. Ailerons are probably one of the easiest parts to build (I have read) so I just built one. Came out smooth and pretty. While admiring my workmanship I laid it on my work table. Left side lay flat, right side was up about an inch. Right side flat, left side up an inch. Somehow I figured that wasn't going to fly. I must have done something wrong. Back to the newsletters. Still no help. So here's a rookie builder writing to the newsletter with a solution to Aileron warp. First, I found that thin gloves and heavy shirt sleeves are helpful while riveting the bottom skin to the front spar. Reaching past the stiffeners with the bucking bar can slice and scratch you up pretty quick. Everything is routine in construction except for the trailing edge rivets. Apparently when the rivets expand, they cause the trailing edge to take the course of least resistance--both vertically and horizontally.

To solve the horizontal (warp) problem, I used a 4 1/2' length of 1" x 1" angle one inch forward of the trailing edge rivets. "C" clamp it to the overlap on your work table. I used clamps on each end and in the middle. I dimpled each rivet hole and countersunk the .5 x 48" spacer. Gives a nice smooth upper skin. To solve the little waves between rivets (vertical warp) I laid the trailing edge on a large flat metal sheet 1/4" thick and used a rubber mallet between rivets. I am pleased with the results.

At the Texoma rendezvous I learned that tie down rings are made of angle bolted to the end of the outer wing main spar. Drill out the top and bottom rivets holding the nose and rear ribs. The tie down ring bar is attached with 2 AN 3-6A bolts. I made the hole for the tie down so that a snap-swivel could not be used. These common tie down accessories are notoriously brittle and are the first things to go in a high wind, leaving you with one wing tied down and the other flying.

I hope some other builder finds this of use--as far as I can tell, it's not in the newsletter.

I have a complete Rattray cowling I'd like to sell. It's off John Walton's bird with no damage.....\$150.00.....complete.

(Bud said someone left an expensive pair of sunglasses in his car at the Texhoma gathering. If you were the one give him a buzz)

Best regards,

*Bud Payne*  
Bud Payne

*BUILDING AILERONS*



January 20, 1988

Dear Dick:

I don't know what value this letter may be to T-18 builders so feel free to delete anything or everything.

I suppose it should be called "reflections" as 18TT has over 1000 hrs, is 16 years old and is flying fine. I'm sure many builders can relate to some of these experiences.

In 1966 Son, Peter couldn't get into vocational training in high school. Class was filled up. So old BC decided we should build "something" at home to develop some mechanical knowledge in Peter. That summer we went to Rockford (EAA conv. site at the time) and what I seen I couldn't believe. Bob Kargard had the 2nd T-18 built there. Open cockpit, GPU and all. Now I never heard of John Thorp - and I could not understand why 150 people would send him over \$100.00 for a set of plans before the 1st airplane even flew -- not even the proto type! But they had! I went home more confused then ever. So after a short time I picked up the phone and called a Dick Cavin (yep, the same guy who prints our newsletter). He was the lead person in the very young T-18 movement and printed the newsletter. My question: I've never even built a boat -- could I build a T-18? (I have done some building of swamp buggies, etc.) I asked the wrong guy I soon found out because when Dick got threw with me he had me convinced all you had to do was cut it out like a paper airplane and stick it together. In fact, I had it all but built and flying before we even got off the phone! He should have been a salesman instead of a 747 Captain!

So off we sent to John for the plans and next I got some aluminum from a steel company in Chicago.

In those days there was no "kits" of parts -- you get whatever you needed wherever you could. Some pre-fab parts were available - roll bar - canopy glass, exhaust system - all from different sources. Boy the newsletters sure were

B.C. ROEMER'S STORY - PG 1

a godsend for people out in the sticks, like me. We have a grass field and not a single airplane is based here. It's a tourist field for people who come up in the summer - it's closed in the winter -- and I knew nothing about airplanes. I was a simple private pilot with 800 hours in J 3 and a 65hp Luscombs. This fact bothered me later on just before I got the 18 finished -- I had nagging fears that I couldn't handle it - which proved unfounded and was a needless concern. Of course I couldn't read the plans and when the aluminum sheet arrived I didn't know what to mark it with. Another phone call to Bob Kargard in Chicago got me to use a common no. 2 lead pencil. Talk about being stupid! Oh well 18TT got finished 5 years later.

### T-18 Parking

In the late 1960's a few T-18's arrived at Osh Kosh - every year a few more. There were no separate parking areas for them -- they were scattered all throughout the show planes and for a builder it was hard to run around to look at them. The next year I made up some "T-18 only" signs on sticks and getting there early I put them at the runway side of our present "area". Next I got hold of "Sonny" a fellow who drove mini bikes to lead planes to a parking place. He agreed to bring all T-18's to our "area" and he informed the other bike drivers to turn all T-18s over to him. Two or three other T-18's <sup>helped</sup> create this area and that's how the T18's were the first to park together. In the late 70's we had 50 planes in three rows some parked tail to tail. Now the builders could look them all over to see how things were done.

### Feathers

Still a problem existed. I couldn't tell who was a T-18 builder or pilot. And lots of times I wanted to have a cowle opened to see how to build or hang the exhaust pipes for example. Now being in the feather business the next year I brought a bunch of yellow feathers for builders, pink for pilots of T-18's. And we all wore them in our caps. It sure made it easy to get a ride or ask questions.

### Table

In the 1970's I made up a sign "T-18 question answered here" -- brought a card table, some chairs and set up business right in the middle of the T-18 area. It served as a sort of gathering point -- later the whole shebang was transferred to Ken Knowls airplane as it got too much to "run" this all day every day and most questions were about parts anyway.

B.C. ROEMER'S STORY PG 2



### Informal Racing

Every year a bunch of T-18's of the same H.P. (180) would take off - put our radios on 122.9 and meet over the lake. On the ground in our area were a bunch of T-18's listening to a radio on 122.9 to keep up with the progress. This wasn't a true "race" in that sense but a loose formation lined up at each of four altitudes: 2000, 4000, 7500, and 10,500. The object being to be 100 feet above the assigned altitude - dive down to it and open her up. Whoever left the pack "won". Many of the T-18's had constant speed props - I had a heavy Blank (76) Cherokee prop cut to 68" fix pitch. Wide open got me 2800 RPM and N18TT won all races every year. After a few years of this the race was discussed at our forum tent. After the meeting Big Bob Dial (11BD) came storming out and said "Roemer - I don't know what your doing but your doing something". Naturally I denied it. It was many years later when I knew him better that I told him. In case you would like to know here's how it's done. Only 4 things: 1 - Have a pretty "clean" ship. That won't do it by itself because lots of the T-18's in the race were clean. 2 - Go up to, say, 4000 feet on a nice quiet evening and use a high cruise setting. Hold the rate of climb real steady (not easy to do) and with feet on the rudder, center the ball. After 30 seconds note the air speed. Then repeat with the ball out of the cage a bit to the left and then right. Chances are you'll get a bit more speed with it out a hair or more one way. That's where you fly it. 3 - Fly with 1/2 tank of gas and 4 - load aircraft at or near aft CG. I had two bags of lead - each 40 to 45# that I would put in the baggage compartment. This along with 1/2 fuel worked just fine. The object is if you have forward CG you have to trim the tail to force the nose up. This puts the tail in a high drag position versus an unloaded (near aft CG) streamline configuration.

### Speed restriction at Osh Kosh

The late Al Neuntofel had a 180HP '18 and of course always raced me. He wouldn't settle just for "the race" - every year he would make some improvement and we would go one on one at 7500 feet. Of course I always beat him. (I wonder why?) After our little race one year he came over and asked if he could fly 18TT. I said sure so with him in the left seat and Pete Roemer in the right off they went. After flying around a bit they returned to the fly by pattern. Now in those days there were no restrictions on type or speed - the pattern had lots of airplanes in it all going around and around. Al figured he would run the pattern once before landing. He did and passed 19 airplanes in one loop. I was at the parking area so I didn't see him. He and Pete were too busy going around

airplanes to count so how do I know it was 19? Well sir, when they got parked a guy from the tower wearing a FAA patch arrived on a motor cycle. He promptly said "this airplane (18TT) is grounded for the rest of the convention". Then he said 19 airplanes on one pass. I objected saying I wasn't flying - so why should it be grounded. Well after heated words we did get permission to fly. (I didn't because I knew they might get me for something else and I wanted no part of that fellow!) The next year we had type and speed restrictions. Chalk up another for the T-18! Sorry fellows.

### The LBF Race (Discontinued in 1987)

I looked at the published results in 1977 and again in 1978. I knew a T-18 could not win the Lowle or Baker part (most miles per gal and fastest speed) but I figured we could take the fastest lap (Faulk) part -- if we kept our mouth shut. The race was 500 miles long - one trip to Osh Kosh and back to Fondulac, then 6 trips (78 miles each around a triangle course. Single place got 18 gal of gas - 2 place got 22 gals. You had to carry 4 extra gals for safety. The race had to be flown in 4 hours. Single place had to take off in 1000 feet over a 5' barrier (string across runway) 2 place had 1200 feet - any head wind would decrease the take off distance. I needed another person so I got Bob Dial to fly while I figured. The field of racers was impressive - lots of formula 1's, (Steve Wittmen etc.) and vary eases and long eases (one piloted by none other than Dick Rutan!) 18TT was the heaviest and had the most power of anyone in the bunch. Race promoter Nick Jones confessed he felt sorry for us and couldn't figure out why we were there. A few weeks before the race Bob and me practiced taking off in 1200 feet (fixed pitch prop of course) over a 5' barrier. We used about 10" flaps and would make it O.K. Peter Roemer figured that at 127 indicated we could make it in the 4 hour limit and be within fuel burn. So I marked the air speed. Getting Bob to fly the mark was another matter. I have no fuel analyzer so I drained the tank - put in 4 gals. leveled the ship and noted the needle on gauge. Anything below that and we disqualified. All the above is fine but won't win anything. We got to have a faster lap than the rest of the guys. Here's the plan: we have to fly the 1st lap fast - (Steve Whittmen always flies the last lap fast when he's the lightest) we take off, fly slow (127) to Osh Kosh, go around pylon head back to Fondulac for the laps. On the way back we climb (using no more throttle to save fuel) to 1500 or so. (All pylons must be rounded ~~AT~~ 500 feet or less.) Then push it over and dive at the pylon at Fondulac and be to the west of it (our next pylon is to the east) this is so we have a small angle to make to get on course to the east. At 500 feet or less, we had to be over 200mph and on our way. If we used any other lap we would be coming from the east and going west and have about a 300 degree turn to make at the Fondulac pylon which is the lap starting point.

B.C. ROEMER'S STORY (CONT'D)

The airplanes are impounded the night before and weighed in the morning. All gas is drained and you are given 26 gals. (2 place), by weight. Airplanes are pushed by hand to the starting line. You crank it up and wait your turn for take off. (About 15 seconds apart) you are racing the clock - not other airplanes. There was wind right down the runway so the take off distance was shortened to 800 feet for the single and 1000 feet for the two place. That's the point they put up the 5' string. All the singles got off and ahead of us was a ~~Very~~ easy. He charged down the runway and ran right under the string never touched it. We were flagged off than and made the string O.K. and later found out they forgot to move it to the 1000 foot mark for the two place!

I timed the 3rd lap and projected our total time to be within the 4 hour limit. We used 3 hours and 45 minutes so it was no sweat. You are required to land, taxi to a parking spot, turn 180 degrees into it and shut down. Then you are put back on the scale to determine how much fuel was used.

Results: we used only 20 gals of gas. Fast lap was just under 208 mph. Good enough for 1st place in the lap race. If we would had a constant speed prop it would be higher. The turns at the pilon kill your speed a lot and it takes a fix pitch quite a few miles to get speed back up. Before the race I checked our tack to be sure it was right. We have a bad freq. on our prop at 2875 RPM so I didn't want to turn it near this. It would turn 2800 top so after leaning I enriched mixture to keep RPM at 2750 -- better for engine of course too.

Talk about running off at the mouth -- er -- pen, I better stop. I've had more experiences with the T-18 than any other airplane. (Also have a Bananza) It's the easiest airplane to land in a crosswind I've ever flown. One's life isn't complete till he or she flys a T-18!

B. C. (ROEMER)

It isn't enough to just say "Thanks a million, B. C." Not just for the latest in your always excellent reports, but for all the effort and enthusiasm that you've put forth in behalf of the world's best sportplane. When OSH '88 rolls around and B. C. and his bird are back there on the flight line I hope each and every one of you will take the time to thank him for all he has done for the T-18 group. He's one of the greatest guys you'll ever meet

B.C. ROEMER'S STORY (CONT'D)

VIDEO TAPES

CORRECTION RE VIDEO TAPES: I previously made the statement that we had both Texhoma gatherings on one VCR tape. Not correct I just happened to mention that to John Crook, who has been doing all the tape duplicates at his place of business, and he said, no, it requires TWO tapes to cover both events. Tape number 1 is of the May '87 meeting only. Tape #2 is the Oct '87 meeting only, and it includes the interviews with Paul Shifflet on his fold down instrument panel, his electric trim set-up, and his tail spar bucking bar. It also has our night time "forum" on the porch of one of the cottages (flight test procedures, performance, etc.) If any of you want Tape #2, but sent two tapes and got only #1, please advise & we'll send it. If any one else wants either #1 or #2 just send the price to buy a tape, plus postage (\$6 is plenty). Sorry about that, gents.

SUNDERLAND BOOK

We had Mrs. Sunderland send us all the T-18/ S-18 books she had left over when Lou passed away, so she wouldn't be burdened with it. We now have 45 left and when these are gone there probably will be no more, so if any of you have been intending to get a copy and have been putting it off, this may be your last chance. I have an ad coming out in Sport Aviation this next issue on the books and this will probably clean them out. The cost is \$25 ppd. Not only will this help Mrs. Sunderland out, but the book is truly an education in building the T-18, flying it, etc and is a valuable addition to anyone's library. It is beautifully bound and printed and it covers Newsletters #1 thru #44 (edited and updated). I think you'll agree it's worth the price. If you don't, send it back and I'll send you your \$25.

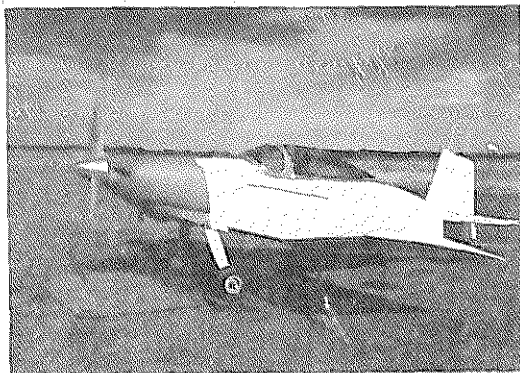
T-18 SILVER ANNIVERSARY

OSHKOSH '88: The T-18's SILVER ANNIVERSARY. To all of you that now own flying T-18s or S-18s, I sincerely hope that ALL of you will make the supreme effort to have your airplane on hand for the PARADE OF FLIGHT, which will honor the T-18's place in aviation history. Don't worry if your paint job is ailing or your upholstery is getting shabby. The main thing is to BE THERE!!! Don't get it torn down for an annual or such and not have it airworthy at OSH time. We would like to put 50 T-18s in the air in trail formation at one time. All of you that have T-18s have said many times how grateful you were to JOHN THORP for giving us the T-18 design, so this is the time for you to show it! We are planning the parade to coincide with our annual dinner on TUESDAY and we are planning to interview each and every T-18 owner and builder on video tape with their airplane, plus taping every airplane in the fly-by parade...plus the speaker part of the dinner...plus what ever shows up in the way of component parts, etc. It will probably come out to several tapes. We also hope to have our regular "Cowlings Open" feature around noontime Tues and this, too, will be taped. To properly prepare for all this, we ask your help and cooperation. PLEASE send us a postcard that gives your N number, engine, and serial # (if you know it, or date first licensed if you don't) and also state, "I WILL BE THERE" or I can't be there, or I HOPE TO BE THERE if...and PLEASE do it NOW.

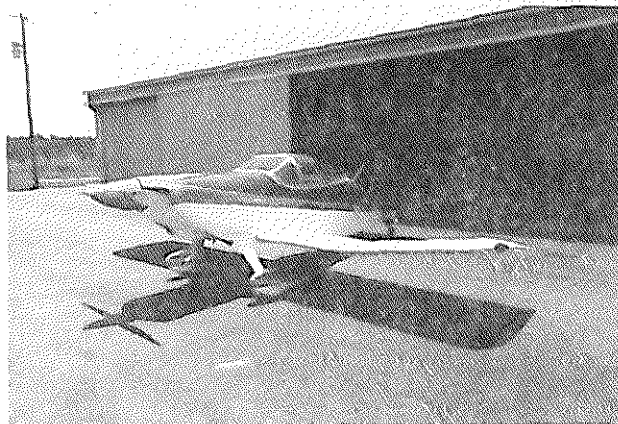
RE NL #69

To close #68 the rest of the NL will be pictures. For #69 I have a four page article by Paul Shifflet that I'll have to re-type as it wouldn't reproduce, an article on Loran by Pete Roemer, a three page full size drawing of Bob Highley's home built military type throttle quadrant, another two page article on several items by Harlo McKinty, an article from the Seattle Chapt nl that diagrams a fuel system like John Walton's, and at present that is all....unless YOU get with it and send in a story. This issue WILL come out the day after I get home from Sun'n Fun and it also have a reminder about our MAY 14-15 TEXHOMA GATHERING and RE-UNION. JOHN WALTON has been in Boston at the Harvard Medical School hospital the past two weeks taking chemotherapy treatments for his lymphoma and he is getting good news from his tests. Our prayers are with him. He'll be back home soon, so maybe you like to send a card or give him a call. Home # is 713/ 440-8093 and his address is 5726 Boyce Springs Dr , Houston, TX, 77066.





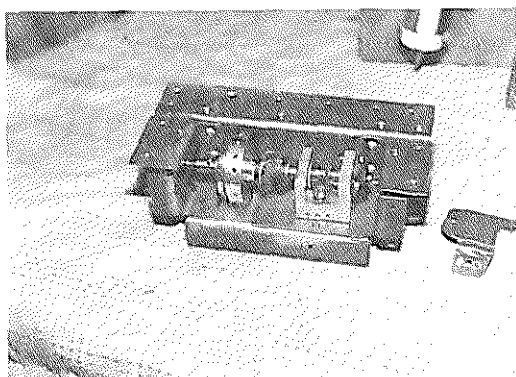
FRANK LANIER, COLORADO CITY, CO, RUNS UP HIS BRAND NEW T-18 RIGHT AFTER FAA SIGN OFF.



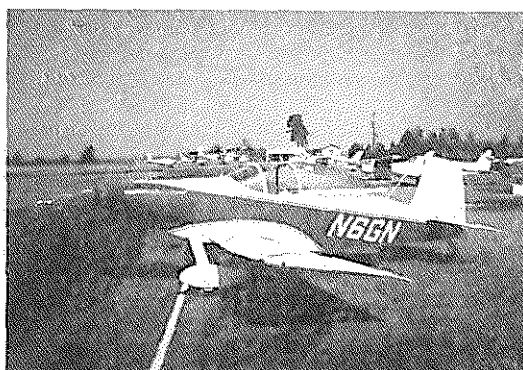
WORTHY WARNACK, BAYTOWN, TX, and his round back T-18



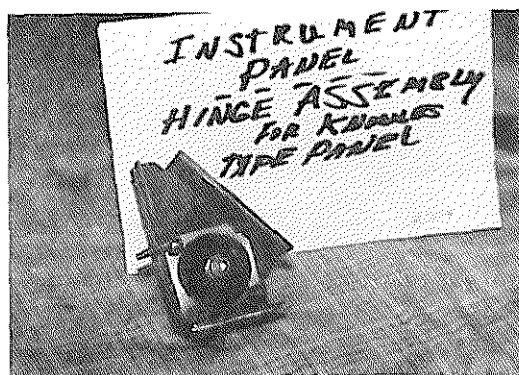
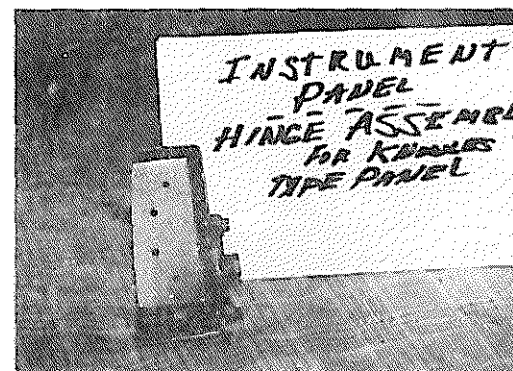
WHO IS THIS OLD PAT FELLOW JUST TAXIING BACK AFTER FLYING LEROY HOLT'S S-18? NOTE LEROY'S NEW PAINT SCHEME.



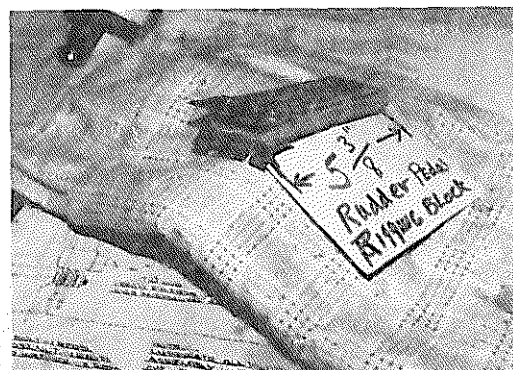
PAUL SHIFFLETT'S ELECTRIC TRIM UNIT (ABOVE)  
SEE TEXT N.L. #69



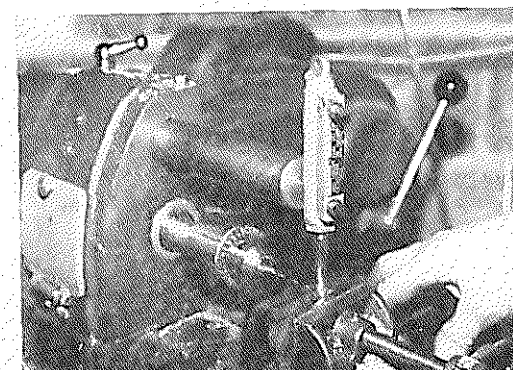
GARY NIVA, MONTE SERNO, CA



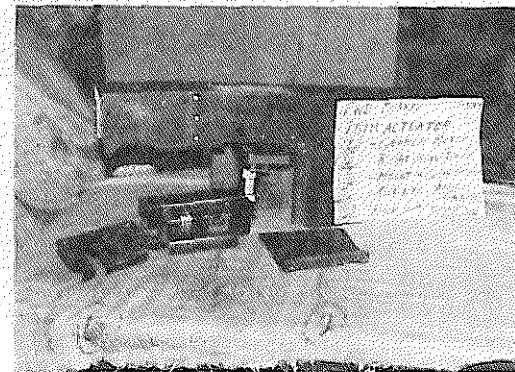
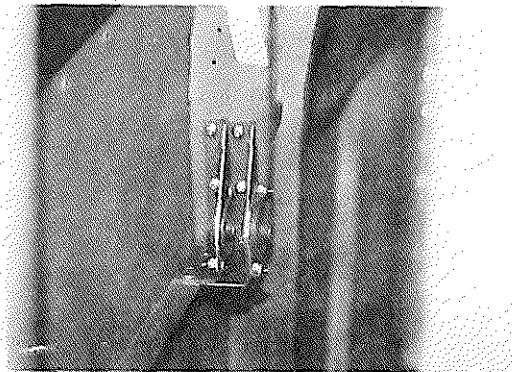
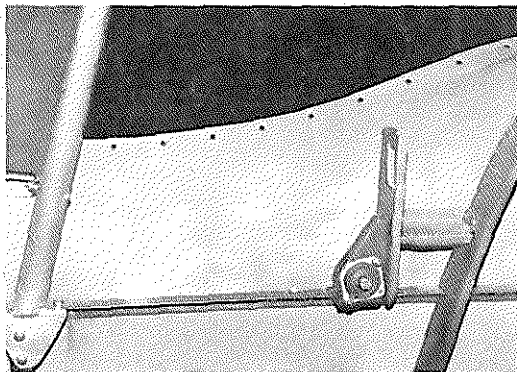
SIDE VIEW INSTRUMENT PANEL HINGE (PAUL SHIFFLETT)



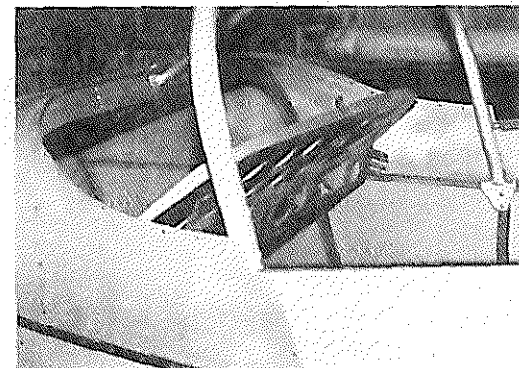
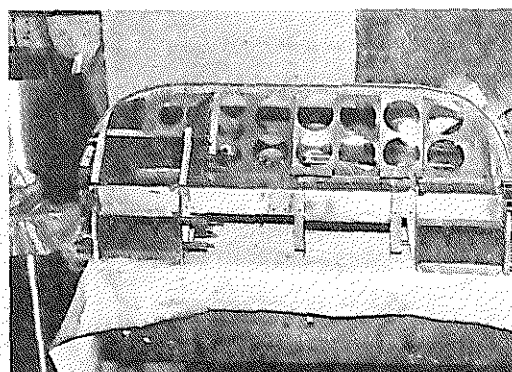
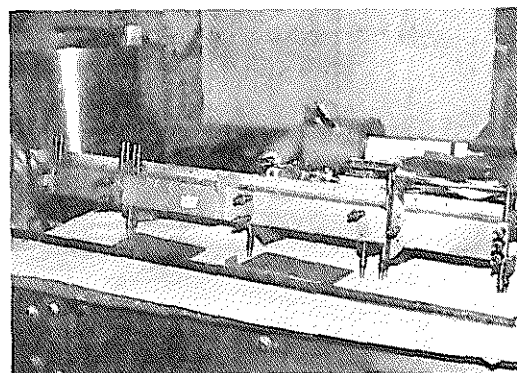
PAUL SHIFFLETT'S INSTRUMENT PANEL HINGE (ABOVE) AND MODIFYING A PIPER BRAKE CYLINDER (BELOW) (SEE TEXT) N.L. #69



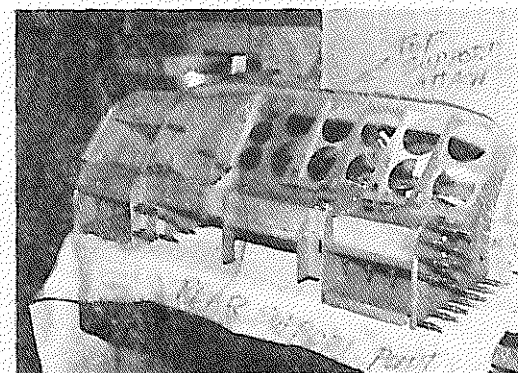
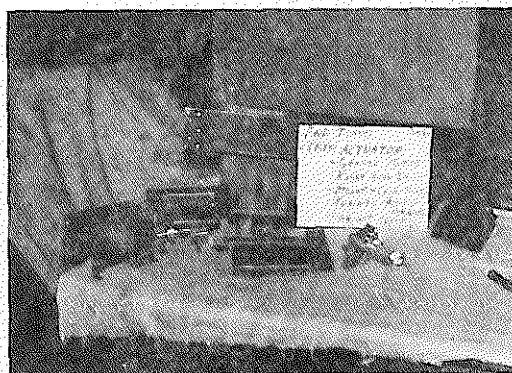
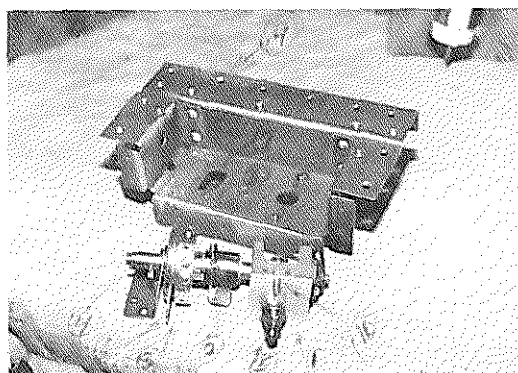




ALL PICTURES THIS PAGE ARE OF PAUL SHIFFLETT'S TILT DOWN INSTRUMENT PANEL AND ELECTRIC TRIM SYSTEM, AS SEEN AT TEXHOMA IN OCT. 67



AVAILABLE SPACE THIS N.L. DIDN'T PERMIT US TO PRINT ALL THE EXPLANATORY TEXTS TO ACCOMPANY THE PHOTOS. IN THE NEXT ISSUE (#69) WE WILL PUBLISH THE EXPLANATION OF PHOTOS AND PAUL SHIFFLETT'S WRITE UP ON THEM.



I hope all of you appreciated the effort and attention to every little detail that PAUL SHIFFLETT gave in your behalf in the pictures in this issue and the upcoming texts in N.L. #69.

I also hope this will motivate some of you (hopefully YOU) to at least take some good quality pictures of either your completed airplane or some component....either while it is being built, or after completion.. and send it to me.

Those of you that have bought T-18s are very much included in the above, too. We would like to have pictures of your airplane to include in our photo section. If you submit in-flight pictures you will probably need to have the picture blown up if the airplane doesn't take up more than 10 to 15% of the total size of the pix. If you can get a shot over a lake as a background (like we do at OSH for the mag) it adds a lot to the shot. A forest or large field of grass also makes for a pleasing backdrop.

If you shoot the airplane on the ground, it's especially important to choose your background carefully. Shooting in front of hangar doors isn't the best, but it's better than having a background telephone pole that appears to grow up out of the fuselage, etc. I would advise you first of all look around your airport or home for the background FIRST, study it through your viewfinder before you move your airplane to the area. Also try to see what shadows do to the area in morning, at noon (usually bad), and in mid afternoon. You also need to shoot your whole roll of film at one session when you shoot. Shoot the airplane from several angles. Be sure to fill up the viewfinder with the airplane as much as possible, but don't overdo it and cut off half the spinner, etc. Leave a little margin, as viewfinders aren't always exact at all distances. If you can borrow a pickup, shoot standing up in the bed, for an exceptionally good angle. Also you might get a shot or so lying down. Sometimes that makes for good shots. 3/4 front and rear views are good and sometimes a side profile is very good if the paint scheme is especially attractive. If you shoot your engine compartment or cockpit it's a good idea to use flash fill, even in bright sunlight. Watch your focal length carefully, too, and talk to a pro about depth of field if you don't fully understand it.

In case I haven't mentioned it before, my diabetes forced me to sell my T-18 in early Oct last year. Jim French, of Wimberly, TX, recognized my phone no. in my ad in S.A. and told his neighbor, Jim Hidalgo about it and the next day they were up here in French's T-18 and Hidalgo bought it. He's had a ball with it every since. He wasn't quite ready to solo it when we had the OCT. gathering at Texhoma, but shortly after that he and his wife went Cross-country in it to visit relatives in Enid, OK. Guess who met him on the ramp at Enid? Gary Green, who heard his unicom call in and recognized the number. Jim also got to make a 25 kt. crosswind landing at an OK town on the way up, so I guess he got thoroughly T-18 qualified before leaving. He's now putting new upholstery in it and a new instrument panel in it during the cold weather. He'll report on this later. Jim runs a mail order business for fine sunglasses. You've likely seen his block ad each month in Sport Aviation, so the next time you're in the market for good shades give him a rattle. He does prescriptions, too.

His buddy, French, the trouble maker, is repainting his airplane and also replacing his gear with one cut in two (longer, too) and we'll have some fotos and copy on that operation in #69, also. It was another gear with tiny cracks at the gussets and we couldn't get it re-heat treated in one piece, so it was make two pieces. See ya, Dick.

TALK ABOUT PHOTOS





Just returned from the '88 Sun 'n Fun thing, where we spent Wed. and Thurs. The weather was just about perfect when we were there, but they had had one rain day on Tuesday that slowed things down a bit. I saw 5 T-18s while I was there, but I never did see even one of the T-18 people, darn it! Dave Eby had been there, but he left early Wed., so I missed him, too. There was one T-18 from Calif., which has a large "gull" painted on the side. I had seen a picture of it in a magazine article several years ago, but don't know the owner, since he doesn't belong to the M.A.S. I did recognize Bob Highley's bird, but was unsure of who the others were, since they didn't have a registration card on the prop. I also recognized the one and only single place T-18 (which also has a retractable conventional gear). It was built in Sugarland, Texas about 15 years ago. It was sold to someone in Calif. later. I saw it at a fly-in at Chino, CA, about 10 years ago, but again no registration card, so I have no idea who owns it. It still looks very good, too. Hope the owner brings it to OSH this year.

In our previous NL we urged all of you to be sure and write letters of protest to the FAA about the NPRM and send a copy to me, also. I am sorry to say that I only received 13 copies of letters from the entire group of T-18 MAS members.....I certainly hope that the copies I received were not all the letters that were sent to the FAA.....If they were all that you sent, all that I can say is that's a lousy percentage from a group of men that stand to have their hobby done away with because they are too apathetic to spend a few minutes on writing a letter. I well know that getting the average person to write ANY kind of letter is very close to utter impossibility. I've begged, wheedled, cajoled, and pleaded for you guys to sit down and write a simple report on your project and to date I would guess the response is in the 3 to 5% range....so, yes, this is one thing I KNOW about human nature for sure. Even so, I simply cannot comprehend why people would shirk their duty on anything as important to all general aviation as this. Can you? Or maybe you think this NPRM thing and the Mode C are a good thing and that we can live with it? I sincerely hope you haven't been that badly misled. ....Not only will literally hundreds of private airports be rendered completely worthless and will go out of existence and probably fall into the hands of developers, but also the cost of services from remaining FBOs and fuel sales outlets will go sky high.....Consider, too, what kind of treatment you'll get from ATC when you ask for PERMISSION to penetrate their radar area, what kind of frequency congestion there will be, how far in advance you will have to file a flight plan before flight, how you will have to wait to receive approval of your flight plan, how you will be DIRECTED as to what heading and altitude you WILL fly... (regardless of weather)...how there will be so many blips on their scopes that it will be humanly impossible for a radar controller to safely separate traffic (like it is now in some areas). Now when all this happens and everyone decides to get out of private flying in disgust and sell their airplane....just who do you think will have any interest in buying it???? So if it's okay with you if you have to fly your airplane on a string or an R/C model (assuming Big Brother doesn't decide they, too, are a menace) just go right ahead and do nothing. Just go ahead and wait on someone else to write those letters and I can promise that you will get exactly what you deserve!!!

As of about a week ago the FAA had received over 35,000 letters of protest on the RPM and they were forced to extend the deadline to May 12th. When this NL arrives you will only have less than a week to write and mail your letter, so that it arrives by May 12. Not only should you write FAA (again if you wrote before) but you should write to your congressman and senator, too. THIS IS VERY IMPORTANT! The original impetus for the NPRM came from

*WRITE!*

Congress, but the FAA airheads seized on it as their golden opportunity to control everthing that flies....and in the process they can create lots of new supervisors, raise salaries, etc.You get the idea (I hope). We must MUST convince members of congress that this proposal will not only wreck a vital industry, cost thousands of jobs, etc., but we MUST also make it plain to them that airline safety will actually deteriorate.

Again, amigos, I beg you to spend a half of an hour suffering and get those letters in the mail....PLEASE! DON'T BE A QUITTER! . FIGHT BACK!

*LAKE ARROWHEAD LODGE REUNION*

NEXT ITEM OF BUSINESS: Our ANNUAL SPRING RE-UNION at ARROWHEAD LODGE on Lake Eufala, OKla.....As Leroy and Mary Holt explained in the special mailing, we had to move from Texhoma, as the lodge there was sold out up thru July. (I sincerely hope this won't be our last one). That's the week-end of MAY 14 & 15, with some of us arriving on the 13th (Friday). If some of you have delayed making your travel plans and reservations until the last minute, don't wait too long. You need to let Leroy and Mary know as soon as possible, so they can make eating arrangements, etc. If you drive in you might want to bring a couple of folding chairs, a thermos, etc. A folding table or so to have near the flight line would also be welcome. If you have a video camera bring it along, too. We plan to do a complete video on the proceedings, with detailed interviews with the aircraft owners. Remember, no programs or activities are PLANNED, no invitations are being issued. We are just saying that a group of us with common interests are going to get together on that weekend and share a meal or two and some Bravo Sierra type visiting and we'll also be sharing some details of our building and flying of the T-18, so everyone is on their own. At our last get together Paul Shifflet started a trend when he brought in his fold-down instrument panel, a stabilator bucking bar, and his version of electric trim. If you drive in, why not bring some component of your project for new builders to study? If such parts aren't readily transportable, how about a video of it or some good fotos to show details? I just got a letter from Paul, with pictures of how he is going about making a metal cowling for his project. If he comes again he may bring the form blocks, etc., but if not I'll bring the package of fotos he sent (I'll put a couple of them in this issue, too). Anyway, we are looking forward to having another super-good time, like we had at both Texhoma gatherings. Hope to see you there.

*OSH - COME!*

OSHKOSH '88, THE T-18's SILVER ANNIVERSARY: We are also getting close to our annual convention time at OSH and I need to get your commitments as to whether or not you will have your airplane there. PLEASE send me a post card ....TODAY....as to whether or not you will have your airplane there. If you are unable to make definite plans at this time, but hope to make it, let me know that, too, please. I have told Tom Poberezny that we hope to have as many as 50 T-18s at OSH this year and they are making DEFINITE plans to allocate enough reserved parking space at the north end of the display area (the regular area). They are also blocking off an airshow time on TUESDAY for a mass flight of all T-18s there in the Parade of Flight. We would urge you to make every effort to be there even if the paint is peeling off, the upholstery is ragged, whatever....just be there! If your bird is out of licanse, get busy and be sure it will be ready for OSH. You will never again have an opportunity like this to pay tribute to John Thorp for giving us the best homebuilt design going. A lot of you have often expressed the desire to thank John in some way, so this will be a superb way to pay tribute to a fine gentleman. You can appreciate that EAA HQ needs concrete numbers to make plans, so we must have some definite numbers right away. Hopefully, your card will say, "Yes, my T-18 will be at OSH '88". The T-18 dinner will also be on Tuesday nite at Butch's Anchor Inn, as usual, so please indicate if you plan to attend that, too.

(More on OSH later in the NL. In the meantime enjoy Cliff's report)

N18CR  
Clifton Redden  
609 Wise Rd.  
Lynchburg, Ohio 45142

T-18 Mutual Aid Society

Dear Dick Cavin,

Since its a rainy weekend here in Ohio, and I can't go flying my T-18, here's my newsletter contribution.

N18CR (serial # 1330) was started in the fall of 1979 and was finished in the spring of 1987. It passed the FAA inspection on 7/14/87. Before the inspection I started a series of taxi test. Being a low time taildragger pilot, (4hrs. in a Cub) I had a lot of very exciting moments: almost ground looping, getting inadvertantly airborne, ect.

I got in touch with Jim Paine (N747JP) of Dayton, Ohio to evaluate the plane and give me some advice about the taxi test. I continued taxi practice untill I could get up and down the runway (3500 ft.) on the main gear, maintaining directional control. On 7/18/87 Jim came down and test flew the plane for me. The Plane required full nose down trim and forward stick pressure to maintain level flight and the engine ran rough in flight.

After Oshkosh, I rebuilt the magnetos, installed longer trim links, adjusted control surfaces, and installed a veriner throttle. On 8/12/87, Jim Paine test flew N18CR for the second time. This time everything was OK. With 6 gal. fuel, I went up with Jim to check out the trim. With this loading configuration, we had plenty of trim control.

Jim gave me a couple hrs. dual in his T-18, then we switched over to my plane for a couple more hrs. of dual. On 8/30/87 I soloed N18CR for the first time. WHAT A GREAT MOMENT THAT WAS! That one flight was worth the 8yrs. building time. THANKS, Jim and Judy Paine, "Great T-18ers"; THANKS, John Thorp, for a GREAT aircraft!

I have 73 hours on my T-18 at this time. I still have a little trouble landing once in a while. If I bounce too much, I just go around and do it right the next time. At first I did wheel landings, but now I have learned how to 3-point it on pretty good. In the pattern I slow to 100 kts. before putting on the first notch of flaps. This gives me about 90 kts. for the base leg. On final I pull on full flaps and hold about 80 kts. slowing to about 65 kts. over the fence, and touch down at 55 kts.

(ADD 15% TO CONVERT TO MPH FIGURES)

I recently did some measured course speed runs to check out my airspeed indication. At 140 kt. indicated, my measured /calculated speed turned out to be 143½ kts. (better cruise speed than I thought)

CLIFF REDDEN'S REPORT ON N18CR

(Cliff Redden report cont'd)

N18CR Specs:

Empty wt. 949lbs.  
Gross wt. 1550lbs.  
Engine 0320 E2A, 150 Hp.  
Prop Hendrickson 68 x 72

N18CR has a full gyro panel, an Edo 360 Navcom, a Genave transponder, and an STS C110 Loran. In addition to the usual rear canopy vent, "ankle level" vents are provided. The plane is painted white, and is trimmed in blue. It has the standard body and standard wing with the Sunderland airfoil. The pitot tube is under the left outer wing, the static ports are located on each side of aft fuselage.

The engine will over rev in level flight with this prop at 3000' msl. Flight performance is 140 kts./2450 rpm, 150 kts./2700 rpm. This prop does not have enough pitch for this engine-plane combination. I have a Pacesetter 200 prop ordered, (should be here in December) which should match the engine better.

→ The Sunderland airfoil sure does its stuff on the low end. I have slow flew at 55kts with full flaps, making 15 degree banking turns, without it stalling. It stalls a little below 50 kts with full flaps.

(NOTICE KTS, NOT MPH)

Every time I fly the T-18, it makes my day! It sure is a sweet flying airplane. All the local pilots really like this little plane. Now if only I can get a couple of these guys started building their own T-18!

Thank you, Dick, for your dedication to the newsletter. I don't think I could have built this plane without it. Thanks to all you T-18ers out there for all your ideas and help.

Sincerely,

*Cliff Redden*

Thanks a million, Cliff, for an excellent report. We'll be looking forward to seeing you and your new bird at Arrowhead and also at OSH. You and Jim Paine should enjoy the formation flights together.  
(See foto of Cliff's beauty this issue).

STANDARD DISCLAIMER: Since I have a small blank spot on this page I'll use it to advise our readers, new and old, that all past, present, and future newsletters of the T-18/S-18 Builders and Owners Association (formerly known as the T-18 Mutual Aid Society) that we would make you aware that these newsletters and/or video tapes we issue are ONLY presented as a clearing house for ideas, opinions, and personal experiences of both our members and non-members in both building and flying the T-18 or S-18 or any of its derivatives and anyone using these ideas, opinions, or experiences do so at their own discretion and risk and no liability is implied or assumed.

ED. (Now here's a subject that a lot of have thought about when it came to start in building your ailerons and flaps. Many factory built airplanes use a bent up trailing edge, so many ask, "Why not the T-18?" Remember, the T-18 was designed to make maximum use of Matched Hole Tooling for the beginner builder. Several builders have gone this route with no problems, so you might consider it a viable option).

February 10, 1988

T-18 Builders and Owners Association  
10529 Somerton  
Dallas, Texas 75229

Dear Dick:

I've been working on my S-18 about a year now, and I'd like to share a couple of ideas with you.

I started building ailerons first, and I thought that I would try to make them with single-piece aileron skins. Somewhere I read that this could be done if one had access to a good bending brake. I don't have one of those, but of course I had to try it anyway. I made up sort of a homemade thing that "kind of" worked. After scrapping the first two skins I realized that it was necessary to become more resourceful. The problem was that I would get considerable curvature in the trailing edge. The cure for this was to bend the skin only about 20 degrees at first, then take the skin out of the brake and reverse it in the brake. In other words, the skin is put back into the brake and clamped on the half of the skin that was outside of the brake during the first bending operation. Then the skin is bent another 20 degrees or so. Then take it out, reverse and reclamp and bend a little more. I kept doing this until I got past the 90 degree point, and then I just finished the bend. I don't recommend using the matched hole system when making one piece skins. I cut out my skin blanks oversized, bent them, then trimmed them to size. Mine came out reasonably straight.

The next thing I did was build the outer wings, starting with the spars. I got my spar caps really straight by using the following method. Locate the top spar cap on the spar web in the approximate position and clamp. Do the same with bottom cap. Support the whole works on a 2 X 6 that you've sawed down to about 5" wide. Now drive two nails into your work table about 7' apart, and tie a piece of black nylon fishing line to the nails. Pull the line tight. About 15 pound test line works good. Slide the spar assembly close to the line, but don't touch it. Measure from the spar cap to the line with a good steel rule. Adjust the spar cap until several measurements along the length of the spar produce the same reading. Of course, you will have several clamps along the length of the spar cap. See the sketch below. One final

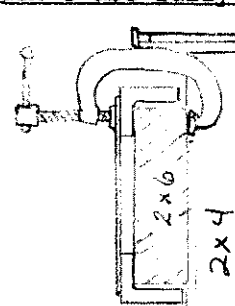
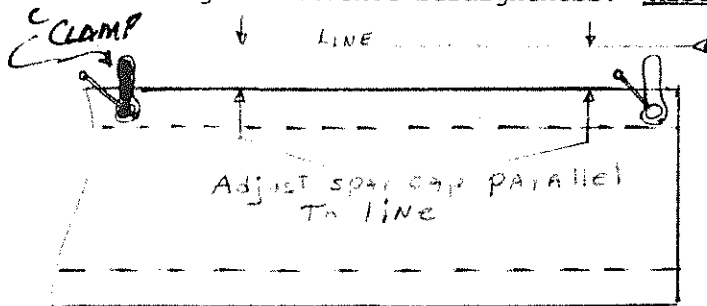
NEXT PAGE

DICK PURDUE'S TIPS ON SPAR CAPS & ONE PIECE AILERON SKINS

(Dick Purdue's letter, cont'd) ..... (Ed. note) We have often pointed out that there are always several ways to build components of the T-18 and one of the functions of a newsletter is to present several ways to do things. When you excuse yourself from writing a report on something you built on the grounds that it wasn't anything especially new....remember how thirsty you were for ANY kind of info when you started, even knowing where to start would help. Surely you can come up with some little story on some component, can't you? WE NEED YOUR STORY TO KEEP THE NL ALIVE!

Page 2

word-this works if you measure vertically, looking down at the string. If someone were to do this looking horizontally, the slight sag in the line might influence straightness. Also, don't use fuzzy, white string.



HOW DID YOU  
DO THIS?

TABLE TOP

I've really gotten a lot out of the previous newsletters, and I've enjoyed meeting several of you T-18 folks.

Keep on Riveting,

Dick

Dick Purdue

DP/cp

Dick Purdue  
RR 1 Box 223  
Byron, MN 55920

Thanks, Dick, for your excellent report. Maybe it will galvanize someone else into writing action. I also appreciate your typing it up so neatly and leaving the L hand margin. It certainly makes my job easier, as all I have to do is type in the top line on the page and use it as is. I also appreciated your drawing a front and side view for clarity.

The next four pages are from Paul Shifflett. This is an account of his building of an electric trim system for the stabilator...plus a couple of tips on riveting and plexiglas. Take note, too, on how he has done the mod on a Piper brake cylinder to conform to Thorp's drawing for arc of travel, height, etc. Here's another area that confronts everyone, so how about a story of how YOU did it and with what result?

DICK PURDUE'S LETTER PG 2

NEXT 4 PGS.

Paul R. Shifflett Rt 2 Ex 44, Earlham, Ia 50072  
515-758-2621

Nov. 17, 1987

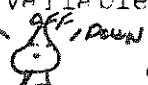
Dear Dick; We certainly enjoyed the Texoma get-to-gether, particularly the T-18 rides in the planes of Jim French and Bob Ebe. My last such ride had been about 10 years ago. I am sending you the pictures and ~~re~~ negatives of my elevator trim system and instrument panel as I had promised. The electric trim uses a Herbach and Rademan, Q5658 gear reduction motor which turns 16 RPM at 21 inch-pounds full load torque. The electric drive maybe clutched out (not part of the motor unit) by a small tab protruding from the top surface of the front tunnel. Manual trim may then be accomplished by rotating the trim wheel which also protrudes above the top surface just aft of the clutch tab. This wheel is actually a shallow (about 5/16" deep) cup, with axis fore and aft, which contains a multiple disc assembly similar to that described in NL 56 pgs 15B & 16A by Harry Wheeler. The Q5658 trim reduction gear motor is also the same unit used with the trim system described by Mr. Wheeler. - - - Full trim range between up and down limit switch operation is 5-7/16 turns and this total range may be reduced or shifted in 1/16 turn increments by relocating either one or both of two screws threaded into the outer rim of the trim wheel. These two screws go into two of 16 equally spaced tapped holes and serve to set the upper and lower trim limits. The two limit setting screws are about 5/16" long, whereas the other 14 holes retain short screws which are not long enough to engage the internal revolution limiting discs. All sixteen screw heads protruding from the rim surface of the Trim wheel aid in manually thumbing the trim wheel and counting trim turn increments by feel. - - - Also in electric drive this wheel turns and works as a visual monitor of trim changes. - - - For fine trim adjustment where there maybe an uncertainty as to just when to Toggle Off, the electric drive maybe clutched out and trim adjusted manually. Note: my latest flyer from Herbach & Rademan is just two years old. That issue still illustrated the Q5658 motor at \$25 each.

ANOTHER TRIM SUEJECT: Several T-18ers with electric elevator trim have commented on the on the irritation of having to Toggle back and forth between up and down switch positions in order to get trim set correctly. Earing a backlash problem, the difficulty is most likely due to coasting of the motor after the Toggle switch goes OFF. The best solution would be to be able to slow down the drive motor to a very SLOW speed. However easy means of doing this, particularly by inserting a resistor in series with the motor seriously reduces motor torque and the motor is apt to stall. If AC were available a variable speed control like on an electric drill would do the job. Such a motor retains full torque at the very low speeds. Another solution is to brake the motor to stop coasting over-run, by wiring in a resistor that is shorted across the motor input only when the motor is off. This is called dynamic braking and works because the motor is a generator when turning with no applied voltage, and will stop more quickly if an electrical load is placed across the motor input terminals. The smaller such a resistor the faster the motor will stop. Actually a wired in short circuit is fine as long as the operating switch contacts don't stick. This is unlikely with such a small motor (generator)\*\*\*.

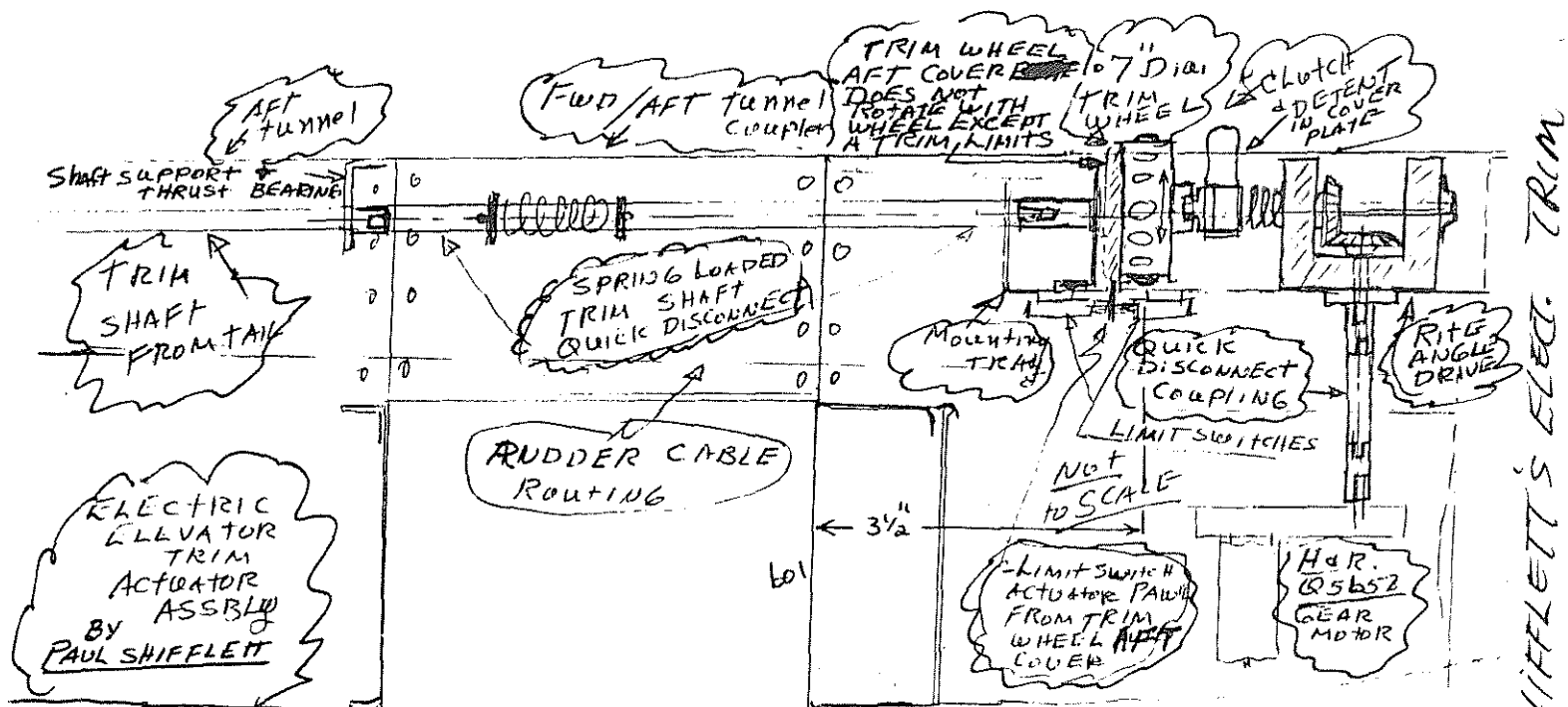
I believe the switching of the motor and resistor would most simply be done by a SPDT relay in conjunction with a DPDT toggle switch - - - ON - Center OFF-ON. The relay and resistor would be wired as shown on attached sheet. Alternatively, to avoid using a relay, and if panel space is available, a 3 pole, three position rotary switch would do the job. UP OFF DOWN A single 12 segment wafer ~~switch~~ with a momentary ON- combination that would work. See attached sheet for schematic.

PAUL SHIFFLETT'S ELECTRIC ELEVATOR TRIM

NOT BUILT -  
NOT TRIED WITH  
Q5658 Gen motor -  
SUGGESTION ONLY

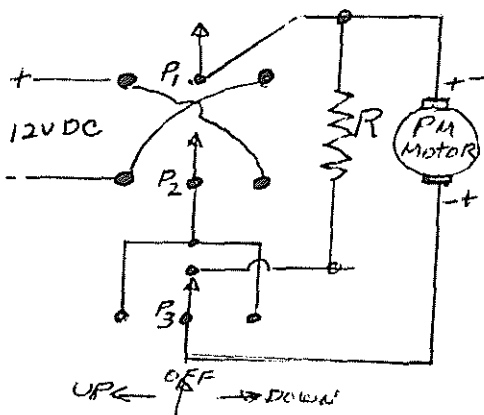






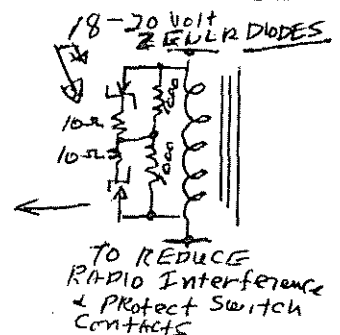
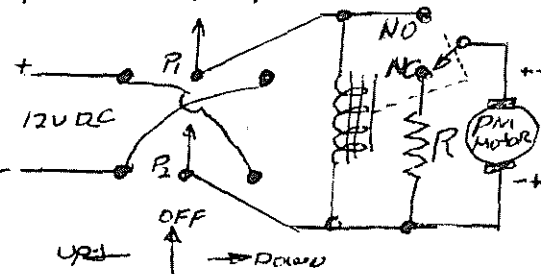
AS SUGGESTION ONLY

NOTE: BRAKING CIRCUITS BELOW HAVE NOT BEEN TRIED WITH MOTOR Q5658



DYNAMIC BRAKING CKT without  
RELAY, USES ROTARY 3POS.  
WAFFER SWITCH - 12 Segment,  
3 POLE, ON - ON - ON  
Momentary

TRIM MOTOR DYNAMIC BRAKING CKT



TO REDUCE  
RADIO INTERFERENCE  
& PROTECT SWITCH  
CONTACTS

\*\*\*Choosing value of R; The initial switch or relay contact current for R equal to 0, (a piece of wire) can be determined to not exceed the motor input current with the armature stalled or locked so it can't turn. For a small motor with a relatively high internal resistance the momentary surge of current through the switch or relay contacts during motor braking should not stick the contacts or damage them. However this depends of course on the switch or relay used. Check the Mfg rating relative to the stalled current. \*BE CAREFUL - DON'T BURN MOTOR OUT IN THIS TEST.

REF: SKETCH ABOVE

A pair of Zener diodes connected back to back and shunting the relay may be necessary to prevent switch arcing. This will slow the opening of the relay. Also protects radio equipment.

Q5658 specifications:

WEIGHT - 1#-1/23

Output shaft 1/4" D x 3/4" L

.22" flat.

gear box 2.85"x3"x1.125"

Motor 2-5/8" L x 1-7/16" D

gear box die cast zinc alloy

12 VDC .5A no load

.8A full load

22 rpm no load

16 " &amp; full load of

21 Inch- Lbs

Starting Torque 75

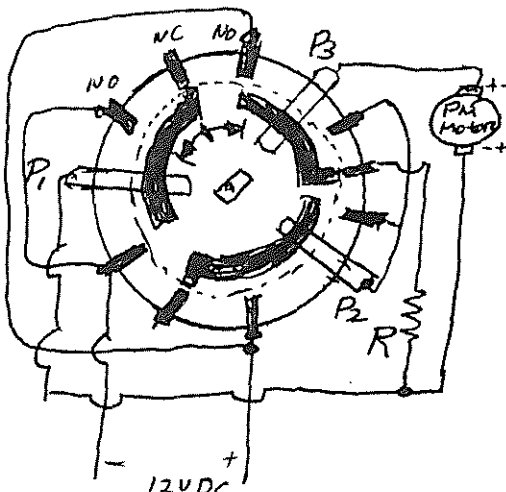
Inch- Lbs

Herbach &amp; Rademan, 401 East Erie Ave, Phil., Pa. 19134

DEC 85 PRICE \$25 ea

215-426-1708

CIRCUIT DIAGRAMS - PAUL SHIFFLETT'S ELEC. TRIM



FROM:

Paul R. Shifflett, Rt 2 Box 44, Earlham, Iowa 50072 ; 515-758-2621

**RIVETING TIP;** This may have appeared in the newsletters before this. If so, I believe it worth repeating. To obtain flush contact between sheet material of small pieces when riveting - - to avoid a gap between riveted pieces - - when necessary. I place a rubber washer, or washers, over the shank of the rivet. The washers should be thicker than the protruding length of the rivet shank; enough to firmly hold the riveted pieces together when the rubber is compressed down to the end of the rivet shank. by the bucking bar or rivet set as the case may be. Riveting proceeds in two stages. (1) With washers in place, drive rivet enough so that the swollen rivet shank holds the pieces firmly together. (2) Remove the washers and complete the riveting. I use a leather punch to punch holes in sheet rubber of various thicknesses. I keep the washers in my tool box and use them regularly. It works great. Especially with a rivet squeezer.

**PLEXIGLASS:** Excellent product literature by Rohm and Haas, manufacturers of plexiglass sheet.

PL-7N Cementing Plexiglass

PL-3L Machining "

PL-10K Annealing "

I walked in and picked up these

items for free from Read Plastics

12331 Wilkins Ave, Rockville, Md

301-881-7900

20852

Regional sales offices are at;

Independence Mall West, Phil, Pa. 19105 215-592-3000

5750W. Jarvis Ave. (Niles), Chicago, Ill 60648 312-592-9100

4585 Simontree Rd., Dallas, Tx 75234 214-233-1021

1920 S. Tubeway Ave., Los Angeles, Ca 90022 213-722-5434

Offices also in Atlanta, Detroit, Elmwood Park, NJ, And West Hill Ontario

PL-7N is a prime source of information

on how to do it, for fabrication and

repairs. Covers application of both

solvent type and polymerizable cements.

Polymerizable cements can be used as a

filler of a void - - Cures into an acrylic

To repair a crack you don't contact

cement it; you open the crack up into

a "V" joint with a file and fill the V.

READ PLASTICS  
STOCKS THE  
VARIOUS CEMENTS

## RUDDER MODIFICATION

A note from Ken Knowles following the last newsletter indicated that all the rudder skins he had sold were from patterns transferred directly from John Thorp's own templates. It would appear from this information that John himself reacted to his own observations concerning the ample size of the T-18 Rudder and possibly reduced it himself.

SO DON'T FRET IF IT DOESN'T CONFORM TO THE DWG.

## CONSTANT SPEED PROP AND SPINNER

The beautiful spinner supplied by Ken Brock for use with the Hartzell constant speed propeller comes without filler pieces to install behind the blades. The necessary information to build these (2) filler sections are enclosed in this newsletter in the form of full size templates. It would be wise to leave a little excess metal on the dash 1 and dash 2 pieces and then trim after assembly so both filler pieces weigh the same. An electronic postage scale or triple beam laboratory balance should be used for this final weighing step.

URN  
TO  
PAGE  
16  
FOR  
DWG.

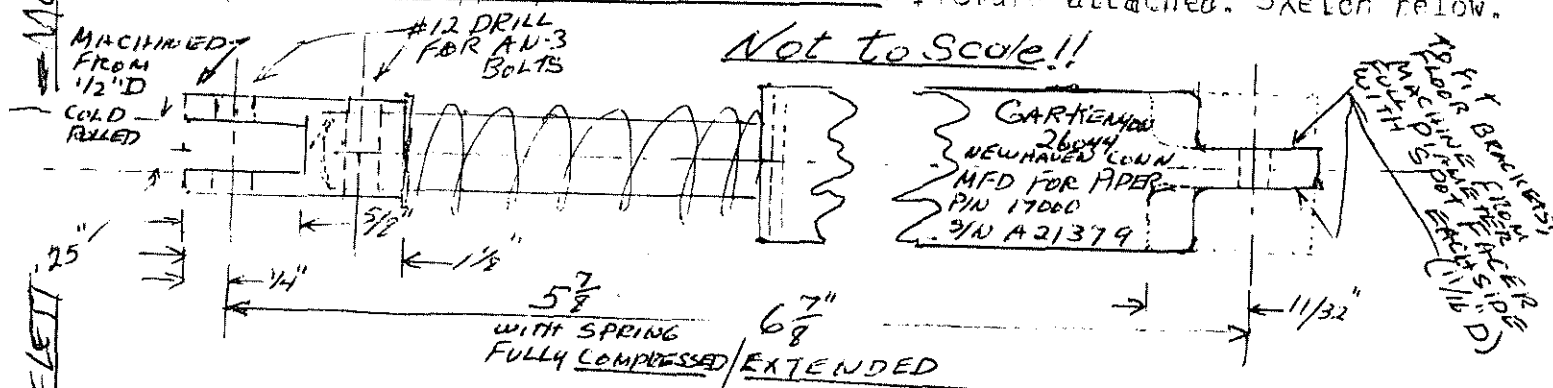
BY JOHN WALTON

Paul R. Shifflett, Rt #2 Box 44 Earlham, Ia 50072 515-758-2621

Selecting & modifying substitute brake cylinders. - Having bought Rosenhan cylinders as being a correct and satisfactory replacement for the Thorn specified cylinder I decided I preferred something more substantial (no prejudice intended). Substituting another brake cylinder requires comparison of piston diameters and travel. Simply equating displacements is not necessarily adequate. A smaller piston diameter will require a longer brake pedal travel for same braking action and will result in a softer pedal. The relative actions are in proportion to the ratio of the piston areas of the original & replacement cylinders.

The cylinder I am using is made by GAR-Kenyon and is labeled as #26044, with PIPER p/n 17000. I bought a pair newly removed from newly delivered Piper training aircraft. (Evidently the operator didn't want dual brakes in his training planes). The piston diameter is 1/16" larger than the Rosenhan units and so will require less pedal travel but more pedal pressure for equivalent braking. The shaft was too long to match Thorn mounting specs of 6-7/8". Not sure of this dimension now, but anyway I cut the piston rod off and made a coupler as shown, giving a 6-7/8" dimension from the center of the lower cylinder attachment hole to the extended position of the coupler pedal attachment hole.

This permits no adjustment of the brake pedals. I preferred doing it this way rather than threading the piston rod. I feared damaging the shaft finish. If I want to change the brake pedal position I will make new couplers with appropriate dimensions. Picture attached. Sketch below.



Paul, we are indeed grateful for your input on these subjects and for your bringing the instrument panel, electric trim, and bucking bar to the Texhoma event. We hope to see you again at Arrowhead and thank you again in person. Now if we had a couple of dozen more like you.....

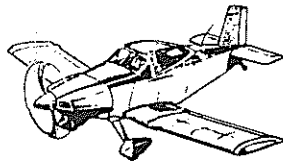
As you may have suspected, Paul is an engineer (E.E.) and worked at the U.S. Navy Testing Lab for quite a few years before retiring to his old boyhood home a few miles west of Des Moines. We all have to admire the professional way that he goes about every phase of his project. I also well know that his airplane will have no peer for technical accuracy when it is complete.

I had intended to re-type Paul's report, but I am knocking my brains out to hurry up and get this NL in the mail, because of the urgency of getting letters in on the NPRM and also to get the latest info in on our Arrowhead reunion. I am such a slow typer (I use two fingers on each hand).

MODIFYING BRAKE CYLINDERS - KUDOS TO PAUL SHIFFLETT

## TEMPERFOAM - SUNMATE

JIM FIX  
3710 AIR PARK ROAD  
LINCOLN, NEBRASKA 68524  
(402) 470-2346



HARLO MCKINTY  
1310 IDYLWILD DRIVE  
LINCOLN, NEBRASKA 68503  
(402) 464-0570

#1152

Dear Dick:

Your constant reminder for us to send you comments for the newsletter pricked my conscience, so I'll send a few of the things that may be of thought to other builders. Lord knows that I've sure been helped by the ideas and all the help from Lu Sunderland, John Schinn, John Walton, Paul Kirik, George Lieder, Peter Hodgens, LeRoy Holt, Chris Fast, John Kleber, Frank Snediker, and many others. I've been plugging away, two nights a week for the most part all this time, but it should get airborne this fall. It was a ride with Al Nuntoufel (sp?) that got me hooked in 1974. I really enjoyed Texoma; I appreciated it as a builder more than Oshkosh (that may be heresy).

I had the earlier wide body T-18 and the canopy frame from Ken Knowles, so I had the wide skirt. The zippy-do grinder at high speed as GB recommended worked fine. I bedded all the canopy attach points with G. E. Silicone and sealed it with that, too. I did put in dual brakes, as Paul Kirik suggested, and a parking brake valve mounted in the center, left of midline with a choke cable control running over the top and back of the tank sheathed in plastic tubing. Heavy maybe, but it won't wear into the tank.

I lowered and rounded the tunnel with a 3" aluminum pipe, opened up and supported by .063 2024 on the sides, with 3/4 X 3/4 063 on the bottom running clear through to the first frame aft of 598. This also serves as the support for GM tailgate motor and sector gear for the electric flaps as Paul Kirik and Bob Dial have proposed. It also serves as a support for the baggage compartment floor. This really lowers the tunnel; I could have a bench seat were it not for standing on the tunnel getting in and out. I out-boarded the rudder pedals and put little pulleys forward of 601, and fairleads elsewhere, like Bob Dial had in the previous N.L.

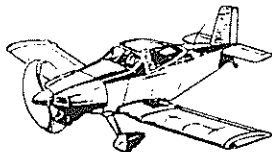
To help on the C.G., I put my ADF antenna, ELT (Pointer), marker beacon receiver and glide slope receiver and blind encoder aft of the baggage compartment, opposite of the battery. The wing leveler gyro is on the back of 592, and the bellows are under the seats, with cables running to the middle to pulleys where they tie into the walking beam assembly.

I used lawn chair tubing for my seat bottom supports as Lu Sunderland recommended and hinged them at the front to tip up for access underneath. I kept the backs separate and fastened the shoulder harness to the top of seat backs so that the straps don't cut into the neck. I used 1/4" plywood for the seat bottoms, reinforced with nylon webbing and a strip of .063 3/4 X 3/4. In the event of a pancake crash, I want the seat to deform. I did use 3" of Temperfoam on top of the 1/4" plywood. I also used 1/4" plywood in the backrest with a structural foam periphery for shape, covered with one layer of fiberglass cloth on one side with only one inch of Sunmate. The back pops in and out like Peter Hodgens' to give full

HARLO MCKINTY'S REPORT Pg. 1

## TEMPERFOAM - SUNMATE

JIM FIX  
3710 AIR PARK ROAD  
LINCOLN, NEBRASKA 68524  
(402) 470-2346



HARLO MCKINTY  
1310 IDYLWILD DRIVE  
LINCOLN, NEBRASKA 68503  
(402) 464-0570

HARLO MCKINTY'S REPORT - Pg. II

access to the baggage compartment. I used chair floor caster balled rods (male) in the seat backs and the female part on the back of 598.

The one Navcom antennae I mounted under the seat, and a Loran (Narco 820) also under the seat on the opposite side, bent of course. The transponder antenna is forward, 4" back of the firewall, just right of midline.

I used a scupper shield around the gas tank with a floor drain. I used a racing car gas cap (automotive) that should not come off. I sealed the scupper to the foreskin with rubber and proseal. I also wet the wings as you had previously written in the N.L.; all 4 bays in the outer wing panels, using .032 skin and ribs. It was really a job, sealing those wings. It took an extra four months, the way I work.(slow) I fastened the tie downs out near the tips--recessed screw in cast ring. I fastened in the upholstery with velcro.

I started the engine the other day with the windshield out and I sure felt like a hood ornament. Checked all the gauges, cycled the prop, etc. I only ran it up to 1300 to check. I'd cleaned out the preservative oil in Clardy's engine with Marvel Mystery Oil, setting overnight. It was a thrill just to know the engine would even fire up. I'll send you a report after I finish up a few things and get some time on the engine. Paul Kirik is coming over next month to go over everything with a critical eye before I rivet in the front belly skin and put on the gap covers like LeRoy Holts'. With all these added goodies, I may be overgrossed before I get in it, but I keep telling myself that Paul White got Kong off the ground.

This should be a long enough letter, Dick; chop it off or edit any way you see fit.

Best regards,  
Harlo

Thanks again, Harlo, for this report and the one you did in #68NL. We do appreciate your efforts.

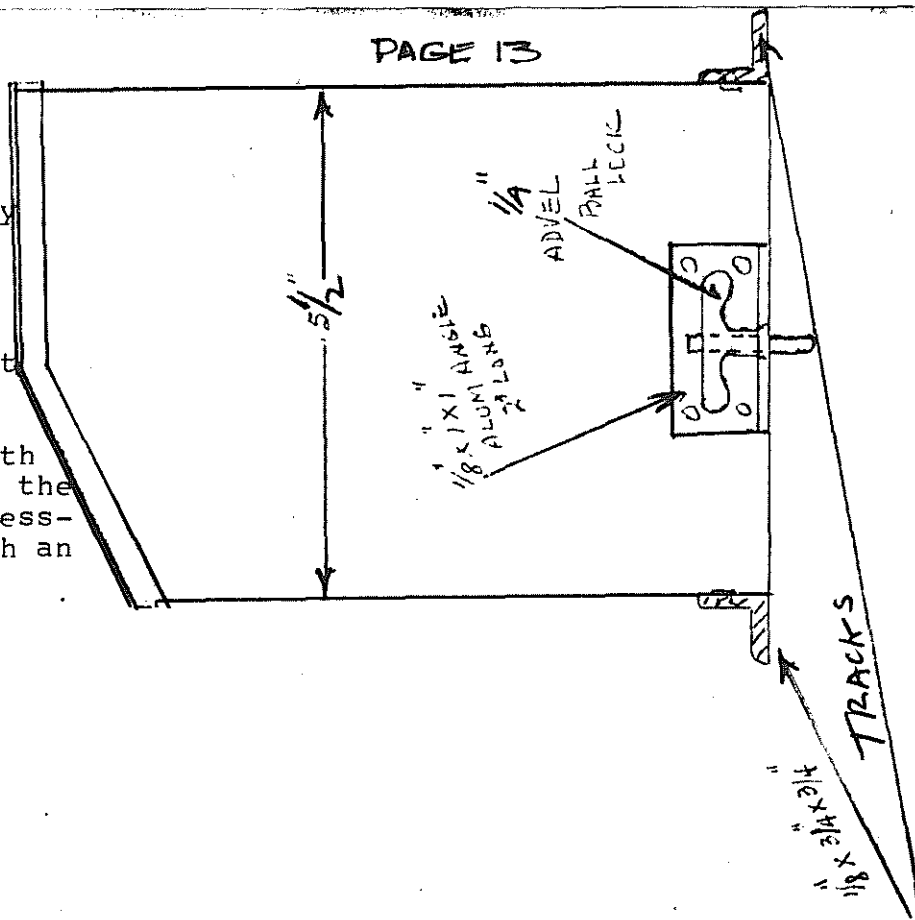
I am especially grateful to Harlo for getting me started on a serious weight loss program. He told me about the success he had had on a program that is called "Medifast" and some other similar names. It is medically administered and supervised. Harlo has lost 85 lbs. in a six month period and is now close to his ideal weight. His diet was 5 glasses a day of a liquid formula (500 cals), but my Dr. has me eat 3 tiny meals per day, with an additional 3 glasses of formula between meals, because of my 72 years and being a diabetic, but I get about 700 cals per day out of it. I'm happy to say that I've peeled off 15 lbs. in the month I've been on it, lost 2" in my waist, and brought my blood sugar consistently down in the low normal range with a big reduction in the insulin used. They project I'll be about 50 lbs. lighter come OSH time and be off insulin completely, with a real possibility that I'll be able to get my medical back! Needless to say, I am ecstatic!



T-18 NEWSLETTER #69

page 13

The next 3 pages are drawings by Karl Lipscomb of his sliding track batt'y box for N83MK. These are excellent drawings and we thank Karl sincerely for the time and accuracy he put in. I've seen it and it works very well. Karl says the only drawback to it is that it would interfere with rudder cables running down the side. It's also easily accessible for jump starting with an aux battery in cold wx.

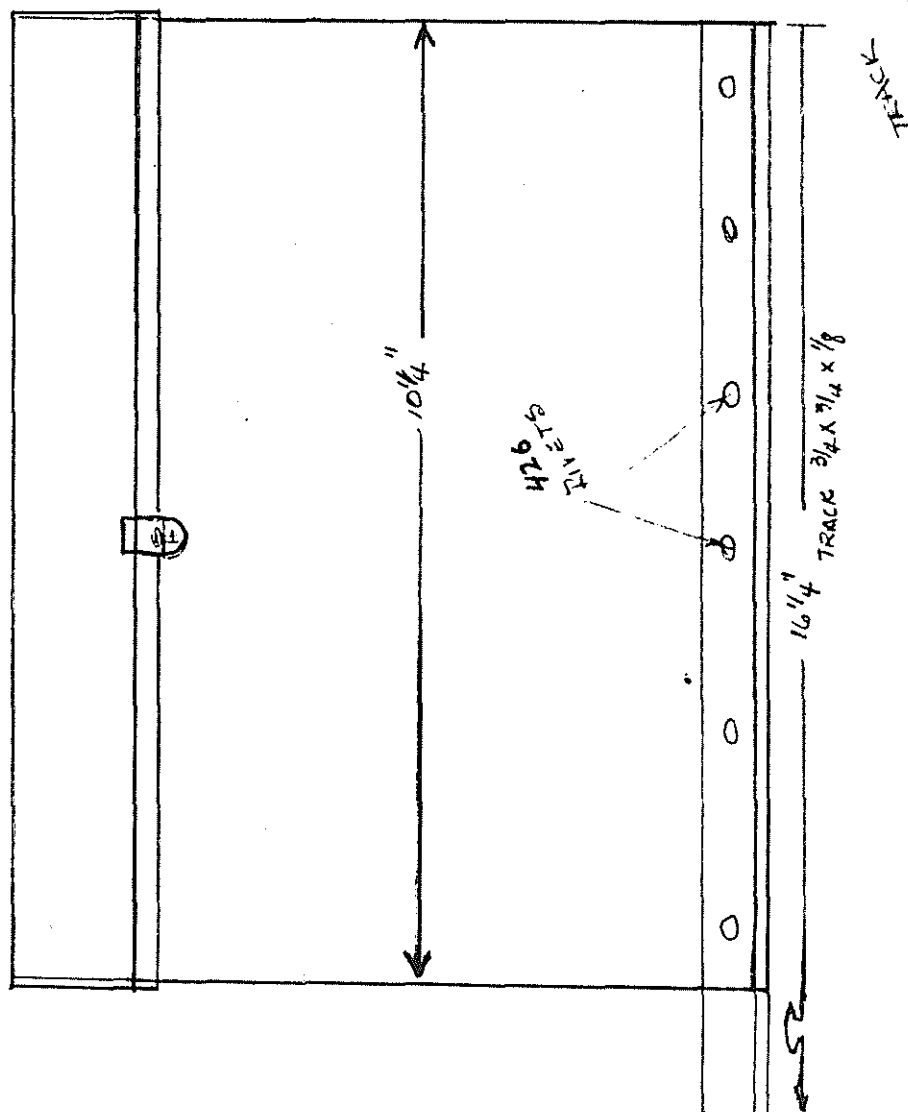


SLIDING TRACK FOR BATTERY BOX

WILL THORP T-18

Y  
Z  
W  
U  
X

Karl has built an external access cover in the right side of the fuselage just aft of station 119.0, with this access cover removed, the withdrawal of a 1/4" ball-lock is the only step required to enable the battery / battery box assembly to be slid outboard for servicing. A neat idea, eliminating all the hassle of working back inside the cockpit to service the battery.



1 RIVETLINE

SLIDING TRACK FOR  
BATTERY ACCESS IN  
THORP T-18

PAGE 2 OF 3  
NB3MK

FORE

STA  
139.0

DOUBLER

MOUNT ON  
STAR BATTERY SIDE

T-18 NEWSLETTER #19

PAGE 14

2" X 2" SQUARE ALUM TUBE

WL 42 →

1" FLUSH RIVET  
FOR DOUBLER

NOT TO  
SCALE

PG. 14

8  
CAMLOC  
FASTENERS

DOUBLER - .040" OF  
.032" AL

STA  
119.0

1" X 1" X 1/8" ALUM  
FLOOR  
ACCESS HOLE  
TO REACH BOLT  
TO BEAM IN 2 PCS

1" X 1" X 1/8" ALUM  
ANGLE  
TIES TO 2" X 2"  
BOTH 2" X 2"  
TUBES

1" X 1" X 1/8" ANGLE  
APPROX 1/8" AL OR .003" H190

BOTTOM LONGERON

SLIDING BATTERY BOX - OUTSIDE ACCESS - KARL LIPSCOMB

FOR

THORP T-18CIN

NSBMK

PAGE 3 OF 3

NOTE: DIMENSIONS  
MAY HAVE TO BE  
CHANGED TO SUIT THOSE  
OF YOUR BATTERY BOX

DOUBLE

OUTSIDE  
SKIN

NOT TO  
SCALE

STOP  $\frac{1}{8} \times \frac{3}{4} \times \frac{3}{4}$   
AL. ANGLE APPROX.  
 $1\frac{1}{2}$ " LONG

BATTERY BOX  
(LOOKING FORWARD)

TAPER, IF DESIRED

$\frac{1}{8} \times \frac{3}{4} \times \frac{3}{4}$   
ALUM ANGLE  
2 PC 16 1/2" LONG

SUPPORTS: .003" H130

2 REQ'D

BOTTOM SKIN

BOLT-LOCK

8-32 BOLT  
TO TAB PER  
THORP OR ANGLE

$\frac{3}{4} \times \frac{3}{4}$   
LONGER FOR

2" X 2"  
ALUM SQUARE  
TUBE

SUPPORT  
FOR FLOOR

2 PCS



DRILL W/ #20 AND  
RIVET K2000-8  
NUT PLATE TO  
INSIDE.

① .040" 6061 Al.

DRILL W/ #40 FOR  
3/32" AN 426 RIVETS (3)

.040" ALUMINUM  
- OR -

SCRAP OF K-BROCK  
SPINNER!

DRILL W/ #40, COUNTER  
SINK FOR AN 426-AD3  
RIVETS TO ATTACH ① ②

DRILL W/ #20  
FOR NO. 8 OVAL  
HD. MACH. SCREWS (2)

Here's still another  
goodie from John Walton.  
Again we are in debt to John  
for his continuing contribut-  
ions to the NL and the organiz'n.  
Thanks again, John, old friend.

DRILL W/ #20 AND  
RIVET K1000-8  
NUT PLATE TO INSIDE

DRILL W/ #40 FOR  
3/32" AN 426 RIVETS (2)

MATERIAL: .040" 6061 T4 ALUMINUM  
TWO (2) EA. REQ'D

K. BROCK SPINNER FILL-IN  
FOR C/S PROPELLER.

FROM  
JOHN G WALTON  
5726 BOYCE SPRINGS DR.  
HOUSTON, TEXAS 77066

12/15/86

TRACED FROM FULL-SIZE PATTERN

FULL SIZE TEMPLATES

## FROM THE RV-3/4 NL.

## LORD MOUNT INSTALLATION:

submitted by John Walton

Procurement and installation of Lord Mounts on Dyna-Focal Engine installations in RVs is a subject which we have never researched and presented thoroughly. Just as we were finding the info sources we needed and were about to prepare a presentation, RV-4 builder John Groce, Kent, WA. sent in information and a drawing he had made resulting from the research he had done. Quoting from his letter:

"During installation of LORD Mounts #J-9613-45 (purchased from Will Neubert A/C Supply) I noticed some confusion among local builders as to the correct installation of them. #J-9613-49's are supposed to be similar, and are found on C-172's, so examining such an installation should clarify things.

The attached drawing (based on LORD drawing #5-6021) shows their recommended installation. Note that each set of mounts consists of a thick rubber mount (J-9612-8) and a thin rubber mount (J-7763-10). The key to their installation is in knowing that the J-7763-10 is stiffer rubber than the J-9612-8, and thus the J-7763-10 should be placed in compression by normal engine weight. This requires the bottom installation to be opposite in sequence from the top. Further, the J-2218-61 washers always accompany the J-7763-10 mounts. These washers are critical on the bottom mounts where they provide a flush surface for the rubber mount to fit over a tab on the engine case."

J.L. GROCE  
7/14/86

TYPICAL INSTALLATION OF  
DYNAFOCAL MOUNTING KIT

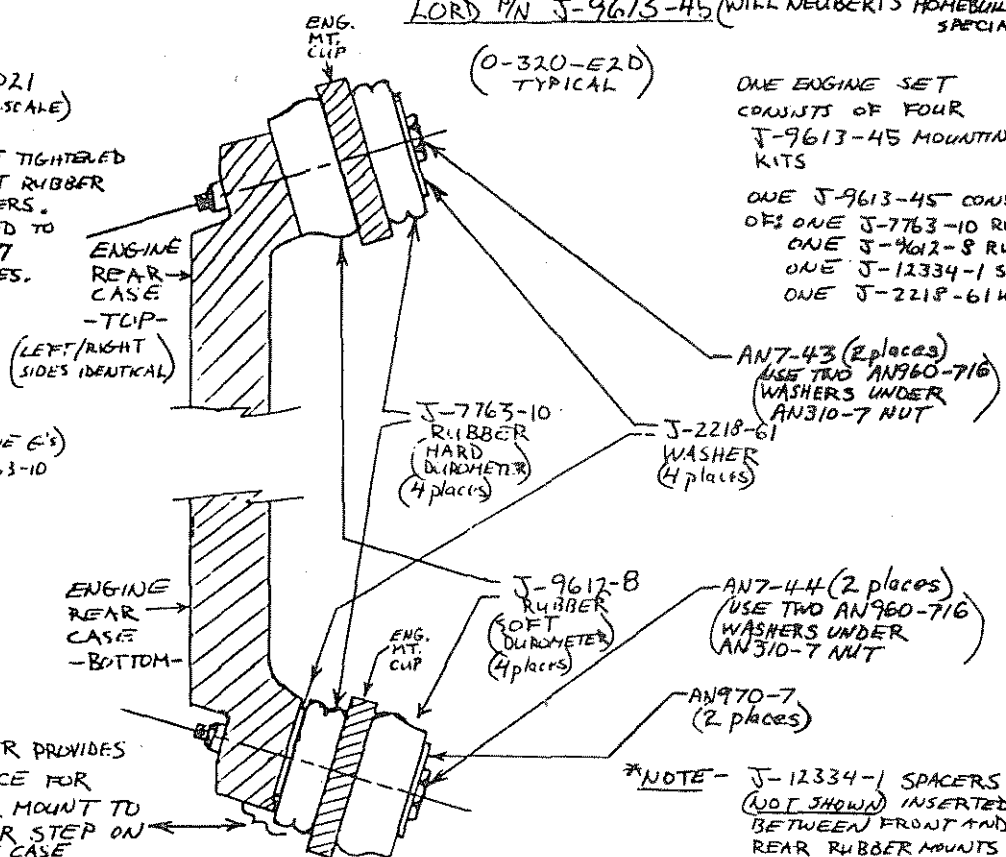
LORD P/N J-9613-45 (WILL NEUBERT'S HOMEBUILDER SPECIAL)

DATA FROM  
LORD  
DRAWING #5-6021  
(DRAWING NOT TO SCALE)

\*NOTE - BOLTS ARE TIGHTENED  
TO BOTTOM OUT RUBBER  
MTS. ON SPACERS.  
THEN TORQUED TO  
STANDARD AN7  
TORQUE VALUES.

\*NOTE WEIGHT OF  
ENGINE (POSITIVE G's)  
PLTS ALL J-7763-10  
RUBBER MTS IN  
COMPRESSION

\*NOTE - WASHER PROVIDES  
CLEARANCE FOR  
RUBBER MOUNT TO  
FIT OVER STEP ON  
ENGINE CASE



ONE ENGINE SET  
CONSISTS OF FOUR  
J-9613-45 MOUNTING  
KITS

ONE J-9613-45 CONSISTS  
OF: ONE J-7763-10 RUBBER  
ONE J-9612-8 RUBBER  
ONE J-12334-1 SPACER  
ONE J-2218-61 WASHER

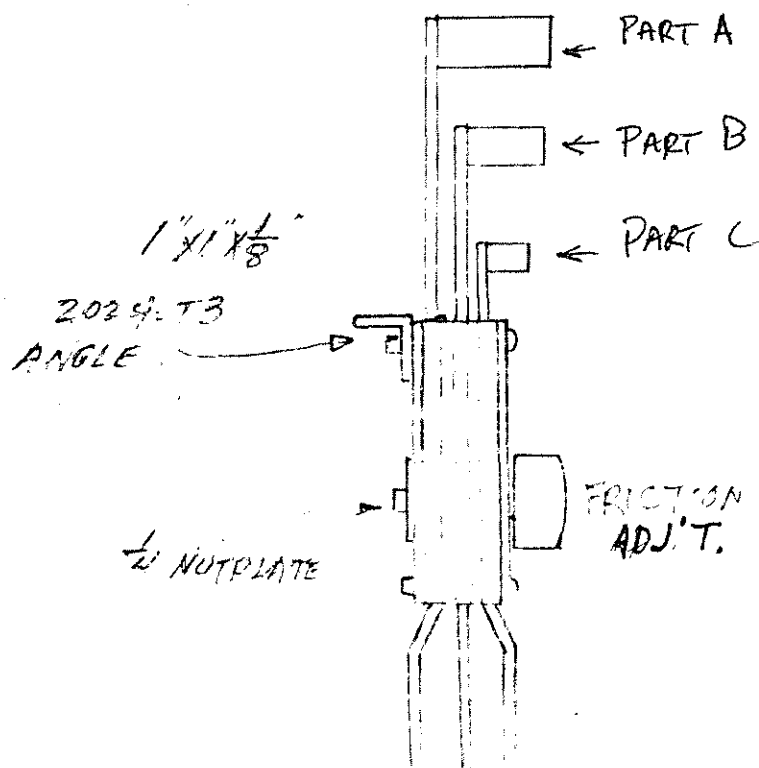
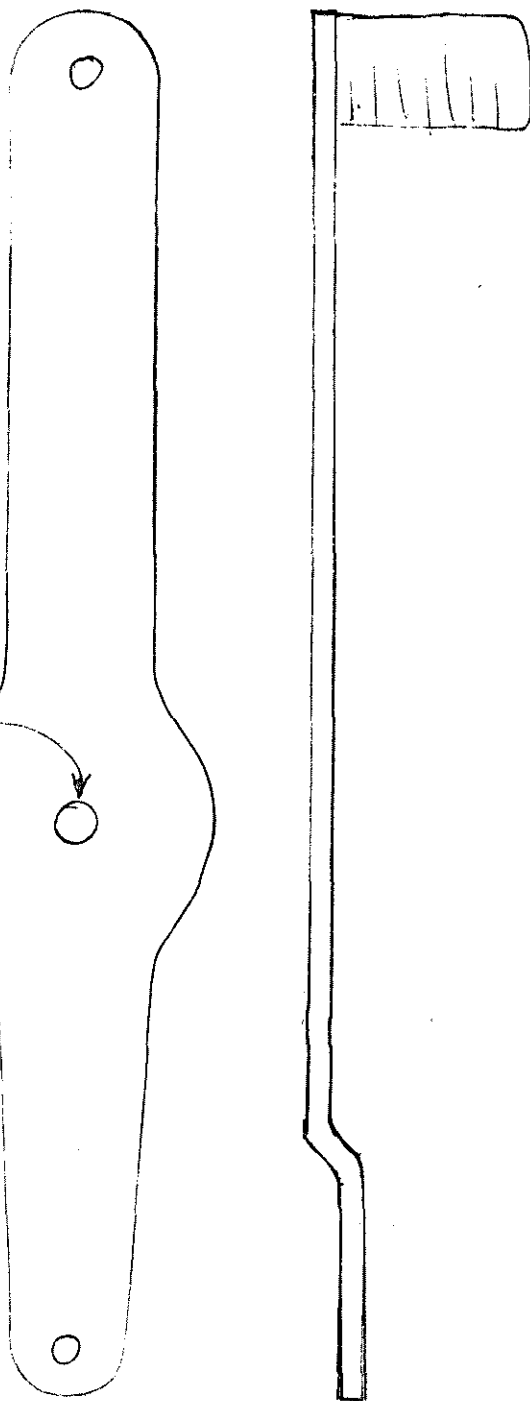
\*NOTE - J-12334-1 SPACERS  
(NOT SHOWN) INSERTED  
BETWEEN FRONT AND  
REAR RUBBER MOUNTS

LORD MOUNT INSTALLATION INFO

THE NEXT 3 pages are full size drawings of Bob Highley's throttle quadrant. Bob is a military pilot and used to the Left hand throttle and R hand stick, so some of you may also want to use this system. To have dual throttles with this method you

would need to mount a cross shaft on the firewall and have a bell crank at ea. end, plus one in the center (that would operate a shaft to the carb'r. Firewall shaft could possibly fit between gear tubes and the firewall.

.125 2024-T3



① ASSEMBLE USING 6 8-32  
X 1/4 SCREWS

② FULL SIZE

BOB HIGHLEY - T-18  
THROTTLE QUADRANT

.125 2024-73

1 ea REQUIRED

(B)

(C)

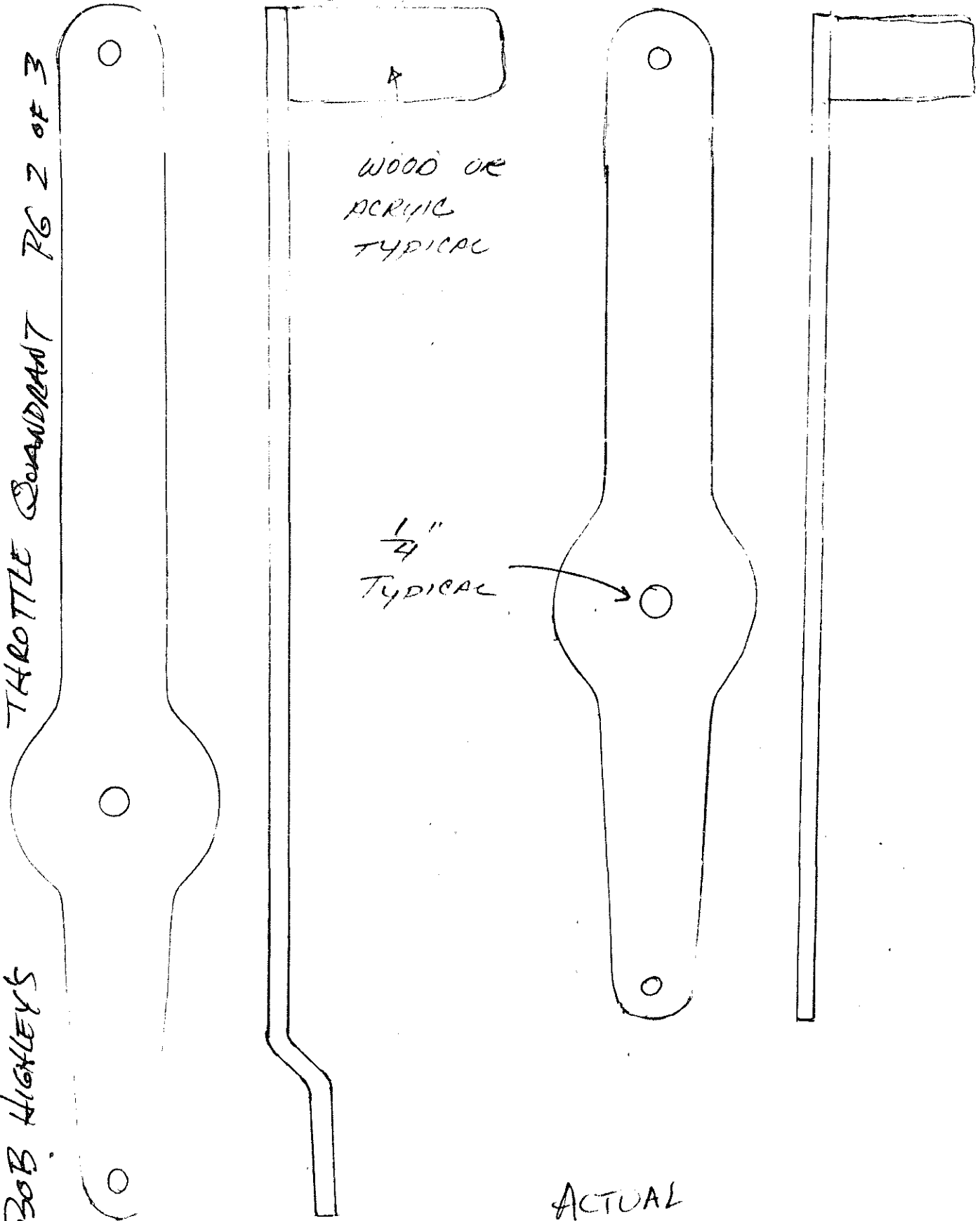
THROTTLE COUNTERPART PG 2 of 3

BOB HIGLEY'S

WOOD OR  
ACRYLIC  
TYPICAL

$\frac{1}{4}$ "  
TYPICAL

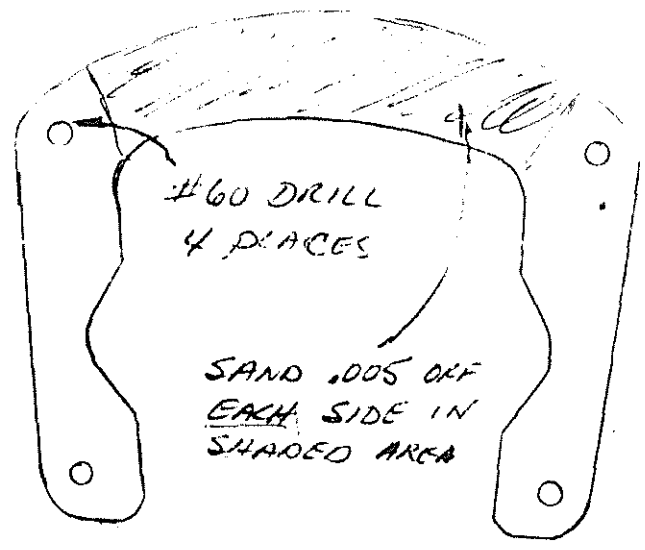
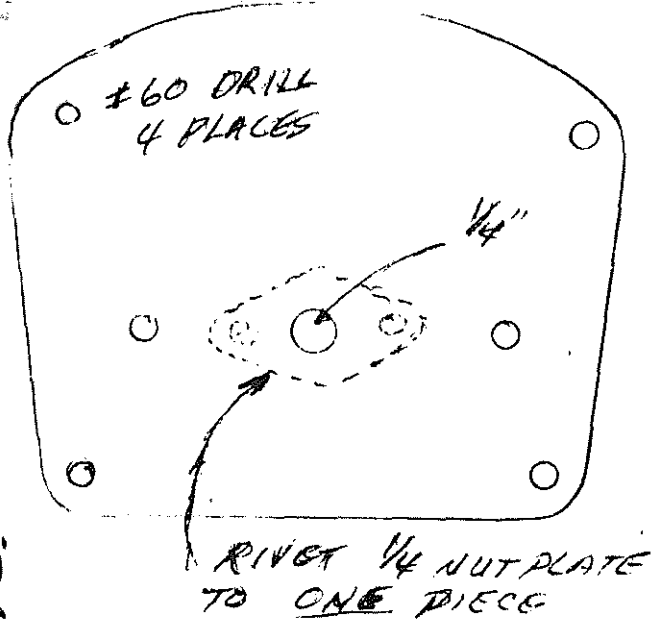
ACTUAL  
SIZE



BOB HIGLEY'S THROTTLE GEARBOX Pg. 3 OF 3

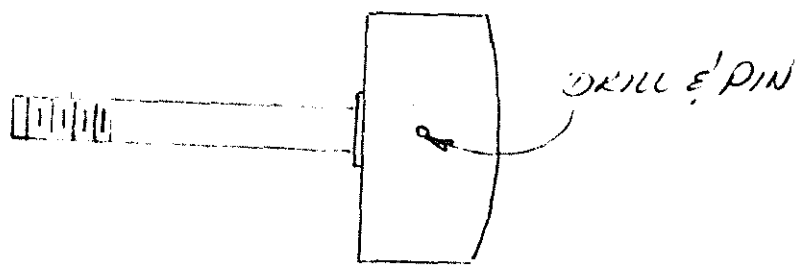
.060 2024-T3  
2 REQUIRED

.030 MICARTA  
4 REQUIRED



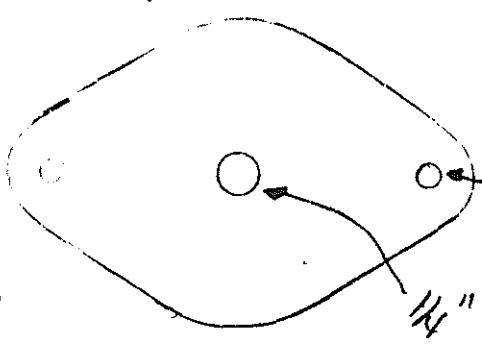
.125 2024-T3  
6 REQUIRED

#60 DRILL  
2 PLACES



AN-4 BOLT OF SUFFICIENT  
LENGTH

.030 MICARTA  
4 REQUIRED



★  
BOB, THANKS A MILLION FOR THE DRAWINGS..  
AND ALSO FOR YOUR CONTRIBUTIONS TO THE FORUMS.  
WE DO APPRECIATE !

#60 DRILL  
2 PLACES

LANDING GEAR MODIFICATION &amp; REPAIR

**LANDING GEARS:** It seems that some of the landing gears have developed cracks where the gusset plates meet the gear legs, so you may want to keep a close eye on yours when you have occasion to pull the cowl off. It is too close to the firewall on the back side to easily inspect without using a mirror and strong light. You might consider using Dye-Chek on both sides at intervals. I've only seen two cases, but both seemed to be because an inadequate amount of welding rod was fileted in. Maybe cracks wouldn't continue to spread, as they are tiny, but who knows? Why gamble? Cracks were found in all four gusset locations on Vern Peppard's airplane and he elected to replace the entire gear with one from Ken Brock (who hasn't had any of his develop cracks, he says). ...When Jim French dismantled his airplane to repaint he found cracks in his. It was an early airplane, built by John Ferko. He also found one gear leg bent backward over 2" (but never had any control problems on landing or T/O). Jim bought Vern's old gear and had a local T-18er, Bobby Collard (who has a machine shop) re-weld the gussets. We first had it annealed at a local heat treat co. We next cut it into and added the 6" long splice tube in the middle of the cross-tube, using four 5/16" bolts, as per an older newsletter. At the apex of the Vee at the top we added an .090 x 1" strap to each tube that projected forward about 3/4" from the tubes and these straps were match drilled for a 5/16" bolt. The straps were welded to the tubes. This was Jim's idea, but it seems like a good idea, even tho' it might be a belt & suspenders approach.

Before the gear was sawed in two we bolted the axle pads to a section of steel angle mounted on a 2 x 6" board as a re-assembly jig. Bobby also made a drill jig out of a length of angle iron. Don't know if you have had the occasion to drill a hole all the way thru a tube, but it isn't the easiest thing in the world to have the drill come out on the other side exactly 180° from where it started, so Bobby used the jig to locate the hole centers on the other side, drilling under size holes and reaming to size. It's a scaled down version of matched hole tooling actually. The splice tube is the next size up from the cross tube and will slide on over it with just a very minimum of sanding of the cross tube. (Sand enough to allow for the thickness of a protective paint film, tho"). .....

I think most of you are aware that it's nearly impossible to find a heat treat co. that has an oven big enough to handle the complete gear. Many, tho' can handle one half of the gear. Even more important, they can hang it from the top bolt hole and this apparently minimizes warping. Jim's two gear halves came out of heat treat with no warping at all. The axle pad holes exactly match the holes in the jig angles and the engine mount went back on like it came off. While we were doing all this Jim was making up a pair of extensions to bolt onto the gear to give him the equivalent of a gear 3" longer than standard. The gear we used was about 1.5" longer than standard, so he added the additional height to the extensions. At the same time he moved the axle center point forward a small amount, instead of projecting it downward in the same plane as the gear leg (thus moving the wheel back a bit. Jim uses 6:00x 6" wheels, with low profile tires, as he does most of his flying from a turf strip at Wimberly, TX. He hasn't flown it of this writing, but he is eagerly looking forward to having a longer gear. After he flew mine with the 3" longer gear he was sold.

To sum up, if you have occasion to take your engine off, that would be a good time to consider cutting your gear in two. It would save you a bunch of money if you ever damaged one leg of your rear and only needed to replace one side of it. Leroy Holt recently had this problem with a bent gear leg. ...We have included a couple of pictures of the rework on Jim's gear in the photo page section this issue.....

(LEROY ALSO HAD NO CONTROL PROBLEMS WITH HIS BENT GEAR)

*JAVELIN ENGINE*  
JAVELIN ENGINE ITEM: In Dave Blanton's recent NL he published a report from an independent testing lab that did a dynamometer test on his engine for HP output at various rpms. The results agreed with his own dyno tests within 1%, so this should put a stop to doubters statement that proclaim the V-6 engine won't deliver the HP Dave claims. The lab actually showed the engine put out a little MORE hp than Dave said. Incidentally there is one flying in a Glasair in Kansas City, Dave said. You'll probably see it at OSH this year.

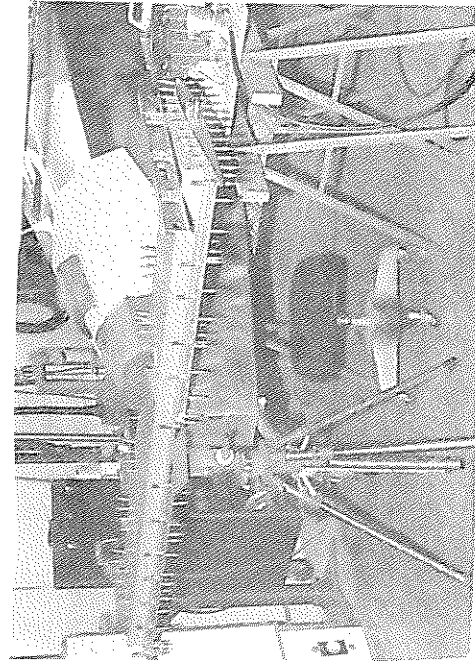
*OSH '88*  
MORE ON OSH '88: We want to make the T-18 Silver Anniversary at OSH '88 a really memorable occasion for all of you and particularly for each and everyone that flies their T-18 there. For one thing, we are going to take individual pictures of every one of you and your airplane to put in a Special OSHKOSH '88 Newsletter issue. It will be mostly foto. We will have shots of the Forum, shots of builders there that haven't completed as yet, shots of the wives, and shots of the T-18 dinner activities. We also will be doing some in-flite shots of the Parade of Flight, and maybe some air-to-air fotos, too. We would like to do a shot of each and every inst't panel, too. We are working on some kind of special souvenirs (that we can afford), so if any of you have any ideas on the subject give me a call or drop me a line. Any and all suggestions are welcome.

*REGISTRATIONS*  
REGISTRATIONS: Now youse guys that fly in....here's something i'd like to ask you to do: WHETHER YOU SUBMIT FOR JUDGING OR NOT, PLEASE FILL OUT THE REGISTRATION CARD YOU HANG ON THE PROP! We would also like for you to fill it out COMPLETELY. PLEASE PUT YOUR STREET ADDRESS & ZIP (and your home phone no. if you don't mind. One more thing:....If you want to go off and see the sights, please put a card or note INSIDE on the deck that says when you expect to be back. We can't get your picture at the a/c if you aren't there, ya know!....I also will need some help on the foto bit, since EAA will expect me to carry on with my regular interviews and such, so if any of you have a good 35 mm camera please volunteer ASAP. I'll supply the film, so all you'll have to do is shoot. We will try to again have an info table on the flite line to coordinate. Anyway, let's make this the greatest year ever for the T18 at OSH....okay?

*BOB DIAL*  
 B.C. ROEMER called me the other day to tell me Bob Dial had had more heart problems the past year, plus another problem that affected the sight in one eye, so let's give ol' Bob a call or card to let him know we're still pulling for him, hey? B.C. said the paint on his bird was getting bad, but I talked him into bringing it anyway. The idea is for them to be there in numbers this year and if they look like the owners had used them, so much the better. (Bob's home phone is 313/ 626-7975)

*JOHN WALTON*  
JOHN WALTON: Is staying in his brother's condo at 344 Ocean Ave, Marblehead, MA, 01945 (617/ 639-0187) while he is continuing his radiation and chemotherapy treatments. Mostly, he is an outpatient. He is making slow, but steady progress in his treatment of lymphoma and expects to improve enough the coming week to undergo a bone marrow transplant, which should put him out of the woods. I know all of you are pulling for his complete recovery, so a get well card or call would help his morale a bunch. He has a lot of time on his hands, so the hours drag for him. He has mentally rehearsed the completion of his new upholstery a dozen times or so, so when he gets back home it should go fast. Right now he thinks he might make OSH with it, if he continues to progress. HANG IN THERE, JOHN!

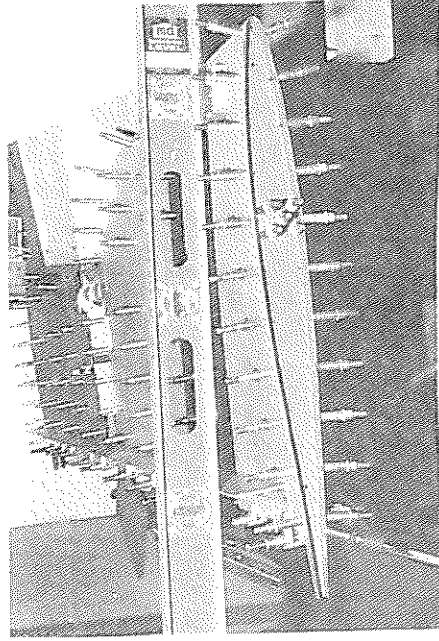
*FOR SALE?*  
 NEED AN ALMOST FINISHED PROJECT? I continue to get calls from people that would like to pick up an almost finished project. Let me know if you have 1. JOHN WALTON'S 2ND PROJECT STILL FOR SALE (A BARGAIN) IT FLEW IN & COULD FLY OUT WITH A DAY OR SO WORK ON IT. CALL HIM FOR DETAILS.



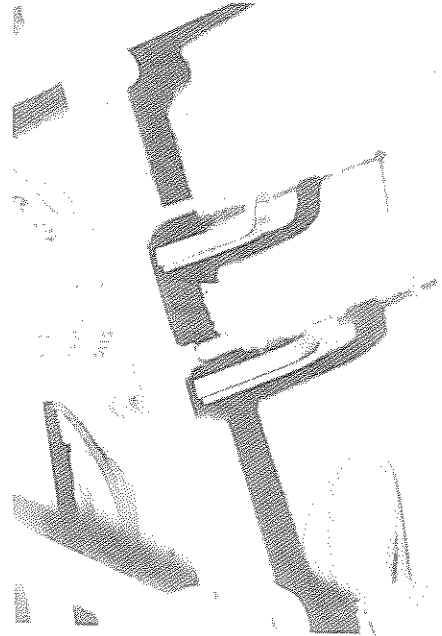
PRO PHOTO, ROBERT CLAYTON, SALT LAKE CITY, SENDS 3 PHOTOS OF HIS STABILIZER UNDER CONSTRUCTION. GREAT PHOTOS.



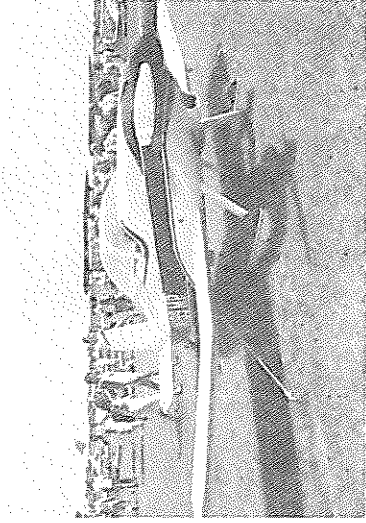
ROBERT CLAYTON'S



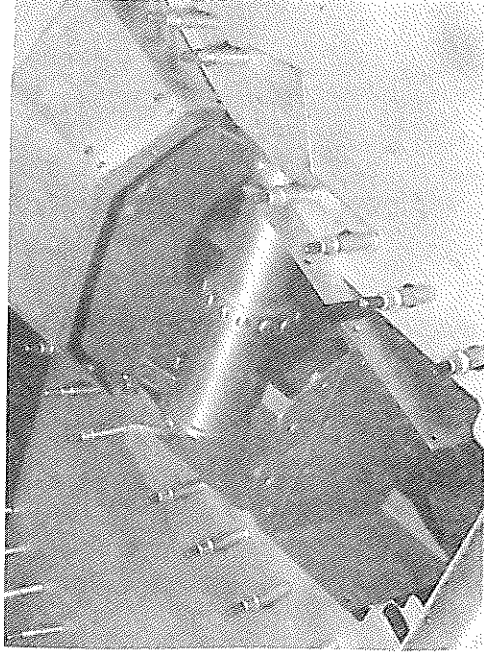
ROBERT CLAYTON'S



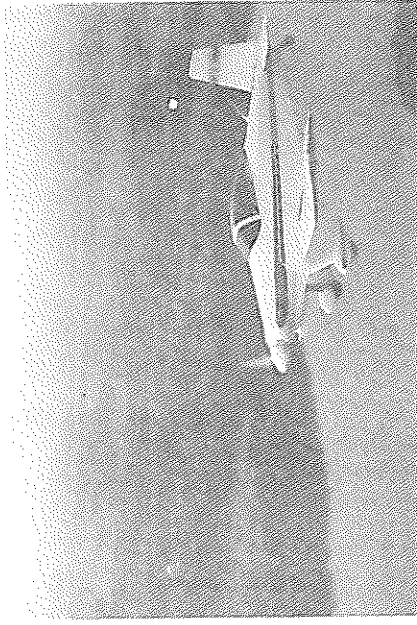
DRILL JIG IN PLACE PRIOR TO DRILLING



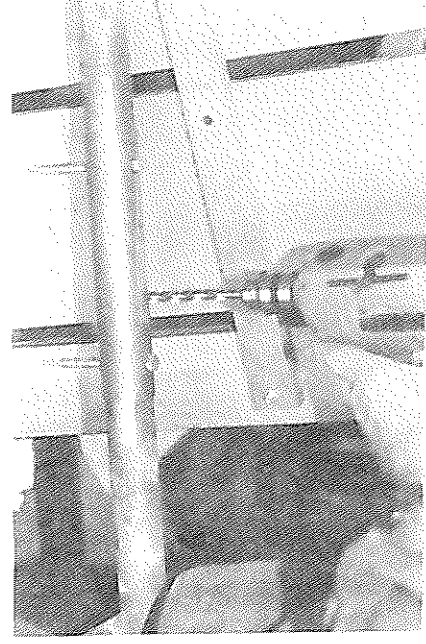
WHOSE PARTY T-16 IS THIS?



ROBERT CLAYTON'S



CLIFF REDDEN'S NEW BEAUTY



CROSS TUBE BEING DRILLED.

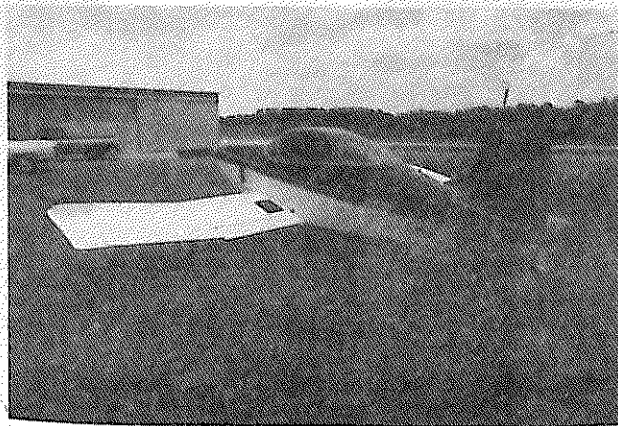


IT'S HALLOWEEN & MAXINE GREEN HAS THE SPIRIT AS SHE ARRIVES AT TEXHOMA COFFEE GROUND BEARD AND ALL.

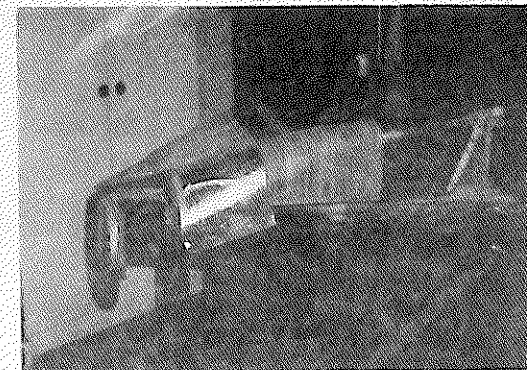




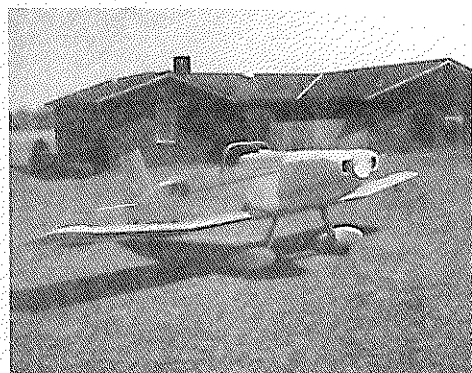
MARY HOLT AND THE FAMILY T-18



WORTHY WARNACK ADDS A T-18 CANOPY TO HIS ROUND BACK. LOOKS GREAT!



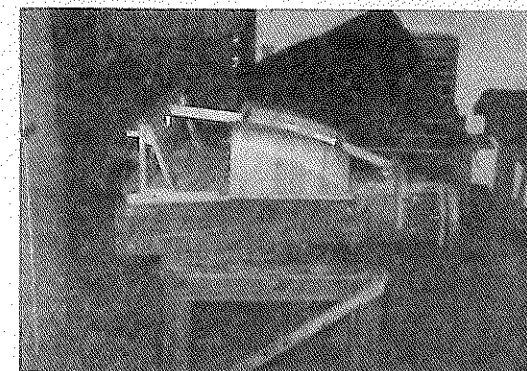
(ABOVE AND BELOW) PAUL SHIFFLETT'S FOTOS OF HIS JIG FOR MAKING A METAL BELLY COWL.



JERRY TINDELL'S T-18 (NOW FLYING)



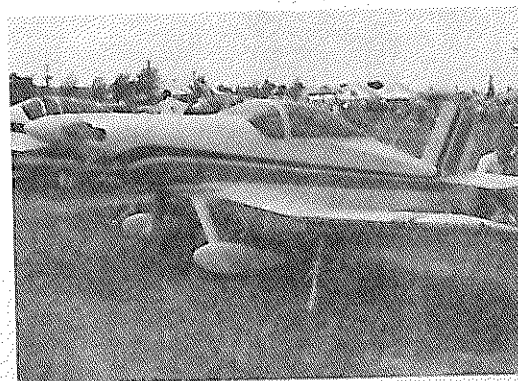
GARY HOLT (LEROY'S SON) AND HIS T-18



SIDE VIEW OF JIG



THE REAL MAXINE GREEN, SANS BEARD



ANOTHER MYSTERY PLANE. WHOSE BEAUTY IS THIS ONE?



JIM FRENCH DRAMATIZES THE END (of this newsletter)

DON'T FORGET TO WRITE YOUR LETTERS — TODAY!

FLASH!....BEN CUPP, Rt. 1, Box 300, Yellville, Ark. 72687 (501/436-5618) just flew his Javelin Ford V-6 powered T-18, the first t-18 with this power plant to fly! At this writing he had made about five flights, all just around the pattern at the Boone Co. airport at Harrison, AR. He has a Warnke 68 x 74'almost' constant speed (fixed pitch) wood prop on it and he has already found that this is not the optimum prop for it and will try another soon, he thinks. It's much too early to get any meaningful numbers yet, but he said he had hit 160 mph in the pattern pretty quickly. He also said his Empty Weight was 960 lbs. and that's pretty impressive in itself, too. He also told me he was doing high speed runs with it on the ground and after several of these he found himself airborne and with not enough room to stop on the runway with the new brakes, so it was go fly time. He came right around and landed, as he thought the temp was on the hot side. Ben made his own cowling (of fiberglass) and his air intake is under the prop, sorta like an old Navion probably. After he called Dave Blanton and talked over the situation with him he found he needed to open up the exit air side of the cowl quite a bit.

Ben has his radiator lying flat on the "floor" of the cowl, just forward of the firewall and it's 19" x 26" in size (don't know how thick or how many tubes it has, etc.) and it's a copper radiator. His first flight gave him a 240° F water temp, with 22-24 psi system pressure. The last time I talked to him he had opened up the bottom cowl opening and had brought the temp down about 10° or 15°. He says the torque seems to be pretty high, as he couldn't keep from sliding the tires at 2300 prop rpm, but felt that maybe his brakes were just too new yet.

Ben is a retired Air Force maintenance specialist and other than that, I don't have any other pertinent information at this time. I hope to be able to fly up to Harrison this coming week in a borrowed 172 with Bobby Collard a local T-18 builder. If this pans out I can possibly get some pictures and more details in time to get them in this issue of the NL.

One of the question marks on installing the V-6 in the T-18 has been the design of a suitable engine mount. Most everyone has been scratching their heads to figure out how to tie into the top hole in the fitting at the very top of the landing gear and that WAS a problem. Now we have two solutions to the problem. The way Ben did it was to lay a ½" thick piece of aluminum bar stock on top of the water line 42 extrusion from the firewall back to the dash frame, and protruding thru the firewall by about an inch or so (long enough to attach a tube there that would run diagonally down to the front end of the large horizontal tube of the bed-type mount). On top of the bar stock he laid another piece of aluminum angle, with one leg of the angle in contact with the side skin. Vertical rivets were then installed to tie the two angles and the bar stock and the skin together. The top angle was also riveted to the skin. (I don't know the width of the bar stock, but assume it was the same width of the WL 42 extrusion, 3/4". I also assume the top angle was the same 3/4" width. More on this later). Ben did all this while the ~~over~~ top of the tank ~~I left out the word~~ "skin") was still un-riveted.

Our other T-18 builder who is installing the V-6 made his decision after the skin over the tank had been riveted and he did it a little differently. He laid a piece of heavy wall 4130 steel tubing (square) on top of the W.L. 42 extrusion, going back about the same distance as Ben did. He used blind rivets to attach the skin and tubing and also used them to rivet the tube to the WL 42 angle from the bottom.

This builder is JOHN POPEJOY, P.O. box 1, Univ. of Neb. at Omaha, Omaha Ne 68182

BEN CUPP FLIES!

THE JAVELIN V-6 FLIES!

V-6 ENGINE MOUNT

(cont'd)

We have included a picture of John's work in this issue.

In a note from John he said that he wouldn't have his T-18 at OSH, as he had had a delay in getting delivery on his engine unit from Javelin and he still had to rivet up his wings and do some other things. We'll be looking forward to seeing his bird at our next re-union (or even maybe at Kerrville '88, if every thing works out okay in the meantime).

I counted 13 rivets in the picture John sent. He is using some brand of a "pop" rivet, which isn't specified. Perhaps plain monel pops would be okay there in the long run, but I personally would be more comfortable with using Cherry-Lok rivets in that application, primarily because of the vibration fed into the tube and the tensile load on landing. Maybe I'm too conservative about these things, tho'. In any case if rivets work loose they'll be where they can be seen.....Anyway, both Ben and John are to be congratulated for being pathfinders.

Ben said his battery was in the baggage compartment. He had to do his weight and balance one wheel at a time, but he used a platform scale. His first weighing only gave him a tail wheel weight of 15 lbs., so he added 31 lbs. to the tail, so his true empty weight may or not be 960 lbs. In any case the empty wt. looks GOOD and he can eliminate part or maybe all of that 31 lbs. by moving his battery back one bay. He could also gain a little more by using one of the aluminum radiators that Dave can get. They only weigh 12 lbs., quite a bit lighter than the copper ones, and are more efficient in cooling.

Amigos, the door is finally open for much lower cost power for our airplanes and the threshold has certainly been crossed. In the near future the V-6 engine will be an aluminum engine, saving even more pounds. At long last automotive technology will break the grip that greedy corporations that control Lycoming and Continental have had on aviation for so many years. We're going to see it in all size engines, large and small, too. Dave says the new 351 cu. in Ford engine will be worth about 400 hp in an airplane. There are several engines in lower hp ranges that are available right NOW, one of which is the Subaru and soon we'll be seeing airplanes designed specifically around automotive liquid cooled engines.

I was talking to Jack Cox about Ben's T-18 a day or so ago and in our discussion on the V-6 engine he told me of an RV-4 at the Merced fly-in that he had seen a week or so before and he watched it fly. The builder had shown him how he had built a small false bottom (plenum chamber) below the belly, about under the pilot's area. He had mounted two SMALL radiators in the area in the form of a VEE and the radiators were somewhere around 2" thick, 4" wide, and maybe 20-24" long and he said it cools very well.

Such a set-up could be used on the T-18, with very little drag penalty if done right. The T-18 could also easily mount its radiator in the bay just aft of the cockpit, using a flush NASA scoop on the belly for inlet air and an exit air door on top of the fuselage, that would be controllable to regulate flow. It could also incorporate a fan for extended ground operation....or it could help in scavenging cockpit air, too. Liquid lines could run under the belly and be enclosed in U shaped metal channels of perhaps .016, thus isolating the cockpit from hot water or steam in case of a leak. Radiators could also be mounted in the gills of a regular T-18 cowl, it would seem. For those of you in northern climes, you can have a hot water heater and windshield defroster for those nippy mornings, too.

John Pope  
MORE ON LIQUID COOLED ENGINES

*New Look Cowl*  
 JOHN POPEJOY said in his note that he wanted to make his cowl look a lot like the P-51's, with a minimum size ring shaped opening around the prop. Dan Dudash, of North Hollywood, CA, built a Tailwind long years ago that had such an opening around the prop hub. John Thorp had designed an augmentor-type cooling for it that used exhaust gases to pump cooling air in around the jugs. It cooled fine, but was noisy, as all augmentor tubes are, and it was a pain to remove all that to change plugs. Experience has shown that all engines seem to need airflow around the oil pan, whether liquid cooled or not, so no doubt the V-6 won't be any different. The V-6 uses a combination oil filter/heat exchanger that is very efficient and eliminates the need for a separate oil radiator. This will save some weight as well as money, since it's a standard Ford item. It will also do away with potential oil leaks from a cooler & its piping.

*Metal Cowl*  
 It's not quite clear yet what the average cowl will look like on a T-18 with the V-6 engine. Jack Cox said the cowl on the RV-4 looked somewhat like a Ranger-powered PT-19 or Fairchild 24. This may well mean that the builder can build all or most of it of metal himself, possibly only needing a fiberglass nose cowl. Look for the RV-4 picture in Sport Aviation soon. Take note, also of the picture of the metal cowl that Paul Shifflett is building over a laminated wood male mold. He brought the mold and cowl to our Arrowhead re-union and it looks VERY GOOD. He MAY have to use a small amount of fiberglass to go in the compound curve areas, but my guess is he will make it all-metal. We covered it on the video we took, incidentally. If a simple, good looking metal cowl emerges, this will be another area that can save the new builder a few bucks. I well know that there are still a lot of builders out there that have to cut costs to the bone to get their airplane built without busting the family budget.

*Lord Mounts*  
 Aircraft Lord mounts are another big expense item that deserves attention. Local builder, Bob Yeakey says there are new automotive engine mounts available on several foreign cars that have viscous liquid centers and are a marvel in super smoothness and he is optimistic that we can use them on the V-6...so if this pans out we can do away with a lot of the vibration we now put up with from 4 cyl. opposed aircraft engines and save \$,too.

*Exhaust System*  
 I think we may well come up with exhaust system with effective mufflers with such engines, too. Again, excessive noise is something we now put up with, but it doesn't have to be that way. We wouldn't put up with it in our cars, so why should we in our airplanes? Why should we have to wear those big and uncomfortable head sets to hear our radio and converse with each other without screaming? You probably know that in Europe each airplane has to meet a certain decibel test to fly. This could be a very fruitful field for the amateur experimenter. It's probably in the cards for U.S. aircraft in the not too distant future, too, so you might give it some serious thought.

*CS Props*  
 We are finally on the verge, too, of having light, relatively cheap constant speed props available. They will be controlled by solid state electronics and have wood and plastic blades. If noise gets to be a big factor you'll be seeing four blade props on a lot of airplanes using two blade props now. More blades are less efficient, true, but they are also quieter. The props we are now using on T-18s are FAIRLY efficient...for one condition only, but a constant speed prop doesn't have to give up performance in one area to get it in another. All in all, it's safer, reduces operating costs for fuel used, and allows us to operate out of smaller fields with safety. The Prescott Pusher people have such a prop. Another is from New Zealand and is being marketed in the U.S. by Aero Trading Ltd., Box 336 Colchester, IL, 62326. (It'll be at OSH '88 on a RANS S-10).



18 T-18s  
ARROWHEAD REPORT:.....IT WAS GREAT! We had a ball! We had 18 beautiful T-18s there, and I do mean beautiful. There were five of them there from Texas, three from Oklahoma, three from Illinois, two from Ohio, one from Michigan, one from Missouri, one from South Dakota, one from Colorado, two from Arizona. We also had an RV-4 and a Sonerai II drop in on us, in addition to Dave Blanton's Javelin powered Cessna 175

Dean Cochran, from Broomfield, Co. came down with the flu at the last minute and Karl and Mazie Lipscomb had a last minute problem that forced them to cancel. We also had expected Lee Reilly from Wagoner, Ok, just a few miles away to be there and Jim Laney from Springfield, Mo, too, but they didn't make it for whatever reason. Also, Gary Cotner, from Tulsa would have been there in his new bird, but it only had 1.5 hours on it, but he'll be there with bells on the next time.

Our weather was beautiful. The temperature was in the '80s, and the wind was usually 10 to 15 mph pretty much right down the runway. Our parking area was at the north end of the runway and accomodated all 18 airplanes okay. The lodge itself was a couple of miles away, on the edge of Lake Eufala, which is one of the largest artificial lakes in the country, I'm told. The airport itself is nearly 500' above the lodge, as it sits on a flat shelf on the side of a hill and has a golf course alongside the runway. The golf course has a beautiful modernistic clubhouse about halfway down to the Lodge. Numerous large duplex type cabins are scattered about a one square mile area near the lodge. Everything is a little too far to walk to, so they have buses or vans that pick one up promptly. The lodge is built of native stone, as are the cottages. It has several large dining areas, indoors and out, plus a large lobby. There was another convention there when we were, the Binks paint gun dealers. The lodge has a considerable number of guest rooms on two levels, all very nicely furnished. There are also camping areas nearby.

We had our big family reunion dinner in one of the larger dining rooms. It was served buffet style and the food was excellent. Waitresses served sald, bread and butter, dessert, and coffee. Other meals there were also excellent, everyone said. The lodge itself is leased to the Choctaw Indian Nation, one of the five big Indian Nations in Okla.

Gary Green led off our after dinner speaking, paying tribute to Mary and Leroy Holt, who did the lion's share of organizing the reunion, and also to Maxine Green. The Holts went in the hole about \$70 on postage for mailing of the reunion notices, but we passed the hat and made that up. We also heard from Harlo (Skinny) McKinty, Gary Cotner, Bob Sanderson, who brought a clever cardboard mockup of his tilt-down instrument panel for our perusal, and Bill Warwick and I shared a few anecdotes and memories of the early days of the T-18. Everyone in the room was introduced and stood up and said a few words about their airplane or project and it was all thoroughly enjoyed by all present.

At the dinner we concocted the idea of an early morning giant rat race formation around the traffic pattern, that would have all 18 T-18s in trail formation. We actually should have thought of that one for Saturday afternoon, as it didn't work out for Sunday morning, as some of the group that had a long way to go (like AZ & CO, etc) wanted to get an early start before afternoon thunderstorms popped up in the mountains. Maybe we can do that ring-around-the-rosie routine at OSH this year. We will do it for sure at our next reunion, you can bet.

ARROWHEAD LODGE  
AFTER DINNER SPEAKERS

METAL COWLING

PAUL SHIFFLETT brought the laminated wood mold for his new metal cowling down in the back of his van, with an almost complete metal cowl on it. Paul has been the star of our last three re-unions, with the T-18 components he has brought in to each. We also covered this unit on our video. This reunion we had three of us shooting video, John Crook, Jim Hidalgo, and myself and we are again putting it all together for those of you that were not able to be there. They will be available after OSH for cost only. We will ldt you know after OSH. One nice thing about home video is that it's available immediately for viewing. After the Saturday nite dinner a bunch of us went up to Jim Hidalgo's room to look at the tape Jim had taken that afternoon. John Crook covered the dinner, but the sound wasn't quite as good as it might have been....but we're learning. One of the big problems I have when shooting outdoors is considerable wind noise that beats on the mike. The mike has a foam shield around it, but that's not adequate to keep out wind noise. Maybe some of you know the answer?

TAPES

Speaking of tapes, John Crook recently made a tape of the entire operation when he and John Russell painted the outer wing panel of Vern Peppard's T-18 and it's an excellent step-by-step procedure and is accompanied with thorough explanations of each step. If you are contemplating painting your own bird soon this would be a good tape for you. It runs the full length of the tape, too. If you want one, send John a check for \$8.50 to cover the costs and send it to John c/o my address. \*

ARROWHEAD

We were so pleased that Bill and Millie Warwick were able to make the party and were also pleased to see Bill's new paint job, which is light silver gray, with darker gray highlights. He doesn't have the new tiger painted on the side yet, but expects to by OSH. He now has over 2100 hrs on the ol' Tiger and it has been nearly free of any maintenance items. They are now retired in Aguila, AZ, but spend the hot months in Idaho, where Bill is the curator of the Henly aerodrome collection.

Steve Hawley and his wife were again there from Tucson, AZ. Steve has also shed about 25-30 lbs. We again interviewed him on our video, so we won't go into great detail on his bird here, except to say it still is really an outstanding jewel of an airplane, cosmetically and mechanically.

This was the first T-18 reunion for Walt and Bev Giffin, now living in Pueblo, where Walt is department head of a college. Walt's T-18 is a 100% stock T-18. He replaced the original 135 hp engine with the present 160 one and the airplane still looks like new after several hundred hours on it.

THOSE ATTENDING

Another first timer this year was Paul Kirik's beautiful bird from Moline IL, where Paul is Maintenance supervisor for John Deere's fleet of jets. Paul will also be flying copilot on one of their jets this fall. His son, Steve, is a Lt. in the AF at Vance AFB, learning to fly T-38s. Steve took his instrument rating in dad's T-18 before he went in the AF. Paul just arranged for me to go along on a test flight of a co. G-2 and the Capt. very graciously took pity on me and let me fly it awhile to kill the worms in me. I haven't come down yet! Thanks again, Paul. Paul will also be one of the moderators at our T-18 forum at OSH this year.

THOSE

Also from Illinois way was Ken Rhoads. Ken Has one of the DOERR cowls on his bird and has yet to paint it. The cowl design was attributed to Peter Garrison, but a reliable source told me that John Thorp actually did the numbers on it. Ken says it cools very well. Ken also has gear extensions on his bird, but he cautions that they should be heat treated!

\* WE NOW HAVE ARROWHEAD & TEXHOMA I-II TAPES FOR \$850 ppd.

BILL COX, of Baytown, Tx, was another of those coming for the first time. This is Bill's second T-18 and it has a very attractive paint job on it, basically yellow, with red striping. Bill has a Lyc. 0-360 engine in it that's been de-rated to 165 hp, and he also has a c/s prop on it. Bill has made several Kerrville fly-ins in past years with his bird.

Another first timer was Jerry Turner, from Marion, IL, and his bird is also a S-18 and still fairly new. He hadn't had a chance to get his upholstery in yet, but this gave the troops a chance to discuss insulation with him. He also had a very nice multi-colored paint scheme.

My old airplane is now owned by Jim Hidalgo, of Wimberly, TX, and it missed our earlier Texhoma re-unions as Jim was getting checked out on the bird. Jim French was riding shotgun with Hidalgo on this trip, as his T-18 was all apart at his home in Wimberly, getting a new paint job and new interior. He also has added gear extensions in the process.

A regular fixture at all three of our re-unions has been Dave and Pat Eby's beautiful bird from Wichita Falls, TX. Dave likes to fly right handed on the stick, so set his cockpit up to fly from the right seat. This often gets them double takes as they taxi in someplace new with Pat in the left seat. Dave's airplane will soon be joined with an identically painted one that's now ready to fly by Dave's hangar mate, John Mihaila. John Kleber was the first to paint his T-18 this way and he sold that airplane to Doug Frantz, of OKC. His new airplane is also painted that way, so you might well see three or four T-18s at OSH with the same paint scheme.

Another of our reunion regulars is Dick Amsden, of Mt. Clements, MI and he, too, has an outstanding paint scheme. He now has around 400 hours on it and it still looks like new.

From Dayton, OH, way again came Jim Paine, another of our regulars and his immaculate T-18. Jim also has an outstanding yellow and brown paint scheme of his own design. His neighbor, from Tipp City, OH, Cliff Redden, came down with Jim in formation in his relatively new T-18. It was also an outstandingly finished airplane of basic white and deep blue trim.

Still another there for the first time was Ed Luedke and wife, from Sioux Falls, SD. They, too, were justly proud of their finely crafted T-18. Their paint scheme was basic white and multi-color striping, most excellently done.

Randle Woolaway, our 77 yr. old elder statesman, and his son were again on deck with his blue and white T-18 that he flies from his own airport, Timberline Airpark, in Cassville, MO, and his airplane also still looks like new.

Leroy and Mary Holt didn't have too far to come, only about 20 miles from McAlester, OK, where they base their bird. Their son, Gary Holt, was the last to arrive from his home in Tulsa and he had to do some last minute buttoning up of the cowl and baffles, where he was doing some major modifying. As usual, he and Leroy's airplane spent more time in the air than they did on the ground. Leroy again let me fly his bird and I really like the way it flies.

Gary Green had to go all the way up to Enid, OK, to get his T-18, as he had to go off and leave it there when he got out of the AF and signed on with Delta a few days later.

ATTENDEES AT ARROWHEAD (COA 70)

JOHN CROOK  
Last on our list of the 18 T-18s at the re-union was Vern Peppard's bird from Dallas, flown in by John Crook. John has been flying Vern's airplane almost continuously since the new wing and painting was completed and he and John Russell got kudos from those present for their paint efforts and perfect match of colors.

VERN PEPPARD  
Unknown to us at the time, Vern was in surgery for a quadruple by-pass at the time we were all in Arrowhead. It came about quite suddenly as he was taking his daily walk and started to have chest pains. He was savvy enough about these things to get to the doctor pronto and in a matter of an hour was on the operating table. It was a success and he is now recuperating in good shape, altho' as expected his enrgy level is still quite low. We all wish him a speedy recovery. A lot of the success of the newsletter is due to his generosity in doing the printing and collating in his plant. His plant is a 55,000 sq.ft. facility that turns out geology maps for the oil industry world wide. They do our work for a very nominal fee that covers just the cost of materials, so we are very indebted to him. I seriously doubt if I could singlehandedly write, publish, collate, fold, address, stamp, and mail the NL like I once did. My good wife has taken a lot off my back by taking care of the NL member list, dues, etc.

JOHN WALTON  
SOME MORE GOOD NEWS:.....JOHN WALTON is back in Houston after a several month ordeal in the hospital in Boston and is showing every indication that the treatment was a success. He is gaining strength by the day, but he has to admit he won't be up to the OSH trip this year, but don't count him out for the Kerrville bash in Sept. just yet and this is the best news of the year for all of us.

HARLO MCKINTY  
HARLO MCKINTY FLIES!.....After ten long years Harlo's T-18 got daylight under its wheels the first of July. Gary Green was planning to come up to Lincoln and test fly it for Harlo on the 1st, but being a brand new pilot for Delta all but wipes out days off options for new hires. Steve....., who was doing the annual on Harlo's airplane offered to fly it and he did a fine job, Harlo said. It behaved like a winner in every respect and now has several hours on it with no problems. Harlo will soon do a complete report on it for a future NL. No, he won't have it at OSH, as he will have a Temperfoam booth again and he can't bring the airplane and booth stock, too. It hasn't been painted yet either, so we'll be looking for it later this year. Congrats, Harlo, from all of us. Just one negative note, tho, Harlo. Do you realize that you've gone and worked yourself completely out of your hobby? Now what?

Plans of MICE AND MEN DEPT: We've all said that the most dangerous part of this flying business was the drive to and from the airport, right? Well, take it from me...BELIEVE IT! Jim French had just flown his newly re-painted and refurbished T-18 a few days before June 29, so decided to make a cross country up to MO from his Wimberly, TX, home, making a stop at McKinney (TX) to let me see it and fly it. As I was driving merrily along to meet him and going along a brand new 2 lane street in the outskirts of Plano I started up a small hill and to my horror saw TWO cars abreast coming at me at considerable speed. I had about two seconds to deal with it and I starte to take to the ditch on the right, but just as I started to turn this hot dog turned right in front of me. I caught the last few feet of his truck that stopped me in less than two feet and spun him around out into the field. I pulled an estimated 35 Gs against my belt, but it held and I didn't break any bones or get cut, but I got a massive bruise inside my chest. I have spent a week of agony with the worst pain I've ever had and have been living on pain pills and shots, but am finally some better.



Because my accident has cost me about ten or twelve days that I couldn't work on the NL and time is getting VERY short until OSH time, I am having to cut the NL shorter than usual, but I will save the material I have on hand until later in the year.

As we said in the last NL our post-OSH issue will be a big 'un, as it will be our 25th anniversary issue. We will be doing a personal profile on each and every T-18 owner that is present at OSH this year. We are going to have some cream puff T-18s there, yes, but what we really want to accomplish in this, our 25th Silver Anniversary year is to have as many T-18s there as possible.....NO MATTER WHAT THEY LOOK LIKE! If your T-18 is in need of new paint or upholstery, what the heck? Bring it anyway! Almost every one of you at one time or another have said you would like to convey your appreciation to JOHN THORP for designing the best airplane in the homebuilder's world.....well, now is your chance to put your T-18 where your mouth is. It would be a tremendous tribute to John to have 50 T-18s at OSH in '88, so please you guys...ELIMINATE THE NEGATIVE AND ACCENT THE POSITIVE... John can't be there, because of his health problem, but his personal T-18 will be there, as he has given permission for Marc Bourget to bring it there. There will be T-18s from California, Washington, Oregon, Florida, Texas, Louisiana, Illinois, Missouri, Arkansas, Colorado, Arizona, Ohio, Connecticut, Massachusetts, Michigan, Iowa, Minnesota, Nebraska, Georgia, Colorado, Tennessee, Virginia, Oklahoma, South Dakota, North Dakota, North Carolina, Kentucky, Pennsylvania, New York, New Jersey, and also from Canada. There is a 50-50 chance that Ben Cupp will be there with his Javelin T-18 if he can get his test time flown off by then. Anyway guys, you get the idea.....I hope. This is an event that will go down in sport aviation history, but only if each one of you T-18 owners do your part and don't pull back into a shell. ....Let's lay it on the line. When you decided to build an airplane you joined EAA and asked for all the help you could get and MANY people generously GAVE of themselves, helping YOU in many ways, either directly or indirectly. You well know that you would never have made it without their help, you would never have made that dream real ALL BY YOURSELF.....none of us could....so now it's time to square your account ! The T-18 group is a brotherhood actually...and a special one at that. We were the first to organize and publish a newsletter and we have left a trail of a lot of other firsts since then. It would be a disgrace if only a handful of T-18s showed up at OSH. The T-18 has so much to be proud of, so let's not put a smear on that record, whether you built your bird or bought it. If you are one of those that has to sell your bird for some important reason, don't forget that you'll never have a better chance to sell it at a good price. If you are not sure of housing when you get there, don't let that stop you. We've got a committee working on that, too, and if nothing else, throw a sleeping bag in the bird and we'll find you someplace to bed down.

We need some volunteers to do photography, get EACH new arrival registered with US immediately, check on housing, transportation, and a half dozen other details, so please check in with our T-18 desk on the field. We need someone to bring a folding table and chair or two in, like in past years. If everyone will take on a little job it will be no burden on anyone and we'll all enjoy it and take home a great memory. Bring your camera or camcorder and we'll have NL #71 that will be a treasure... and we'll have some TV tapes of it ,too.

What else can I say, amigos? All I have been trying to do is talk to you about having one of the greatest times of your life, maybe reminding you that like everything worthwhile, you get out of it what you put in.!!!..

- So DON'T BE AN OLD STICK IN THE MUD -

APPEAL FOR OSH T-18s TO BE THERE

Since writing the copy on page 8 I've had a little setback of a couple of days, when my pain got worse for some unknown reason and I had to back off. I'm still pretty tender but am up and around again today, so I hope to get the NL over to the print plant early tomorrow.

I haven't used pictures of all the T-18s at Arrowhead in this issue, as I had done a story on the reunion for Sport Aviation and sent them my other set of prints and also the negs. Anyway, the ones I left out are ones you have previously seen anyway. All of you that have ordered TV tapes will see them all much better in it ...and in color, too.

*John Popejoy*  
JOHN POPEJOY (Omaha) called today to tell me more on his V-6 T-18, which will fly late this fall. We will do a complete story on it at that time, but to sum up it looks very good. He told me that he figures the complete engine and redux system will cost him about \$2600...and he said that is LESS than the cost of overhauling a carb for a Lyc. 0-360! I asked John to be at the T-18 Forum at OSH, so we'll let him fill in more details. He has been down to see Ben Cupp's project and gives it high marks. He also told me that MONROE MAXFIELD, Of Glendale, AZ, has a V-6 T-18 that's well along. BEN CUPP has sent me black and white pix of his bird, that are supposed to be here tomorrow, so I am going to do a full foto page in the NL when they get here.

*FOR SALE*  
T-18s FOR SALE: OATS TOKLE, 3483 Skyline Blve, Reno, NV, 89509 has decided to sell his beautiful T-18, one of the best T-18s ever built. It has an IO-360, c/s prop, is full IFR, and is loaded with avionics and is in the 20k range...and worth every penny of it.....JIM HIDALGO's wife, Marty, says the ir T-18 is too small, so he reluctantly is putting it on the block ( for \$15,500). He has a new Loran and other extras that he will sell separately for his cost. For details call him at 512/ 847-3881 nites or 512/847-5571 days. (That's Wimberly, TX, near Austin). In case you want a single place T-18 with retractable gear The airplane is owned now by the Swift Association, Athens, TENN. Contact Chas. Nelson, for details (his no., 615/745-9547). The a/c was slightly damaged in a gear up landing it will take over 10k to buy it, as they already have a 10k offer on it.

*SAFETY TIP*  
WATCH THOSE SEATS! JIM FRENCH called to tell how close he came to getting it on a landing in Houston Saturday. When he pulled all power off the a/c pitched nose down sharply and full aft stick didn't correct it, nor did the electric trim. He gave a blast of power at the last second that raised the nose slightly, but he hit hard and bounced high. More bounces and it finally stopped, but he said it gave his long gear and extensions the acid test, but all came out ok. The culprit was his seat had slipped out of its res training angle and slipped forward enough to prevent normal full aft stick movement. It's those "little" things that will kill you, things you wouldn't give a second thought. Jim had flown over to visit John Walton, who he said is looking good, altho'still very weak.

*DISCLAIMER*  
 STANDARD DISCLAIMER: As always, we advise our readers that in all past, present, and future newsletters of the T-18/S-18 Builders and Owners Association (formerly known as T-18 Mutual Aid Society) that we would make you aware these newsletters and/or video tapes we issue are ONLY presented as a clearing house for ideas, opinions, and personal experiences of both our members and non-members in both building or flying the T-18, S-18, or any derivatives of each and anyone using these ideas, opinions, or experiences do so at their own discretion and risk and no liability is implied or assumed.

(The following four pages were  
left over from NL #69)

07-APR-88  
804 LEADING LANE  
City of Allen  
Republic of Texas  
75002-3124

Mr Richard Cavin  
10529 Somerton  
City of Dallas  
Republic of Texas  
75229

Dear Dick,

Well let's see, I'm about four or five conversations behind with you. So I'm going to try to catch up all at once in this letter.

#### Video Report

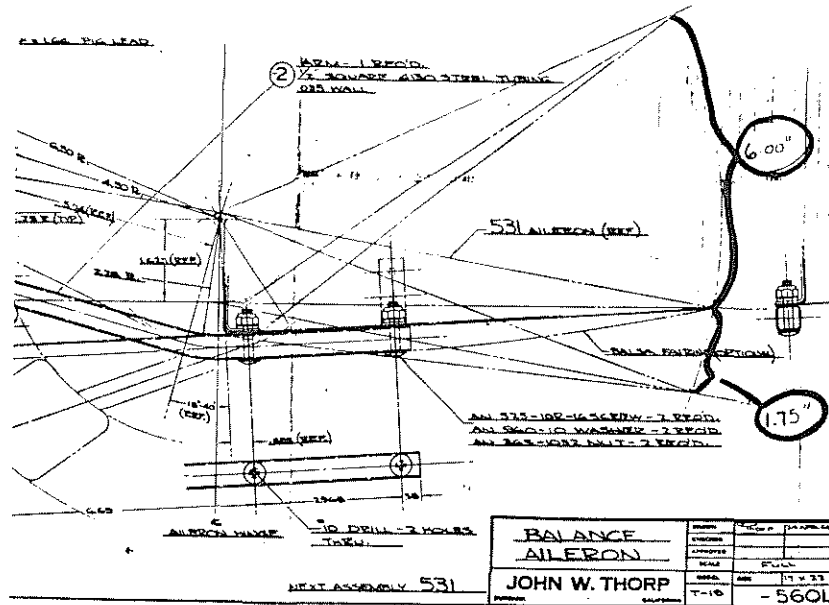
In the wonderful world of amateur video film making we (the camera, my secretary, and myself) have made a great many improvements as we figured out what we are doing and how we were messin' up. First from this time forward we will shoot original tapes on only the extra high quality tape stock. Secondly, we will construct the masters on only extra high quality tape. Thirdly, we will only reproduce ten copies from each master. Number four, we will continue to buy only the better quality Name Brand Tapes for distribution. In order to do so at this time, we have to wait on the sales at the local wholesale houses but the results will be a quality tape for viewing with no surprises and bad pictures other than those taken by yourself and myself. These steps should give everybody better viewing.

John Russell and myself have just finished a two hour tape on painting a wing panel for a T-18. This tape includes every step that we went through and will illustrate some of the classic techniques as well as mistakes. We'll probably put this on the back of the May '88 Arrowhead Fly-in Tape, if we have room.

#### Ailerons :

In October of '87 I measured the aileron throw on at least ten different T-18s at Texoma during the Fly-in. Drawing 560L shows that the throw as measured from the trailing edge should be 6.00" up (meaning aileron trailing edge above wing trailing edge) and 1.75" down. The average I found at Texoma was 4.28" up and 1.68" down with a couple of cases in which the left and right ailerons had different up and down measurements of more than one inch on the same plane. Dick, please note that even with the planes that had throws that measured different from left to right there were no cases of substandard or detrimental performance. It should also be noted that some of the builders used the old method of (TLAR), "that looks about right," for determining the throw settings. Just for the record the min and max throws were max up 4.9", min up 3.3", max down 2.0", and min down 1.1". In all cases for example the max up

say 4.9" was always coupled with a max down of 2.0". So big throws up were coupled with big throws down and small throws up were coupled with small throws down. In all cases, the full throw, no matter how small, would only be used in strong cross-wind landings.



(Ed. note: After John Crook finished repainting the aileron and was re-installing it he noticed that it fell down without the push rod connected. Thinking they had put on too much paint and destroyed the balance and might be setting it up for flutter he checked the other aileron. Same same. Another T-18 was the same. Now came the question. "To what extent should we balance the aileron--80%, 90%, or 100%? I remembered Thorp once told me that you should not balance to 100% or it might go divergent and he said as a general rule that 80% was a good ball park figure. To be sure, I gave John a call. He said, "Don't worry about it! Probably there would be no problem if there were NO weights on them at all, except for ailerons being very stiff to move at cruise". To sum up, just use the standard weight called for in the plans and don't worry how much paint (or lack of paint) you have on it....and it's perfectly normal for the ailerons to fall down when push rods are disconnected. John's health hasn't significantly gotten better, but apparently it's not much worse, either. He has good days and bad ones, as most of us old folks do. He does appreciate the calls and letters from you guys, as he misses the Good Old Days of building T-18s by the "clan" in his Burbank shop...and that frustrates him, naturally. I hope to visit with him again one of these days soon, I hope).

ED. NOTE INSERT

### CONTINUING JOHN CROOK'S LETTER:

The above is the good news, the bad news is that I found only two cases where the control input to the ailerons was stopped at the adjustable stops on the control stick down near the walking beam mount. All the other planes were "stopped" by a number of different methods. Six were stopped when the mass balance weights on the end of the aileron hit the inside top of the fiberglass wing tip. One was stopped when the push/pull rod hit the auto-pilot that

had been installed and coupled to the control stick. The point here is that the stops on the control stick stop the movement of the control inputs without loading the system detrimentally. If the ailerons are "stopped" by the mass balance weight striking the inside top of the fiberglass wing tips, then a pilot could be bending the aileron push/pull rods. An example would be holding a cold drink straw by one end and pushing on the other end. If enough force is applied the straw will bend and/or kink in the middle. After repeated applications the straw will fatigue crack and fail. So to the moral of the story, I know of a number of older T-18s that, if this type of situation has been occurring for a number of years, then they are to say the least strained. Dick we need to tell everybody to make sure they are "stopping at the right place".

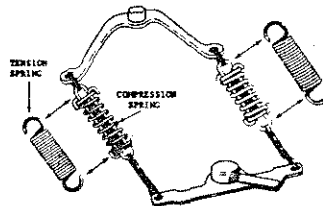
### Old Tailwheels :

Thanks for all the help you gave us in putting all the pieces back together in the wing panel. The plane is now flying again and the paint video mentioned above may help some other T-18ers. As a review of all the things one could do to not repeat the accident, There are two majors things that should be passed along. Even if you used compression type tailwheel springs, all springs, connectors etc are subject to wear and tear. Dick, as a Special Note tell everyone not to even think about using tension type springs on their tail wheels. The reason is, when they break or stretch - there goes your tailwheel steering. With a compression type, if the spring breaks, the clips (the long pieces that fit inside the springs) inside the spring will continue to allow you to steer the tailwheel. Regardless, it would pay all T-18ers to, at least at annual time, raise the tail up on blocks. This to relieve all the pressure on the tailwheel components and inspect the fire out of the entire assembly.

I found as part of the accident investigation that the compression spring clips were all well worn and one had failed. Note again some T-18s are getting up in age. These clips had been on this particular plane for 12 years.

### TENSION SPRINGS ( FAR LEFT AND FAR RIGHT)

THIS TYPE OF SPRING IS A NO-NO

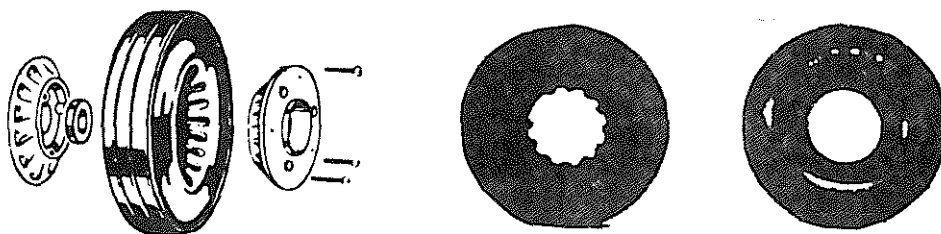


COMPRESSION SPRINGS SHOWN ATTACHED TO TAIL WHEEL STEERING ARM

The tailwheel tire (a solid soft General tire) had left the wheel at some during the ground loop. I found out why when the new tailwheel

## CONT'D

re-installation was attempted. When the two halves of the wheel were bolted together they put absolutely N-O pressure on the tire. The tire that was on the plane was a big soft solid General rubber tire. Inside that tire there are normally four rubber knobs that fit into slots in the Scott wheel halves. All of the knobs were gone, worn smooth. In fact the entire inside of the tire was worn smooth and could be spun freely with the wheel assembled (the two halves bolted together). This is the point where a good inspection of the tailwheel with the tail blocked up could have saved some big bucks. When the spring let go. The tire soon followed. Or it could have been the other way first.



I installed a new solid hard rubber Goodyear tire with 11 knobs and new springs and clips. Note to assemble the wheel the tire is sandwiched between the wheel halves and it takes no less than a 6 inch vise to compress the whole thing together. That's a tight fit and it should be. Again, Dick, tell all the T-18 drivers that a good heart-to-heart with your tailwheel group at least once a year may save them a \$1,000 or 2.

Dave Blanton's Ford 302 V6 :

I have fallen in love with the Dave Blanton Ford 302 V6 conversion and intend to install it in my new T-18. Have you or any of the T-18ers heard anything about motor mounts, cowlings, raditors, etc. If you have any info plez to put same in the Newsletter. I'll have the new T-18 ready for the engine in 18 months.

Thanks

Dick, thanks for all the work with the newsletter etc. I'll see you at Arrowhead in May.

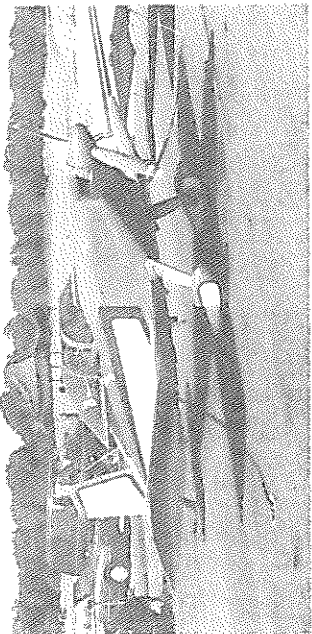
Respectfully submitted as always your humble servant.

Very T/S/CW/X-18ly,

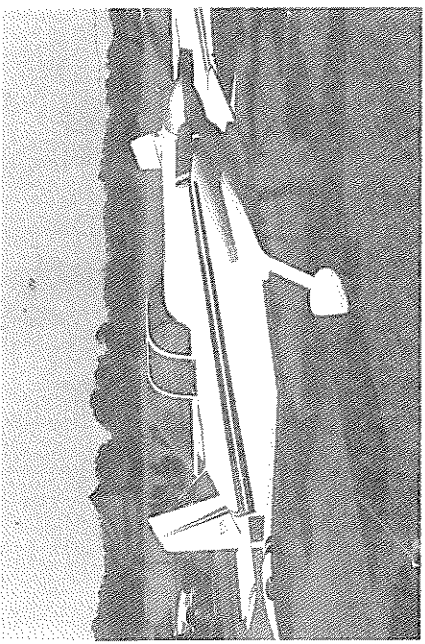
*J. C. Crook*  
J Cunnick Crook ATP/CFII/DGP  
etc/etc/etc

NOW ENJOY THE FOTO PAGES

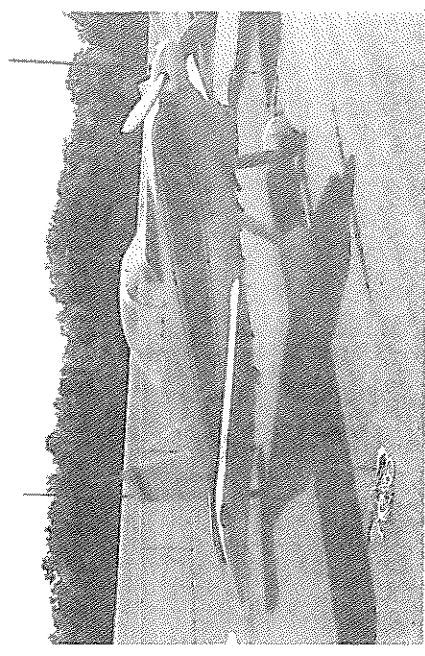




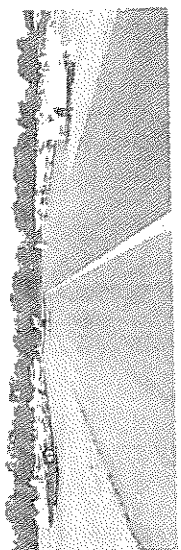
VERN PEPARD'S T-18 from Dallas, TX



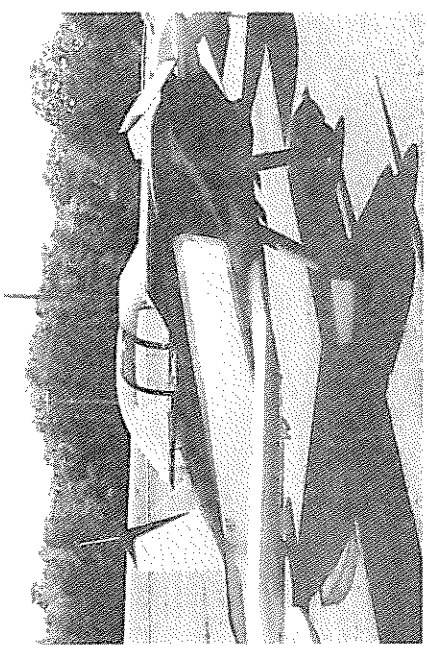
PAUL KIRK'S dazzler, from McLean, IL



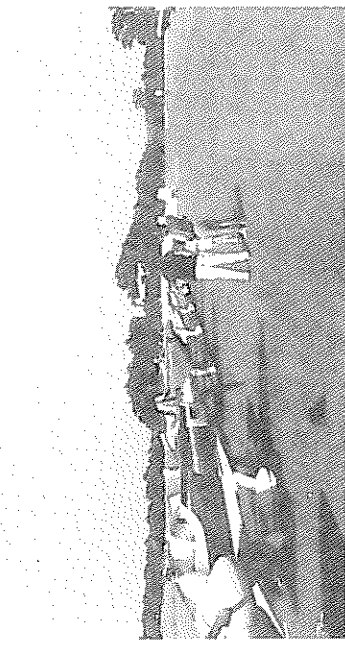
BILL COX'S second T-18 from Baytown, TX



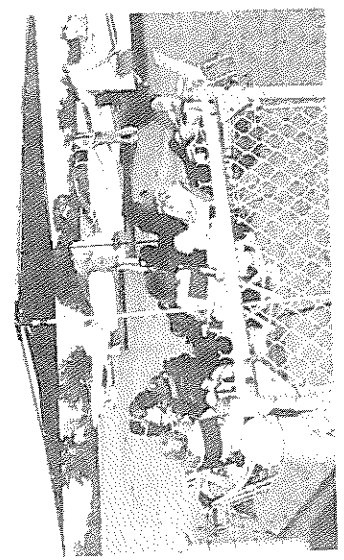
T-18 LINEUP AT AROSHHEAD



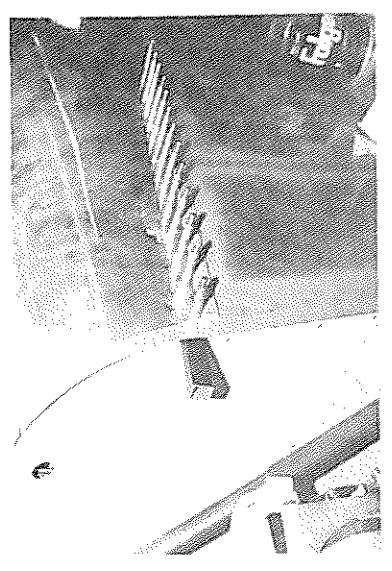
PEPPY TURNER'S S-18, from Marietta, IL



ASK OF TOP TWO LINES OF T-18s AT AROSHHEAD



BRAVO SIERRA ACTION WITH WIVES IN THE SHADE



JOHN POPEJOY'S TOP ATTACH POINT ON V-ENGINE MOUNT. DIAGONAL TUBE GOES FWD & DOWN FROM THIS POINT. LOWER POINTS ATTACH TO PRESENT LUGS ON GEAR LEGS.

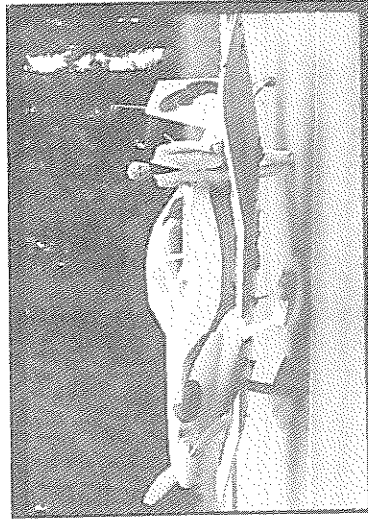


KEN REEDS, PEORIA, IL, SHOWS THE DOORS COWL ON HIS T-18

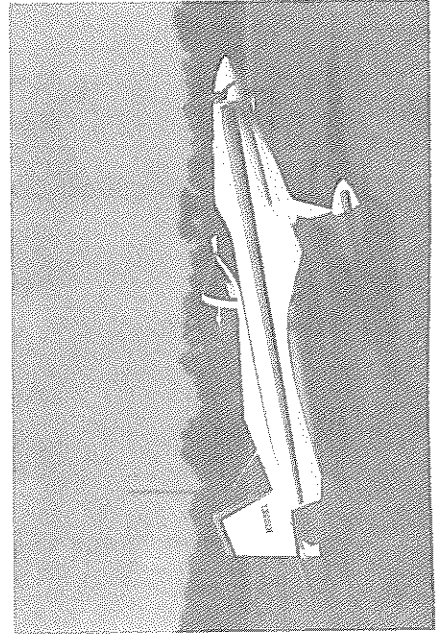




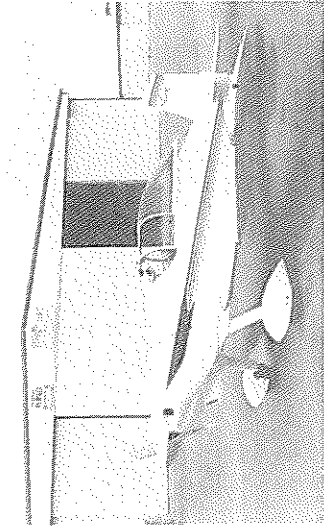
JIM PAINE, DAYTON, OH, AND HIS PROUD BIRD



QATS TORLE (RENO, NV) STANDS BESIDE HIS T-18 WITH ITS FABULOUS FREE FORM PAINT SCHEME, A REALLY IMMACULATE BIRD.



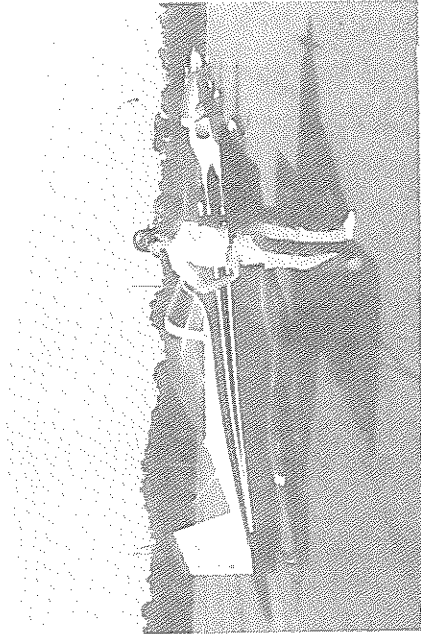
ED LUEKE, (SIOUX FALLS, SD) AND HIS NICELY DONE T-18



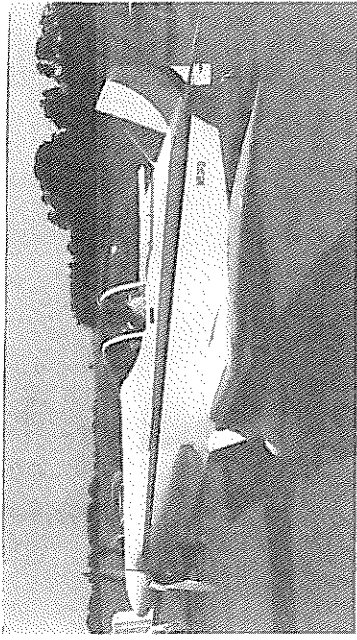
JIM FRENCH'S LONG LEGGED T-18 and its sassy new paint job, from Wimberly, TX. PURTY!



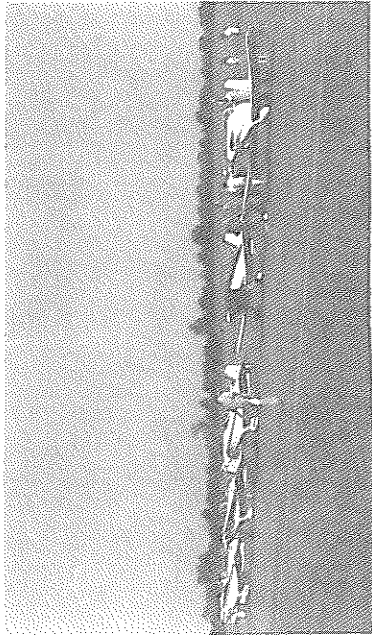
RON JOHNSON, RENO, NV AND HIS T-18



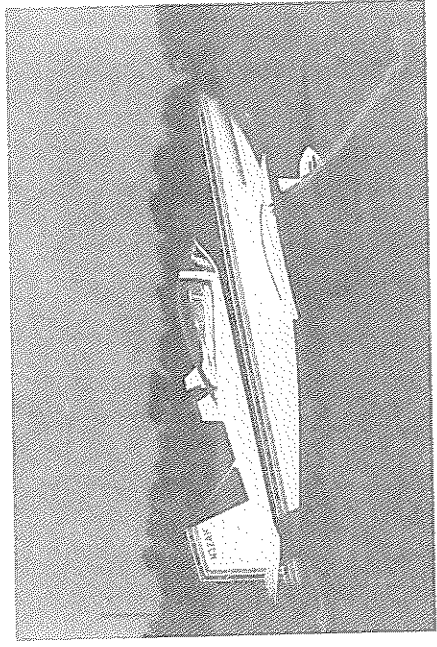
WALT GIFFIN (PUEBLO, CO) & HIS STOCK T-18



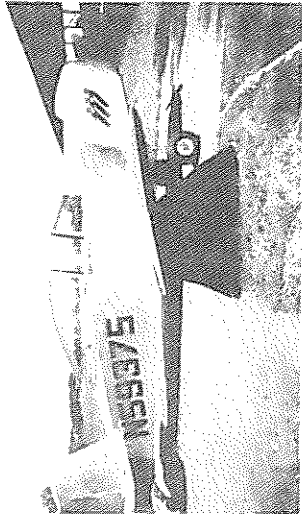
CRAIG CATESAR JUST BACK FROM A LEAP, STOP RIDE IN DAVE EBY'S BIRD (NICHITA FALLS, TX)



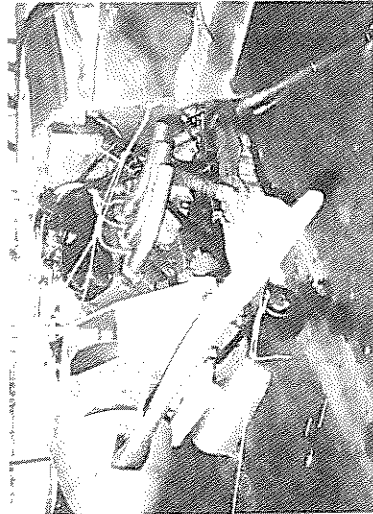
THE OTHER T-18 LINE AT ARROWHEAD



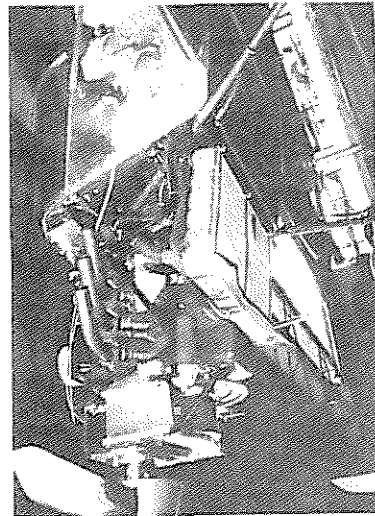
DICK ANSDEN, MT. CLEMENTS, MI, BACK AGAIN.



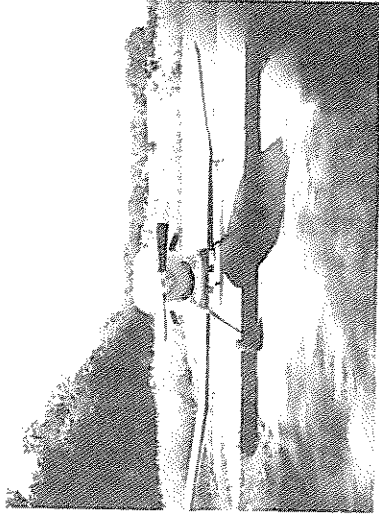
HERE'S BEN GUPP'S JAVELIN FORD V-6  
POWERED T-18. THE FIRST OF THIS TYPE TO  
FLY (SEE TEXT). DO WE CALL IT A T-18V?



TRACE THE ENGINE MOUNT MEMBERS. PROF IS A WARNER.  
ALMOST CONSTANT STIFF.



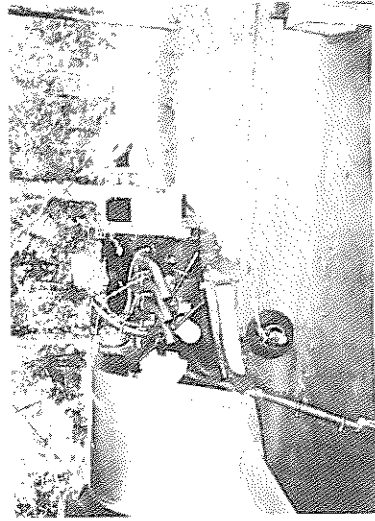
LOWER VIEW OF SPEED REDUX UNIT & COGGS BELT DRIVE.  
COOLING AIR EXITS BELOW THE RADIATOR.



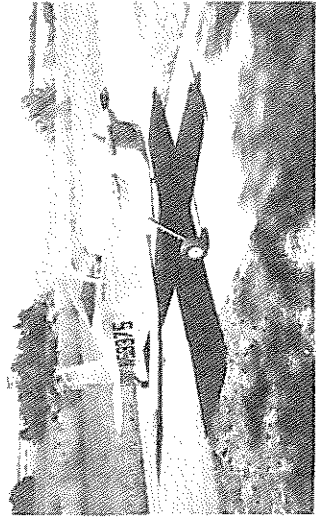
WOULDN'T YOU SMILE, TOO IF YOU HAD SUCH A FINE  
ENGINE AT A BARGAIN BASEMENT PRICE?



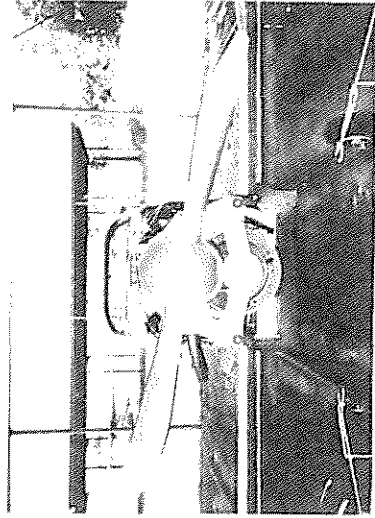
GOOD VIEW OF RADIATOR LOCATION, SPEED REDUX UNIT,  
EXHAUST STACKS. NOTE OIL COOLER? FILTER (ROUND).



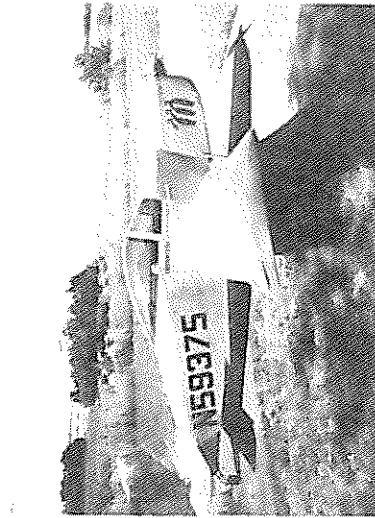
NOTE EXPANSION TANK LOCATION, WITH OIL FILTER  
COOLER FORWARD & SLIGHTLY LOWER. ALSO NOTE THE  
COOLANT HOSE JUST BELOW EXPANSION TANK.



DISTINCTIVE LOOFING FROM ANY ANGLE, I'D SAY



COMPARE SPINNER DIA. WITH TOTAL ENGINE WIDTH.  
FRONT VIEW OF SPEED REDUX UNIT.



SHAPE OF THINGS TO COME? REAR, TOO. THE N NUMBER  
IS NOW DIFFERENT, DUE FAA FOUR-UP. *N50122 Now!*

SEE ALL OF YOU AT OSH '88

- DICK



As the old saying goes, "Better late than never". The past three and a half months have been what might be a masterpiece of understatement, a "Learning Experience", so to speak. In other words, it has been hectic. I know it's hard for many of you to believe, but here it is the middle of November and I'm just now finding time to get the newsletter out. I came home from OSH '88 completely exhausted and spent one solid week just resting and sleeping. I probably shouldn't have tried to make OSH this year and stayed home and recuperated from the auto accident and as usual I guess I push myself too hard at OSH. I had planned to spend a lot of my time on the T-18 flight line, since it was the Silver Anniversary year for the T-18, but we had so many new and interesting airplanes show up this year that the editorial staff was pushed to the limit to get them all covered and photographed before they left for home. Almost 3/4 of them stay no longer than Tuesday and getting interviews or pictures on Sat. or Sun. is a zoo with such a mob scene going on. I had almost caught up by noon Tues. and hoped to spend the entire afternoon and evening getting interviews and pix on the T-18 line, but it wasn't to be, as I got a last minute "must" assignment to cover the scale Warbirds, in particular the Honda Prelude engine installation in a scale P-51 that Rex Taylor (Hapi Engines) had done. Incidentally this engine might conceivably find its way in some T-18s, as it may put out as much as 125-130 hp.

Anyway, I did get loose long enough to go down to the flight line and watch our much modified fly-by and finally to get over to Butch's Anchor Inn in time for our annual dinner with my tongue hanging out. Incidentally, we had 216 attendees at our dinner this year, an all time high. It was again ably emceed by Lee Skillman.

The sad part about OSH this year was that just a few days before opening day we lost our dearest friend, JOHN WALTON. Just when things looked the most hopeful that he had whipped the dreaded cancer it was a sudden bout with pneumonia that did him in. John had been thru sheer hell with weeks and weeks of hospital treatment in Boston, where it was a constant round of chemotherapy and radiation treatment that made him horribly sick. Not only does the treatment kill the cancer cells, but it also destroys the body's ability to fight off almost any kind of infection. When he got the pneumonia, even antibiotics didn't turn it around. John never gave up, tho'. He displayed an inordinate amount of both courage and cheerfulness right up to the end and his goal was to get his T-18 back into the air again and bring it to OSH again, even tho' he probably couldn't legally fly it himself. Oshkosh was always the high point of his life in his later years. John was the one who started the annual T-18 dinner and always made all the arrangements, including the speaker, program, etc, getting the ball rolling months in advance.

John and I were as close as family to each other...maybe closer than some family members are. Some of my fondest memories were our trips to and from OSH in our T-18s, where he always flew in trail with me. There were times when the weather just got too lousy and we had to hang it on the hook for the nite. I remember one trip back from OSH when we only got as far as Janesville, WI, on a Friday and we had to RON there until Sunday morning before it was good enough to go. He always had his youngest son, Lee, with him and loved the T-18 as much as John, and who became a walking encyclopedia on airplanes as a result of his complete devotion to his father and his hobby. It's always with the greatest fondness that I recall the many pleasant hours we got to spend together and altho' I've met a lot of fine people in the T-18 group I can truthfully say that John was

JOHN WALTON

JOHN WALTON, cont'd

one of the finest people in every way that I have ever known..a true Prince of a man, one who did everything he undertook in the RIGHT way, whether it was building something on his airplane or taking care of his family and home. It was the same with his business life, too. His big grin, his generosity, his willingness to give of himself unstintingly, his loyalty, and unfailing kindness to all, were his hallmark. As you may remember, John was a true craftsman in every respect and a few years back he got the recognition he so richly deserved when he was selected as the outstanding T-18 representative at the Wright Brothers Annual Awards at Dayton and that was indeed a signal honor. John took his son, Lee, with him to Dayton, as he did to Oshkosh, and I know how proud of his father he was.

Actually, I don't know of anyone that ever got to know John (even casually) that didn't think he was a super person in every way. That's a pretty fine recommendation for anyone to have, I'd say.

It seems so totally inadequate to say that all of us will really miss John, but mere words fall so far short of expressing our deepest inner feelings. He made our corner of the world a much better place. Our deepest sympathies and condolences go out to Barbara, his warm and lovable wife, and his sons.

Since I wrote the above two months have gone by. I'm sure most of you would find it hard to believe that I couldn't spare a week during that time to write and get the newsletter out, but first of all I've had to put my writing duties with EAA first and for six months after Oshkosh is the busiest time of our year, as we report on all of our interviews, award winners, etc. As you know, we publish 5 magazines each month and each month I have a deadline to get all my articles in by the 15th and each month I just barely make it by the skin of my teeth. I often have to get up at 4 am to get in some work. To make this long story short, this almost 73 yr. old codger has been under too much stress for the past three years and my tread is wearing mighty slick. Common sense says I've got to make some changes. Instead of pulling 9Gs all the time, I've got to back it off to a couple. Trying to play catch up all the time keeps one's adrenalin going full tilt all the time, and that's no good for someone whose health is no better than mine. My wife's health is even worse and with her ongoing heart problems (and age) it puts an additional load on me for prosaic household things that can be time consuming.

We are going to take a long vacation this spring, driving first to So. Cal, and then visiting Honolulu again, then driving up the West Coast to SEA and on up to Victoria and Vancouver, then across B.C. to Calgary, down to Idaho, SLC, and to visit our son in Aspen and then home, taking time to smell the roses on the way, as they say. When that's all over I will then make a decision on how long and at what pace I will continue writing for EAA and also the final disposition of the T-18 Newsletter. I'll do my very best to get four issues out this year, time and health permitting, but after that it may be that I'll have to hand it over to someone else. If any of you have any thoughts on the matter I'd appreciate your sharing them with me. I would like you (someone that might have the time or the inclination to take over writing the newsletter...or at least part of it) to be thinking about it. We have enough in the kitty right now to make it thru the year and possibly thru part of the next year and I'll turn whatever balance we have over to a successor at that time and also advise him on the mechanics of the publishing and writing if he so desires.



## NEWSLETTER FUTURE (cont'd)

JIM HIDALGO, of Wimberly, TX, who bought my T-18 a little over a year ago, called me recently to volunteer his help on the NL. Jim has a large mail order business in custom-type sun glasses and he has a sophisticated computer set up that he uses to print up his catalogues. (I'm sure you have seen his ad each month in Sport Aviation). Jim has offered to type up any hand written letters on his computer, which will save me a whole lot of time. I have never learned to touch type and you can imagine how long it takes me to type even a single page using the two finger hunt-and-peck system and I've never had time to stop and take a typing course. I write all my copy in long hand and send it to OSH, where one of the girls in the steno pool types it up. Jim's doing this will be a big help to me, if I don't have to take the time to type the handwritten letters sent to me.

We still have the ongoing problem of only a trickle of input material from you guys. This is in spite of the fact that I plead, cajole, beg, etc, in every issue I write. I always get a lot of mail that says, "Here's my dues for the year," followed by, "You are doing a great job on the NL. Keep up the good work". Or I get a lot that say, "The Newsletter has been invaluable. I don't think I could have built the T-18 without the NLs!" Most of the time that's the last I hear from them. I appreciate the kudos, but I'd appreciate them even more if the builder would just sit down and write an account of his building or flying the airplane...or even some little part of it. I well appreciate the average guy just simply doesn't know what to write and also perhaps He is afraid if he writes anything that he'll make a mistake and the others will think he's a Klutz or something. Just plain shy, I'd guess you'd say. I've gotten letters that I've had to make some corrections on spelling or grammer, but that's no big deal. A lot of the smartest people in the world have trouble with 'speling' or grammer, so don't let a little thing like that stop you.

ANOTHER NEW T-18 FLIES! JOHN MIHAILA, of Wichita Falls, TX, is passing out cigars since his new T-18's first flite the first weekend in Jan. '89. His buddy and fellow builder, DAVE EBY, called me the evening of the 1st flite day to give the good news. Dave flew it for him, since John still has to go get a new medical, and he said it flew perfectly. Dave said he had started initial takeoffs with it on two previous occasions, but he aborted both times when he got a strong odor of gas in the cockpit at about 40 mph. After the 2nd time John went thru all the agony of taking his instrument panel out and dropping the tank and having it leak checked (again). The tank was perfect, so on the 1st flite day Dave AGAIN had to abort. The light came on when both of them realized that the tank had a VENTED CAP (with a hole in it). The acceleration made it squirt a good sized stream out of the 1/8th" hole. John then went back and welded the hole shut and that was the end of problems. The airplane flew great, trimmed out perfectly, with no squawks of any kind. It has a Lyc. 0-360 in it and is loaded with \$4000 worth of avionics in it. His paint scheme is identical to Dave's, which most of you have seen at OSH, and was also a Wright Bros. attendee a couple of years ago. There's an interesting story behind these two airplanes, that began 11 years ago, and Dave promises to send in a full account "soon". This is the third T-18 in Wichita Falls, making it have about the most T-18s per capita of any city over 100,000 in the U.S I'd guess. 'Course Jim Hidalgo and Jim French live in Wimberly, TX, and two T-18s in a city of maybe 2 or 3 thousand probably gives them the prize for the most per capita....or do any of you know of others that might challenge?

JIM HIDALGO'S ADDRESS: P.O. BOX 1390  
WIMBERLY, TX, 78676-1390 (MARK "PERSONAL")

JOHN MIHAILA'S T-18 FLIES

5 March, 1988  
Tom Kerns, N10TK  
7033 Autumn Terrace  
Eden Prairie MN 55346  
(612) 934-6833

Dear Dick;

In N.L. 67 you posed some specific questions as a poll to us T-18 builders. Following are some of the lessons learned in building and flying my T-18.

"Tuck" with flaps My T-18 exhibited disturbing flight characteristics matching those described by T-18 builders who have a problem with uncontrolled pitch-over with full flap and forward C.G.. While my airplane did not actually depart controlled flight, it displayed the symptoms of pending stabilator stall. In newsletter #59 I described small "floors" in my wing root fairings which eliminated all undesirable symptoms after installation. At least two other T-18's have had success with the modification; however, this should not be taken as a sure fix, be careful! My T-18 does not use the original full flap travel. My flaps have always been limited to 30 degrees deflection. Beware that stabilator stall symptoms may become worse at higher approach speeds with full flap and forward C.G. (solo with full fuel). The full flap extended speed range should be investigated at a safe altitude with most forward C.G. (be sure to check slips with flaps).

Brake lines As I wrote in an earlier newsletter, my T-18 uses plastic brake lines of the sort used in the Vari-eze and Glassair designs. This stuff is light, cheap, and easy to install. I have now developed a leakage problem with the plastic lines where they join to the calipers. I modified my wheel pants to provide less than 1/4" gap between the pants and the tires for drag reduction. The resulting poor brake cooling pushed brake temperatures up to the point where the plastic brake line suffers from creep, and I get a persistent weeping of brake fluid where the line seals to its metal fitting at the caliper. Tightening the fittings will stop the leakage until the next landing in which I use any more than very light braking. I instrumented the brake line fitting at the caliper and measured a peak temperature of 240 degrees F.

The plastic lines seem to do well in a well cooled installation, but if you plan to use tight wheel pants, I strongly recommend a short length of standard aircraft flex line at the lower end of the gear legs to take the heat. The nylon lines seem to work well in the (cool) cockpit. Remember to insert a 3/8" length of brass tubing inside the plastic lines before installing the brass compression fittings. The internal brass tube (available in model airplane hobby shops) will be squeezed by the compression nut action and will not subsequently creep with temperature. This should help maintain joint integrity at moderate temperatures.

Tail wheels Eddie Eiland is building a beautiful T-18 in Red Oak Texas. One change he made was to taper the steel tailwheel springs from the clamping beam forward. The weight savings is considerable without too much softening of the spring. I intend to modify mine on the next annual.

Flight rigging Because of the problems I have seen in other T-18's with building a perfectly straight wing, I built adjustable cams in the rear wing spar junction between the inner and outer wing panels (non-folding wing). The cams allow me to adjust the incidence of the outer wing panels as required for trim. Experimenting with the rigging has provided



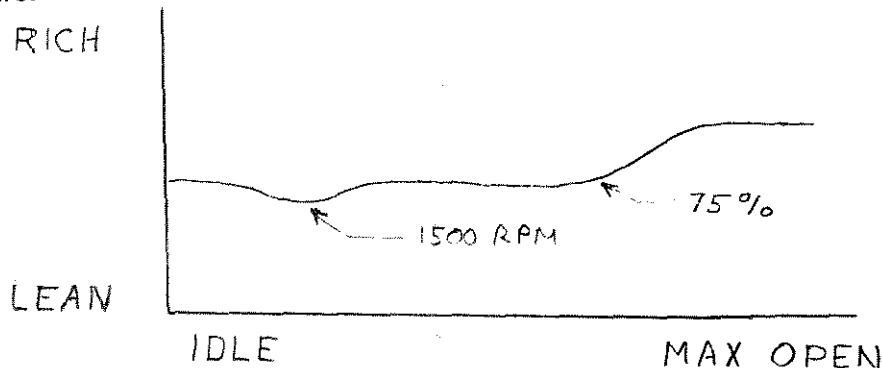
## TOM KERNS LETTER, cont'd:

some surprises. My original trim would fly hands off with pilot and passenger on board, and the airplane would stall straight ahead. When I flew solo, the T-18 required considerable right stick pressure to fly wings level (no roll trim), and would stall straight ahead. I tried compromising by washing out the right outer wing panel, raising its trailing edge about 0.050" with the cam. The revised trim resulted in near hands off trim when flying solo, heavy left stick pressure when flying dual, and a break to the right when stalled. My model airplane days tell me that washing out the right wing should cure right wing drop in a stall, not cause it! Apparently, reducing the incidence of the outer panel forces the inner panel to carry a greater share of the load, and the stall occurs earlier on that inboard wing panel. Bob Dials first T-18 N5BD showed similar symptoms. If you are having trouble trimming a T-18, you may be a victim of this apparent "backward" response in stall behavior.

Cockpit controllable roll trim is essential in the T-18 due to the significant roll trim change with and without passengers. My airplane has electric flaps, which eliminated John Thorps standard roll trim mechanism. I have since installed a light weight jackscrew and trim tab on the left aileron with a model airplane servo motor for power to provide roll trim.

Carburetor matching For the first 170 hours I flew my T-18, I had trouble with a rough engine. The problem was that my engine/carburetor combination which had flown smoothly in a Piper Tri-Pacer for many years was not suited to the T-18. My engine would run smooth anywhere except between 72% and 80% power. The problem was a too lean mixture caused by differences in the carburetor air intake systems.

The Tri-Pacer provided relatively low ram air pressure to the carburetor inlet due to low flight speeds and an exceptionally inefficient air filter and air box system. My T-18 has a modified Thorp banjo box induction system which provides considerably more ram air pressure to the carburetor inlet. With increased air pressure at the carburetor inlet, the carburetor throttle valve is in a more closed position for any given engine power output when compared to the original Tri-Pacer installation. Fuel/air ratio in the carburetor is governed primarily by throttle valve position and was factory set to give the Tri-Pacer a schedule as shown in the figure.



The carburetor was set up to work in the Tri-Pacer, but would not work properly in the T-18 because more carburetor airflow (and power) was achieved for any given throttle valve position (fuel/air ratio). The T-18 installation was running too lean at 72 % to 80% power. I fixed the problem by drilling out my power jet (main jet) orifice from its original 0.0935 inches to 0.0980 inches. Engine operation has been flawless since enlarging the power jet orifice.

My engine is an O-290-D2 with an MA3-SPA carburetor. My hangar mates Glassair with an O-320 and MA-4 carburetor experienced an identical problem and cure. Walt Giffens T-18 N78WG had the same symptoms with its O-290-D2, but Walt re-engined with an O-320 before it occurred to any of us to enlarge the main jet.

Tom KERNS



TOM KERNS LETTER, cont'd: (page 3 of 3)

If your T-18 provides substantially better intake air than the airplane for which your carburetor was built, you may also require a richer power jet. The symptom of a lean power jet is an occasional engine stumble felt in the rudder pedals (not heard) at moderate power settings. The engine will probably smooth out at higher power settings where the fuel/air mixture goes rich for full throttle engine cooling. Some leaning will be possible at lower power settings, but any leaning in the rough power range will make matters worse. It may take a couple of minutes for the symptoms to develop when moderate power is first applied because of the time lag as the lean engine heats up. Walt Giffen noticed a correlation between OAT and roughness in his airplane.

Fuel contamination When I had my fuel tank welded up, the fuel inlet fitting was inadvertently positioned so that it sticks up 1/8" above the tank bottom. This created a condition where 1/8" of water or other contaminant could pool in the bottom of the tank without entering the fuel lines-until disturbed by flight motion. I fixed this by adding a tank sump and drain. I purchased a weldable 1/8" pipe thread flange from Wag Aero, machined a recess in the flange to provide a small sump, and welded it to the bottom of my tank. A 1/8" pipe thread quick drain with an overboard drain hose allows pre-flight draining of the sump (I also have a conventional firewall mounted gascolator to drain). Any contaminant sloshing in the bottom of my tank drops into the sump rather than remaining trapped or entering the fuel lines. Check your own tank outlet geometry to see if you have a potential problem.

Temperfoam seat cushions Temperfoam is great stuff. It is energy absorbant (may help in a crash) and exceptionally comfortable. The only drawback I have found (other than cost) is that Temperfoam is temperature sensitive. When flying in New Mexico in the summer time, the seats are soft, like I would imagine sitting on a bag of jello. The seats are firm and comfortable at "normal" temperatures, and rock hard in a Minnesota winter. The result is that my seating height changes with temperature, yielding minimal clearance between my head and the canopy in wintertime. The seats start out rock hard in winter but within 30 minutes body heat softens the cushion surface to drop me down 1/2" in height and the seat becomes comfortable. If you plan use Temperfoam in cold climates, allow for sufficient headroom when the cushions have the elasticity of concrete! On the seat backs, I used 1" of medium temperfoam and am delighted with it. The 1" on a contoured seat is all that is needed for a very comfortable fit.

Wingtips for sale Chuck Larsen of EAA HQ (414) 426-4800 has a pair of T-18 wing tips for sale or swap for an ELT. He says they are a well made set of "droop" tips.

Fuel feed problems I detailed my gravity feed fuel system and problems encountered in a previous newsletter. Basically, if I have good ram air to the fuel tank vent, the fuel flow is entirely adequate. If I have only static air pressure to the tank, fuel flow is inadequate and my engine will quit at higher airspeeds when ram air pressure to the carb air intake (and carb float chamber) rises to the necessary level.

TOM, that was a super letter in every way. I especially hope it will serve as a guide for other members. I well know that every single T-18 flying has had some little problems come up during the building or after it has flown. If you're one of those guys that says, "I'd be willing to write a piece for the NL, but I don't know what to write about...and it seems like everything has been covered.", then this letter of Tom's ought to stimulate the old brain cells. Start with the spinner and work back. ....(i. e. "How did you go about installing YOUR spinner?"

(cont'd)

THANKS  
AGAIN,  
TOM!

(cont'd)

How did you go about fitting it to the backplate? How did you accurately lay out attach holes and blade cutouts? Did you install front plate in the spinner shell? Did you fasten the front plate to the shell? (you really should) How did you lay out and locate the holes in it? Maybe your letter would say, "I read the NL comments on this and also Tony Bingelis' recent column in Sport Aviation on it and both were very helpful, but I found a little different way to do part of it and I.....etc". Now I know that each and every one of you has had some problems with making engine baffles. How did you go about that job? Where did you install the oil cooler and how did you plumb it with what size fittings and hoses, etc? You could go on and on about every accessory in the engine compartment, what make and type of engine controls you bought, their size, how you routed them where you located them on the panel. We could fill several NLs with accounts about air boxes, filters, & other intake system parts. The same certainly goes for exhaust systems. And FUEL systems...start at the carb and go back-wards to the tank, detailing EVERYTHING, including the cap, the filler door, the scupper drain, AND the indicating system, its calibration and type and make. Now take a close look at YOUR brake system from top to bottom, going into every detail, including hardware callouts, how you routed the lines out of the cockpit, etc. As for instrument panels...every one is different. Why not make a drawing of yours, showing what instrument you placed where, how far apart they were, how you wired them, where you got a good deal on them, how you lighted them, and maybe a note on your own philosophy on how you arranged things, etc. Very little has been written about radio placement and installation, about antennae for Lorans and the results. What make Loran did you buy, why, and your candid opinion of it, its limitations, accuracy, ease of use, etc. And how about where you plug in your headphones, locate a speaker, what brands, along with what type of interphone you have? Or you might want to go in great detail on your baggage compartment, where you located your battery, what kind of box it's in, what size and type solenoids and wiring from the battery to the starter.....we all would especially like to have the numbers on your WEIGHT AND BALANCE, HOW YOU WEIGHED IT, WHAT EACH WHEEL WEIGHT WAS!

Perhaps you may think that those items above would only be of value to the brand new builder....well, they are....but you know we have a lot of T-18s flying that are no longer owned by the builder, sometimes there may have been three or four previous owners....and these people have only a limited knowledge about T-18s and their log books may not give many details. Such info would be of excellent value to them. By the way, WEREN'T YOU DESPERATELY LOOKING FOR ANY AND ALL SCRAPS OF INFO WHEN YOU STARTED? Just HOW grateful are you?

Okay. Again, I've laid out a whole lot of subject matter for you to light a fire under you (no not you..I mean YOU)! How long do you think a magazine or newspaper would last if the "reporters" all leaned back on their thumbs and let George do it and only a tiny trickle of copy came in???? Well, gents, your (our) NL is no different and, yes, it indeed will go down the drain if there is no info to fill its pages with....and I'm not blowing smoke!

In response to several requests to repeat some of the monthly "Tin Bender" articles I write for EAA's "Experimenter" magazine, I'm doing a foto reprint of one of these articles that I used the T-18 as a reference, so the next 4 pages are typical of the articles. (They were originally printed on gray paper, so the xerox comes out dark, too). In case any of you are interested, yes, back issues ARE available from EAA at \$1.25/copy. There are now a total of 31 Tin Bender articles to date. If time permits and there is any interest

(cont'd to page 12)

OPEN LETTER (PLEA) TO M.A.S. MEMBERS

and back and also at each end.

We chromate the aileron all over inside, so no accumulated moisture can start corrosion. This is important on a tail dragger that sits for long periods of time in a three-point position. The chromate also allows us to draw plainly seen lines we need for layout. If you use a sharp lead pencil for this you really should erase them and lightly sand the lines when finished with them.

At the ends we can use our flat layout of the aileron rib as a hole template, but take note while the typical rivet spacing on the rib is 1.48 inches, there is one spacing at the front end of the top flange that is 1.62 inches. To use that template we would measure 2.00 inches forward from the aft edge of the sheet to locate our "anchor" hole for the rearmost aileron rib rivet hole (as shown on the aileron assembly drawing).

We will use the "peek through" method in using our .040 layout template. Using quick release clamps (i. e. nu-vise) we sight through the holes in our template, using the old "eyeball" method to see that the holes are centered over the rivet line. (Yes, the eye is a remarkably accurate tool).

We can now use the nibbed Whitney punch and a small hammer to tap a tiny hole center mark on the sheet, or we can use the non-nibbed punch to go through the hole in the template and actually punch out a perfectly round hole. The punch method is more accurate, of course, even if we use a sheet metal grind drill bit that fits into the tiny center punch mark.

Here again you will find many metal workers prefer to drill (or punch) 3/32 inch (No. 40) holes first. Upon assembly with clecos they then ream them out with

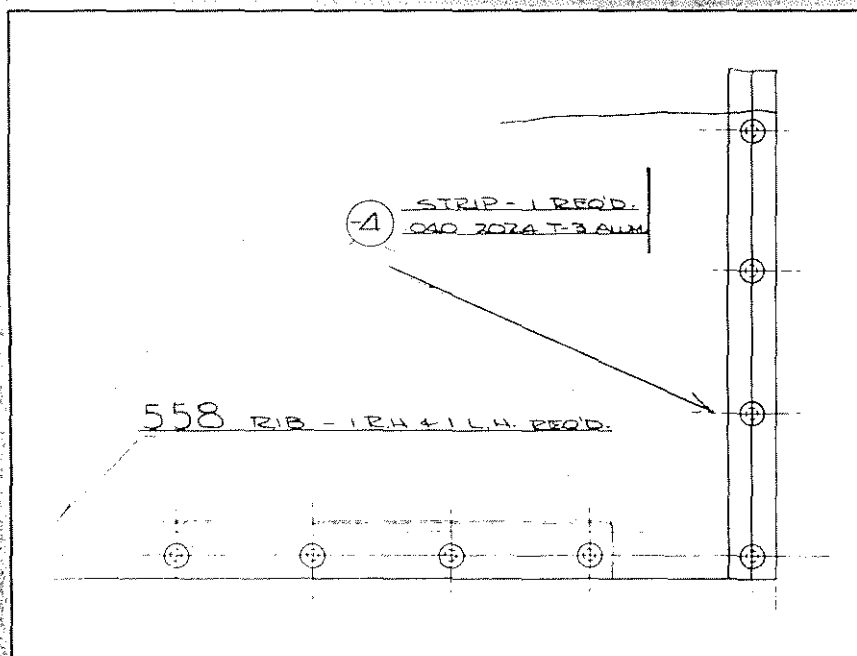
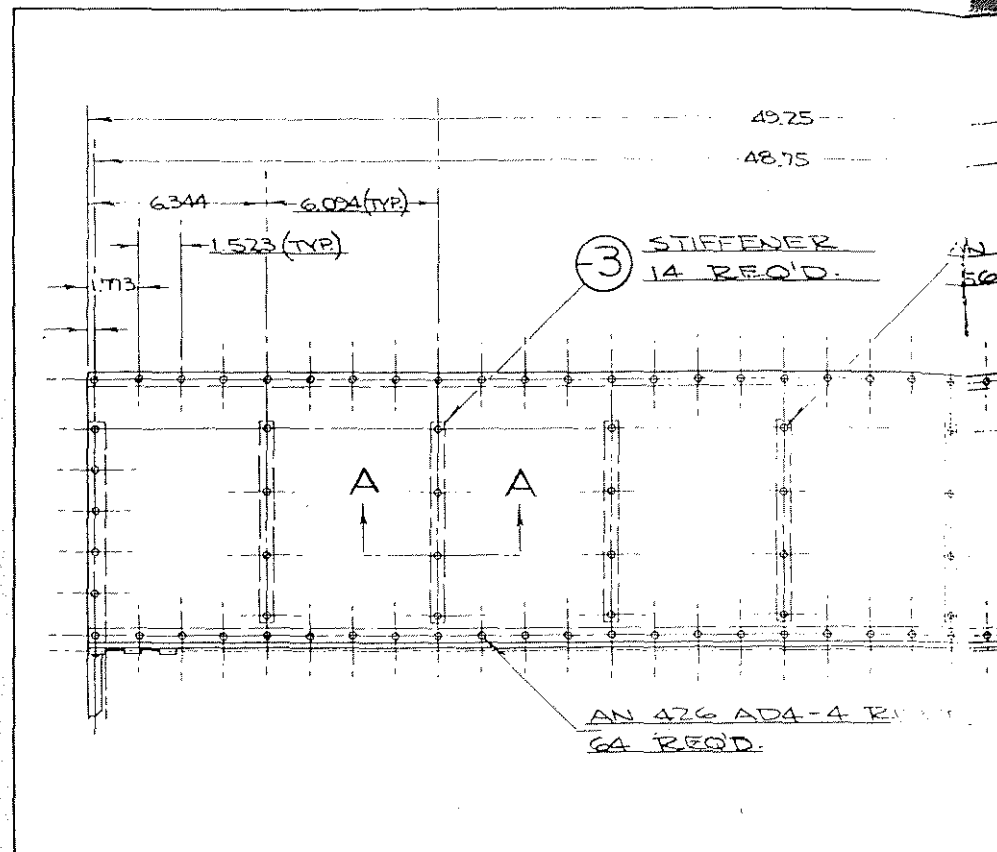
an 1/8 inch drill bit, if the holes are to be dimpled (which stretches the hole so that a 1/8 inch rivet will slip in with a tight fit). If the rounded universal head rivets are to be used they ream the No. 40 hole with a No. 30 drill bit.

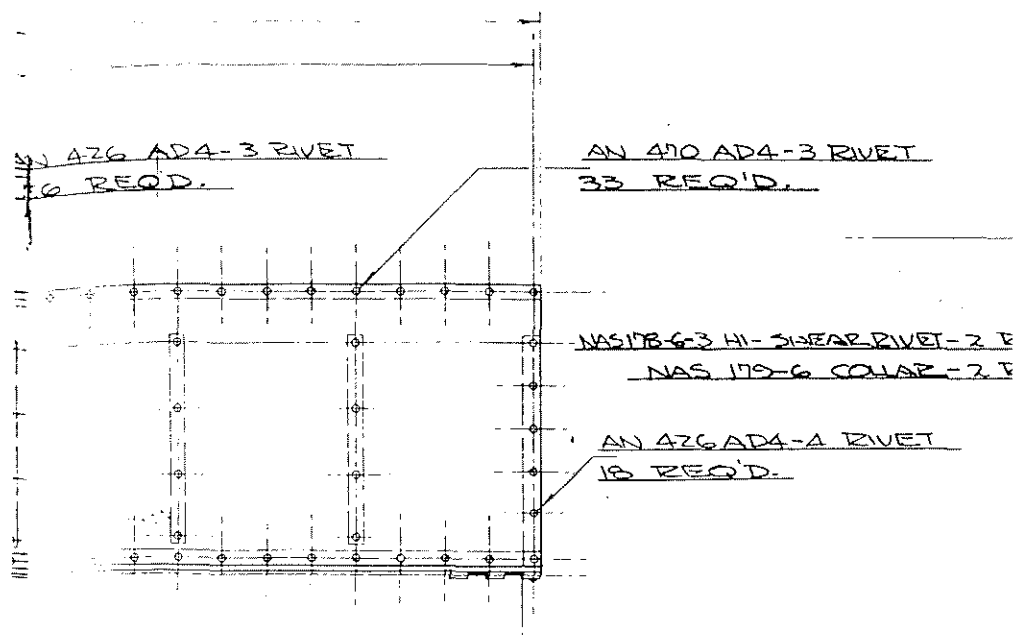
To regress a bit, we haven't yet used our stiffener template to locate the four rivet holes on the skins. If you will look at the Aileron Assembly drawing (the part that shows the flat layout of the

skins) you will note that the stiffeners are located on a line that connects every fifth rivet on the spar and trailing edge. All we have to do now is draw a line on the skins that connects each fifth rivet and lay our template on that line and peek through it. Of course, we have to be sure to put the center of the template's rear hole where it crosses the line that's 2.00 inches from the rear edge of the skin that is our starting point, or "anchor hole."

If we already have No. 40 or 1/8 inch holes in our stiffeners we can skip using the template. Here we can position the rear hole of the stiffeners over the 2.00 inch line and drill through it and the skin simultaneously, cleco it, then do the same thing with the front hole and cleco it. We then do the remaining two holes in between, repeating the process down the line until all 28 stiffeners are clecoed to the skin.

Seems as if all sounds complicated doesn't it? Well, it really isn't. It's actually very simple in actual practice, but if you have ever had to write a manual of any simple operation and describe things so that every facet of the operation is accurately described in detail, you will know that it takes thousands of words to describe. You can't assume that the reader knows much more than which end of a hammer to pick up, even though 90 percent are at least already semi-skilled workmen. It always takes ten times more time to describe it than it does to actually





do it.

Therefore, I hope you will overlook the volume of verbage it takes to unravel the mysteries of making anything as simple as a stiffener. In the main we have been walking through an educational drill

on practical use of matched hole tooling, as introduced by Mr. John Thorp, the outstanding advocate of simple sheet metal construction.

Once you get your feet wet with this type of construction you will really begin

to appreciate what a labor saver it is.

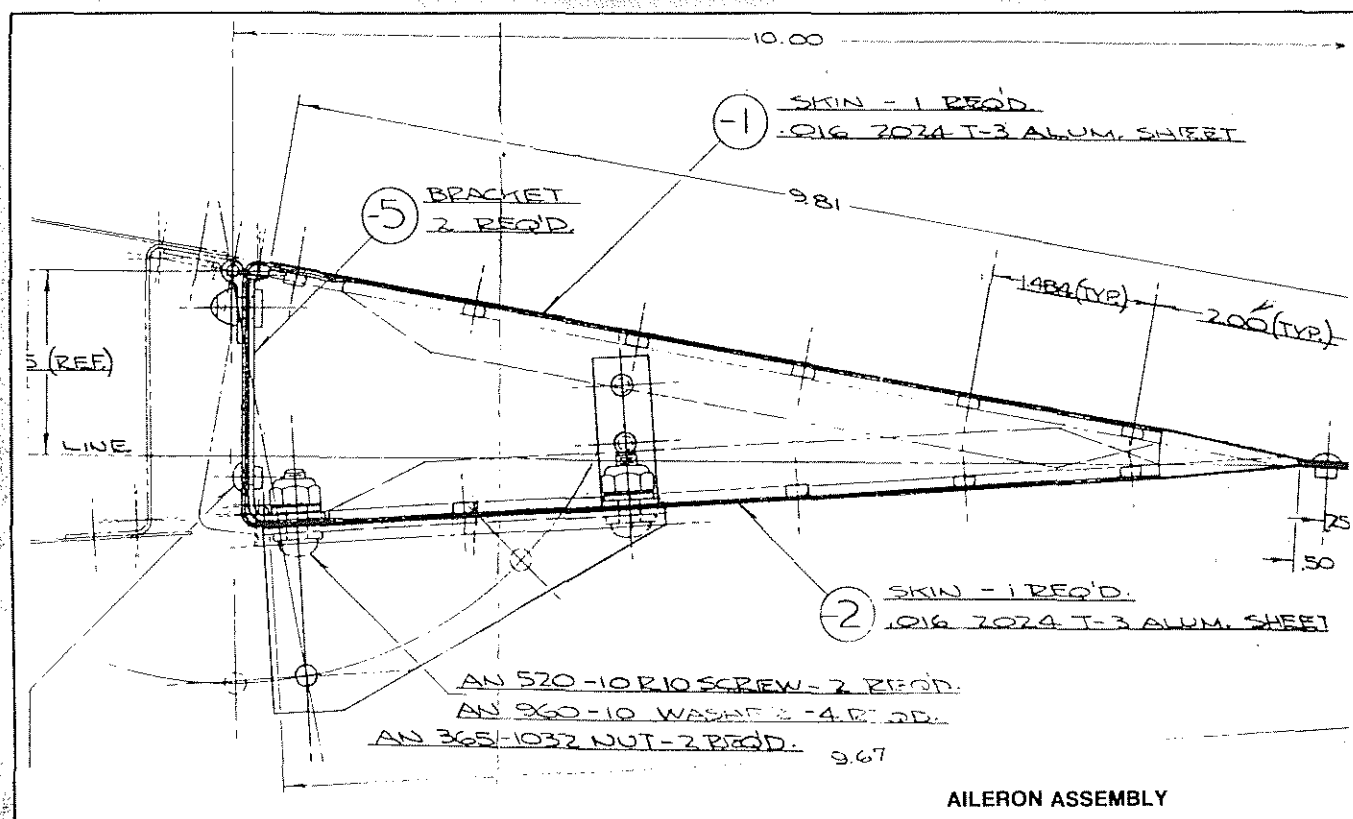
The building of the aileron is the first place we advise the new T-18 builder to start. It gets him acquainted with the value of making and using layout templates, the use of the nibbed and non-nibbed Whitney punch, accurate drilling or punching holes, familiarity with the use of the decimal measurement system, the proper use of dividers, and where and when to use a scribe or other marking method. If he gets careless and screws up an aileron skin or spar, he hasn't cost himself very much money.

In our T-18 newsletters we often point out that the new builder should expect to have to pitch parts in the wastebasket pretty often at first. It's sort of like poker in a way. You'll have to pay to learn at first, so it's better to start on things that are much less expensive.

Before we wind this epistle up for this month I'd like you to mentally walk through the sequence of riveting the aileron, keeping in mind that the entire T-18 was designed to be riveted with regular AN rivets, with access for the bucking bar in all units. While some have been built using blind rivets, 100 percent of the airplane can be built either way. Write down the sequence and check yourself as we finish up the ailerons next month. For instance, *when* and *how* would you rivet the stiffeners to the skins?

We're going to get deeper into the easy way to use a brake, too, and we are still going to look at a homemade brake or so. Until next month then, amigos.

EXP



AILERON ASSEMBLY

we might be able to get foto reprints of the entire series of articles for whatever the costs per page, binding and postage run. I wrote the entire series directed at an absolute beginner, who scarcely knows which end of a hammer to pick up, so to speak. My follow on series will be a step by step story of the design, stress analysis, building, and flying of a super easy to build all metal, high wing parasol mono that will go ultra-light or homebuilt.

Just to illustrate how my time for the NL seems to evaporate, since I wrote the above paragraph that over three weeks has gone by. First, my wife's brother in a nursing home died suddenly and we took up four days going thru the funeral process, since he had no family. Two days later I was on the way to Hendersonville, NC, on a story assignment on an engine and a line of three very light airplanes. There went five days, which included two long and hard travel days. After a day to rest up, I started in on three long stories for Sport Aviation and the Experimenter. One of those stories was a Tin Bender article on layout and building of fins, in which I used the mathematical method of flat layout of T-18 fin skins. I used a photo repo of the T-18 fin assembly drawing as an illustration. All of this took up a week, so here I am on another day to "rest and relax", before it all starts all over again.

I'm taking up all this valuable space in the NL to tell you these things, because I feel that I owe all of you an explanation as to why you haven't gotten a NL for several months and I hope you understand and forgive.

After I finished my last story yesterday I called EAA HQ and explained to them that I couldn't keep up <sup>the</sup> I've had to keep the past three years and that from now on my wife and I were going to take time to take some vacation trips and smell the roses some in our remaining years. This will give me time to get T-18 NLs out at a much better rate. I'm going to make the supreme effort to get three more NLs out this year after this one. After that time I don't know. We'll just have to play it by ear. I would appreciate your input on how we can keep the NL alive.

Just today I received a marvelous and authoritative dissertation on T-18 airfoils, their history, the various modificztions, graphical comparison of their performance parameters, plus a study of the possible use of an alternative airfoil. I got this from HARRY RIBLETT, an authority on airfoils and well known author, with several of his articles appearing in Sport Aviation the past year or so. I plan to use it in the next NL and I think you will find the information quite fascinating.

A couple of weeks ago in the midst of all our bitter cold weather I finally got to see HARLO' McKINTY's new bird for a few brief minutes. He and his wife had been here on a dental convention for several days while I was out of town, but we did finally get together for lunch Sunday before he had to leave for home. Harlo' hasn't had time to put gear leg fairings and wheel pants on, nor upholstery, either, but he's making up for lost time flying it now. He says he'll get it all prettied up this spring in time for summertime flying. Looks pretty good right now, Harlo. He's got it loaded with radio and inst'ts. He's been flying it IFR quite a little and is really pleased with how well it does IFR. He had to file IFR to get out of here that Sunday, too. We all say, "Congrats, Harlo, and we'll be looking forward to seeing it all prettied up at OSH this year. He'll also be sending in a story on it for the NL "soon", he says.

JUST IN CASE YOU DID NOT RECEIVE THIS MAILING WE'LL REPEAT IT HERE.

Mary Holt had major surgery last month, but is recuperating nicely.

T-18 SPRING ROUND-UP AT LAKE TEXHOMA

Dear T-18er:

We'll have our Spring 89 T-18 weekend again at Lake Texhoma. We've made reservations at Lake Texhoma Resort for the 2nd and 3rd of June.

For those of you who have not attended our gatherings at Lake Texhoma, it is located on your Dallas-Ft. Worth sectional approximately 10 miles West of Durant, Oklahoma and 20 miles North of Sherman, Texas. The Lodge has a 3000' paved runway within walking distance. Dining arrangements will depend on the number attending.

IF YOU PLAN TO ATTEND, PLEASE:

1. Call the Lodge at 405-564-2311 before the first of April to make reservations. Will only hold rooms 60 days in advance. (Holt/Green party)
2. Call or write Gary Green, 2530 Bellechase, Granbury, Texas 76048. Phone 817-579-1995. Give name
3. and number of people in your party.  
If you later find you cannot attend please cancel with Gary as well as the Lodge.

4. Bring your own tie-downs.

The Holt and Green Clans in co-operation  
with Mr. Richard Cavin

BEN CIPP & V-G. POWERED T-18 WILL BE THERE

The following received after our last Texhoma fly-in. Rick is a former Braniff pilot, now on active duty with the AF at Wright-Patterson AFB, who bought Ron Zimmerman's T-18, which has a Modified gear, that uses tapered steel rods (Wittman gear) plugged in the A frame. His wife is just about checked out in it now, as you saw on the Texhoma 111 tape. Dick,

Just a short note to tell you how much Louann and I enjoyed the fly-in at the lake. We didn't get to spend much time with the group on Saturday as Louann's sister and family drove up and we were obliged to spend the day with them. We did enjoy the hospitality of the group though and look forward to many more.

The attached fax copy of N13117's first few log entries shows the results of Rob Zimmerman's trials of flight with one flap disconnected. Dave Eby asked about this.

I would like to add a few thoughts about some of the things I have added to my Thorp:

The ACK mode C - just a perfect system, cheap, easy to install, light and worked without calibration  $\pm$  20' all the way up Compatible with almost every Txp on the market.

Gyro package - Century Instruments sells a light-weight complete package (Attitude, DG, vacuum pump, filter, regulator, guage, hoses, fittings, clamps - and a one year no hassle guarantee). Good people to work with and all new or yellow tagged parts.

Fuel gage - My Thorp has a clear plastic fuel line for a gage. Sort of a stand pipe system - very accurate, fail safe but the plastic did not hold up to the effects of the fuel for very long. It would get brittle and start to go opaque in about three months time. I tried several types of tubing with little success. Then I discovered a medical lab supply house that carries clear tubing called Tygon R 3303. The catalog says that it is impervious to virtually all chemicals and comes in all sizes. Mine uses 3/8" od 1/4" id. I finally found some in Clarksville, Tenn (Clarksville Medical Supply). Fairly cheap too.

That's about it from here. Winter is coming, trying to get the last minute outdoor things done before the snows come. This climate is rough on a Texas boy.

Take care, see you soon.

Also, please sign me up for the newsletter. Attached is \$10 for that. Thanks. And thanks for the time you spend putting it out, great job.

*Rick Jones*  
Rick Jones  
7155 N. River Rd.  
S. Charleston, Ohio 45368

Thanks, Rick. Looking forward to seeing you again soon. Thanks, too, for for the tips & the info from Ron's log on the flap. Nice to know the T-18 has the aileron power to combat the asymmetric flap.

Rick Jones Report



EXCERPTS FROM RON ZIMMERMAN'S LOG FROM RICK JONES, Ron did a lot of serious test work when he had the bird.

| REMARKS  | DATE | INSPECTION - MAINTENANCE - REPAIRS - ALTERATIONS |
|--|------|--|
| Disconnected right flap. Can be turned right & left in stall with power off to full power. Did 1 landing with 2 left flap & 1 with full left flap - stalls from a steep climb. To the left - stalls over the tip. To the right - stalls over the tip & enters spin. When with 2 flaps, difficulty full flaps | 7-15 |  |
| Still climbing 700-800 FPM @ 11000 ft OAT 35°  | 7-17 |  |
| attempted to calibrate oil temp gauge. Oil temp read 520 for 450 true  | 7-20 |  |
| Steadily black Pitch dampers out to almost nothing in 3 seconds CG 16-172  | 7-21 |  |
| Roll ability in normal - will hold 30° bank in 720° turn. Left & Right of cross power  | 7-22 |  |
| <p>I performed a <u>rolling flight</u> - <u>climb</u> and <u>covered a</u> <u>vertical</u> <u>climb</u> of operation. Limitation dated 7-22-1967</p> <p>James L. Zimmerman</p> <p>CFE-GHDO-710</p>   |      |  |

Take note of the  
reaction out of a  
crossed-controls  
slip.

REMARKS

From Ron Zimmerman's Log Book

SIGNATURE

LICENSE  
NUMBER

DATE



20704 BIRCH MEADOW DR.  
MT. CLEMENS, MI. 48043

from Dick Amsden:

DEAR DICK, (T-18 BUILDERS & OWNERS ASSOC.)

AUTO GAS ? I HAVE BEEN USING UNLEADED 87, 89 OCTANE IN MY THORP THE PAST 5 1/2 YEARS. IT HAS A LYCOMING 150 HP 0320 E2G. ALSO I USE 100LL ON MY TRIPS. (CAN'T CARRY MY CANS) HOWEVER, I UNDERSTAND PETERSEN'S STC RECOMMENDS USING SOME 100LL EVERY 75 HOURS. DON'T KNOW WHAT EAA RECOMMENDS.

STARTED FLYING IN MARCH, 1983 USING 100LL. IN 43.5 HOURS THE BOTTOM PLUGS WERE SOLID WITH LEAD. CLEANED AND REGAPPED BUT HAD A MISS AT CRUISE RPM.

BOUGHT A NEW SET OF PLUGS EM40E. SWITCHED TO UNLEADED AUTO GAS AND RAN 144 HOURS (INCLUDING 16 HOURS ON 100LL)

CLEANED AND GAPPED, RAN 161 HOURS, (INCLUDING 20 HOURS ON 100LL) BUT ON A TRIP BACK FROM TEXHOMA THE PLUGS WERE FOULING. (FORGOT TO LEAN ON THOSE LONG TAXIS IN ST. LOUIS.) GOT HOME OKAY THOUGH.

THEN I BOUGHT A NEW SET OF PLUGS REM37BY. THESE WERE DEVELOPED FOR USE WITH 100LL. FLEW 123 HOURS (INCLUDING 37 HOURS ON 100LL) PULLED PLUGS AND THEY WERE JUST LIKE NEW EXCEPT THE GAPS WERE .018-.019, SO REGAPPED TO .016. THESE PLUGS RUN BEAUTIFUL ON 100LL OR UNLEADED.

DICK AMSDEN'S REPORT

PAGE #2 from Dick Amsden's letter:

I ONLY USE AMOCO OR SHELL UNLEADED 87-89 OCT. AND ONLY BUY FROM HIGH VOLUME DEALERS. HAVE A 5 GAL. AND 2-2½ GAL. METAL CANS WITH PLASTIC SPOUTS AND A PLASTIC FUNNEL WITH A SCREEN. (COULDN'T FIND RIGHT SIZE METAL FUNNEL) I USE A 12' JUMPER CABLE FROM THE METAL HANGAR TO THE TAILWHEEL SPRING AS A STATIC GROUND. ALSO, I ALWAYS TOUCH THE METAL CAN TO THE FUSELAGE BEFORE POURING.

LAST WINTER WHEN I WAS TIED DOWN OUTSIDE IN FLORIDA, I USED A JUMPER WIRE FROM THE TAILWHEEL SPRING TO THE METAL TIE DOWN STAKE THAT WAS 4 FEET IN THE GROUND.

THE FISH SPOTTER IN FLORIDA HAD A CESSNA WITH A 150 HPC. AND WAS PUMPING UNLEADED OUT OF 2-16 GAL. PLASTIC CANS IN A STATION WAGON, USING THAT AERO FUEL TRANSFER PUMP ADVERTISED FOR \$295<sup>00</sup> WITH ALL PLASTIC LINES AND NOTHING WAS GROUNDED TO NOTHING!

INCIDENTLY, I HAVE BEEN USING A GELL CELL BATTERY IN THE THORP SINCE 1982. SAME BATTERY. NEVER HAVE TO WORRY ABOUT WATER ADDITIONS. A COUPLE OF TIMES IT WENT DOWN FROM NOT BEING USED, BUT A QUICK CHARGE 20-30 MINUTES ON HIGH (ABOUT 20 AMPS) AND AWAY WE GO. THAT BATTERY IS 6 YEARS OLD.

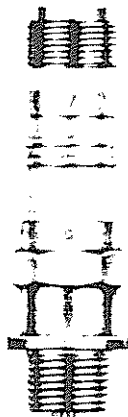
SEE YA IN THE SPRING.

Dick Amsden  
N32 AH

THE END OF THE LINE

**CHAMPION****AVIATION SPARK PLUGS****SPARK PLUG TYPE  
DESIGNATION SYSTEM**

All Champion Aviation Spark Plugs are identified by type designations selected by virtue of the plug design as applied to the following Spark Plug Number and Symbol Chart. The symbol is composed of a rating position number together with prefix and suffix numbers to indicate major plug design characteristics.

**A TYPICAL SPARK PLUG NUMBER  
WITH SYMBOL EXPLANATION**

**R H B 37 E**  
 ↑ ↑ ↑ ↑ ↑  
 ① ② ③ ④ ⑤

**RESISTOR**

None — No Resistor  
 R — Mil Spec. Resistor—Erosion protection

**BARREL STYLE**

None — Unshielded  
 E — Shielded  $\frac{5}{8}$ " 24 Thread  
 H — Shielded  $\frac{3}{4}$ " 20 Thread (All Weather Plug)

**MOUNTING THREAD—REACH—HEX SIZE**

B — 18mm  $\frac{13}{16}$ " / 2.06cm  $\frac{5}{8}$ " / 2.22cm  
 M — 18mm  $\frac{1}{2}$ " / 1.27cm  $\frac{3}{4}$ " / 2.22cm  
 J — 14mm  $\frac{1}{2}$ " / 0.95cm  $\frac{13}{16}$ " / 2.06cm  
 L — 14mm  $\frac{1}{2}$ " / 1.27cm  $\frac{13}{16}$ " / 2.06cm  
 U — 18mm  $1\frac{1}{8}$ " / 2.85cm  $\frac{13}{16}$ " / 2.06cm

**HEAT RATING POSITION**

Low number — cold High number — hot

**ELECTRODE DESIGN**

None — Conventional single  
 E — Two prong massive  
 N — Four prong massive  
 P — Fine wire (Platinum)  
 W — Fine wire (Iridium)  
 B — Two prong massive, Tangent to Center  
 R — Push-wire — 90° to Center

**HOW TO INSPECT SPARK PLUGS**

Remove seat gasket from plug and inspect it. Severe deformation in the form of gasket collapse indicates it was overtightened. Inspect each plug for the following defects, any one of which will disqualify it for re-use:

- Cracked insulator tip at firing end
- Severely rounded shell hex
- Cracked insulator in connector well

Spark plugs are often discarded long before their usefulness is ended. Plugs that have undamaged threads, shielding barrels, shells and ceramic insulation are good for many hours of reliable service as long as they are periodically cleaned and regapped.

If a spark plug is accidentally dropped, discard it. Internal damage is likely, even if no damage is visible.

Look inside the ceramic insulator well at plug top for grey pencil-like lines. These carbon tracks indicate ignition flashover from lead connection to shielding shell, causing misfiring and power loss. It occurs most often during full power operation, as at take off, but can also occur at high altitudes with somewhat less power.

Black, soot-like deposits in the well usually show that abnormally high temperature has caused lead insulation to deteriorate. Ask for help to find the cause. Have the lead replaced if insulation is badly damaged. A too-short lead, brought on by a missing or broken spring, can cause misfiring by preventing firm contact between connector spring and contact cap at bottom of plug's insulator well. It will also cause contact cap burning or pitting.

Factory Price List Dated 1/31/85

REM40E PLUGS (5/8-24) WITH BUILT-IN RESISTOR - EQUIVALENT TO  
 AC PLUG SR-88 FOR USE IN MOST CONTINENTAL AND LYCOMING ENGINES.  
 LIST PRICE \$16.30 OUR PRICE \$9.95

NEW REM37BY SPARKPLUG LIST PRICE \$16.30 OUR PRICE \$9.95

**CHAMPION SPARKPLUGS**

| Spark Plug Designation |         |             | List Price<br>Each | Our Price<br>Each |
|------------------------|---------|-------------|--------------------|-------------------|
| Shielded               |         |             |                    |                   |
| 5/8-24*                | 3/4-20* | Unshielded  |                    |                   |
| MASSIVE ELECTRODES     |         |             |                    |                   |
| REJ38 (14MM)           | RHB37E  | M41E (18MM) | \$15.60            | \$9.45            |
| REL37B (14MM)          |         |             | 16.30              | 9.95              |
| REB37E                 |         |             | 16.30              | 9.95              |
|                        |         |             | 16.30              | 9.95              |
| REM37BY                |         |             | 16.30              | 9.95              |
| REM38E                 |         |             | 16.30              | 9.95              |
|                        |         | RHM38E      | 16.30              | 9.95              |
| REM40E                 |         |             | 16.30              | 9.95              |
|                        |         | RHM40E      | 16.30              | 9.95              |
|                        |         | RHU27E      | 20.50              | 13.49             |
|                        | RHB29E  | 16.30       | 9.95               |                   |
| REB32E                 |         | 16.30       | 9.95               |                   |
|                        | RHB32E  | 16.30       | 9.95               |                   |
| IRIDIUM ELECTRODES**   |         |             |                    |                   |
| REM38S                 |         |             | 39.80              | 24.45             |
|                        | RHB32S  |             | 46.30              | 28.30             |
|                        | RHB36S  |             | 46.30              | 28.30             |
|                        | RHM38S  |             | 39.80              | 24.45             |

\* Shielded barrel thread size. Check barrel size - 5/8x24 or 3/4x20 threads - before ordering and select proper plug number. See page 161 for Champion/AC Cross-Reference Table and page 163 for Sparkplug Application Table.

\*\* The new "Iridium S" sparkplugs replace the Platinum and "W" Iridium types. Increased bore diameter improves scavenging action. Greater clearance volume can accept more combustion deposits. Single Iridium electrode offers greater resistance to lead attack. Easy to clean - Easy to gap.

**CHAMPION SPARKPLUG ANTI-SEIZE**

Apply sparingly to second and third threads. Do not contact electrodes as it could short out the plug. Do not apply to shielding barrel threads. Unbreakable 2 oz. bottle with applicator brush top.

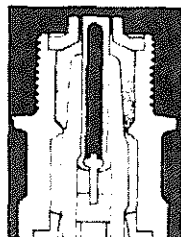
#2612 \$2.50

**SURPLUS SPARKPLUG BARGAINS**

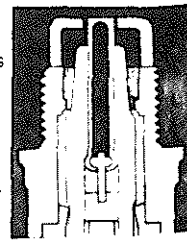
BG341 (New Surplus) 18MM long reach, shielded, 3/4-20 barrel. FAA approved for Continental IO-470, G10-470, TS10-470, IO-520 and GTS10-520. Not for O-470, which uses short reach plugs. \$4.80 Ea  
 C10S (New Surplus) 14MM short reach, shielded, 5/8-24 barrel. For VW, Franklin. \$4.50 Ea

**NEW REM37BY SPARKPLUG**

Designed specifically for Lycoming O-235 K/L/M engines. Approved for O-230 and O-360's of 180 HP and less (not turbo). Performance has been sensational! Notice that firing tip is raised well beyond the bore with extended insulator and center electrode. This allows plug to fire dependably even though a build-up of lead fouling deposits may occur. Assures longer plug life and less cleaning. Promises to replace the REM40E sparkplug in all applications.



Standard Spark Plug



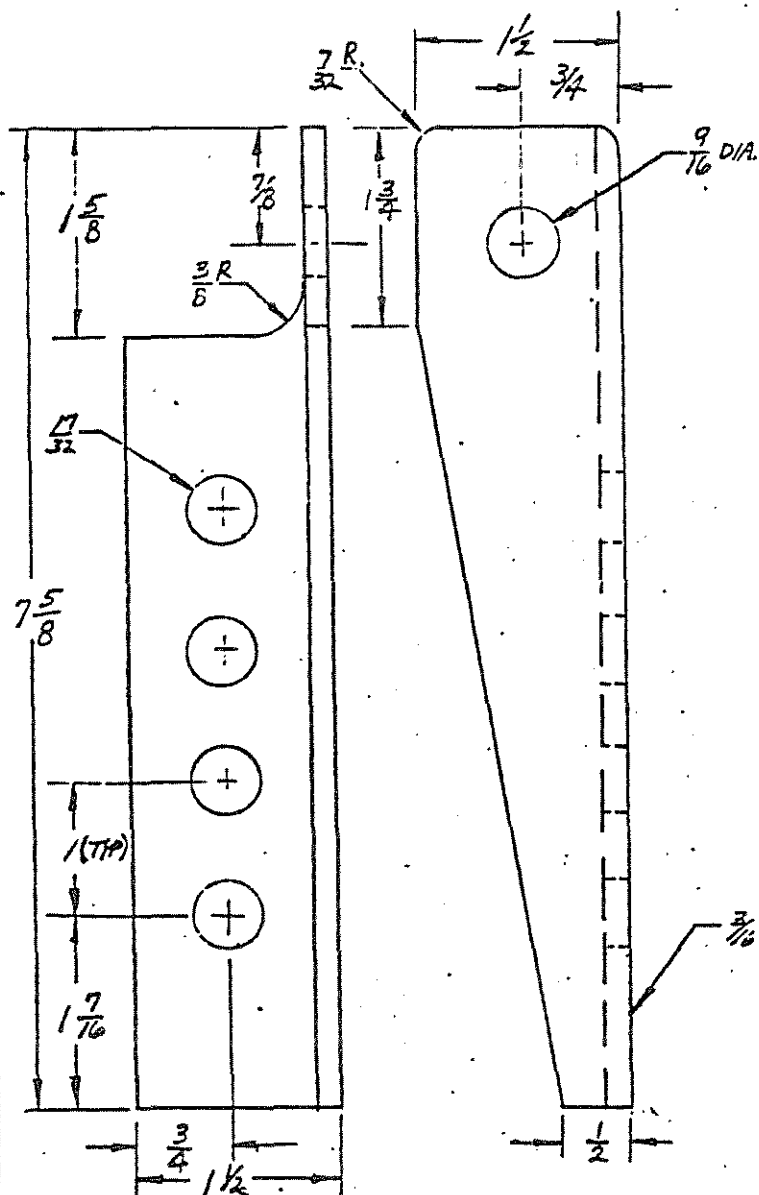
New Champion Spark Plug

August, 1988

FROM— Chapter 92 Hangar Flyer

SOME BUILDERS HAVE ALSO USED AN I BOLT THAT SREWS INTO A HEAVY PIECE OF ANGLE BOLTED TO THE SPAR (is removable).

## TIE DOWN FITTING INSTALLATION



CUT SLOT  $1\frac{1}{2}$ " LONG  $\times$   $\frac{1}{4}$ " WIDE,  
 $\frac{3}{4}$ " INBD FROM EDGE OF WING SKIN.

- BOLT TIE DOWN FITTING TO UPPER & LOWER SNAR CAP
- RIVET TO WEB IN BETWEEN SNAR CAPS
- USE MOUNTAIN CLIMBER'S SNAP RING IN  $\frac{9}{16}$ " DIA. HOLE FOR ATTACHING TIE DOWN ROPE

$\frac{3}{16} \times 1\frac{1}{2} \times 1\frac{1}{2}$  AL. ANGLE  
2024 T-3 AL.

T-18 WING  
TIE DOWN FITTING  
BY MEL CLARK  
12/7/87

# LIGHT WEIGHT TIE DOWN FITTING

(Rec'd at last minute)

310 Oakwood Court.  
Lutz, FL 33549  
March 7, 1989

Dear Dick,

Here it is 1989 already, and I haven't sent in my Newsletter subscription money nor have I made the progress that is desired on my S-18. Enclosed is my check, and I hope to see you at Sun N Fun or Oshkosh again this year. Meanwhile, keep on writing; the Tin Bender articles and the Thorp Newsletters are great reading, especially for beginners like me.

By the way, Bill Williams of Tampa, Florida is moving right along with his project, a Thorp S-18, and he sure has been a big help to me. At the end of February, he had completed the wings, flaps, ailerons, horizontal tail, rudder, and vertical fin. Bill says that the newsletters have provided a lot of useful information, and I sure agree with that. Bill recommends the following sequence of steps for assembly of the outer wings (little has been published before on this so it might be a good item for a future Newsletter). Please note that this is written for an S-18 with fuel tanks in the outer wings:

OUTER WING ASSEMBLY      S-18

1. Assemble the front spar; install 315 spar fittings.
2. Rivet splice on rear spar (if splice is used).
3. Cleco all ribs to front and rear spars. Do not rivet any hardware to aileron bellcrank rib (320-1 rib).
4. Rivet ribs to front and rear spars. Do not rivet the 310 and 201-2 ribs or the 320-2 and 201-1 outboard ribs yet.
5. Rivet fuel tank hardware to the nose ribs.
6. Rivet doublers, inspection cover plates, & fuel tank drains to wing skins.
7. Rivet lower skin to main spar.
8. Continue by riveting lower skin to rear spar and to all ribs except the 310 and 201-2 ribs and the 320-2 and 201-1 ribs.
9. Fold upper skin forward and seal the fuel tank.
10. Rivet aileron hardware to 320-1 rib; install bellcrank (while it is accessible).
11. Rivet upper skin to main spar.
12. Rivet all nose ribs including the 201-2 and 201-1 outboard ribs.
13. Rivet skin to 320-2 rib and the 320-1 rib beginning at main spar and working back to rear spar.
14. Rivet 310-2 rib.
15. Rivet second 320-2 rib.
16. Rivet third 320-2 rib.
17. Rivet 310-1 rib.
18. Rivet trailing edge of rear spar.

THANKS, LES, FOR  
YOUR REPORT

Sincerely,

Les Connell

P.S. Just got my "Sport Aviation" - Great article on the T-18

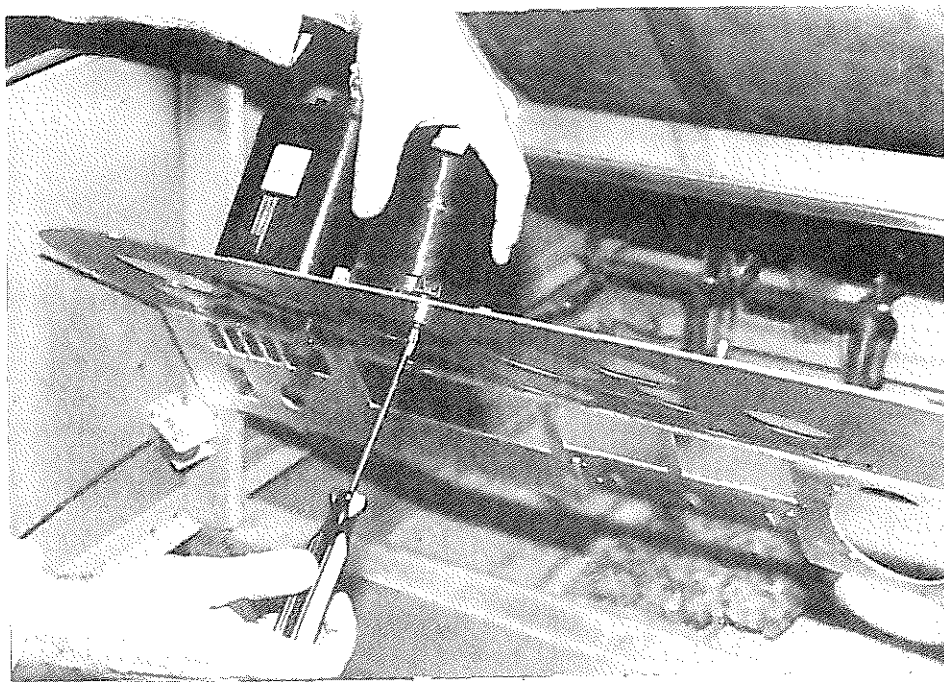
SWING DOWN INSTRUMENT PANEL

Don't climb in the hole no mo'. By means of unique engineering, instruments and connections can be serviced from either a comfortable standing position or sitting position. Design includes shock-mounting of total panel. No change is required in length of hoses, tachometer drive or propeller and throttle control push-pull cables..

Fabrication is inexpensive, simple and fast with little or no modification to standard panel. The panel illustrated has the usual full IFR setup with Nav-com, Loran, and Transponder. Switches and circuit breakers are Cessna standard.

A detachable "eyebrow" glare shield with dark naugahyde top is incorporated with the  $4\frac{1}{2}$ " aft-mounted position of the assembly for avionics clearance.

An automotive type 6 cylinder engine is planned for this T-18 w/ Dave Blanton reduction unit to obtain the full potential of the engine.

OWNER INSTALLING INSTRUMENTS

INSTRUMENT PANEL IN  
SERVICING POSITION

from:

Robert Yeakey  
9729 Bellewood  
Dallas, Tx, 75238  
214/750-7438

(note rudder  
cables/pulleys  
on sides)

send a S/SA to  
Yeakey for a  
hinge drawing

HE ALSO HAS A PAIR  
OF 500X5 GOODYEAR  
WHEELS & BRAKES FOR 125.

← RUDDER CABLES

THANKS BOB



## FOR SALE PAGE: (FREE LISTING TO MAS MEMBERS)

JOHN WALTON's FAMILY have now decided to sell John's T-18 (the one he built and later installed a 180 and constant speed prop in ). DEL HAINLY, a family friend and former owner of a T-18, has generously offered to take over the finishing of the airplane, installing the new upholstery and other cosmetic items. If you remember, this one has the new airfoil, folding wings, aux fuel tanks in L.E. (wing flew some 50-6- hrs before). This is an immaculately built airplane in every respect and at the \$21K price is an excellent buy for someone. Serious inquiries call Mrs. Walton at 713/440-8093, for details. If I could get my physical back I'd buy this airplane in a minute.

Hurant Karibian, 621 Woodstock Rd., Virginia Beach, VA, 23464, 804/420-5606. is close to flying his #1 T-18, but has another partially completed one for sale for \$6500, WITH a 125 Lyc. 0-290D (1300 TT, 380 SMOH). He also has two Hartzell HC-82XL-2C C/S props for sale. One is 69" dia. for \$900, the other is 72" dia. for \$2500. Space doesn't permit complete listing of all items on project, but looks like good buy for someone in that area.

EDDIE EILAND, 140 Burkett, Red Oak, TX, 75154; 214/576-5268 X Has a #479 welded engine mount and engine mount ring (#478-1) fully machined, bought from Leisure Aircraft for sale for \$200...plus miscellaneous other T-18 parts, including GPU parts. He also has a couple of VW Slick mags, one new, the other with 200 hrs.

CRAIG CAESAR, has a complete project for sale. I don't know how much is riveted, but maybe I can get further details before I close out the NL. If not, call him at his brother's house in the pm after 7 at 817/457-7037. The project was bought from Warren Spencer in Chicago within the past 6 mo. and is a good one. Craig is in a financial tight and may even have to sell his Super Cub, too. He and David drove all the way from Arlington, TX to bring it home.

CHET WELLMAN, 406 Napoleon St., Rockford, IL, 61105, 815/ 963-0015, has a project that could fly in very few months. It is a wide body fuselage and has John Walton's former standard wing. John also built the horiz'l tail. Chet has given up on getting his physical back (heart), so will sell for what he has in it (under \$10k, with Lyc. 0-320 low time engine). As I remember, it needs only a canopy to complete. Has canopy frame & roll bar.

Dan HEERSMA, 2680 Terrebonne Ave., San Dimas, CA, 91773 (~~XXXXXXXXXXXX~~ 714/599-3406. Has a folding wing partly assembled, all other parts, some duplicates, ailerons, flaps, center beam, outer beams, all assembled. All parts bought from Ken K or Phil Tucker. No price was quoted.

Larry Cresse, 2647 Bent Spur Dr., Acton, CA, 93510, 805/269-1291 has a project he's asking \$5k for & has o'hauled 0-290G with it. 90% complete.

Sam Stokes, 2616 Laguna Dr., Endicott, New York, 13760 (didn't send phone#) has most of parts for st'd T-18, but only outer wing panels & ailerons are complete. He lives close to L. Sunderland & Lou made a lot of these parts he said. Since Lou died he has lost interest in finishing. A/C is 607. Price is negotiable, I think. *ALSO HAS 0-290G, DISASSEMBLED.*



BEN CUPP 's JAVELIN V-6 powered T-18 update: I talked to Ben a couple of days ago and as you might expect, the engine just runs and runs and just gives no problems. He has about 70 hours on it now and it does what it does in your car....it starts on the first blade, whether it's cold or hot and from then on you just about forget it is there. The V-6 is smooth from idle to full power. Now that he has the radiators in the aft fuselage theres no longer a cooling problem. As you may have noticed in a previous NL, the automotive air cleaner does stick up above the normal cowling line, so Ben's original cowl had a hump in it and that didn't look too slick. He has since built a new cowling that he says looks a good deal better. Ben considered lowering the engine so that the air cleaner would clear the cowl, but he was apprehensive that the lowered thrust line might affect the flight characteristics adversely. The air cleaner location and type isn't a major problem to solve, so no doubt it WILL be solved.

It certainly appears that ol' Dave Blanton has a winner in the Javelin engine. It has taken a long time to get the message thru to the troops and get them to use it, but you are going to hear lots more about Dave and his engines in the future. For a lot of people, his engine will be the deciding factor as to whether some people can afford an airplane or not. The liquid cooled aircraft engine is here (or should I say, back?)

Any aircraft engine NEEDS a variable pitch (or constant speed) prop to enable it to perform efficiently in all conditions. That, too, is now here and at a price and weight that many can afford.

The prop is called "LECTRO PROP". I just turned in a short story on it to be used in next month's "HOT LINE" in Sport Aviation, so I won't repeat all the info, except to say that it will weigh 28 lbs. complete and cost about \$3000. (That's light and that's cheap compared to a new Hartzell c/s prop). It's electrically controlled via solid state electronics and is available in either a toggle switch controlled variable pitch version, or a constant speed version that maintains a pre-selected rpm. This prop may well be a perfect complement to the Javelin engine, enabling the pilot to get maximum horsepower from a standing start, plus a markedly better rate of climb, adding up to a big safety plus on every take off. It also will pay for itself in better fuel consumption in cruise.

The Javelin engine doesn't lend itself to the use of a Hartzell c/s prop. In addition, the weight would be prohibitive. The LECTRO PROP can be an "add on" item, with very little effort involved. I'll be doing a complete story on it in the near future.

The history of EAA and aviation progress has been inseparately wedded to forward looking men with vision, men like Dave Blanton, who despite many setbacks, keep pressing on. Call them modern day pioneers, men who deserve our respect and plaudits. This list also includes people like Ben Cupp, who is equally deserving of our appreciation and congratulations.

Incidentally, Ben told me that he definitely will be at our June reunion at Texhoma. Hope you'll be able to join us there, too. It will be a golden opportunity to observe and compare the Javelin T-18 performance with the others. There is an outside chance that John Popejoy will also be there with his Javelin T-18, if everything goes as expected.

That's it for now, gents. Again, I apologize for the long delay. In the next NL, #72, we will have pix of all OSH '89 T-18s, etc. Sayonara.

## Oshkosh '89

We really made our mark at Oshkosh last year, and it was quite a feather in the T-18 cap, but hopefully you who couldn't fly in last year can make it this year. Also, we hope a goodly number of you who flew in last year can do so again. The T-18 dinner is still Tuesday evening at **Butch's Anchor Inn**, as always. I hope to see you there and on the flight line, too. I'll be hitting it in high from daylight to dark each day doing interviews, etc., for EAA magazines (all five), but I'll be up and down the T-18 lines several times, you can bet on it. If you want to get hold of me for some reason, leave me a note at the **EAA Press Building**, behind the tower.

## Javelin mates with Electro

EAA headquarters has just OK'd an assignment for me to go up to Harrison, Arkansas right away and do a story on **Ben Cupp** and his **Javelin engined T-18**. I'll also continue on up thru St. Louis and beyond to do the complete story on **Tom Foster's** on-going test program with the **Electro Constant Speed Prop**. It's mounted on a Javelin V-6 engine. By Oshkosh time they will have about 400 hours of tough, continuous testing on the combination, running it at high power day and night, cycling the prop from stop to stop every few seconds. We always have at least two months lead time on the stories, so it probably will be sometime in the fall before the story shows up in **Sport Aviation**. We are always pretty well "loaded" with Oshkosh award winner stores for quite a while after the convention, too.

This combination of engine and prop is looking more and more like the best power plant package for the money to get max performance out of the T-18 and S-18. It's operating cost per hour will be far less than an O-360/Hartzel package, and initial cost will certainly be only as little as a third of a new Lyco/Hartzel. You will see the test unit at Oshkosh, plus a 3 blade prop on a Cherokee 180, in addition to the **Javelin/Electro** combination on **Davey Blanton's Sport Racer**.

## Newsletter going "Down the Tubes"

Dick Snelson (central IL) is now building his second T-18 and he recently called me to ask a question on the T-18. In the course of our conversation he asked me if I had gotten any response to the feeler in the last newsletter about my turning over the NL to someone else not too far down the line. My answer was, "NO". I didn't receive a *single* reply from anyone on that subject. Dick said he might be interested. So we are going to explore the subject at length at Oshkosh this year.

We may go to some arrangement, like Lu Sunderland and I did at the beginning of the Newsletter, 25 years ago. At first, I would write one, and then Lu one. When my wife had her first heart attack I had to have Lu take over.

I would again like to remind you that without a steady inflow of information from builders and owners—**there can be no Newsletter!!!** I've outlined at least a hundred subjects you

can write on in past NL's, so I'll not waste time going over it again. As they say, "**The ball is in your court now, amigo**", it's sink or swim.

## Penman causes Postal Overload

At least **some** of my wheeling and needing in the last Newsletter paid off. I received a super 10 page letter from **Dick Penman** (5918 Boardman Rd., Dryden, MI 48428) and it included full size pages of drawings on (1) Vacuum system, (2) Inlet air filter, vac system, (3) a \$5.00 Battery Box, (4) How to wire a Battery Box & Master Solenoid, (5) Alternator hook-up, (6) Exhaust pipe clamp to landing gear, (7) Complete Baggage Compartment Drawings (2 pages)!!! These drawings are all professionally done, absolutely! **Really super, Dick!**

I can't run all these drawings in this NL, because too many pages runs our postage bill up too high. We'll have to save some back for NL #73. I also have a report from **Harlo McKinty**, that's another good 'un, and a short one from **F.E. Rogers**.

Our Most profound thanks to **Dick Penman**, **Harlo McKinty**, and **F.E. Rogers** for their efforts. I'm sure all of you are going to rave about the quality of Dick's drawings, even as I did. How about some of the rest of you writing something?

## Thin skins & countersunk rivets do not mix well

**Warning to new builders:** If you intend to flush rivet your T-18, be advised that the minimum thickness metal you can **countersink** and use 1/8" dia rivets is .040. I got a call from a fellow the other day that had bought an 80% finished T-18 and he told me the entire airplane had used countersunk 1/8" rivets, **NOT Dimpled!** There is no .040 external skin on the airplane, with the exception of the forward floor. The problem is the countersink tool makes a hole much too large in .025 or .032 (and you can't include the bulkhead or rib thickness with the skin's to get the .040 minimum). This guy's only out now is to drill new rivet holes in between the present rivets and use universal head (non-flush) rivets, either regular AN's or "pop" or Cherry type where he doesn't have bucking bar access. You can countersink .032 if you use 3/32" rivets, but T-18 plans call for 1/8" rivets. Some T-18's have been built using 3/32" rivets, with closer spacing (on skins only), and apparently have had no problems, but you are on your own if you do so. It's a good idea to remember that some day you, or your heirs, will probably sell the T-18, & some off-beat thing might radically affect the sale. Remember: **DIMPLE ONLY** up to .040.

## Newsletter on the MAC

I am sending this copy to this point to **Jim Hidalgo** (POB 1390, Wimberley, Tx 78676) who will typeset and print it on his MAC computer, saving a whole lot of time for me, and I do appreciate! Jim owns Hidalgo Supply Co. and sells a fine line of sunglasses and pre-

scription glasses by mail. *He also has my former T-18 that he's making into a glamour girl (you might want to send for his FREE catalog).*

## Performance Data Survey

Dear Dick,

Here is the first "Typeset" newsletter done on my MAC. It dawned on me, while entering this stuff in the computer, that I too, had promised you a few (several) articles on what I had run into as a buyer of a T-18 (yours). Since time is down to only a few days to get this newsletter out, I won't be able to submit much. I would like to ask the owners of **EVERY FLYING T-18** to participate in an extensive **Performance Data Survey** (we'll call it a **PDS** to save space) for fixed pitch props.

From reading old Newsletters you can come up with enough data to make a decision on prop selection. But I've found that prop selection is a lot more critical than expected. The difference of only an inch or two in pitch can make a great deal of difference in performance. I also found out that not all prop manufacturers use the same method of measuring pitch—so a Pacesetter prop with 68" of pitch may not be comparable to a Great American prop or other brand with that same pitch. Also, as times change and new propellers become available, we would like to know if anyone has compared two different makes of props on the same T-18. Since propeller selection seems to be as much "art" as "science", **we can make very expensive mistakes by selecting the wrong one** (most wooden props now cost over \$500.00).

I would like to submit the following form to be used to gather information for our T-18 prop survey.

Please send us all the data you can get. We would like comparison data if you can test more than one prop on your T-18, or if you have changed engines and used the same prop, etc. Even if you can't test the prop at all the different altitudes on the form, just provide what you can. Most people need to know the "Static" RPM on the ground, and at least one MAX speed run to see how their T-18 engine/prop combo compares.

## Foster wants to mate with French

**Tom Foster** just announced that he plans to test the Electro prop on **Jim French's** T-18. Maybe we'll have a report by next newsletter.

## Brain-picking attempt

Let us know how you like the new format for the NL. We are always open to suggestions, and would like to have your thoughts.

**See you at Oshkosh, Dick C.**

**NOTICE:** (Standard Disclaimer) As always, in past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas, opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.

## T-18's Descend on Texhoma

We had 13 beautiful T-18's gracing the parking ramp at Texoma Lodge this year (June 3, 4, 5, 1989), and all present really had a super time.

The weather was a real problem this year. We had strings of really vicious thunderstorms that ran from the eastern slope of the Rockies, down thru the Texas panhandle, into a wide belt that took in Central and North Texas, swinging up NE thru Oklahoma, Arkansas, Missouri, Illinois and on up the Ohio valley. Getting through some of these situations ranged from pretty iffy to impossible.

The weather over northern Arkansas was the source of one big disappointment to us. We had hoped to see Ben Cupp's V-6 powered T-18 in the flesh, but he couldn't make it.

## John Walton's T-18 arrives

We did have one surprise, tho', that made up for it. **Wendell Green**, who lives in Argyle (Tx) between Ft. Worth and Denton, arrived in the early afternoon Saturday with his precious jewel—**John Walton's** former T-18 that he had bought just a few days back. As a matter of fact, he had just checked out in it the previous day. After three takeoffs and landings he brought it home. *I thought we were going to have to stop drill his cheeks to restrain that grin of his when he arrived.*

Wendell is a TWA pilot and has been looking all over the country for the last 2 to 3 years to find a flying T-18. He bought a set of plans over 15 years ago and made a start on a T-18, but other things interfered. But, he never lost the thirst for one. He got **Gary Green** to fly with him and evaluate his technique. Gary said he found very little to pick on. He had to leave about 5 PM and go back home, and had planned to return Sunday morning.

## Huge Thunderstorm hits Texhoma

Saturday night was a real bummer. Huge thunderstorms brewed up (over 70,00 feet) just about 40 miles west of Texhoma, and strung a path of high wind, big hail, and torrents of rain (4 to 5 inches) for 100 miles to the east! The lodge ramp escaped the hail and 80 mph winds, but I was scared to go look the next morning. A second wave of weather followed the first at 4 AM, it lasted about 5 hours, then cleared off & went to high overcast.

Getting in to Texhoma seemed to depend on the time factor. **Bill Hall**, from Russellville, Ark., was the first to arrive on Friday. **Jim Paine** of Dayton (OH) came soon after, along with **Jim French** from Wimberley (TX). **Gary Green** (TX) was next to show, and then **Leroy Holt** (OK). **Eddie Elland** (Dallas) again flew his Sonerail in Friday. **Jim Paine** was enroute to San Francisco to visit his daughter on his vacation, so had to leave early Saturday morning to get thru the thunderstorm area—before they built up in the PM.

## Bad Weather Forces T-18er's to Divert

Tom Kerns, Ed Ludke and Bob Ryan got a late start Friday, and by the time they got down in the area there was weather—so they diverted to Ardmore, OK, where they picked up a car and came on in. They went back and picked up their airplanes early Saturday. **Harlo McKinty** had the same problem, only farther west at Lawton, OK, so he too, drove in to Texhoma, retrieving his airplane the next morning.

**Gary Cottner**, from Tulsa, was the next arrival followed by **Dave Eby** (Wichita Falls, TX). **Gary Holt** was last to arrive Saturday.

## Crook leaves Peppard's T-18 in Dallas, Mob arrives by Car

**John Crook** (Dallas) had to leave Vern Peppard's T-18 at Dallas, as they didn't quite get through with the annual. **Bobby Collard & wife** also drove up from Dallas. Bobby's T-18 could fly by next spring—he was hoping to see Ben Cupp's V-6 powered bird. Builder **Al Pereira** from Austin also drove in.

Besides the ones that flew in, we had several builders that drove in. **John Mihaila & wife** (Wichita Falls, TX) had to drive in, as his newly completed T-18 only has 5 hours on it to date. He also brought "Stash" Simpson & wife with them. Stash's T-18 should be flying by next summer or late spring. **James Borg** (Minneapolis) rode down with **Tom Kern**. His T-18 has been flying for some time.

## Doctor Amputates Back!

**Dr. & Mrs. Bud Payne** (Austin) also drove in. Bud's T-18 was a round back, but he removed the round back and replaced it with standard T-18 components. He, too, might fly by summer next year. **Roger Dengler** (DFW) and family drove up to see the airplane he sold to **Bob Ryan** when it was about 80 to 90% complete. He was impressed with the way it finished out. Ft. Worth builder **Ken Morgan** and wife also drove in and thoroughly enjoyed themselves.

## T-18er's Forced to Take Hour-long Ride on Boat!

We had an unexpected diversion on Sunday afternoon when Bob and Peggy Cutter (who share a hangar for their Swift with us at Addison) saw the T-18's flying around while they were docked at the Marina with their big 50 foot cabin cruiser. They paged me and nothing would do, but load the boat up with T-18ers and their wives and take an hour cruise. It was a delightful break and thoroughly enjoyed by all.

## Award Winning Documentary Available

We again have a video we made, and if any of you would like to add it to your collection we'll send it to you for cost (\$8.00 ppd). There's "nothing" on it very educational—except for

the interviews with **Toms Kerns**, **Harlo McKinty**, **Wendell Green**, **Bill Hall**, **Bob Ryan**, **Ed Ludke**, etc.

## Shifflett shows Cavin his Cheeks!

**Paul Shifflett** was there again with his metal cowl, which is now finished. He showed me the cheeks (just finished) and I planned to tape it later when the light was better, but I slipped up and didn't. Paul has made a step by step photo record of the project, and it would be an education to look at them. He'll probably bring the cowl and album to **OSH** if you'd like to see them. Maybe we can do a tape on it there.

## Last Re-union!

This will probably be our last re-union at Texhoma, at least for a while. The lodge policy is to require 2 nights minimum stay over a weekend and there is an unfair hardship for some that could only manage one overnight. Nominations for some other locations are now open.

The next location should be a place that has either easy access to a motel (with restaurant), or one within walking distance from the runway (like Texhoma). Most important, it should be a non-controlled field and not within a TCA or ARSA. It should have 3,000' or longer runway(s), hard surfaced. Nav radio facilities aren't essential, but nice. It should have uni-com, but this is also not essential. Adequate sized parking ramp with tie down spots for 15 to 20 T-18's is needed. Fuel is not a requirement, but it shouldn't be too far away.

Several spots in Oklahoma have been suggested already: **Mushogee**, **Shawnee**, **Ardmore**, **Durant**, **Okmulgee**—to name a few. There are also several other state parks in OK that have nice airports—**Arrowhead**, **Fountain Head** (Eufala), **Grand Lake**, etc. There's also a fancy place called **Shangri-La** on Grand Lake that caters to conventions.

In eastern Kansas there's **Chanute**, **Coffeyville**, and **Independence**. In western Kansas there's **Liberal**, **Dodge City**, **Garden City**, **Hays**, **Pratt**, etc.

In north Texas there's **Gainesville**, **Sherman** (where they hold the IAC Championships), **Paris**, to mention a few. We had our first re-union at **Temple, Tx.**, but that was a little too far south for some.

Actually, there's no one place that will suit everyone. We probably need several of these re-unions; one for Western states, one for the Midwest, and one for the Eastern states to do it right, but it is obvious there's no easy solution.

**Jim Paine** (Dayton, OH) has gone to a lot of trouble to check out a State Park in Southwestern Kentucky, **Kentucky Dam Village**. It lies on a line between Nashville and St. Louis, or on a line between Memphis and Indianapolis (see a fuller description later in this NL on Jim's proposal for an Oct '89 re-union). This location would be between 2-3 hours flying time northeast of Texhoma. It would be more convenient for some, a little less for others.

HERE NOW IS THAT GREAT REPORT BY DICK PENMAN:

May 20, 1989

Dear Dick,

I'm sure I was typical of many Thorp builders. I show up at Oshkosh back in 1973, with no real intentions of building anything--let alone an airplane! There was all this hustle-bustle around the T-18 tie down area and I, like so many, was attracted to that flurry of activity.

John Shinn, from Ormond Beach, FL., was giving rides. When John asked if I was interested, I wasted no time climbing in. Incidentally, John took best T-18 that year. Well, for me, there was no turning back. My life would change from that point on. I had to have one!! Walking back to the campground that same afternoon, we stopped by the sheet metal workshop area. This enthusiastic guy, by the name of Lu Sunderland, had the attention of at least 100 people, showing them just how easy it was to hammer out wing ribs and drive rivets. Armed with all that good experience and knowledge, we were on our way to a great adventure.

However, the next 18 months would be spent entertaining myself by studying prints and practicing to drive rivets. Construction started in April 1975, but the aircraft would not fly for another 9 years. During that time I met many fine people from all over the country and learned many new skills. After overcoming typical obstacles, N199DP finally flew on May 15, 1984. The extra time I spent in wing and tail alignment paid off. The aircraft stalls straight and clean and no trim tabs are required. The only two problems to show up after the first flight were brake pedal and trim tab adjustments. I'm sure that all Thorp builders, past and present, recognize that you don't build one by yourself. It takes alot of dedicated friends and an understanding spouse. So, I would like to thank some of those people who have helped so many builders like myself. Gary Copeland, for his time and confidence in testing my ship and checking me out in it. My good friend, Bob Dial, for the many hours of flying, teaching me what the Thorp

## DICK PENMAN REPORT, continued:

could really do. Also, to you, Dick, and the late Lu Sunderland for your dedication to the newsletters. Without these newsletters most of us would not have finished our aircraft. It's been a great experience building the T-18 and exciting each time I fly it.

I am sending along some drawings that may help out some new builders; baggage compartment, tail pipe hangers, battery box, vacuum hook-up and alternator wiring hook-up.

Best regards,



Dick Penman

5918 Bordman Rd.

Dryden, MI 48428

Dick, I was absolutely overwhelmed when I received your letter and all those beautiful drawings. (I still am). We are all truly in your debt for those drawings and I'm sure all of the T-18ers join me in expressing their deep and sincere thanks for your efforts. They are really professional quality. Hopefully they will stimulate others to do some of the same. Again, Dick, a million thanks!

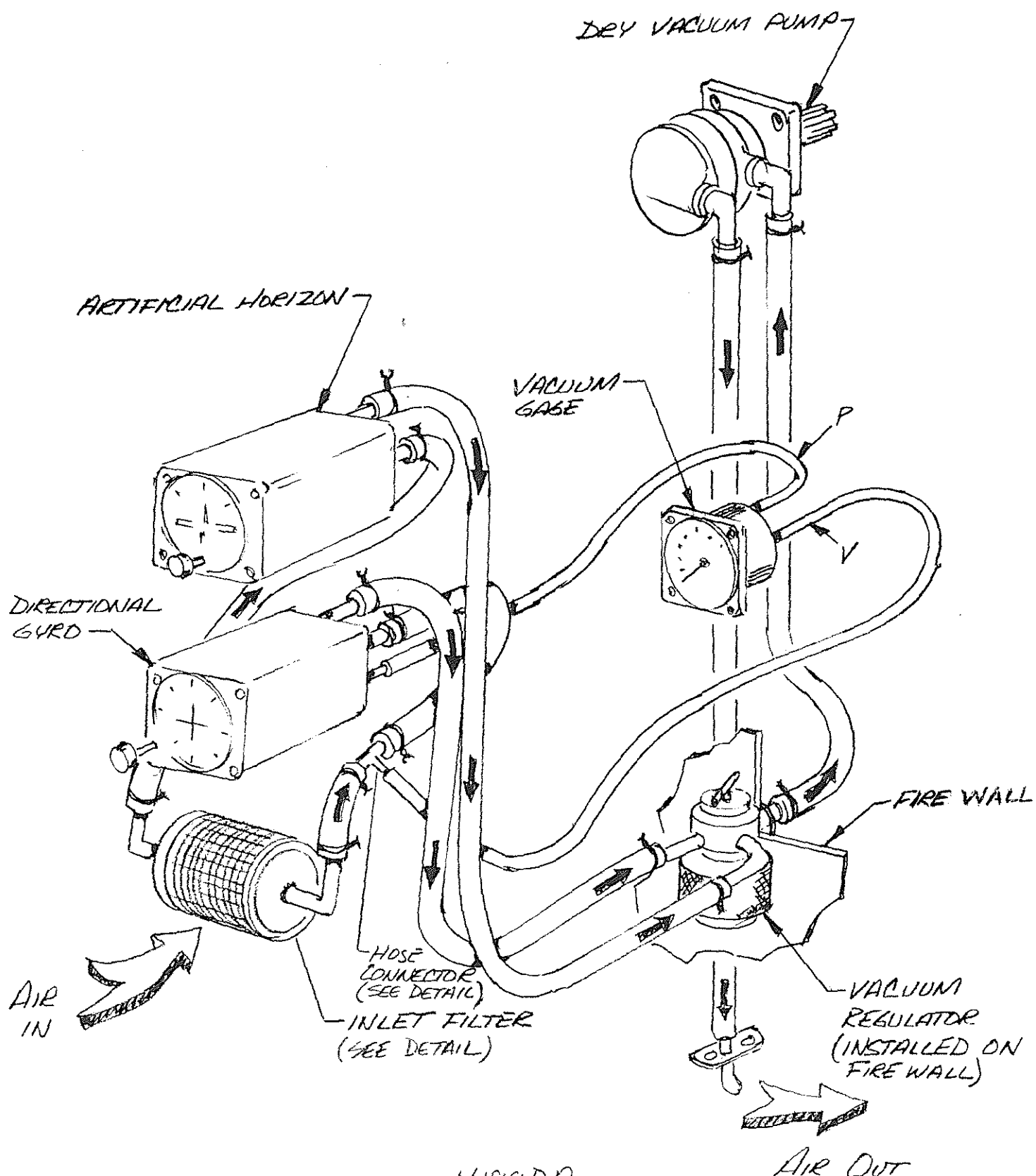
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I was also delighted with the new format for the NL that JIM HIDALGO did on his computer. It was really an eye opener for me to see what you can do with a computer. If you, too, are pleased with it, how about sending a post card with your comments?

Since Jim was able to condense the 10 pages of handwritten material I sent him into two pages we now have space for all of Dick Penman's drawings in this NL.....Also LYLE TRUSTY sent me an excellent multi-page report on his airplane since I wrote the material on page 1 and 2. I also got a detailed report from FARLO McKINTY on his new bird, a report and drawing from F. E. ROGERS, and a letter from MONROE MAXHEIMER, who also sent in some excellent drawings of how he is installing the JAVELIN V-6 engine and attaching the motor mount to the fuselage, so I already have material for NL #73....but, PLEASE, don't lean back on your thumbs and not send YOUR report, just because we have enough material on hand for another NL.

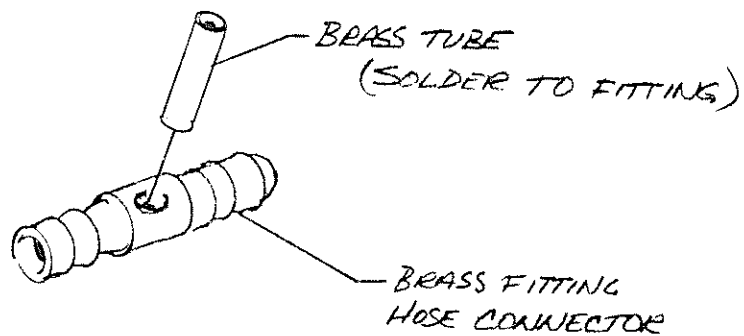
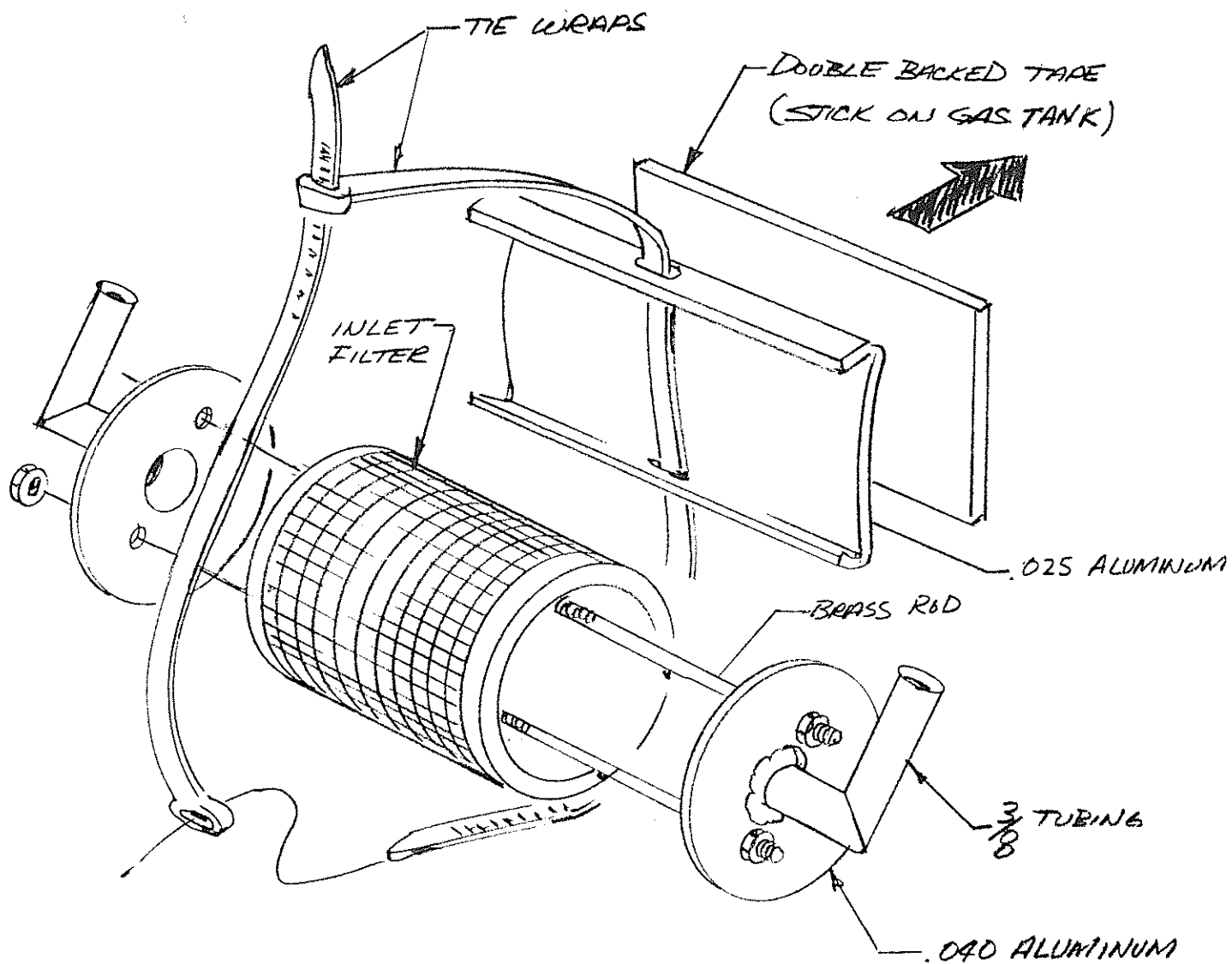
Since I have a little extra space on this page, I guess this is a good time to tell you about a trip I just got back from, an assignment from HQ to go up to Harrison, AR, and do a story on BEN CUPP's V-6 powered T-18, and then over to Wichita, KS, where I was to meet TOM FOSTER, who was bringing one of the LECTRO props over to put on DAVE BLANTON's test bed Cessna 175 first and then to put it on DAVEY BLANTON's Sport Racer for its trip to OSH. (more later in the NL on this).

from DICK PENMAN



N199DP  
VACUUM SYSTEM  
DICK PENMAN

from DICK PENMAN

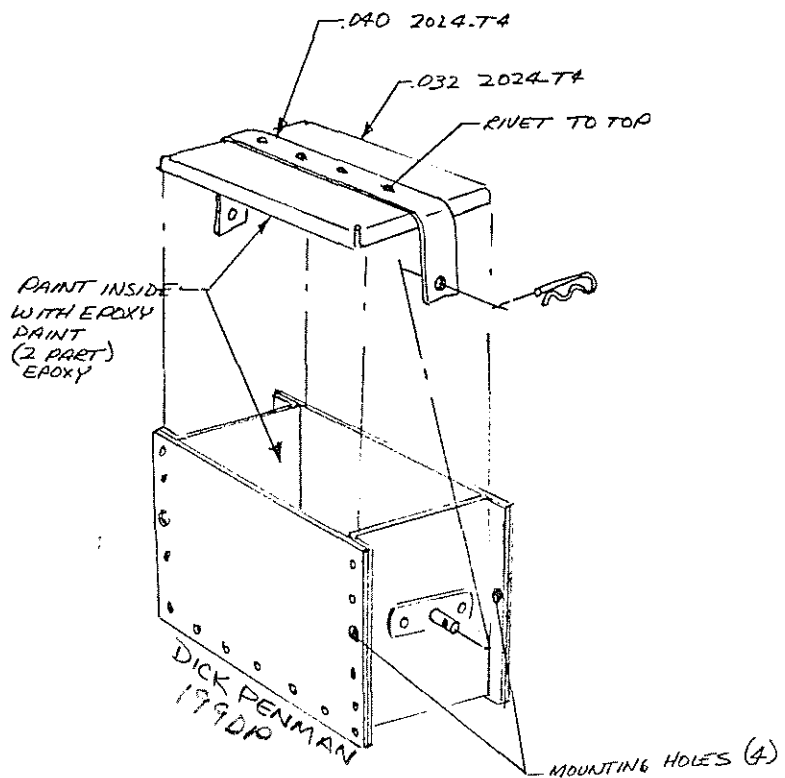
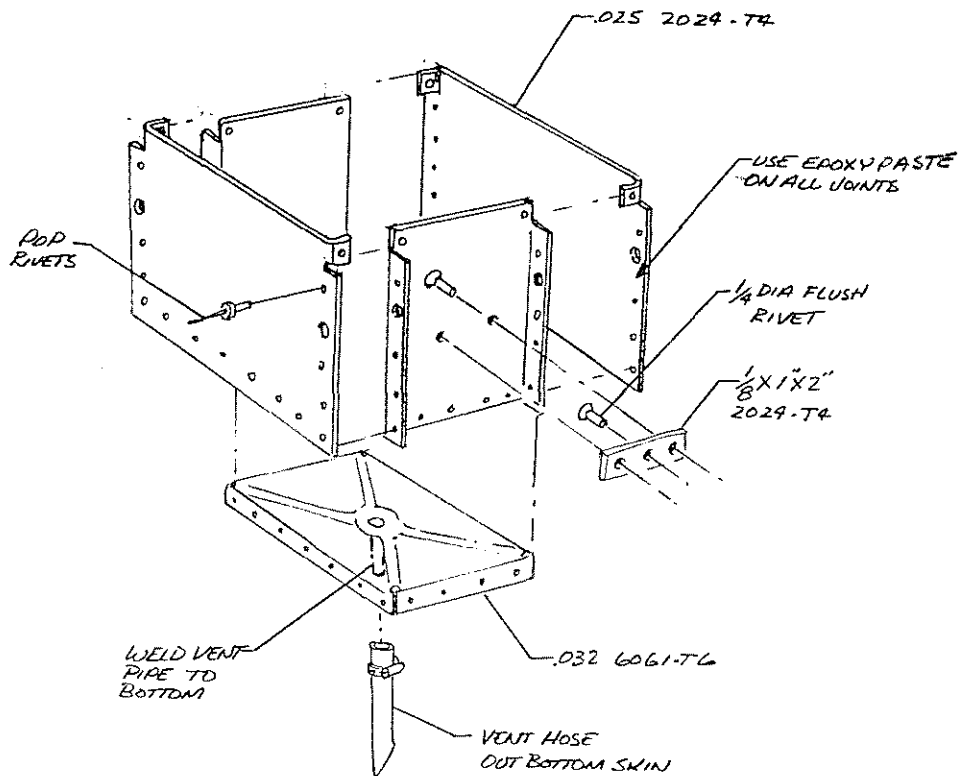


VACUUM GAGE HOSE  
CONNECTOR

INLET AIR FILTER  
MOUNTING BRACKET

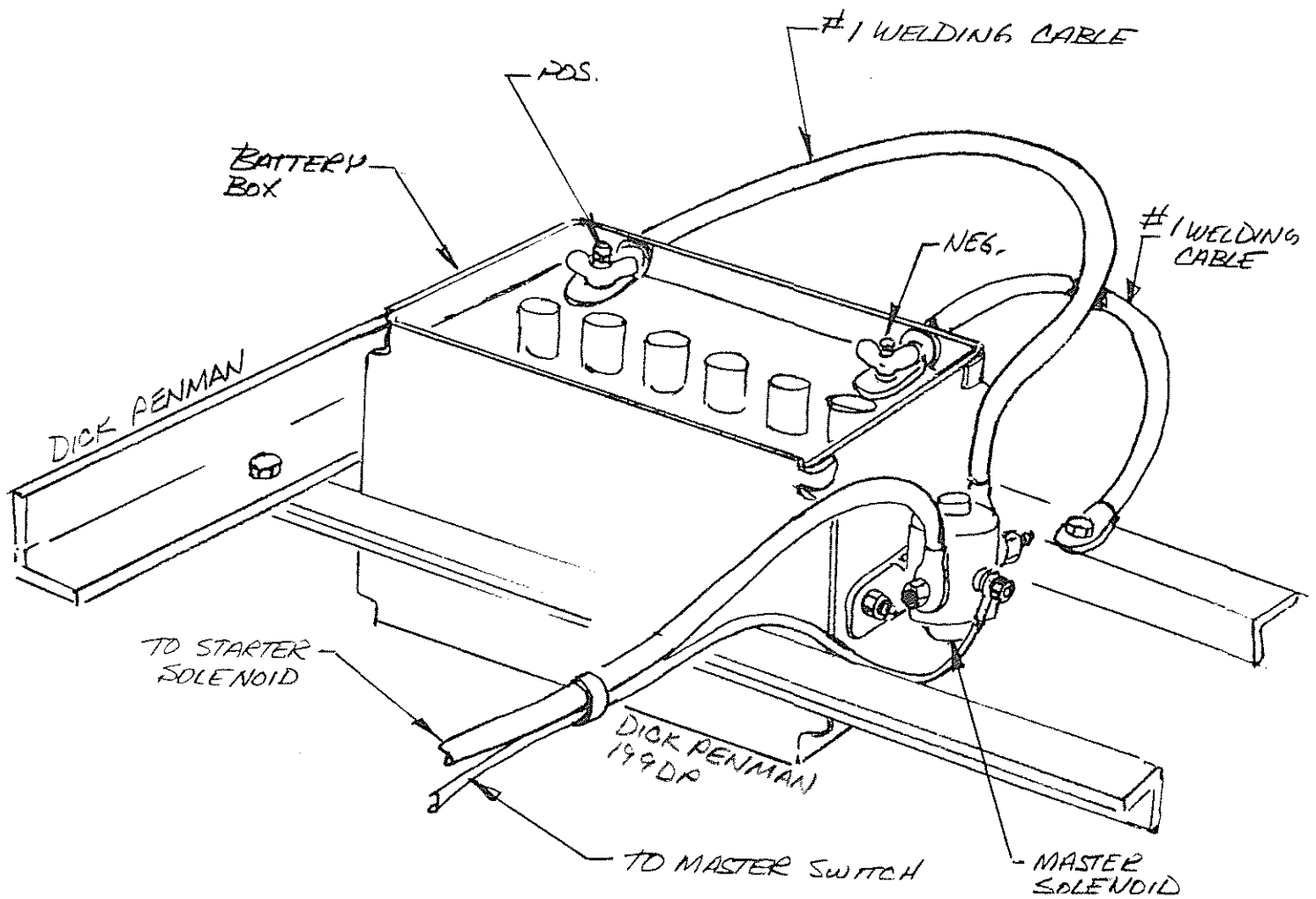
VACUUM SYSTEM  
DICK PENMAN  
199DP

from DICK PENMAN



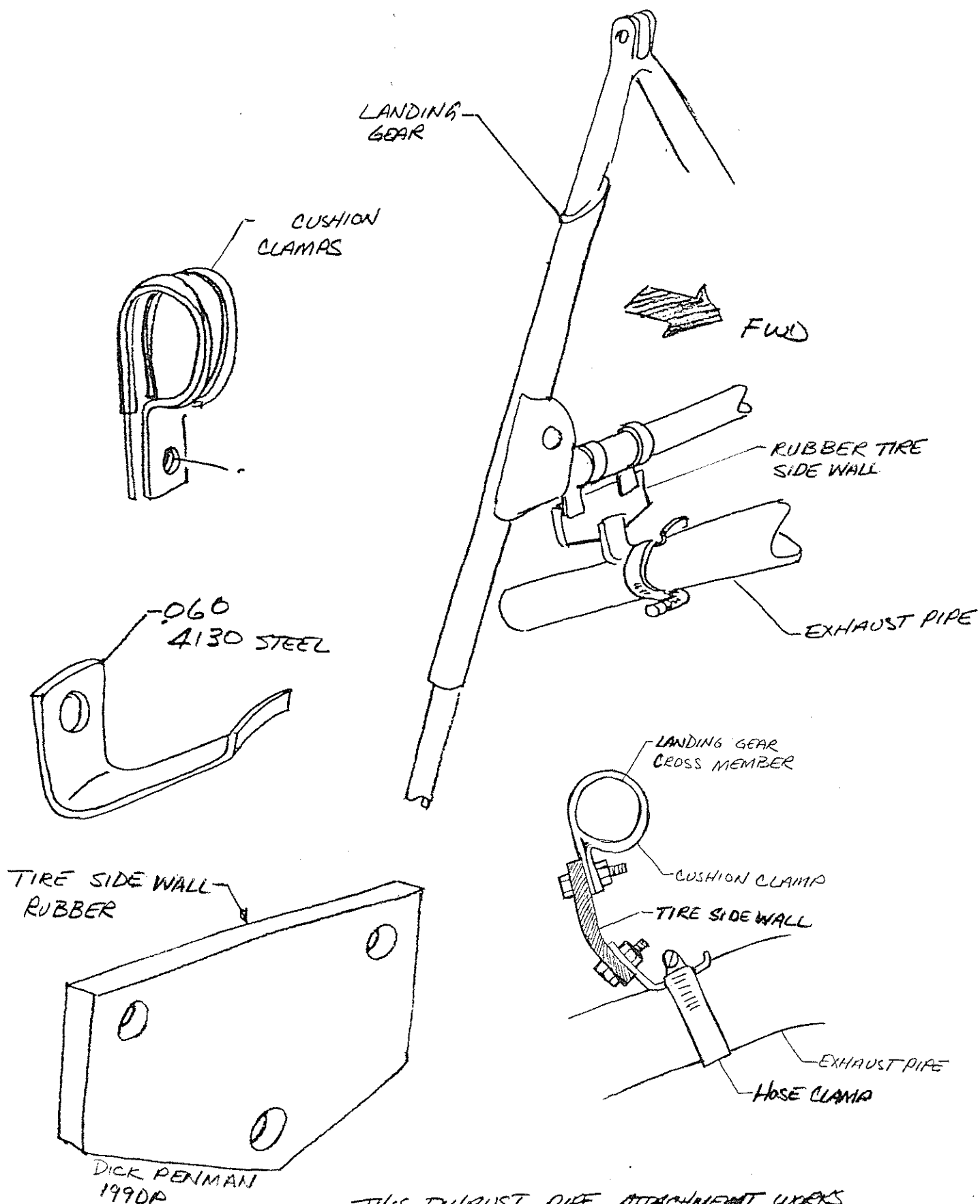
BUILD A BATTERY  
BOX FOR \$5.00





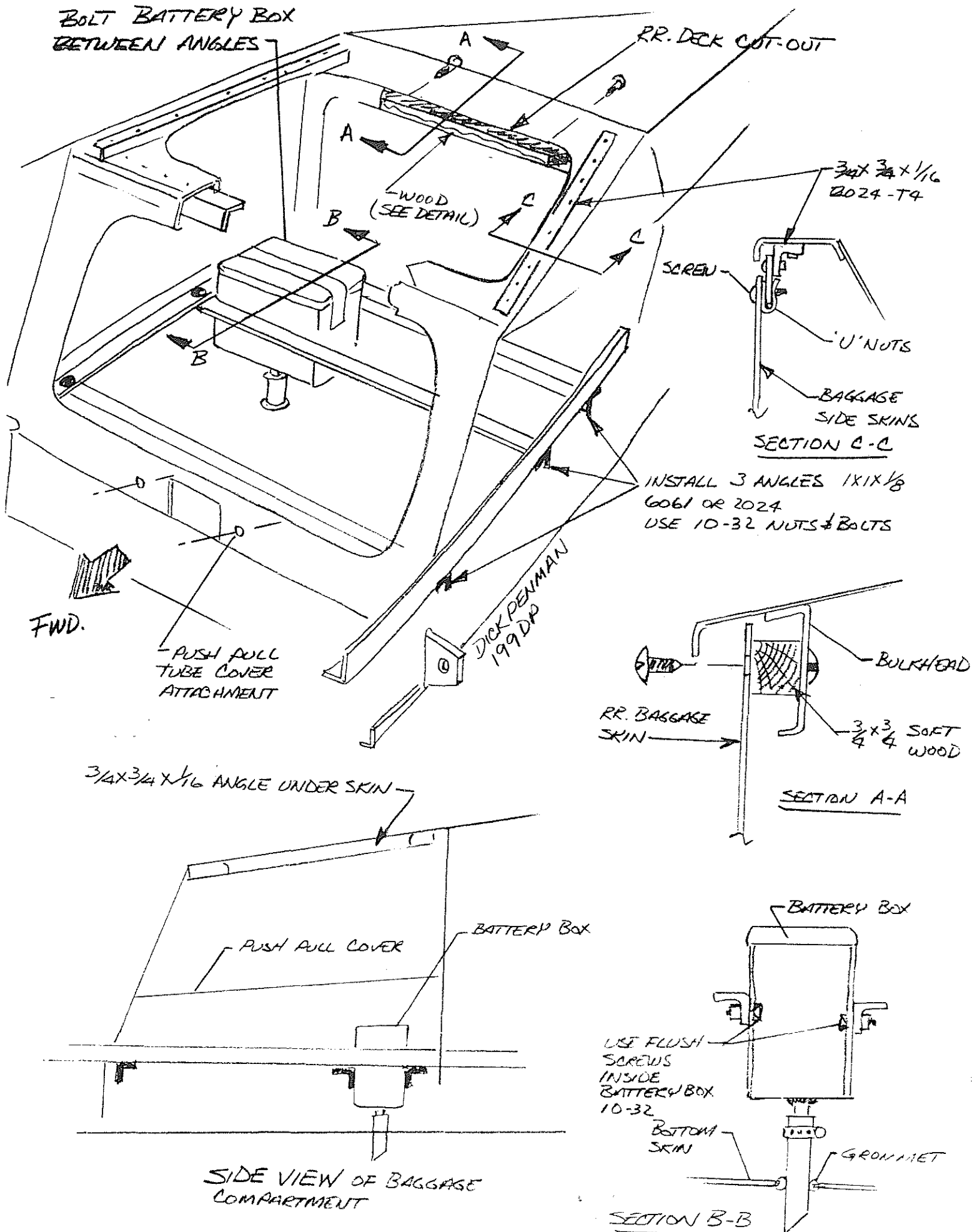
HOW TO WIRE BATTERY BOX  
& MASTER SOLENOID

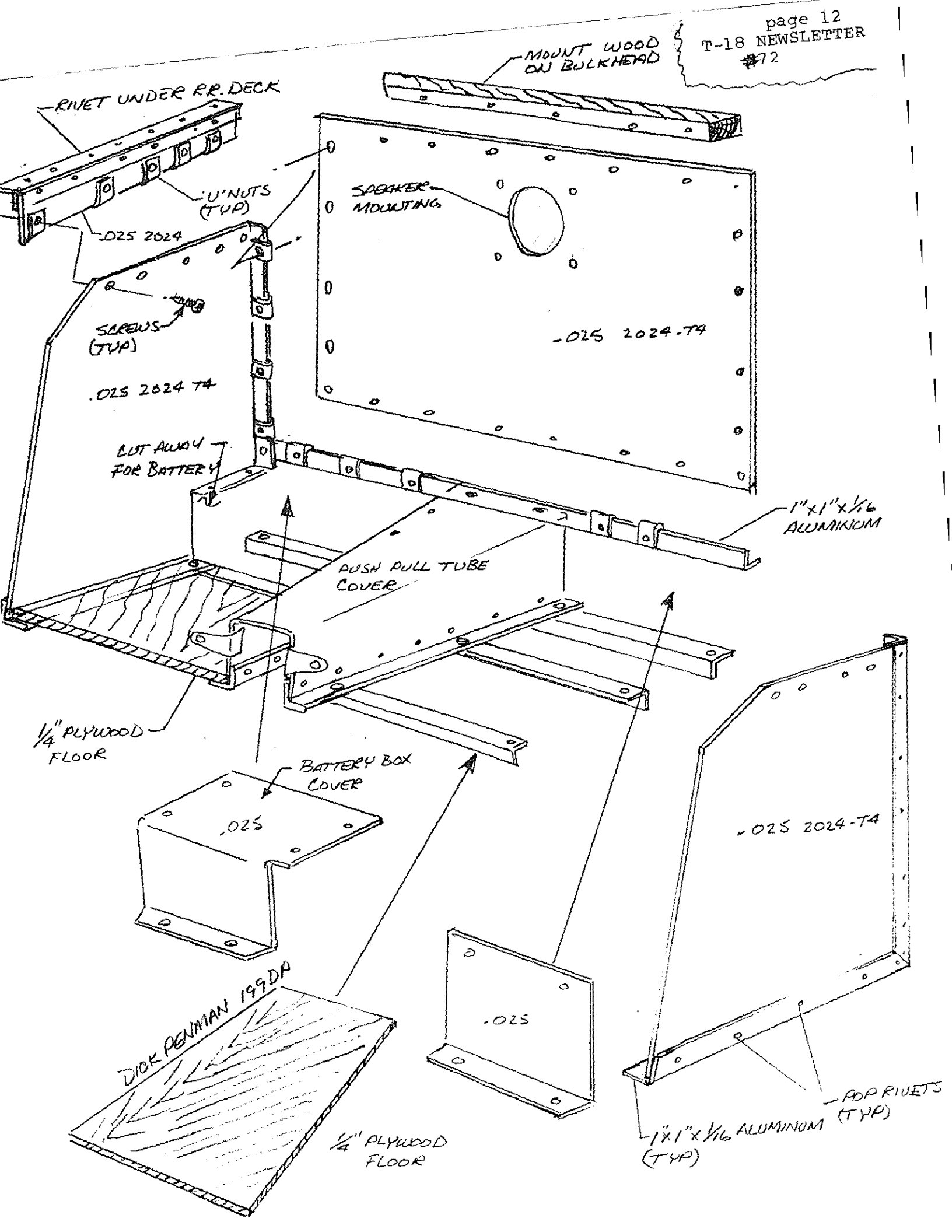




THIS EXHAUST PIPE ATTACHMENT WORKS  
VERY WELL AND IS SIMPLE TO BUILD.

# BOLT BATTERY BOX BETWEEN ANGLES





It's always a delight to hear of a new T-18 taking to the air and here is TOM OSTENDORF's story of his brand new bird.

DICK CAVIN,  
21 JUNE 89

I'M WAITING FOR INSPECTION OF N54266 S-18 SERIAL # 42  
I STARTED BUILDING IN DEC.86.

I DIDN'T ENCOUNTER ANY MAJOR PROBLEMS DURING CONSTRUCTION,  
BUT THE CANOPY TOOK SOME MODIFICATION OF THE FRAME AND LONGER  
SKIRT AROUND THE BOTTOM TO FIT.

I CONSTRUCTED THE VERTICAL FIN DIFFERENTLY. I HAVE A CAD/CAM  
SYSTEM AT WORK. I CREATED THE RIBS ON THE SCREEN WITH THE RIVET  
HOLES MARKED AND THE SPACING OF THE RIBS PER PRINT. THE CAD/CAM CAN  
GIVE YOU THE LENGTH OF ARCS AND SPLINES SEGMENTS WHICH MADE IT EASY  
TO CREATE THE FLAT LAYOUT FOR THE SKIN WITH RIVET HOLES MARKED.

I PLOTTED THE LAYOUT FULL SIZE, GLUED THE LAYOUT TO THE FLAT  
SKIN MATERIAL, AND CENTER PUNCHED THE HOLES THRU THE POINTS ON  
THE DRAWING.

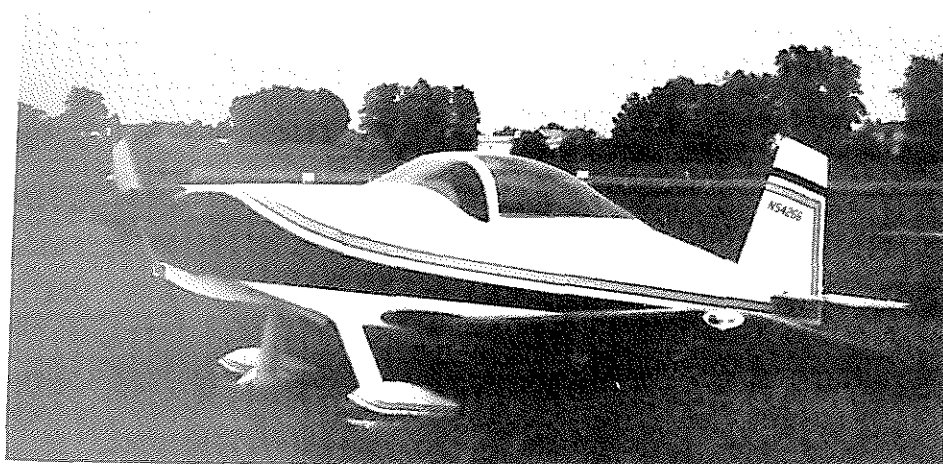
AFTER DRILLING THE HOLES, IT WAS EASY TO MAKE THE HOLE  
TEMPLATES BY TRANSFERING THE HOLES THRU THE SKIN. BY MARKING THE  
RIVET CENTER LINE ON THE RIBS I COULD WRAP THE TEMPLATE AROUND THE  
RIBS, CLAMP AND PUNCH THE HOLES AS PER STANDARD THORP METHODS.

I HAVE BEEN TAKING SOME DUAL WITH JIM PAINE IN N747JP GETTING  
READY TO FLY. JIM OFFERED TO DO THE FIRST FLIGHT AND I TOOK HIM UP  
ON THE OFFER. JIM KEEPS HIS PLANE AT THE NEW CARLISLE, OHIO AIRPORT  
WHERE I HAVE BUILT A HANGER.

I'M ANXIOUS TO FLY AND HOPE I CAN GET THE TEST TIME OFF BY  
OSHKOSH 89.

A PICTURE IS ENCLOSED AS PER YOUR REQUEST. HOPE TO SEE YOU  
AT OSHKOSH.

TOM OSTENDORF  
450 KENT RD.  
TIPP CITY, OHIO 45371





Monroe Maxhimer  
10202 N. 46th Ave  
Glendale, Az. 85302

T-18 Newsletter  
10529 Somerton Dr.  
Dallas, Tx. 75229

Dear Dick,

Enclosed is \$20. Please reinstate me on the T-18 news letter mailing list. The last news letter I received was #69. I should have been keeping you informed on the progress of my project but I am a real procrastinator when it comes to writing letters. The project is moving along, but slower than I would like. The fuselage is basically finished on the outside with the exception of hanging the engine, which I am in the process of doing now. I am using the Javelin engine (Ford 232V6) and am in the process of putting it together. I had the machine work done on it that Dave Blanton suggested, which was honing the cylinders for a .004" clearance. I also had the engine completely balanced, with the lower pulley installed on the crankshaft, to within 1/2 gram. According to the the speed shop that I dealt with, production engines are usually balanced to within 20 grams at best. Hopefully this will make a difference in the operation.

A considerable amount of time on the project was consumed in the development of the firewall attach points for the engine mount. I wanted the strongest possible mount with the least amount of weight. It took me two tries before I was satisfied with the results. Enclosed are detailed drawings of this effort. The one disadvantage of the method I used is the fact that the fuel tank must be modified, as shown in the picture, for clearance of the longeron to firewall gussets. If anyone is interested in further discussion on this mounting method they can call me at 602-939-4064.

I am planning to spend more time on the project in the next few months in order to try to finish it by June of next year. With a little luck I may make it.

*Monroe R. Maxhimer*

Thanks, Monroe, for your very considerable efforts in your report and the most excellent drawings you submitted. Your approach on the motor mount also looks well thought out. Your solution is the third method we've seen now, all of them different. I certainly hope both you and John Popejoy will soon be flying your V-6 T-18s. This will provide a shot in the arm for some of the builders that have gotten discouraged at the skyrocketing costs of aircraft engines. I already know of several new builders that had aircraft engines on hand, but resold them and are going to install the V-6. They felt that not only would they save quite a bundle on installation, but also much more in operation.



A brief explanation of the four point engine mount modification.

Along with my drawings I have included portions of Drawing S15, on which I have marked the location of the bolt hole for attaching the engine mount to the firewall.

The parts that I have added are shown on rough drawing M1 and on detail drawings D4, D5, D6 & M2.

Gusset D4 fits below the longeron at WL42.0 as shown on drawing M1 and on detail B of drawing M2. As shown on dwg D4 there is a .060 joggle on this gusset to accomodate the firewall flange and cowl attach doubler.

This piece may not be necessary but I wanted to distribute the stress in this area more evenly to the skin.

Drawing D6 actually shows two pieces. The 4130 steel fitting and a 2024T3 spacer. The fitting rivets to the firewall and overlaps the firewall corner stiffener which runs between the two longerons. To make the overlap even without joggling the fitting I put the spacer between the firewall and the D6 fitting. The size of the spacer is shown on the D6 drawing.

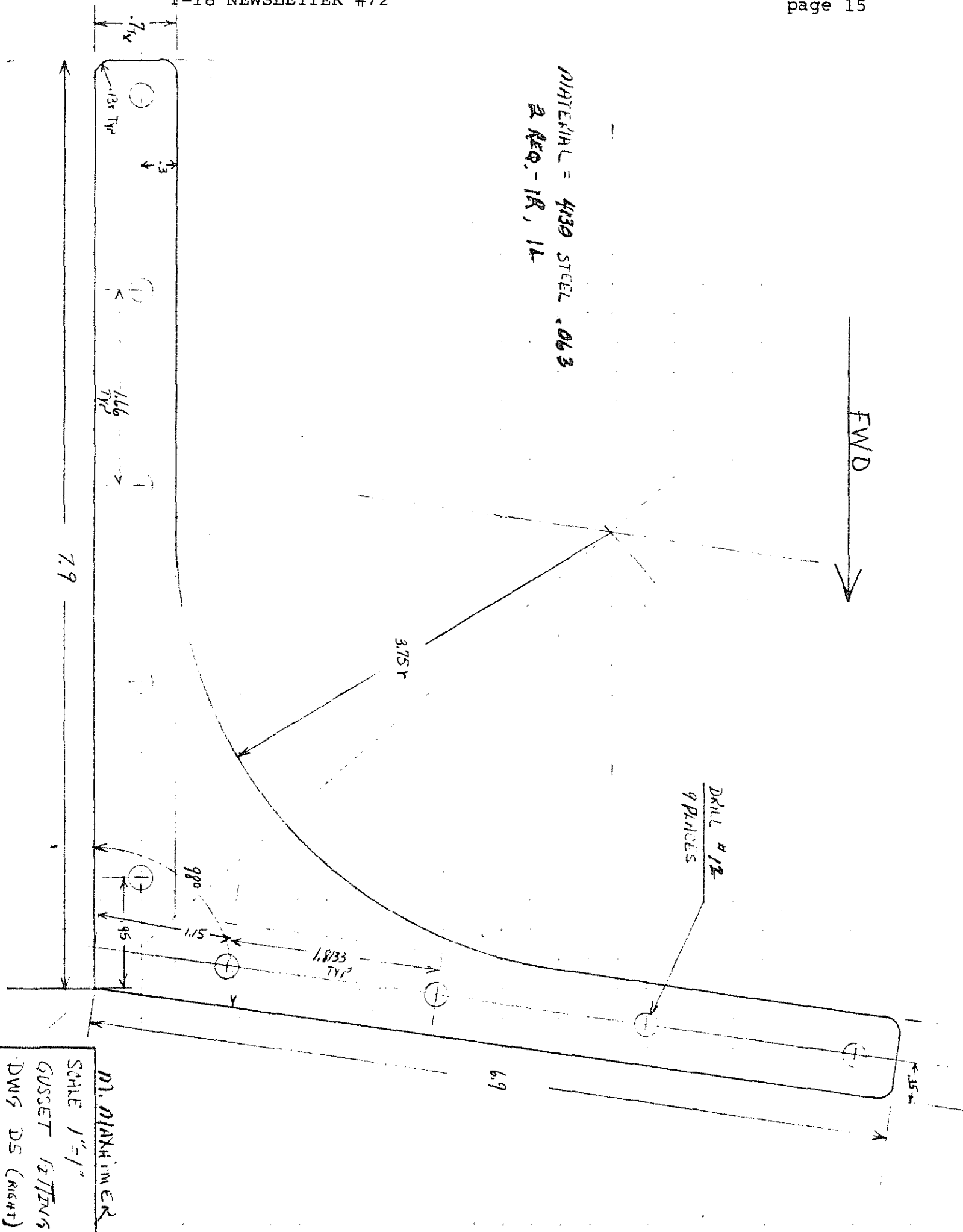
To stiffen the firewall between the right and left D6 fittings I attached a 2024T3 angle (1" x .75" x .093"), which I made by cutting down one side of a 1" x 1" angle. The top of the angle is positioned at WL42.0 and extends to within .25" of the side skins.

I wanted this angle and the D5 fitting to carry torsional loads. As you can see on dwg D6 there is a 109 degree bend at the top of this fitting. The top of the bend is parallel to and coincident with WL42.0.

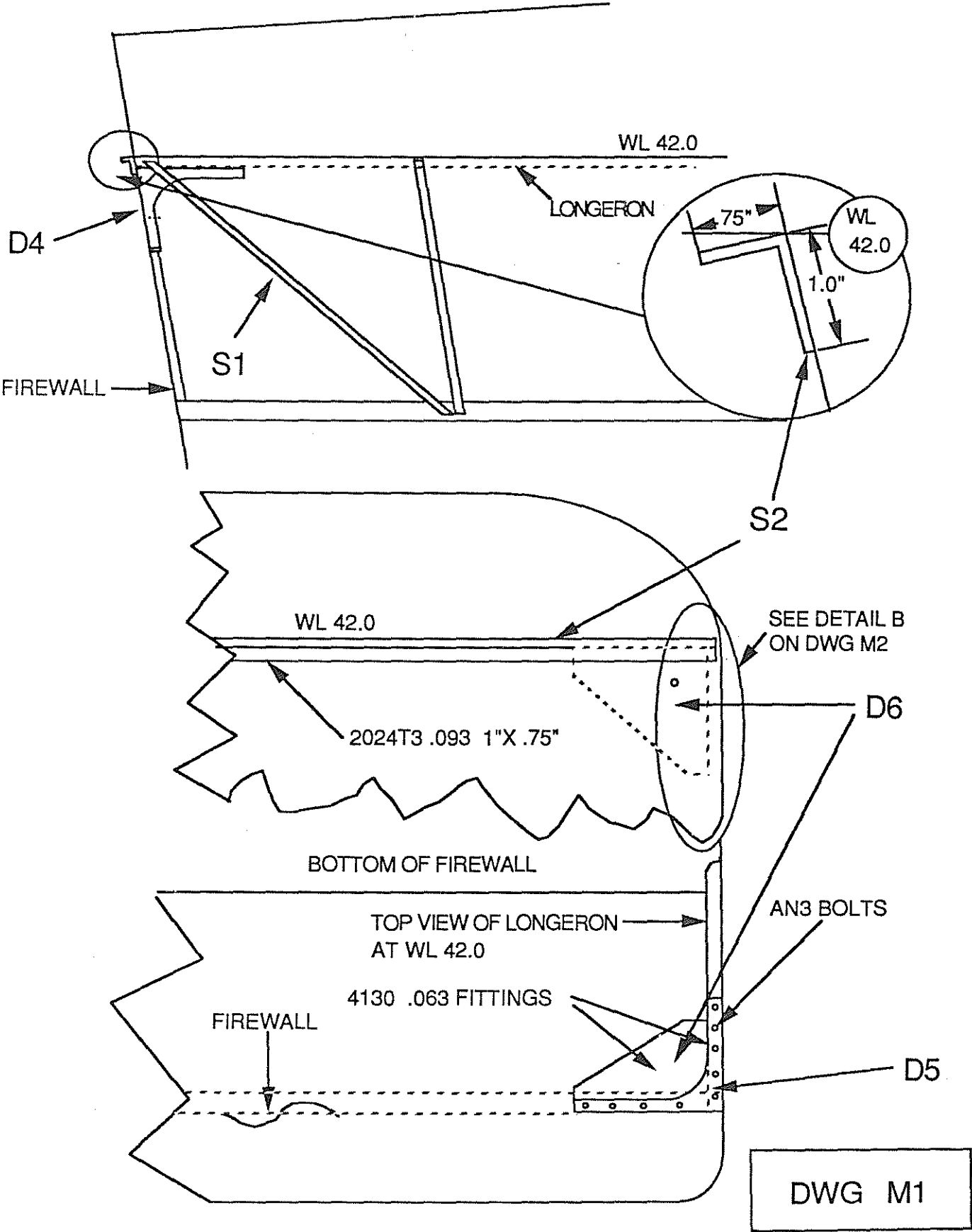
Fitting D5 bolts to the top flange of fitting D6 and the longeron at WL42.0. On dwg M1 is shown stiffener S1. I added this for extra insurance. It overlaps both longerons and gusset D4. Drawing M2 is to show the detail of parts in the mount area.

If any questions call me at 602-939-4064.

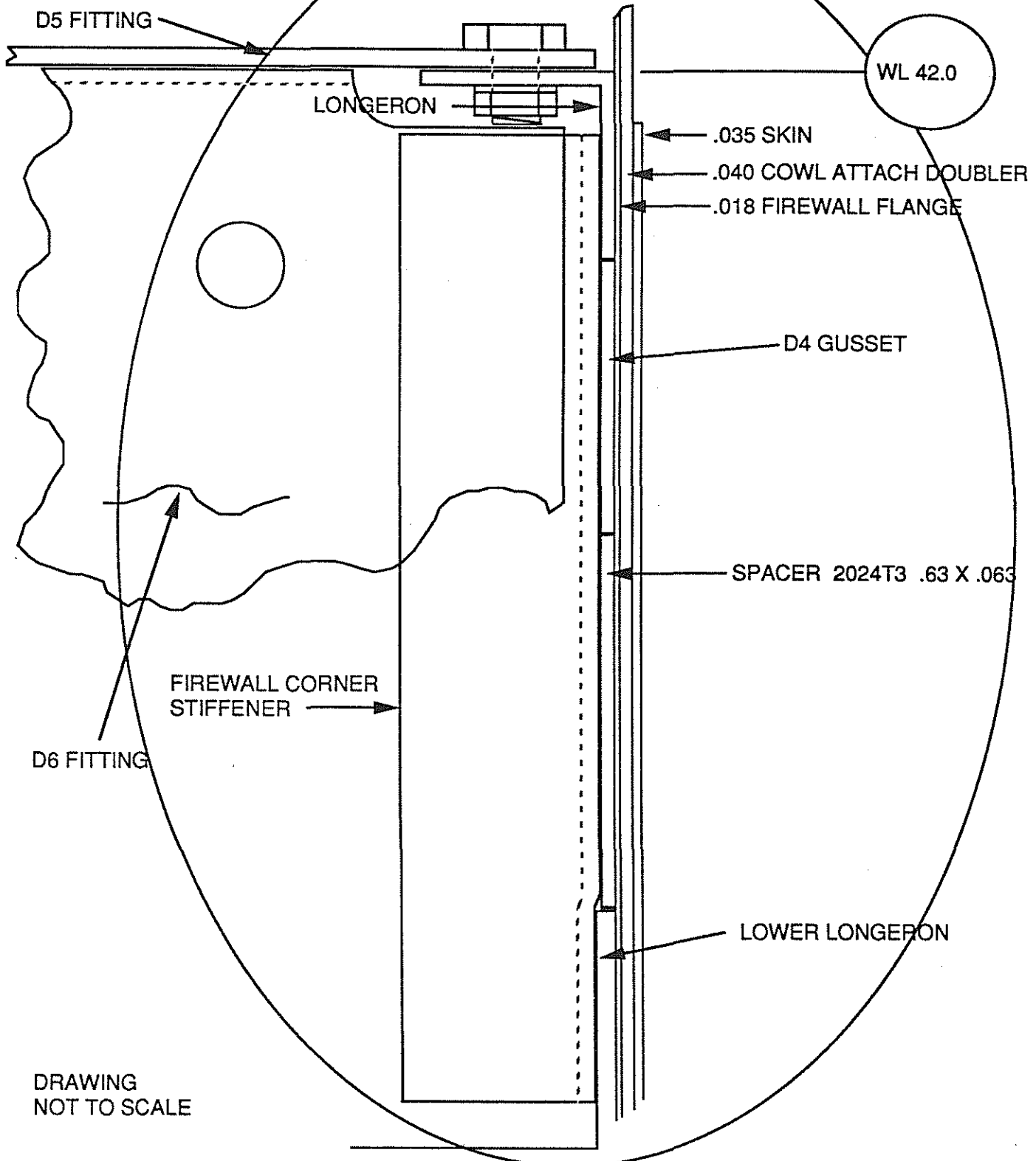
Monroe Maxhimer







# DETAIL B



DRAWING  
NOT TO SCALE

DWG M2



1.75 (REF)

.697 (REF)

.688 (REF)

1.25 (REF)

1.7379 (REF)

WL 49.20

WL 42.0

30.3537 (REF)

WL 48.2108

19° 0'

25°

2.69 (REF)

CENTERLINE FOR  
UPPER POINT  
ENGINE MOUNT  
BOLT HOLE.

ASSEMBLY AS INDICATED  
REAT TO 180,000 #/IN<sup>2</sup> ..  
FLUX INSPECTION

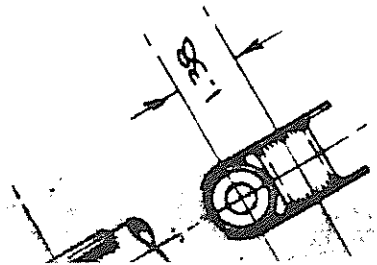
486-7 FITTING - 4 REQ'D.

REQ'D.

2 STEEL TUBING

TUBE - 2 REQ'D.

ALSO CHECK TUBING







If you think you can make the fall get-together , please send Jim Paine a card, so they can make plans for accomodations, etc. It looks like a beautiful spot, with lots to do, in the color brochure Jim brought to Texhoma .

Mr. Dick Cavin  
10529 Someton  
Dallas, TX 75229

June 22, 1989

Dear Dick,

Regarding the Kentucky State Park reunion in October, would you please publish the following in the next T-18 Newsletter.

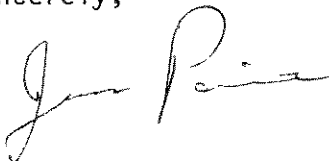
Reservations are to be made with Kentucky Dam Village State Resort Park  
General Delivery  
Gilbertsville, KY  
42044-9999  
Phone: (502)362-4271

If reservations are cancelled after 9/7/89, there will be a \$10 service charge. All reservations must be made by that time. The reservations should be made for the rooms being held for the Paine Party.

The rates are: \$42.75 (single)  
\$51.84 (double)

I will be sending out invitations to all those who have made the get-together in the past, but perhaps we can pick up some new ones through the Newsletter.

Sincerely,



Jim & Judy Paine

4240 Wagner Rd.

Dayton, OH

45440

(If you can come, don't forget to get up a "kitty" to re-imburse Jim for his mailing costs. It isn't too hard to spend \$100 for stamps these days).

513-426-9671

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Have some extra space here, so will use for some FOR SALE notes:

BILL HALL, #2 Normandy Circle, Russellville, AR, 72801, has his T-18 for sale for \$16,500. It has an O-290 in it and is a beautifully painted and finished A/C. It was built by Don Thompson in PA some years back. I have lost Bill's tel. #, but the A/C is 501.


STEVE RIFFE, 3532 Tripp, Amarillo, TX, 79121 has an almost ready to fly project for sale. He has \$11k invested in it, but will sell for \$8900 OBO. The wing is the folding wing (new airfoil) and the wing was built by John Walton. Fuselage is standard T-18. I can't find his letter that had details, but I do know it's a good buy for someone. Steve just lost interest after his dad died, as it was sort of a partnership project. Give him a call.....I forgot to mention that Bill lost his hangar +building new house.

As you can see from the copy on the previous pages, I have made an enroute change in the NL content, primarily to maintain continuity on the articles by Dick Penman and Monroe Maxheimer. I am also running out of time that I have available between now and OSH. Today is July 20 and I leave for OSH a week from today. I am taking the NL master over to VERN PEPPARD's GEOMAP plant today to be printed and collated and with a little luck I can have it in the mail a couple of days before I have to leave. If I run too late to get copies to you before OSH, I'll try to bring a few copies with me. Vern has invited me to be his copilot in his turboprop King Air, so we will have some cargo space. I'll be all over the place doing interviews, so won't see much of you until the Tuesday nite dinner at Butch's. Sorry we slipped up on the T-18 Forum. I thought someone else was handling it & I guess they thought I was. We may still have it.

I'll have to let you in on a little secret: We just got back from a 5 day trip, first driving up to Harrison, AR, (12 hours !) where I did an interview with BEN CUPP for a story in SPORT AVIATION, with pix and a demo flite. Ben has his new cowling on, altho' unpainted, and still hasn't had time to do his gear leg fairings, but it GOES! At 3500' MSL, with surface temps above 90° it indicates 195 mph....and Ben says his A/S is pretty accurate! In my book, the V-6 in the T-18 is a winner. The next day we drove up to Springfield, MO, where I visited with some old school chums, and then the next day we drove over to Wichita, KS, with a brief stop in Lamar, MO, for a quickie visit with Karl & Mazie Lipscomb, and we got to hear a first hand account of how their T-18 took a duck thru the windshield. Mazie's face was a mess, but no permanent damage. Got into ICT in mid afternoon, just in time to see one of the modified Tri-Pacers, with a V-6 engine. It was a beautifully finished airplane and after some taking of pix with the cowl off..and on..I got my second ride in a V-6 powered airplane. Again, I was impressed with the performance. The next day Tom Foster, from the ELECTRO Prop Corp arrived with a 3 blader that they installed on DAVE BLANTON's test bed C-175, where it flew for some 15 hrs. before installing it on DAVY BLANTON's Sport Racer. You'll see it at OSH. Just last nite Tom Foster came thru DAL on the way to Wimberly, TX, where he is installing a two blade ELECTRO prop on JIM FRENCH's 150 hp T-18. I will have stories in S.A. on all these airplanes, etc. You will also see the V-6 STOL at OSH and quite probably French's T-18, too.

Again, I want to thank all of you that sent in material for the NL and again encourage all of you to contribute a story (please). Thanks, too, for JIM HIDALGO for his work on pages 1 & 2 and the clever captions. We will be getting NL #73 out right after OSH, now that I've got some help. Hope to see all of you at OSH. If you need to contact me you can leave me a message at the EAA Press Bldg (just behind the tower).

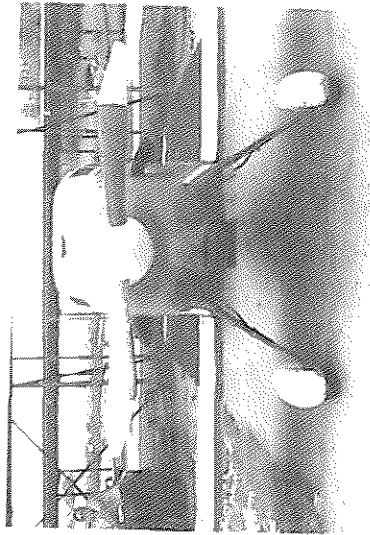
Until then enjoy.

  
Dick Cavin

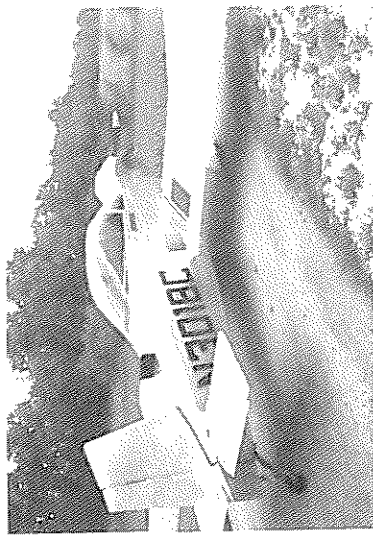
PLZ note the enclosed PERFORMANCE DATA SURVEY. Please take a few moments to fill this out and return to me. We NEED this info badly and, remember, it's as much for YOUR benefit as well as others. Okay/???



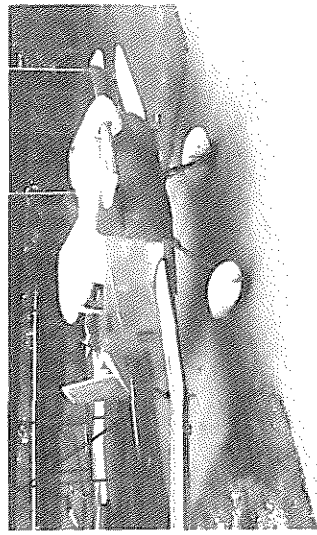
THE TUG BOAT WAS ON THE RIVER



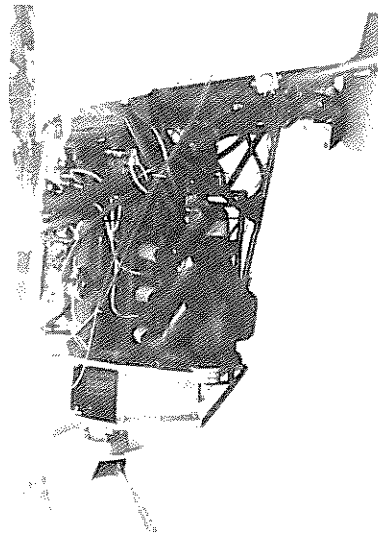
THE TUG BOAT WAS ON THE RIVER



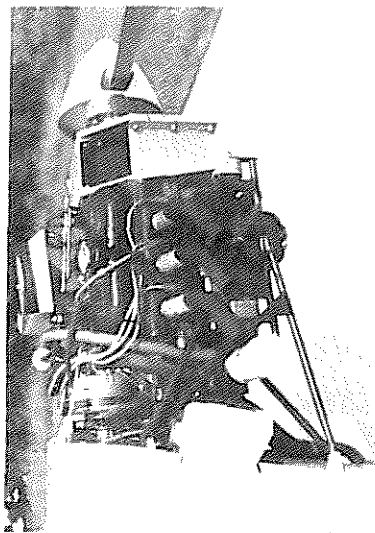
THE TUG BOAT WAS ON THE RIVER



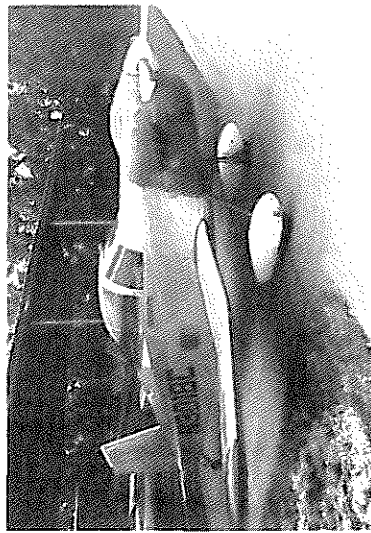
WITH NEW PUMP  
AIR LEAKS ON TOP OF THE HUMP



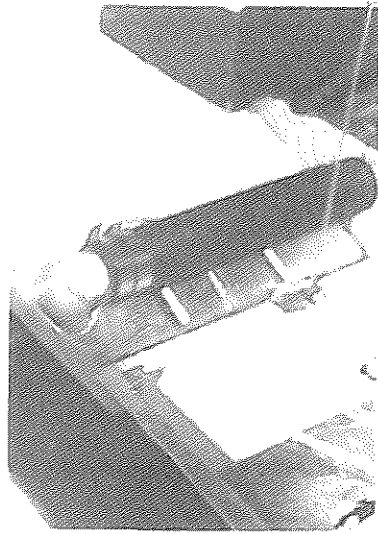
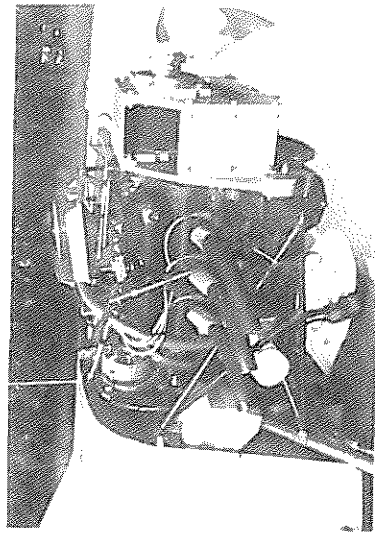
THE TUG BOAT WAS ON THE RIVER



THE TUG BOAT WAS ON THE RIVER



IN FUTURE ONE DOESN'T EVEN  
NOTICE THE AIR LEAKS "HUMP"



THE TUG BOAT WAS ON THE RIVER



THE TUG BOAT WAS ON THE RIVER



# T-18 NEWSLETTER #73

PAGE 1



## KENTUCKY LAKE -- FALL 1989

### IN THIS ISSUE:

Flight and Safety Tips for the T-18 Operator

Kentucky Lake a great success "A Dawn Attack" by Rich Snelson

Kerrville, a sellout crowd by Dick Cavin

LectroProp News

V-6 Engine Notes

New FAA Tactics

Glare Shields and Canopy Trim Strips by Terry Adams

Flight Report by Frank Lanier

First Flight by Russ Ross

For Sale Items

### IN THE NEXT ISSUE:

Repair bolts, what they are and where to get them

Send your stories, for sale items, safety tips and what ever you would like to say

NOTICE: (STANDARD DISCLAIMER) As always, in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.

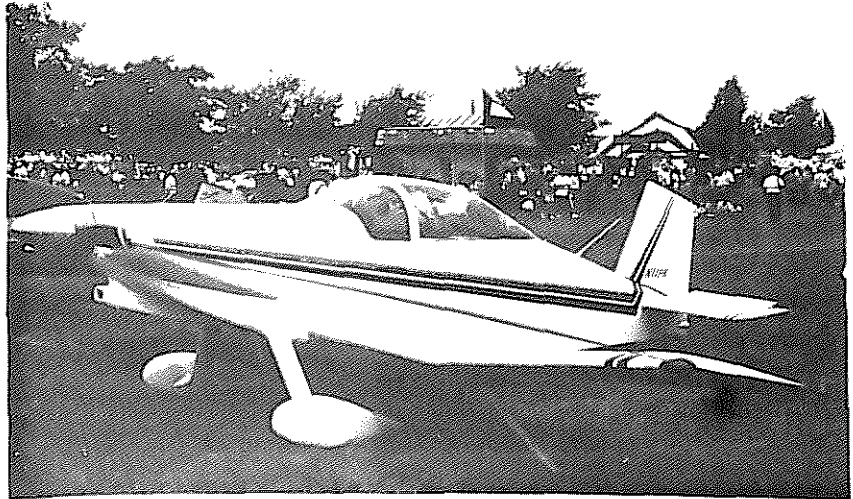
67  
66  
13300  
10000  
6500  
29,800  
30,000



## Kentucky Lake a great success "A Dawn Attack"

by Richard O. Snelson

The 1989 Fall T-18 Event at Kentucky Dam Village State Park, was acknowledged as one of the best T-18 get togethers ever, by everyone present. It started for me with an invitation from Paul Kirik to join him to fly down for the fun. Frankly, I needed some fun! After many years of building the first T-18, "and never flying it", 2 more years on a Pitts Special "and never flying it", plus over a year on the current T-18 project, made me ready for all the fun I could get. At that point, I didn't realize just how much fun and action was to come. "Combat in Kentucky" and "Aerobatics", to only hint at part of it. Having met Paul at the Springfield, Illinois Airport Saturday morning, we departed southeast for Kentucky, when level at 7000 (IFR), his beautiful beige with orange/dark brown trim T-18 started clicking off 145 knots true, a



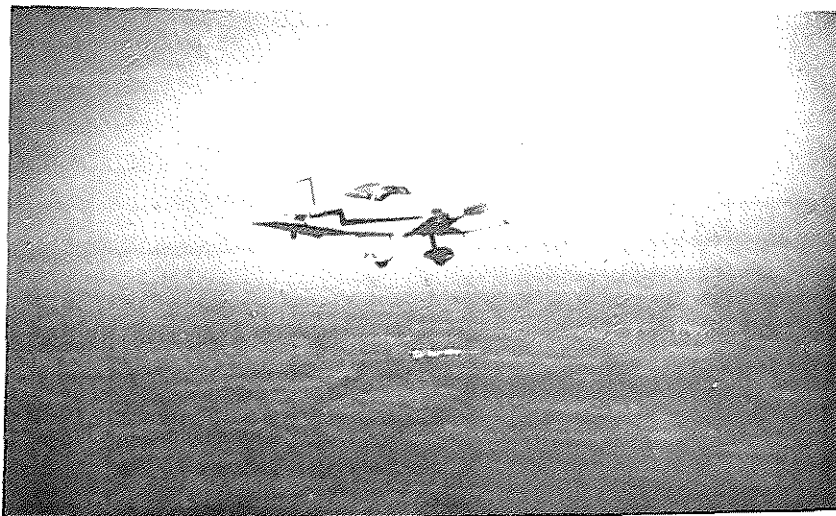
Paul's Beautiful N11PK

check of the Loran showed our ground speed to be 178 knots -- not bad folks. Trimmed out the bird just set there, stable, solid and fast.

Paul had won the 1989 Wright Brothers Memorial Award at Dayton, Ohio for his

craftmanship on this ship. For those of you not familiar with this award, it is really quite an honor. An individual must be selected, nominated, and then voted on. Paul had been recognized for his 1988 "Best T-18 Award" at Oskosh, which put him into contention for the Dayton honor. The award was then presented at Dayton, in the Wright Brothers Mansion on Hawthorn Hill, by a distant relative of the brothers, Mr. Wilkerson Wright. N11PK is one fine airplane, Congratulations Paul!

Paul's fine workmanship had paid off: in just one hour and ten minutes "Kentucky Lake Airport", much to soon for me, as I was still waiting to just hold that stick and feel what this whole T-18 thing is all about, Oh well maybe later! We were greeted at the ramp by



Jack Hull's N55P in "action"

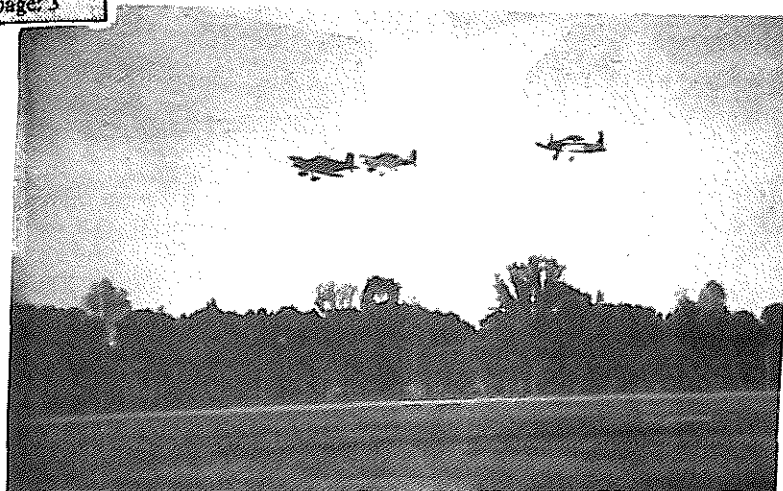




four other T-18's and several individuals that had arrived by auto and commercial air. The ramp was bare, not a single building. When the get together was originally considered an office and lounge, with fuel, phones, and restrooms existed, now they were all gone, bulldozed for progress, since the state had provided money for all new facilities.

Soon the five T-18's had lots of company, the sky thundered with fly-bys as two, and three birds arrived together. There was nothing to warm the heart of the "stuck in the basement" homebuilder then a flight of three T-18's crossing the field, wing tip to wing tip. Twenty T-18's, arrived to complete the gathering. After greetings were exchanged and everyone got over the initial euphoria caused from seeing so many T-18's in one place, the birds were arranged in a large circle so our professional photographer Jack Hull, from Blue Grass, Iowa could take the impressive photo that is a part of this newsletter. Jack climbed the airport beacon tower to shoot it, not me! (Jack has sent a copy of this photo to all persons attending the fly-in, Thanks Jack) He happens to be the owner of N55P, a beautiful beige with brown/dark brown trim T-18. The air to air photo is Jack's bird in action.

Saturday afternoon was spent with cowlings removed, and everyone getting their chance to ask questions, and to note the various builders'



### *The T-18 Attack Force in Action*

approach to T-18 construction. Any builders wanting/needing a T-18 ride was given the opportunity to jump aboard one of several planes offering this chance. I rode with Gary Green of Granbury, Tx in N118GG. Gary got it off the ground and promptly said OK! it all yours. Well first of all, I had spent many years of thinking what the T-18 controls would feel like, I had the impression that this would be like sitting in a BD-5 Jet with nothing but a toothpick for a stick to control the darn thing. Not true folks! ailerons are responsive, and do require moderate pressure to make the turn happen, pitch is stable but sensitive. My first turn resulted in a climb, since the T-18 nose is built to droop and needs to be below the horizon, not on it for a level turn. Very little rudder was needed for cruising turns, so feet can be kept on the floor. Gary explained that he does only gentle aerobatic, with no snap maneuvers to cause wear on the crankshaft, which is amplified by the long prop shaft extension. Using an

entry speed of 160 mph, Gary demonstrated the loop, he only completed one, my ears and sensory system did at least one more, the G meter showed 2.5Gs max. Next the barrel roll entered from a slightly nosehigh attitude at an air speed of 110 mph, very smooth with only positive Gs. Thanks Gary! for the chance to experience T-18 aerobatic action!

After returning to the ramp, strange sounding engines were heard coming from the north, "enemy aircraft", three Long Ezs, intent upon a low pass, scrafig run that caught our T-18's all on the ground. Several of the more aggressive T-18 Warriors had to be physically restrained from leaving immediately for air-to-air combat. Hold on fellows we may have lost this battle, but not the war!

Rumor had it that the Rutan crowd was having a fly-in at Rough River State Park, 95 miles away. This sort of counter attack needed planning and coordination, it had to include the element of surprise, "Sun-



day Morning at Dawn", or on second thought, after Brunch, a 10:30 Launch.

In the mean time Saturday evening featured a fine buffet dinner with all the trimmings and the great company of over 50 T-18 enthusiasts and their families. Kentucky Dam Village State Park turned out to be a great place to stay, dine, and enjoy the get-together. The group present decided that another get-together in the Spring at the same location would be great, plans are for May 12 and 13. Call the Lodge early to make your reservations that number is 502-362-4271, ask for the special T-18 Group Rate. That evening the group moved to Room 246 to hold a strategic planning session for the "Rutan Payback Attack" to be held Sunday morning. This meeting quickly deteriorated into a "can you top this story" session, the best of the evening follows:

*A certain husband had spent months in his garage working on his T-18 project without a break (whats new here?) to take his red-headed wife to a movie or even to dinner. After promising the evening out, he went to the garage and promptly became involved in more important T-18 matters and frankly forgot his date. The wife appeared at the door, dressed to go out, and quickly got the message that her husband had forgotten their date. Being a red-head, she picked up the closest thing she could find and threw it across the T-18 at the husband. Quote by husband."You know*

*when someone throws a chair at you, it is going to hit you somewhere!" Next she crossed behind the plane and proceeded to throw the chair twice more. Quote from husband. "Honey, I don't think you're taking this very well at all." Thanks to Leroy and Mary (Mary is a good-looking redhead).*

On with the new days events: Morning came with an excellent brunch, country ham, eggs, biscuits and gravy, bacon, more food! more food!. A quick trip to the airport and a short hop with Paul to fuel-up and back for the departure for Rough River Park. Twelve T-18s bound for a brave journey of 95 miles to let those Rutan guys know that the T-18 bunch is one outfit not to reckon with. Can you imagine "centers" reaction to 12 transponders from the same area at the same time! The first wave of "fighters" flew a tight formation of three ships, followed by a second group of three, and all us nonmilitary types spread over several miles of sky. Surprise was on our side! We caught them on the ground! Three fly-bys convinced them that we meant business. One poor unlucky fellow actually got off the ground, but didn't last long against the T-18 superior turn rate. Now we would all be able to paint fiber-glass stars on the side of our T-18 cockpits! What a weekend to remember...

This weekend had shortened my building time by at least a year, provided that every day has 5 extra hours and my wife can give up movies, and dinner

dates (no problem she doesn't have red-hair). The trip back to Illinois was great, since Paul gave me the controls and worked my tail off with navigation and T-18 flight control. Thanks Paul!, Gary, Jim and Judy Paine and everyone that made this get together so great. I hope that someday I'll be able to pass on the same sort of T-18 experience "in my T-18" to some other builder.

Until we fly again T-18 Warriors!

### **FOR SALE :**

Fiberglass spinner shells for replacing aluminum, call Jim Payne 513-426-9671

Dick Cavin's old T-18, about 450 TT, 325 smoh, Lyc 0-320-b2b, Loran, KX145, Xponder, Alt Encoder, etc. \$15,900. Call Jim Hidalgo at 1-512-847-3881 after 5 pm.

T-18 plans, one set wide-body, one set standard, and folding wing addition. Wide body templates, wide body bulkheads, many misc parts, standard fuselage, gear, canopy, roll bar. Call Rich Snelson 217-935-4215

Your Add can be here next issue.



## *Kerrville a sellout crowd by Dick Cavin*

KERRVILLE 89

It's nice to start this newsletter on an upbeat. The past weekend was the 25th annual Southwest Regional Fly-in at Kerrville Tx. and it just couldn't have been any more perfect. The weather was gorgeous, not a cloud in the sky, a light wind, daytime temps in the mid 80's, and in the high 50's at night.

I don't have all the figures yet, but the airport was close to being full, both in the display area and across the runway in the area reserved for Wichita Wallflowers and other such prosaic transient. I would estimate we had as many as 1500 airplanes there all told.

To make my cup runneth over, I got to go to and from the Fly-in in a T-18 -- and not just any T-18 at that! I rode with Wendell Green, who is the proud new owner of John Walton's former beauty. We alternated flying and navigating. We climbed to 6500 MSL going and 7500 returning, and with a light crosswind we were averaging about 190 mph each way, pulling 24" and 2400 one way and 23" and 2400 coming back. A little better than 3 miles per minute and that was verified by ground speed read-outs on both the Loran and the DME. My thoughts kept going back to the times John and I flew formation to and from OSH, back when he had the 150 hoss engine and fixed pitch prop in it. The 0-360 engine and C/S prop make quite a difference. I

particularly noticed it in take-off and climb.

Wendell and I had to leave Saturday, the 2nd day, and come back home, as Wendell had a trip out on Sunday. (He's a TWA pilot and commuter to St. Louis from his home in Argyle, Tx, near Denton.

Friday was really my day. I got to fly in 3 T-18s the same day and this not only made my day, but my month, too. Jim Hidalgo, who bought my T-18, made a special seat and seat back so big guys like me can fly it comfortably. Jim is shorter than I am and he re-upholstered it and made new seats with thick upholstery for real comfort, which was just right for him and his wife, Marty. He was going to let me fly it last fall, but I couldn't close the canopy then. Jim, bless his heart, went to all that trouble to make that extra seat just so I could fly it at Kerrville. What a nice guy! and boy! oh boy! it was a real kick in the head to fly the "Yellow Bird" again. There's just nothing like a T-18. It just plain spoils one for anything else.

No sooner had Jim and I gotten down than Jim French loaded me in his bird and I got to see how his bird flew with the new LectroProp, that I'd been telling you about in the newsletter for the past year or so. It was quite a revelation, too. His takeoff run is drastically shorter and his rate of climb is about double what it was before! I was also pleasantly surprised

at how much smoother the engine was and I believe it is a little quieter too.

One nice thing about a variable pitch or C/S prop is how quickly you can get slowed up to pattern speed when you flatten the pitch a little. I also noticed the landing roll is considerably shorter, with the prop's flat pitch acting as a 1st class drag brake. A friend of mine with a Mustang II had told me he cut his landing roll in half when he changed to a C/S prop.

French will contribute a short report on the prop later in the N/L, so I won't dwell on it here except to say that I think you'll see a lot of these LectroProp on a lot of airplanes in years to come. Bear in mind that Jim's airplane has the big 600x6 tires and correspondingly larger wheel pants, which cost him about 10 mph.

You might also want to know that Wendell's bird was the winner of the Grand Champion Award in the Plans Built Category! It also won the same award at Kerrville about 5 years ago when John had it.

Just before OSH '89 I made a trip to Harrison Ar, to do a story for Sport Aviation on Ben Cupp's V-6 powered T-18. You'll read about it in S.A. so I won't go into great detail here except to say it flies great! Without gear leg fairings on a 95 degree day, @ 3500 ft-msl it indicates 195 mph and Ben says he has verified the A/S indicator. Wow!



LECTROPROP NEWS

That same trip I went over to Wichita to witness the installation of the LectroProp on Dave Blanton's V6 Ford engine in his Cessna test bed 175. This was the culmination of nearly 300 hours of running the prop in one of Dave's engines by Tom Foster, the national distributor for the LectroProp. During the 290 hour grueling ground run an automatic set up cycled the prop from stop to stop every few seconds, thousands and thousands of cycles. Both the engine and prop performed flawlessly. Since then an independent lab in Mich. has done "pull tests" on the blades and hub, with the result that i took a pull of 51,000 lbs to pull it in too - and the blades stayed in the hub even then! All these tests are far in excess of FAA requirements to certify a prop, which they plan to do soon. They also want to accumulate several hundred hours of active flying on five or six different types of homebuilts before certifying it. They are now getting an STC on a 3 blade installation on a Cherokee 180. Just think what a difference it will make on Cessna 150s and 172s, as well as Cherokees, etc.

DUFLUNKY CUB

That same trip I got to fly in one of the "Duflunky Cubs" that Dave has talked about for years. It is a stretched (2 ft) Tri-Pacer on conventional gear, with 18" extensions to the outer wing panels, with the V-6 engine in it. It, too, flies great, a

real STOL. Both Ben's T-18 and the V-6 STOL will soon get the LectroProp installation and I believe it will make skyrockets out of both on T/O and climb.

V-6 ENGINE NOTES

On that trip I found out why some people have picked on Dave's engine, saying it didn't put out the power he claimed. It seems Ford put out a bunch of V-6 engines with an 8.1:1 compression ration, while all of Dave's dyno and flight testing have been on engines with an 8.8:1 ratio, so if you are going that route on yours T-18, be sure you have the 8.8:1 engine.

NEW FAA TACTICS

In case you haven't heard the news in your area, you need to be aware of a drastic change in policy in regard to a wave of nit picking enforcement activity by field inspectors. To begin with, they have hired who knows how many new inspectors. In the Southwest region alone they have added 15 new ones and guess what their main activity is -- checking the paperwork of pilots and their airplanes! all that in the name of safety and motherhood, of course.

They are doing what they call "ramp checks" and they are hitting every airport in their region and they proclaim they are doing it day and night, Saturday and Sundays & holidays. They are already swarming fly-ins. They are lurking

around airports, just waiting for someone to come taxiing in, or preparing to get in their airplane and leave. (I don't think they have the authority to enter a parked airplane without the owner being present.) As a pilot, be sure your license is current and valid. Don't forget to see if your medical is also current.

To justify this new enforcement and harassment program the FAA is proclaiming that homebuilders have taken too many liberties with maintenance and alteration of airframes, engines, and props, etc. Maybe we have from their standpoint. Anyway, they want us to execute Form 337s each time we make some alteration, just like a certified airplane, and if any major changes are made, submit it for re-licensing (just like at first) and we may have to go through a new test period, etc. You may want to contact your nearest FSDO and get a copy of a new (free) bulletin directed at the aircraft owner & operator of general aviation types. It's called "Aircraft Maintenance Responsibilities" and is 18 pages long. Here in the SW Region the address is "FAA FSDO", 8032 Aviation Place, Love Field, Dallas, Tx, 75235. If you don't have a local FSDO (no longer a GADO) close by you can write to the above address.





## Flight and Safety Tips for the T-18 Operator

Jim Paine 4240 Wagoner Road, Dayton, Ohio reports more T-18 gear welding cracks, both in his ship and in one owned by Dan Wolf. Jim's gear has a small crack on the front of the lower weld where the cross member is attached, he has stopped drilled it and will watch its progress. Dan Wolf's ship had severe cracking damage to both front and back welds and is grounded as a result. Jim is investigating the problem and will report the results, he has a potential fix that is being analyzed by an aeronautical engineer. Make it a point to check your plane for this cracking before your next flight. Call or write me (address/phone # below) about this problem as I would like to know more about the details, type of welding?, extended gear?, hard-landings?, etc....

Review old news letters for all the many safety tips contributed in the past. Then do something about them!

That's all for now, Richard Snelson

## Editors Trim Tabs

I'm very disappointed that only 5 of the Performance Data Survey slips were returned. I'm not too surprised, tho I guess. I don't quite comprehend just why the great majority of you simply will not pick up a pen - ever for a simple little letter. It really gets discouraging. We have the potential to exchange a huge amount of information that would be of inestimable value to each and every one of the members, whether they have a flying airplane or a project.

When - and IF - we get a sufficient number of returns of the Performance Data Surveys we will publish a tabulation.

Come on guys! I'll give you one more chance, but if you let me down again I'm washing my hands of the whole thing! If you're too lazy and indifferent to take 5 minutes to fill out a simple form and buy a 25 cent stamp I'll be forced to conclude that you have no consideration for your fellow pilots and builders and your only interest in the N.L. is to be mildly amused - or something like that.

I just received a bound listing

of all the T-18s that are flying, the Thorp T-18 section of the Experimental Aircraft Model Directory, published by "Air Data", 408 Evergreen Ave, Glen Ellyn, Ill 60137 phone number (312) 858-2428. They list about 200 airplanes that are identified from FAA listings as a T-18. I'm quite sure there are at least twice that many more that do not use T-18 in their name listing. The list is published in a bound booklet of 4" x 11" size, so we had to reproduce the pages vertically. Please look at the list carefully and if you know of corrections to be made, I would appreciate your sending them to me.

*in N.L. # 74*  
If you have airplanes, projects, or parts for sale please type details up neatly. Leave a good margin on left, give your complete name, address, tel# day or night, price etc. If you have a good picture of complete airplane we'll try to include that too.

*Sincerely,*

DICK CAVIN

My name is Richard Snelson, after having used the newsletters from this Mutual Aid Group for over 25 years I've decided to lend Dick a helping hand with the writing and publishing of this excellent media. I feel that it has

saved me hours on both T-18 projects that I've worked and is the best "money" a builder or operator can spend. I started my first T-18 in St. Louis about 1963 or 64 with Howard Henderson, Lee Skillman and Sylvan Keebler. By 1975 when I went into business for myself it was on the gear with the engine tested and the instrumentation all in. Needing money! I ran an add in trade-a-plane and sold it very quickly. I know it went to California and may have had it N number changed. (Old number was N685RS) Any one have any information on this old ship? After a number of factory built airplane the lure of OSII! got me again, so it was back this time with a Pitts Special. About a year ago, the old T-18 Bug got me again and here I am with another project underway. I have purchased several incomplete projects, and have a lot of parts, but basically I'm building the new ship with Sport Aviation Parts. Center wing is about ready to rivet, in a jig, so I'll do a story with picture about that later. I'm getting set up with a photo scanner, and desk top publishing software to do the newsletters, so hope you like the new format. It may change some more as I

develop the different features of the software. I also have photography as a hobby so hope you like the many pictures that I'll provide. My goal will be to get a newsletter out before each major T-18 event, and after each if possible. Feel free to send articles to me as I plan to do most of the letter publishing and formatting. Give me a call and discuss your ideas for this great tradition. Richard Snelson, Route 3, Box 295 Clinton Ill. (217) 935-4215

By the way Sylvan Keebler has been very sick, hope your better "Keeb". His wife Peggy tells me he still looks forward to getting the newsletters. I'm sure he would like to hear from all his old T-18 buddies so drop him a card fellows. Address is RR 2, Box 139, Bentonia, Miss. 39040

Rich.



## First Flight by Russ Ross

T-18 NEWSLETTER #73

Here's still another First Flighter report. This one is from Russ Ross. He also sent in a 3/4 rear picture of his new bird, N45RR and one of our T-18 "Performance Data Surveys" slips and the numbers he got sound about right with no gear leg fairing or wheel pants. His paint scheme is very attractive. It's basic white, with flowing blue stripe with narrow gold feature striping outlining the blue.

Dear Dick;

Inclosed is a picture of my T-18; N45RR, which I 1st flew on July 11th which happened to be my 60th birthday; 34 years after my 1st solo on my 16th birthday. Talk about elated ! It was absolutely tremendous. Made the front page of the local newspaper.

It is a standard T-18 with electric trim; basic panel, Cochran SS crossover exhaust, dual EGT; dual CHT; VSI; Terra Nav Com with electronic CDI and a Terra TOL-120 loran. Has Rosenhaun wheels & brakes & master cylinders. I have a Sensenich 76EM metal prop cut down to 68" x 74" pitch. (Bob Dial recommended) Scott tailwheel. The empty weight was 901 lbs. Imron paint with corlar epoxy primer. I installed a NASA intake vent on the bottom of the cowling (Rattray) and ducted it to my cabin heater intake which gives excellant cabin ventilation.

At this time I have about twenty hours on the airframe and am still debugging. Gear fairings and wheel pants have not been installed. I am using a piper pitot tube located on the wing gap cover at about 3/5 th chord length. Top speed indicated in level flight at 2650 RPM is 170 mph. I seem to indicate about 1700 FPM climb on takeoff. The engine is an O-320 150 HP.

Thanks Dick for your dedication to the newsletter and all the valuable information contributed by other T-18ers. Especially Ed Rogers formerly from Sioux City and now in Phoenix Arizona, who built the 1st T-18 here in Sioux City. The T-18 is really a super airplane.

Best wishes,

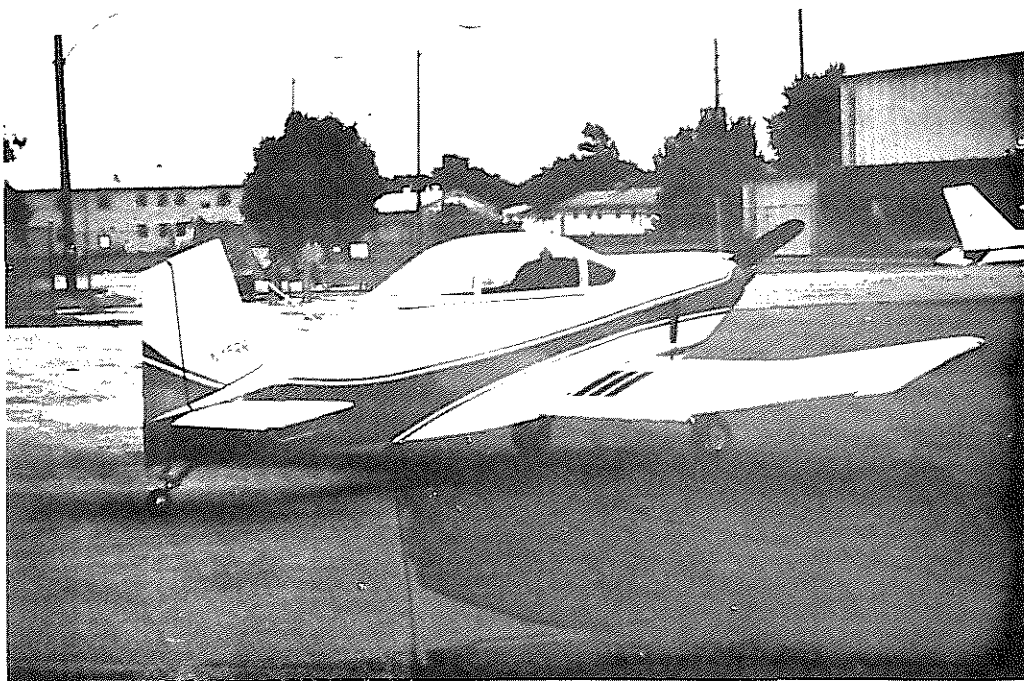


Russ Ross

Russ Ross  
RR#1 Box 411  
Sioux City, Iowa  
Sept. 13, 1989

Again, our very sincere thanks and congradulations to Russ for the report, the picture, and the Data Survey slip.





## T-18 Performance Data Survey

Aircraft number N45KA Pilot RUSS ROSS Engine Lyco-0-320 Horsepower 150

Propeller brand Sensenich 76in Diameter 68 Pitch 74

Test data: Has your tachometer & Air Speed Ind. been checked for accuracy? ☐ yes, ☒ no

Please indicate Static performance on ground: RPM 2100 MP none Altitude 1100

| Altitude                          | 1,000' | 2,000' | 4,000' | 6,000' | 8,000' | 10,000' |
|-----------------------------------|--------|--------|--------|--------|--------|---------|
| Temperature (F)                   |        | 80     |        |        |        |         |
| Maximum Indicated Air Speed (mph) |        | 170    |        |        |        |         |
| Rate of climb (FPM)(MAX)          |        | 1700   |        |        |        |         |
| RPM                               |        | 2650   |        |        |        |         |
| Manifold pressure                 |        |        |        |        |        |         |

Notes: no gear fairings or wheel pants

*by Russ Ross*



## Glare Shields and Canopy Trim by Terry Adams

8

I just received the following letter from Terry Adams re glare shields and canopy trim strips and this is an excellent example of what I've been trying to get you guys to write for the N.L.

Dick Gavin  
10529 Somerton  
Dallas, Tx 75229

Terry Adams  
4364 Boulder Creek Circle  
Stockton, CA 95207

478-7379

Re: Canopy and windshield installation

This was easy spaced out over a year, but really only 20 - 30 hours. I purchased my canopy in 1980 and finally had time to install it in 1988. To install the windshield: use a hardwood block approximately 3/4x2x4 with a saw blade cut 3/4 deep near one end. Use this block to flare the front skin up to approach the angle of the plexiglas. This must be massaged very slowly working back and forth across the edge of the skin in small increments to avoid crimping the skin. Always work the full 3/4 depth. The bend angle will be the greatest on the top of the skin and less as you move toward the side till it is left straight. Use a straight edge from the roll bar down to the skin to check the angle. Next take the plexiglas (untrimmed) and lay it in position from the outside across the roll bar and top skin. Simply mark the approximate shape and trim with a flex cut off wheel mounted in a drill motor, or on a router table. From this point either masking tape the edge of the skin or the face of the plexiglas and slip the windshield in place to mark exact trim lines. Using a #40 (not sheet metal grind) drill bit and a back up block, I transferred the holes from the skin through the plexiglas. Next I masked near the roll bar and marked on the plexiglas using a straight edge the line of contact with the roll bar then layed out the holes from the spacing on the plans. Keeping the drill perpendicular to the plexiglas I drilled through the glass and pitted the roll bar. I chose to trim the back (at the canopy) edge of the windshield so that a vertical level would touch the plexiglas and the back edge of the roll bar.

To make the trim strip above the roll bar start with a 6-8 inch wide strip of poster board etc. long enough to go from side to side over the roll bar. Tape it in place lying flat against the plexiglas, then mark the underside of the poster board at the back edge of the plexiglas and a CL. Remove the poster board and mark a parallel curved line forward 2+" apart (at least wide enough to give screw hole edge clearance) and another parallel curved line +-1/2" rearward to provide overlap of the canopy trim strip. Lay the strip back on the plexiglas and mark the front edge onto the masking tape, remove the pattern and examine the pencil line on the tape compared to your line of screw holes, this will allow you to widen or narrow the strip. Transfer to 6061 al. Remove the plexiglas and position the strip at the CL and with the pencil line on the masking tape, clamp. Using a #40 and a backing block drill through the plexiglas through the al strip. Check for fit, remove, polish the edges of al and plexi, drill and tap holes in bar, and use a bullet grinding stone to open holes in plexi to 7/16", dimple the al strip and skin for #6 countersunk screws and pad with chafe strip. I personally used #6 screws rather than #8. On the front edge of the windshield use a backing strip to distribute the pressure of the screws. Canopy installation in my next letter.





Dick Cavin  
10529 Somerton  
Dallas, Tx 75229

Terry Adams  
4364 Boulder Creek Circle  
Stockton, CA 95207

478-7379

Re: Newsletter material - Glare shield, Canopy trim strips

I was unable to obtain much information on constructing a glare shield and attaching the top of the instrument panel so I proceeded to develop the following.

Once my windshield was temporarily in place I also located my panel approximately six inches back from the dash frame to allow clearance for flight instruments located at the top of the panel. I mounted the bottom of the "Knowles" panel using two 2 inch spare pieces of strip hinge riveted to the bottom lip and then shock mounted to the horizontal longeron. This provided a tilt down panel for easy access.

I thought about using shock mounted spacers (long) off the dash frame to secure the top of the panel but then opted to construct a glare shield which would allow for mounting the panel at the top.

Using a 40" x 15" piece of poster board I curved the two ends down and slid it in across the top of the panel until it reached the dash frame. I then roughly sketched the layout of the glare shield including the front to conform to the bottom edge of the plexiglas, and trimmed until I was satisfied. I wanted the front edge to be secured with the windshield screws, and since the front upper skin is massaged up into an angle to conform to the windshield at this point small wedge shaped slits allowed the poster board to follow this flange.

I used a piece of .025 in the shape of the pattern and crimped the front edge to turn down a flange to be able to meet the windshield screws. I tapered the amount and distance I crimped and the final piece fits very nicely thank you. But then I have this head slicer sitting right on top of my panel! I used a 4' length of 1/2" soft aluminum tubing from the plumbing dept. I gently bent this to the exact shape of the glare shield. Using a router bit in a high speed drill press I cut a 1/16" slot in the tube so the edge of the sheet would slip into the tube and be epoxied in place. Now this was no easy task and I'm sure there are easier ways, but I had another reason for doing it this way. In the center 30" I used a 5/16" router bit which made room for 15 red 'grain of wheat' mini lights to be inserted and thus I have eyebrow lights for the panel.

Once my canopy trim strips were made I used 1/32" rubberized gasket material (from 3M distributors) as the chafe material. I merely sprayed 3M adhesive onto the back of the strips and onto the rubber strips, put them together and trimmed off the excess.

Has anyone ever made approximate patterns available? I will



if anyone wishes them.

Is anyone contemplating the use of the Mazda engine with the Ross planetary drive?

Thank you for providing the back issues I had missed, in between graduate school, moving, opening a business and a baby, the T-18 project has been sitting off the back burner. As I read one previous newsletter there was a note from a gentleman who had sold his project after becoming discouraged about finishing, but purchased a flying T-18. His comments were to those flying T-18s and how much impetus they can provide to those of us still building by providing a quick ride. Perhaps because I would wait for an offer of a ride I am still waiting. Thankfully I see the building as rewarding as the flying.

Question: I asked a gentleman this at OSK 88 but would like confirmation. My fuel tank was from Knowles and unfortunately the outlet is tapped too small for a finger strainer. The gentleman indicated most tanks were that way (his also) and that it was perfectly acceptable to redrill and tap for the larger size though most of the material would be gone from the flange, and further (like his) mount the fuel shut-off directly on the tank outlet with the necessary actuator extension and flex hose.

Thanks for providing the clearing house of ideas



Thank you very much Terry. We really do appreciate your efforts! That's one subject we have never had any N.L. info on. Maybe this will inspire some of you to tell how you did it

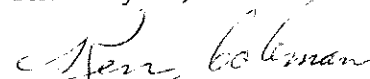
FOR SALE

"Ford V6 engine and related parts  
to make the Javelin Ford Engine  
conversion. \$2200.00 invested.  
Open for offers to re-coup some  
or all of investment."

955 Angelo Drive  
Pittsburgh, PA  
15236

I won't bother you with my reasons for  
dropping the project at this time. Let's just say  
that I lost interest.

Thank you,



Ken Coleman



T-18 Builders & Owners Association,  
10529 Somerton,  
Dallas, Texas.

September 13, 1989.

ATTENTION: DICK CAVIN

Hello Dick!

I've been working on my S-18 projet for 2 1/2 years - my god, time really flys! So far, I've completed all the machined parts; the ailerons, inner wing assembly and outer wings (wet). I'm about to start the fuselage. As I've profitted greatly from the newsletters containing articles written by other builders over the years, I felt I should take the time to contribute.

Although you scared me in NL50 when you related "it is almost impossible to form a 6 foot piece of aluminum by hand" - for the outer wing skins - I've trugged ahead and found my approach to be a piece-of-cake! (Back in '75 I'd successfully formed 8 foot leading edge skins for a Zenith CH200).

As I had elected to go with John Walton's Wet Wing concept, I didn't like the idea of a lap joint on a rib in the fuel tank area, as is the normal fashion.

Instead what I've done is to use the 60" x 180" x 0.032" 2024 T3 sheet which I'd bought for the fuselage side skins and folded it as you see in the photos. Actually we need about 59 1/2" of the 60"-close but adequate. This gives a full one inch lap along the length of the spar which has two staggered rows of rivets. The 0.032" skin goes from the top rear edge forward and under to lap on the lower main spar with an 0.025" skin which continues to the bottom rear edge. Note: The rear skin is "BENEATH" the front skin -the airflow can adhere easier this way.

"Assembly/Sealing Procedure S-18 Wet Wing" (per John Walton) half standard rivet spacing, flush solid rivets, but "spar-wise lap joint".

1- With the wing rib spar assembly inverted, apply PRC A-2 to faying surfaces of spar lower surface only not the top surface at this time, as well as to the nose ribs up to and including the 1st three rivets on the upper nose rib surface - also to the skin mating surfaces.

2- Cleco skins in place on lower surface with front skin hanging over worktable as shown in Fig A.

3- Flip over and finish clecoing upper surface of front ribs and main spar. Fig.B

4- Set all rivets on the lower surface nose ribs working thru the "access" holes, as well as the 1st three rivets on the upper nose rib surface.

5- Delicately remove the clecos on the upper main spar surface and upper rib surface. Note the three rivets at the front upper surface have locked the nose radius.



../2

6- We can now lift the upper skin high enough to have good access (A) to set the main spar lower rivets to the skin as well as (B) to seal with PRC B-2 the inner lower surface of the "fuel tank" everywhere necessary. Remember to leave the lower rear corner of the rib junction to skin and main spar web "OPEN" so that fuel can empty from one bay to the next, otherwise we trap a few gallons we'll never be able to use. Fig. (C)

7- Apply PRC A-2 to the nose rib upper flange surfaces, to the upper main spar surface and to mating skin surface, then close and cleco all in position.

8- Invert wing on worktable supports and proceed to set rivets along nose rib upper surfaces. We can at this stage remove the two outer rear ribs for better access. With these two rear ribs removed and working thru all the access holes in lower nose skin surface, as well as thru the access holes in remaining rear ribs I was readily able to set all rivets on main spar and nose ribs. Fig. (D)

9- Apply PRC-B-2 to the inner upper surface of the fuel tank "thru access holes" everywhere necessary.

10- Return wing to upright position, check for paralelism with a good level along main and rear spars.

11- Remove clecos from top rear skin area.

12- Lift skin high enough to allow access to rivet lower rear skin to ribs and rear spar. (Fig (E))

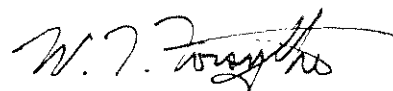
13- Close and cleco upper rear skin in place.

14- Invert wing on worktable. With both the inner most and outermost rear ribs having been left out for the time being, we are able to reach in thru the lightening holes to rivet all the rear ribs to the upper skin, moving outward as we go. (Fig (F))

15- The last step is to insert the two outermost ribs and rivet these in place. All went well.

As I progress further, I'll write in again as so many T-18'ers have done, to the benefit of all of us.

Have a good day.



W.T. Forsythe  
(S-18 Serial #39)

W.T. Forsythe,  
10907 Tanguay,  
Montreal, Quebec  
Canada.  
H3L 3H3.  
(514) 331-3615

P.S. Please find 30.00 \$ to cover  
my dues thru 1990.





FIG. "A"

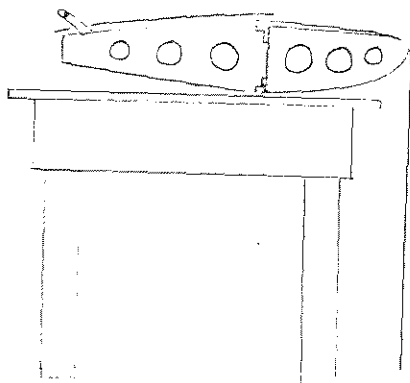


FIG. "B"

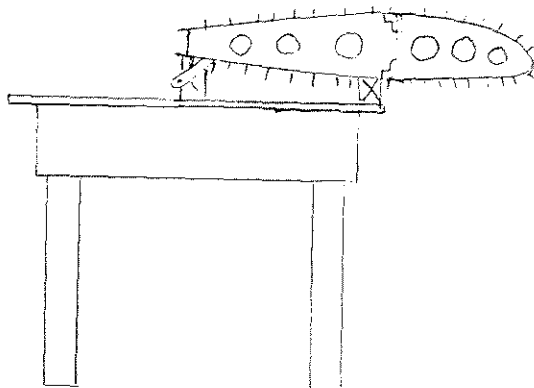


FIG. "C"

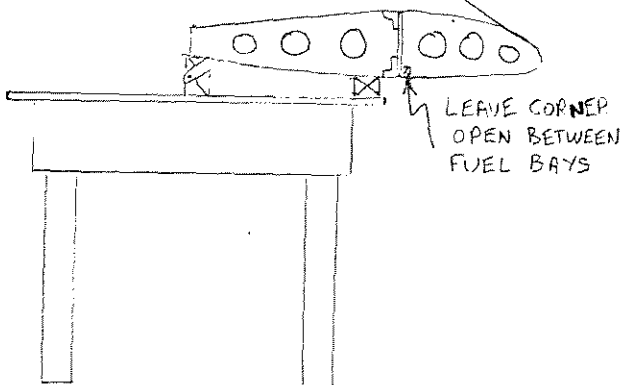


FIG. "D"

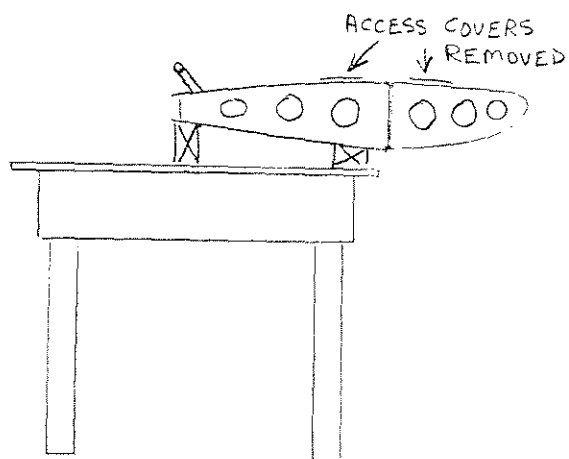


FIG. "E"

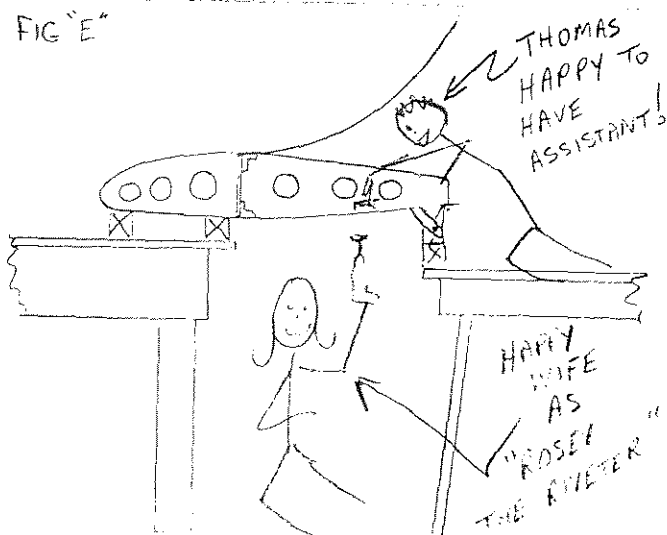
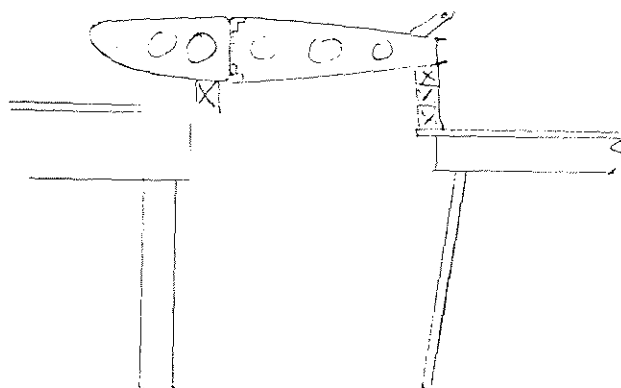
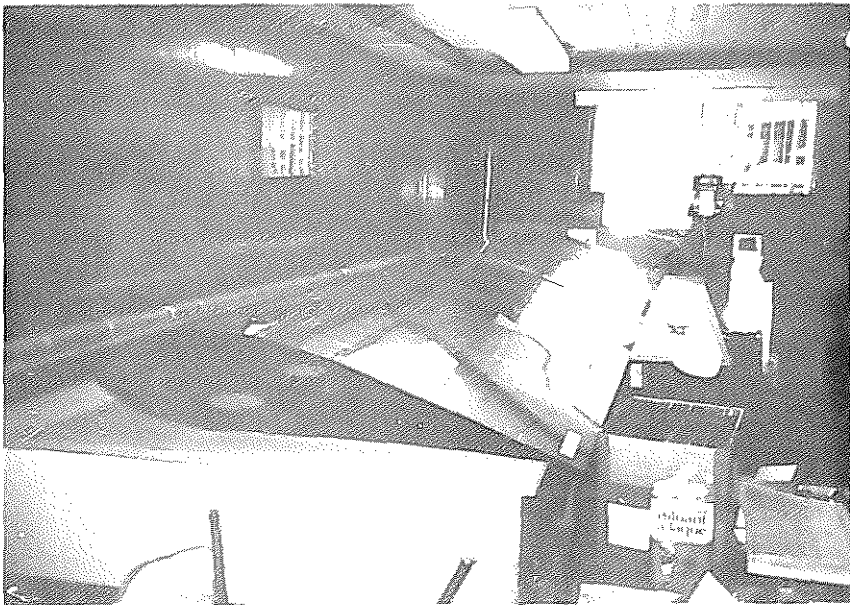
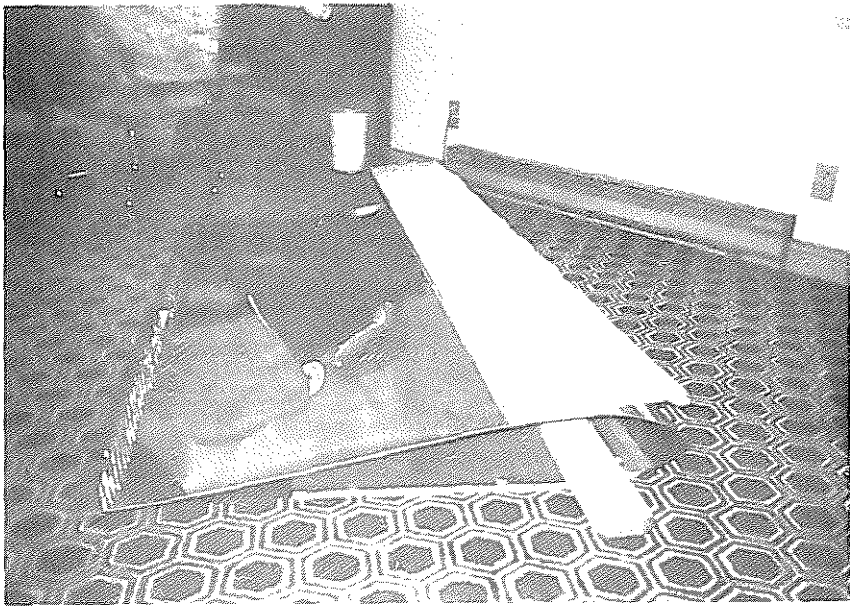


FIG. "F"









4/20/89

Dear Dick,

Your impassioned plea finally got to me; the Lord knows that I gleaned a tremendous amount of knowledge from the newsletters; I couldn't have built m without all the help from so many contributors.

I'll go ahead and write a reply covering some of the topics that you listed, and my comments so far; I've just go 77 hours on the bird now, so I've got a lot of evaluating yet to do. I had a nice visit with Paul Kirik and Bob Olds over in Davenport the other day. Paul gave me a lot of good ideas to plug the holes to let my heater work better.

I really wanted to make it a good IFR cross country airplane, that's the reason I've sort of went overboard on the AVIONICS. I use the ADF quite a bit, and I plan to fly in Canada some.

PLANS# 1152, T-18 CW

#### BAFFLES; AIR BOX

I got these from George Lieder, 5017 Briarcrest, Lakewood, Ca 90713, (213)-866-2198. The Baffles take a lot of time with individual fitting but a cool engine is worth it. The rubber asbestos material I pop riveted on with an aluminum backing strip, and sealed the cracks and corners with RTV. I threaded 1/8" welding rod for the under cylinder hold down. I used the gummy gritty Duratest Locklite (sort of pink) to go around the carb mount studs after John Walton said that his vibrated loose. John Kleber (812)-877-4092 helped me with a S.S. bracket that extends down out and aft to serve as a mount for the mixture and throttle controls on the bottom and side. It goes on the 4 same studs in the crankcase just above the carburetor.

I also got a chunk of wet suit sleeve from George Lieder to go between the air box and the aluminum rectangular box that bolts to the fiberglass air intake. The air filter was from a automotive speed shop-the dense variety.

#### CONTROLS

I hung the controls under the panel - the throttle, prop, mixture in the top row, and the carb heat, parking brake, defrost heat, floor heat in a row under that row. The fuel shut off valve (Paul Kirik's idea in a previous newsletter) that goes immediately under the tank has an extension that is just below and behind this panel that holds the controls, out of the way from bumping it with your knee. I welded a L-shaped extrusion to hold the control cables firm on the aft tank belly.

#### TRIM CONTROL

I used two little switches mounted on the top of the stick grips with a center off for trim control, and a PTT button just forward from the trim switch. The wiring comes



out near the bottom of the stick and goes over to the push-pull tube cover and exits just ahead of the front aluminum cross piece just forward of the spar (I forget the number). I wrapped the small wires with spiral tie wrap for chafing protection and left large service loops for travel. The wiring goes to the side and comes up on the back side of 601.

### ANTENNAS

I used the plans for the wing tip NAV antennas that have been circulated through the MAS - The strap of 020 aluminum. They work great, although I use the Loran mostly for navigation. Why use a horse and buggy when a Cadillac is available? I do use them for the localizer and identifying intersections. I hooked one NAV to the one radio, the other to the other.

The COM antenna for the one radio goes on top forward of the fin (20"), so it will clear the canopy. For backing I tied into the frames fore and aft with an .025 doubler. I used 3M Body Seam Sealer to seat the antennas to the skin. It can be painted, the radio shop man told me. The other COM antenna was bent and goes as far laterally on the belly as you can conceivably put it, just aft of the spar - 4" or so. The Loran antenna is in the same place on the opposite side.

The transponder antenna went on the belly about 6" aft of the firewall just to the right of the middle, inboard from the heat of the exhaust. I wanted to protect it from breaking off during a quick wash job.

The marker beacon went about under the back of the seat below 598, just to the side of the middle extrusion.

The ADF antenna went aft of that about eight inches. The reason for putting this aft of the baggage compartment was to help get weight and balance farther back. The battery is on the other side, on the back side of the frame that is the back of the baggage compartment. The battery box is stainless steel that I got from Sorrell (Hyperbibe) and I used #4 welding cable for battery cables - all copper. The goodies that go with these antennas: Encoder, Marker Beacon, ADF Coil, Glide Slope, ELT Box, mount on a tray in the other bay opposite of the battery.

The strobe power pack I put way to the back end, with an inspection plate (WAG AERO, \$4.50 for both plates) for access under the stabilator. Its great to have a plate there for access to the trim motor and the stabilator arm and counterbalance. I didn't want to add any lead in the tail to compensate the constant speed prop weight.

One thing I sure would strongly recommend: don't rivet the aft belly skin on until you've got your rudder pulleys and cables in, and don't rivet the front belly skin on until you are completely finished with the instrument panel, rudder pedals, fuel lines, cables, wiring, brake lines, parking brake valve, heater ducts and controls, throttle, mixture, and prop controls, main tank vent arranged, etc. You can have the extrusions and pedals fastened in with clecos for planning, but working underneath sure beats standing on your head.





If you're going to put a wing leveler under the seat be sure that all the pulleys, bellows, cables, mounts are all in place before you rivet that front belly skin on.

### OIL FILTER, OIL COOLER

I used the corvair filter, and mounted it on the upper left corner of the firewall and hooked it in parallel with the Stewart-Warner oil cooler with #6 oil lines. I mounted the oil cooler to the front baffle, and to keep the oil temperature up around 200°F, I put an aluminum plate on the front that I can cover with duct tape. I also used an oil separator in line with the oil breather to keep some oil off of the belly.

### FLAPS

I used the set-up that Bob Dial first used, and others have used with a GM tail gate motor and a section of the up and down plate to pull the flaps, as pictured and written up in the newsletters. I used a Cessna flap switch and when I learned to instantly dump the flaps when all 3 wheels initially touch, it sure improved my landings. I outboarded the rudder pedals like Bob Dial's drawing, also; pulleys ahead of 601, aft of 598, and where the cable lines up to go through the aft slot; fairleads in other frames.

### TUNNEL

I used a round section of 4" aluminum tubing opened up with a vertical .063 side and 3/4 x 3/4 extrusion base support to cover the push pull tube. It really lowered the tunnel. I have a flat floor in front, and I could use a bench seat if I wished. but its better to step on the center push pull tube cover.

### TEMPERFOAM/SUNMATE

I agree with what was in the last newsletter, it is hard as concrete when you first sit on it in cold weather, but by the time you sit on it awhile, it is soft enough for long term sitting, and it really is comfortable. It is used for wheelchairs. For the backrest, Sunmate would be better - it is cheaper, lighter in weight, and not temperature sensitive. The reason it is not as good for the bottom is that it does not have the same impact resistance that temperfoam does. One inch of Sunmate will give as much comfort as 3 inches of polyfoam; its great for long legged people for the backrest; only 1" thick.

### FUEL TANKS

I recall the accident where the fuel filter cap popped off (thermos type) so I wanted a positive twist on type, so I got one from a fellow in town that welds race car tanks. I made the tank by the plans, but he said he wouldn't weld the tank with the rounded ends out, so we reversed them for greater strength, but it did cut down the volume a little. I followed Paul Kirik's advice again and put one shut off on the bottom of the tank, with a #6 line going to a fuel selector valve (like a Cherokee 140) where I can switch either main or wing or off. I pressure tested the tank to 2 1/2 pounds - that is a lot of pressure.



For the wing tanks, Paul Kirik brought up a good point - don't have the fuel vent line out at the wing tip, in the case of catching the wing Tip ~~when~~ you were correcting for a cross wind, in a wing low position, and you did hit the tip on the concrete and got a spark; ideally you might bring the vent line back inboard to the dihedral break, or even farther in. My vent is at the tip. I have both wings cross feeding and the gravity flow will give out 15 gallons per hour, after the main fuel flow starts the siphon. I have intentionally run out of fuel at altitude and there is all kinds of warning time. I never take off or land on the wing tanks, though it should be o.k. I used .032 ribs and skin on the wing tanks, and of course plenty of coast proseal 890. I wet the inboard 4 bays for a fuel capacity of 34 gallons in both wings (32 usable). The floats do not work worth a darn, they read full until I'm within 4 gallons of being empty. (of the outer wings)

### COLD AIR VENTS

I used Peter Hodgins's idea of mounting a SCAT TUBE on top of the cylinders on the right side and bring it back to a divider where I use 1-1/4 tubes coming to each side of the instrument panel. I found 2 eyeball vents at the fly market at OSHKOSH - see picture. They work great, along with cool air blowing in over your shoulders, and the leaks under the seat from the flap holes. A lot of air can sure go through a little hole in cold weather, but its very comfortable in the summer.

### SPEAKER, HEADPHONES

There is a speaker between both seats, just behind <sup>on</sup> the 669 deck. I went to a good AIRCRAFT speaker after I flipped the RADIO Master on when all the radios were on and blew out the automotive speaker. I have a Sigtronics voice activated intercom and the headsets plug into each side of 601 just below the instrument panel.

### INSTRUMENT PANEL

I lined up the radios along the bottom to clear the tank, except my one NAVCOM, where I had to cut a recess in the tank to give enough room.

The radios each have a circuit breaker with one on off Master switch to turn everything on and off at once. I also used rocker on/off circuit breaker switches for the pitot heat, panel lights, landing lites, fuel pump, etc.

I mounted the vacuum gauge as near the gyros as possible, with a little red light that warns of low pressure, and the fact that the alternate standby vacuum system is on (SVS-Bend Oregon, Now called Precise Flight 800-547-2558). There are 3 bus bars - one on 601 for most of the lights and instruments, and one for the radios, and one for the main rocker CB switches. There is another smaller one where the 60 amp line comes in from the alternator.

I do have my instrument panel on 2 lighting systems - the regular one with post lites, and then the eyeball lights on the sides in case of the other circuit failing.



I probably left a lot of questions unanswered, but you can see why it took me twelve years to finish it. It still isn't finished and I don't see how that I can get it done for OSHKOSH; I have to get the wheel pants and gear fairings on, and get the upholstery finished. I want to get that done before I paint it. Its too much fun to fly to take time out to finish.

Well Dick you may have got more than you asked for; I sure don't say that all this is the best way to do things. You sure can wind up with a lead sled, it weighs 1,169 pounds, but it still cruises 180 mph at 24 squared and climbs great at full gross, so to say I'm happy is an understatement. As you see, most all of these ideas came from the previous newsletters, thanks to all the contributors for all help.

11/22/89

HINDSIGHT, WHAT NOT TO DO (126 HOURS) - If I had it to do over, I would attach my instrument panel so that it would slide aft as well as tip for accessibility. I used FRANK SNEDECKER's mount (newsletter) to have a tipping shock mount, but I would make it mount the same on a standoff from the extrusion at WL42 with a slotted track to slide aft before it tips so I could work on it much easier; I've had occasion to get back in numerous times and to put it mildly; its a bitch! Also, I would use an electric tach so as not to have a solid tie up to the firewall - ideally wiring on Jones plugs to disconnect easily. Also an access panel in the firewall to get at the front of the gas tank where the ram air hose connects.

What precipitated all my headaches was a faulty automotive voltage regulator. I was on a cross country and as I tied down I noticed the battery drain tube dripping generously. My alternator had gone wild and was boiling the battery. Coming home, I shut the master off right after starting and all went well until I momentarily flipped the master on (an avionics man had said a few minutes probably wouldn't hurt anything for just a navigation fix). He didn't realize that my 60 amp alternator was putting out full voltage. Anyhow, I had instant fireworks, smoke, and popped circuit breakers. It fried everything I had on of an avionic nature. I came home in the dark with no lights and no radios. Fortunately, it was good VFR. I would also build in a readily accessible capped "T" fitting in the static system that is easily accessible to get the static system certified IFR and to have the encoder checked for the FAA.

I'm all back together now after having all the repairs, with an over voltage regulator and I'm going to put in an aircraft voltage regulator instead of the temporary heavy duty automotive regulator.

I've also finally got the wheel pants on and the gear leg fairings bent up. Finishing the upholstery and the paint job are all that's left until I want to play with the cowl flaps.

Best Regards,



Harlo McKinty



Dear Dick

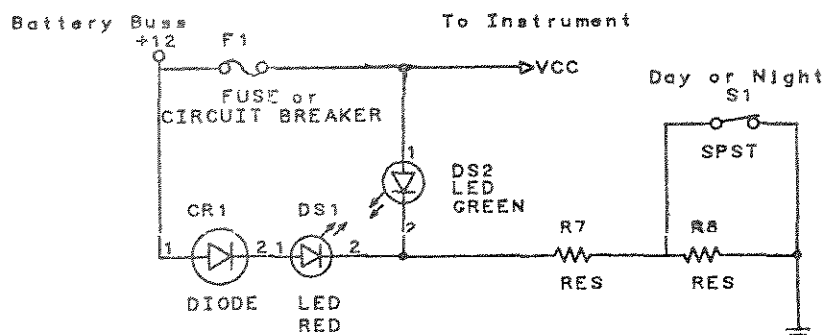
6/15/89

My project is coming along fairly rapidly. I bought Plans #166, last spring, from Dave Simpkins who had completed the wings, tail and fuselage. The Lyc. 0-290 G engine now has most of the accessories installed. I have used the tilt out instrument panel ideas from the past newsletters. Final assembly will have to be done at the airport, since it is being built in a single car garage.

I have several questions, which I have not found answers to in the old newsletters. Can some of you provide answers thru the newsletter?

1. John Thorp suggests using the oil gallery plug (front right of the engine on the 0-290 G) as a source of oil for the filter and cooler. He also recommended restricting the oil flow by using a plug, in the hose, with a .070" dia. hole in it. This works like a thermostat, as the oil changes viscosity. Do any of you have experience using this set up on your T-18?
2. How well does a 68 by 68 wooden prop work with the 0-290 G engine?
3. Do any of you have experience using gell cell batteries? Is there a difference between automotive and aircraft gel cells? Gill Batteries recommends using a higher voltage and trickle charging a low battery to prevent heating damage.
4. Does anyone have a simple in-expensive way of lighting the instrument panel and cockpit at night? A rotary switch and high current diodes can be used to replace the dimmer potentiometer. Do not exceed the current or power dissipation limits of the diodes.

I am installing a visual monitoring system to indicate if the circuit breakers are functioning properly. The electrical schematic is shown below. The green LED is normally on, the red comes on if the circuit breaker or fuse opens. The reverse breakdown voltage of DS 1 should be over 20 volts, to prevent damage when the breaker is open. R 7 should be about 1 K ohm, 1/4 Watt, to operate most LED's. I am using a dual red/green LED (one package). S 1 varies the intensity for day or night operation. R 8 should be about 1 K to 5 K ohms and 1/4 Watt. R 8, could be replaced with a potentiometer and used with up to about 8 LED's (5K and 3 watts). The diode switch (#4 above) will work as well. S 1 can be deleted if you use the potentiometer or diode switch.



In the future I will be designing some simple circuits to monitor various functions like master ON and no oil pressure or a stall warning or other?

Thank you all for your contributions to the newsletter, it really does help those of us who are new builders.

Brad Chapman, 2855 SW 219th Ave, Hillsboro OR, 97123 Ph. 503-591-0377

THANK YOU, BRAD, FOR YOUR LETTER & TIP!

PLEASE DROP BRAD A CARD IF YOU CAN ANSWER ANY OF HIS QUESTIONS.





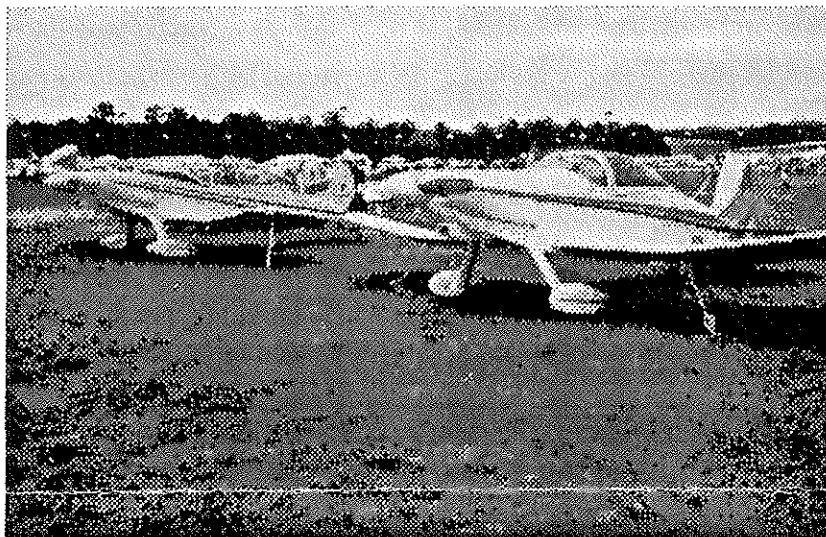
## KENTUCKY LAKE -- FALL 1989





# T-18 NEWSLETTER

ISSUE NUMBER 75

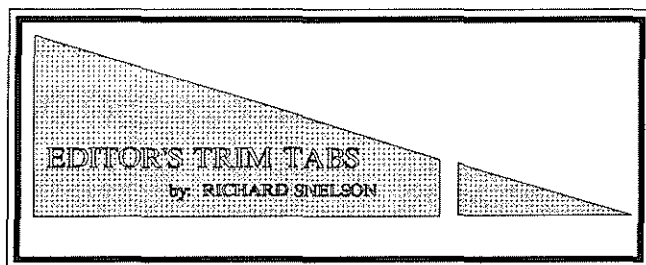


*SUN N-FUN 1990 left to right Jim Paine's T-18, Dave Eby's T-18*

## *In This Issue:*

Editors Trim Tabs  
Flight Safety and Operations  
Sun-n-Fun  
Kentucky Lake Spring 1990  
Builders Corner

**NOTICE: (STANDARD DISCLAIMER)** *As always, in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.*



Getting started on this newsletter has been particularly hard, with a fuselage just sitting there ready to be riveted makes one look very hard at his priorities and somehow come to the right conclusion that the newsletter must go out. Several of the members commented in their letters that we should have a least 4 to 5 letter a year to make it worth while. I agree one-hundred percent to keep the interest we need that many letters, the real determining factor in getting 4 to 5 letter out is contributions of article, technical articles, which have been and should continue to be the backbone of this communications media.

Think of it this way, building a T-18 is a very intense project, working day after day can easily result in burn-out. Witness the many projects that are and have been for sale. Pull back once in a while and pickup a pen, put down some tip or idea for the group, you don't have to polish it I'll do that. If you haven't had time to do that maybe you should adjust your priorities!

In the Flight Safety section we have a good article from Paul Kirik on "Constant Speed Propellers" with an Airworthiness Directive on the subject, and another on "Wooden Propellers" that could save losing a prop.

I was glad to have the news that Dave Eby took second in class at the Sun-60 Air Race topping out at 181.15 over a RV-4 turning 177.27 mph. Thanks Dave for the pictures of the plane at Sun-n-Fun (see our cover).

Kentucky Lake came up short this year due

to a large weather system over the south central area, however eight T-18s made it and lots of other folks drove or flew in for the event. It was a great weekend anyway, my wife got her first ride in a T-18 and lived to smile about it Wow!. Our should I say Rick Jones lived to smile, she told him he would be dead meat if he rolled that thing with her in it, he learns quick!, much faster that I do!.

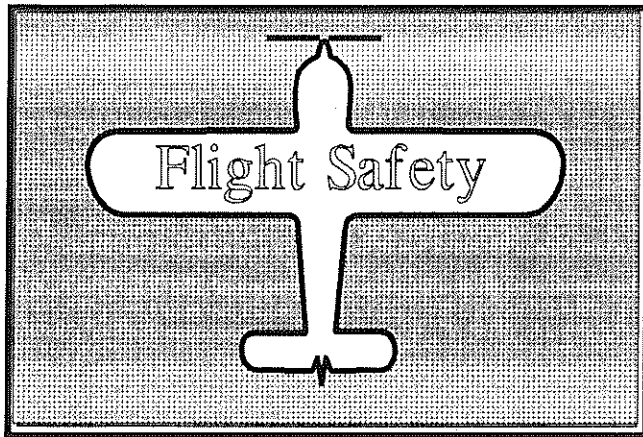
*(After writing this article, I promptly adjusted my priorities and went to the basement and riveted my fuselage. It's now on the gear folks!)*

**Oshkosh Event for T-18s  
T-18 Forum  
Monday, July 30, 1990  
10:00 - 11:14  
in Tent #5**

**T-18 Banquet, to Thank  
Dick Cavin for all he's done!  
Tuesday, July 31, 1990  
6:30 at Butch's Anchor Inn**



*Where in the heck is the riveter? This fellow is Bob Adam a good friend of mine from Boston.*



### CONSTANT SPEED PROPELLERS

The attached (back pages of this letter) Airworthiness Directive is an important one that may not get into the hands of the T-18 builder pilot. If you have a constant speed prop on your aircraft, it is very important to inspect for the presence of the proper clamps as called out in the A.D. If these clamps are missing or broken, the line must be changed. All failures to date were a result of clamp problems.

### WOODEN PROPELLERS

After a local incident, seeing a Mustang II limp into OSH, and several other reports of problems with wooden props, a review of precautions are in order.

The bushings in the prop extensions for the T-18 are inserts that are not retained in the extension. It is imperative when installing a new prop to measure the depth of the counterbore of the prop to accept the bushing. If the depth of the counterbore is more than the length of the bushing, the bushing will move forward into the prop and will cause the mounting bolts to fail. They are not designed to carry the flight loads of the prop. The wooden spacer should be inserted into the counterbore to fill this gap. This happened to one of our local T-18's. When he felt a strong vibration in flight, he made an emergency landing at a small airport. He found four of the six bolts broken and the

two good bolts were adjacent to each other. All of the prop bushings had moved into the prop and were completely out of the extension. Lucky guy!! His fix was to install flanged bushings in the extension. This incident occurred less than 10 hours after the bolts had been checked for torque. Even if your prop has been in service for a while, this is something that should be checked. It is also very important to check the torque of the prop bolts 5 hours after installation and every 25 hours maximum thereafter. Also recheck torque at seasonal changes if flying is less than 25 hours.

Paul Kirik  
4127 36th Ave  
Moline, IL 61265

### *Editors Note:*

*We have more information on gear cracking and also held a Mini Seminar at Ky Lake. Jim Paine is putting together an article on the subject and has come up with a fix that involves installing two bolts through the gear leg and corner web, where the cracking occurs. He stresses that a builder uses this fix at their own risk!*

*By the way ... forgot to include my name and address on the last newsletter:*

Richard Snelson  
RR 3, Box 295  
Clinton, IL 61727

Phone (217) 935-4215

AVCO CORPORATION, LYCOMING DIVISION  
AIRWORTHINESS DIRECTIVE  
ENGINE  
SMALL AIRCRAFT

2 90-04-06

90-04-06 **TEXTRON LYCOMING:** Amendment 39-6427.

Applicability: All Textron Lycoming four cylinder piston engines equipped with a rear mounted propeller governor and external oil line.

Compliance: Required as indicated, unless already accomplished.

To prevent oil line fracture and loss of engine oil, accomplish the following:

(a) Within the next 25 hours in service or whenever the propeller governor oil line is removed, whichever occurs first, accomplish the following:

(1) Inspect the propeller governor external oil line for abrasions, cracks, and oil leaks along the length of the line and at the end attachment fittings. Inspect to determine that the two cushion type support clips (clamps) are properly installed as shown in Figure 1 of the Appendix to this AD, and assure that sufficient clearances exist between the oil line and adjacent components.

(2) If any leaks, damage, or interference condition exists or if support clips are not properly installed, replace the governor oil line and its attachment end fittings with new parts even though the parts show no visible damage. Refer to Figure 1 in the Appendix to this AD, for parts identification, line routing, and location of support clips.

(b) At the next engine overhaul or anytime the governor oil line is removed for any reason, whichever occurs first, remove any governor oil line assembly having aluminum attachment nuts and fittings (elbow/nipples) and reinstall an oil line assembly with corresponding steel end fittings.

NOTES: (1) Special attention should be given to insure both clips and/or supports are reassembled to the original configuration.

(2) The attachment nuts are components of the governor oil line tube assembly which have been changed by Textron Lycoming from aluminum to steel without changing the oil line part number. Aluminum nuts may be identified by their blue colored anodized surface. The attachment nuts as well as the elbow/nipple end fittings may also be identified by using a magnet to differentiate aluminum from steel.

(3) Textron Lycoming Service Bulletin No. 488, dated September 9, 1989, Textron Lycoming Service Instruction Letter No. 1435, Part III, dated April 25, 1986, and Lycoming Parts Catalog Manual for the particular engine model, contain related information on correct oil line installation and end fitting attachments.

(c) Aircraft may be ferried in accordance with the provisions of FAR 21.197 and 21.199 to a base where the AD can be accomplished.

(d) Upon submission of substantiating data by an owner or operator through an FAA Airworthiness Inspector, an alternate method of compliance with the requirements of this AD or adjustments to the compliance times specified in this AD, may be approved by the Manager, New York Aircraft Certification Office, Engine and Propeller Directorate, Aircraft Certification Service, Federal Aviation Administration, 181 South Franklin Avenue, Room 202, Valley Stream, New York 11581.

This amendment (39-6427, AD 90-04-06) becomes effective on February 15, 1990.

FOR FURTHER INFORMATION CONTACT:

Mr. Pat Perrotta, or Mr. Nick Minniti, Propulsion Branch, ANE-174, New York Aircraft Certification Office, Engine and Propeller Directorate, Aircraft Certification Service, Federal Aviation Administration, 181 South Franklin Avenue, Room 202, Valley Stream, New York 11581; telephone (516) 791-7421.

APPENDIX  
90-04-06

In all cases one or both of the Textron Lycoming supplied governor line clamps and/or supports installed at the plant and conforming to Textron Lycoming standards were missing. After careful inspection, it was determined that the clamps and/or supports had not been re-installed per Textron Lycoming specifications during field work on the engine. Proper governor line support is mandatory to avoid engine failure.

A visual inspection should be made to ascertain that both the Textron Lycoming specified clamps and/or supports are installed properly and are intact.

If the visual inspection reveals that clamps and/or supports are missing, the governor oil line should be thoroughly inspected to insure that no cracks exist. This includes that area under the ferrules at the flared ends of the lines.

As a product improvement, the propeller governor oil line now comes equipped with steel connecting nuts, P/N AN818-6. These nuts are a component of the tube assembly and have been changed from aluminum to steel without changing the tube assembly part number. Also, the aluminum elbow at the front of the crankcase has been replaced by a steel elbow, P/N MS20822-6; see Figure 1. There are two ways to identify which nuts and/or fitting you have; (1) aluminum nuts and fittings are anodized making them blue in color or (2) the use of a magnet to determine aluminum from steel. If aluminum components are found they should be replaced at overhaul or earlier at owners discretion.

In reference to Figure 1, the views and identification of parts are only typical. They may not necessarily portray your particular installation. Refer to Parts Catalog for proper clamps. Nevertheless, special attention should be given during dismantling of the governor oil line on your engine to insure both clamps and/or supports are reassembled to the original specified configuration.

APPENDIX  
FIGURE 1  
90-04-06

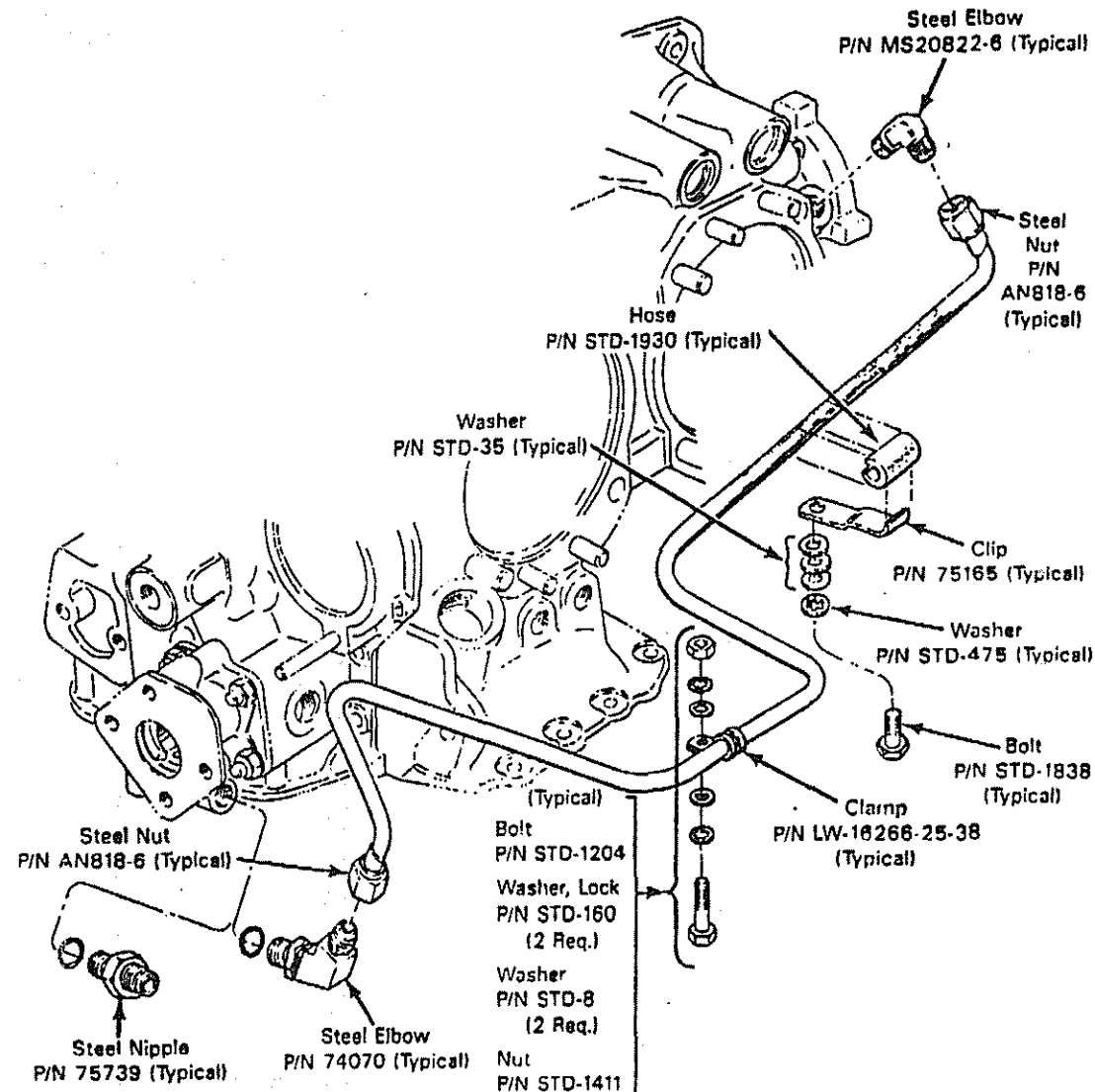
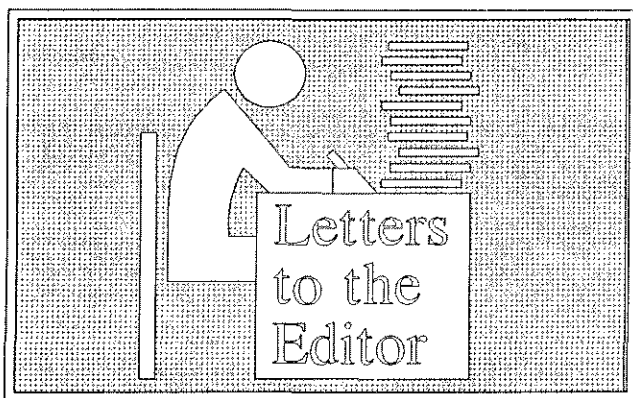


Figure 1. Propeller Governor Line Support





Dear R; I really need the T-18 Newsletter to keep well & happy! Please note enclosed check for a one-year subscription.  
Yours truly, John Frew (written & signed by wife, Terry on John's behalf) John Frew  
3305 Stoneridge Dr, Birmingham, Al. 35223

*Thanks Terry everyone got a laugh out of this one at Ky Lake.*

Dear R; \*\*\* If I can be of help please let me know. I am very involved with a Canadian organization called Recreational Aircraft Association of Canada (RAAC) it represents homebuilders in Canada, if you wish I can print your name, address and the information on the T-18 Newsletter in our magazine. Look forward to seeing you at Oshkosh, say hello to Paul Kirik and Ken Rhoads if you are talking to them. Happy Flying; Jim M.  
Alexandre 31 De Santis Court, Hamilton, Ontario, Canada, L8W 3A9

*Please spread the word Jim. Thanks!*

Dear R; I am interested in buying a good T-18 with the "wide body" and a good mid-time engine. I prefer 150hp, constant speed propeller, 40-50 gal fuel capacity. It will be much appreciated if you bring this to the attention of your newsletter readers. Thanks C Wayne Martin, 1601 Ridgeway Rd Lincoln, Ne 68506 402-488-6821

*Good luck Wayne!!*

Dear Richard; I want to congratulate you on the appearance of your first newsletter; it was a big improvement! I would like to suggest that in future issues maybe some of the articles and buddy buddy references include some of the T-18 builders and owners on the west coast. Perhaps the reason Dick didn't do more of this was because the western owners did not furnish him with material. I would also like to see some articles from T-18 pilots regarding things they have done to clean up the drag and low speed landing performance. (I do not feel comfortable with less than 85 MPH on final until I am ready to flare)

Another thing I would hope we might have is a T-18 fly-in somewhere in northern California--away from the congested airways of the general Los Angeles area, which is a bummer for many homebuilts who flub around in high density controlled airspace. Maybe someplace like the Nut Tree Airport at Vacavill, Calif-- (just for the day) We have five T-18's here but they don't all fly regularly. My Thorp was purchase five years ago from the widow of a deceased friend and it has been a very good airplane with virtually no problems. I have done some things to it to suit myself otherwise it is exactly as he finished it in 1974. It of course has always been hangared and well maintained. It has a Lyc. 0-290G engine with an 0-320 pan and cross-over exhaust system. With a Sensenich 68x68 prop. on a cool day I indicate 160 MPH at 2450 RPM. Of course I would like to have a Lyc. 0-320 but I am not willing to spend the money for the difference. If I was building a T-18 from scratch certainly I would go for the 0-320. I have been using Auto gas regular grade Mobile which in my area have been by BP. I've been using Auto gas for more that three years and every now and then I dose it up a little withsome of that old remedy--Marvel Mystery Oil! (it's good for a cough or what ails you) \*\*\*  
John Thorp lives about 50 miles from here

John Thorp lives about 50 miles from here but I have only met him once and that was when he was in a convalescent hospital last year. I understand he is home now and doing much better. I hope to visit him again soon. Harry Arnold, 4411 Crestwood Way, Sacramento, Ca 95822  
916-441-0811 Aircraft N39JP

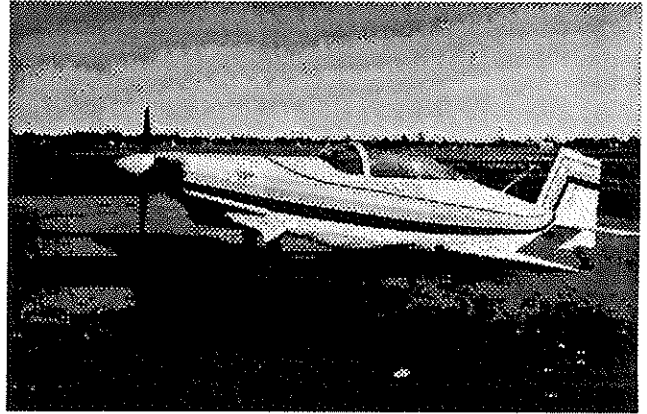
*Thanks for the letter, picture, and information Harry, if you would like a list of all west coast members let me know. Rich Great paint job on N39JP.*

Dear R; Welcome aboard, I'm glad someone has the courage to step up to this job. Dick has done a magnificent service to all of us over the years and we will surely miss his input. Good luck on your editorial attempts, I know its got to be one of the hardest things for me to do! Lyle Trusty  
1665 West Newgrove St. Lancaster, CA.  
93534 805-949-1131

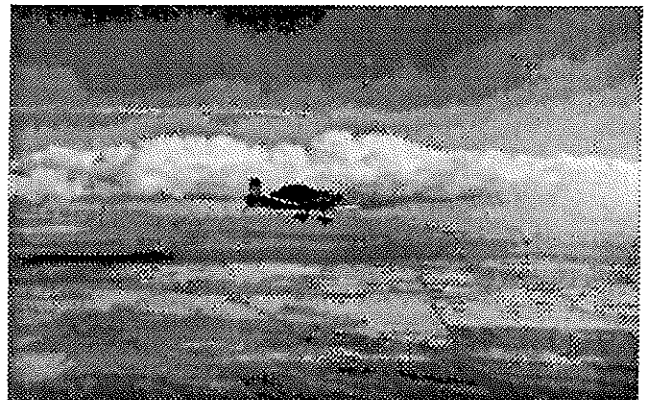
*Thanks Lyle! good looking bird.*

Richard: I understand that you are about to take over the newsletter. Enclosed is money for my continued reception of it. I have found it useful interesting and enjoyable ever since I purchased plan S/N 380 Dec. 1965. I first flew it August 8, 1972. I am sending a picture of the plane. If you are able to look closely you might see that it is not a show plane. As I told Sunderland when I flew it to OSHKOSH in 1973..."I built it to fly, not to show". Heck, I have never bothered to complete the interior upholstery, although I have done the instrument panel three times and the engine mount twice...the last time to assist in installing the automobile turbo charger. I'm only now making motions towards doing the cockpit side panels. Pedro D. Gonzalez 1318 Server Drive Colorado Springs, CO 80910

*Thanks for the letter, picture of N380G, and Performance Data Survey! I'll put the data in a later newsletter.*



Harry Arnold's N39JP



Lyle Trusty's N851LT



P.D. Gonzalez's N380G

Dear Mr Snelson: Enclosed is the information we discussed over the phone. I hope to have the catalogue back from the printers shortly, and I will mail you one. Allow me to give you a brief description of Lewis Aviation for your newsletter readers. We have been in business 1981 building RV type aircraft. We are currently involved with the Nigerian AirForce building and supplying parts for the RV-6A as a basic trainer. We also built the only flying RV-4 RG, which will be featured in the June issue of Kit Planes. We now are also building the Questair Venture kit. The total number of aircraft that we have built stands at 17 RV-4s, 1 RV-6A with involvement in 110 more, and 1 RV-4RG. Please feel free to print whatever you would like in your newsletter regarding our services. David G Lewis 3565 A NE Cornell Rd Hillsboro, OR 97124 503-640-0505

*Thanks David for joining our mutual aid society. Fellows he has some items we can use: Oil coolers, props, strobes, boots for sticks, "Control Stick grips with push to talk switch and 4 way trim switch"!!! more, more----*

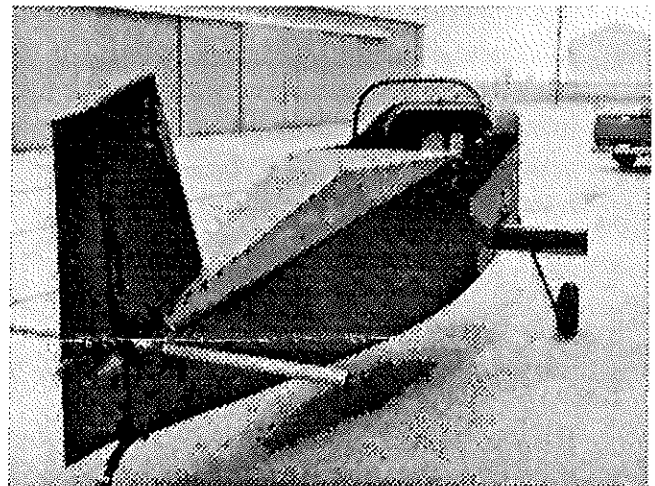
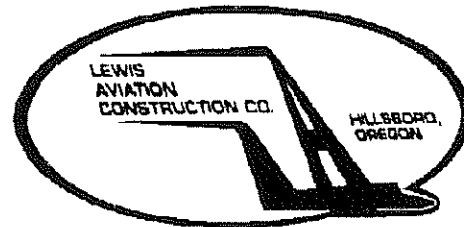
Dear Sirs, Thanks you for sending the newsletter. Enclosed please find our check to help with costs. Lew is hoping to fly this summer, been working at it since 1974. Looking good. Truly hope to hear Dick is improved. Thank you Maxine Avramovich for Lewis 1962- 13th St Cuyahoga Falls, Ohio 44223 Plan #100

*Dick Cavin is doing well and staying busy, he's designing a plane! How about an article Dick? Tables are turned aren't they Dick?*

Dear Dick, Have about 7 years work toward completion of S-18. Hope you make a go of the newsletter effort. I live west and south of Des Moines about 30 miles by road. Thanks

Paul Shifflett Rt 2 Bx 44, Earlham, Iowa 50072

*Thanks Paul, This guy makes it to just about every T-18 event there is, keep up the good work Paul and fly that baby!!*



*Ken Morgan's T-18 Project Dec 1989*

Dear Rich, It was good to visit with you by phone, sounds like your project is coming on in good order. I moved mine back home last weekend to get rid of a 25 mile drive to arpt. should improve my efficiency by a big percent. As I mentioned to you, will send article on dual brake instl & outside rudder cables. Will try to get it to you in couple of weeks. Am forwarding picture as of Dec 89. Now have instr. Panel plumbed & fuel rudder/brake systems complete working on windshield/canopy and seat attachments. Ken Morgan 922 Simpson, Bedford, TX 76021.

*Thanks for the pictures and letter Ken!*

## SUN-N-FUN 1990

EAA Sun-n-Fun Fly-In  
Lakeland, Fl.

I didn't make it to Sun-n-Fun, but several good folks sent me some information on the air race. Here a little bit from that newsletter.

### RAIN-LOW CEILING-CLOUDS-MORE RAIN-

That's what Mother Nature did to us on race day this year. She did let up just in time for the start, with some blue skies showing through. Out of all race pilots only 3 wanted to cancel and go next day. Sooo off we went. We had 42 entries with 2 more to show up race day, but with the bad weather only 32 planes started the race.

The big race this year was in open class 1A, that's under 100 hp., with seven aircraft on the line at start time. Pat Cargile in his 85 hp. Wittman Tailwind took first at 161.40 mph., Man that is really smoking for a 30 year old design.

\*\*\*\*\*

The open class 150 to 160 hp. had 3 entries with Frank Smith taking 1st. in a RV-3 at 212.87 mph. followed by DAVE EBY in a nice T-18 for 188.15 mph. Claudia Tonnini in his RV-4 was 3rd. at 177.27 mph.

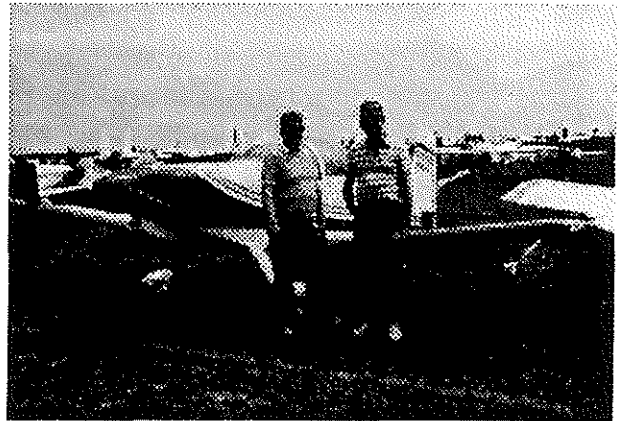
### NEXT YEAR

1991 SHOULD BE A GREAT YEAR FOR THE SUN-60 RACE.

with 42 paid entries this year we were able to buy better trophies that usual. \*\*\* Next year we hope the weather is better.

Looking forward to seeing you all next year-

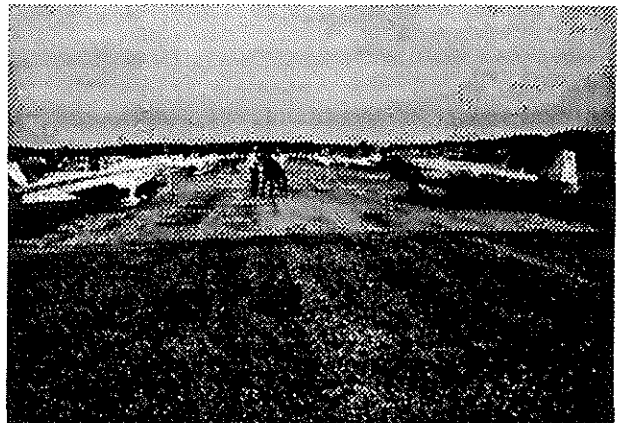
Charlie and Marshall Gray  
P.O. Box 251  
Loughman, Fl. 33858  
813-424-6060



*Tom Ostendorf and Ron Reiter (left),  
Tom's S-18 54266 first flew on July 1, 89*

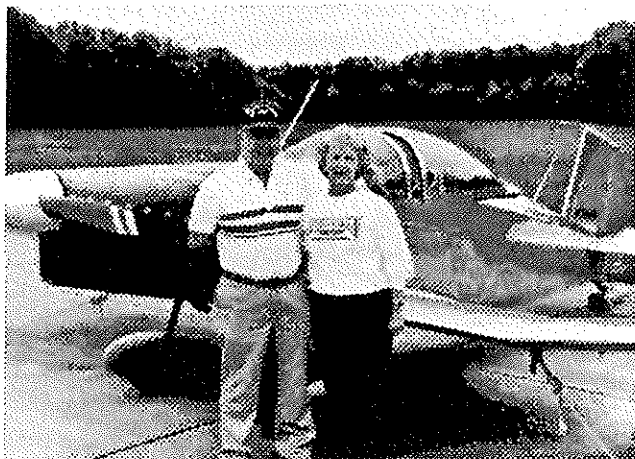


*Jim French working in the Electro Prop  
Booth at Sun-n-Fun.*



*Flash! Flash! Dave Eby's T-18 places  
second over an RV-4, at a speed of 188.15  
mph in the Sun-60 Air Race.. Congrats.  
Dave.*

## Kentucky Lake Spring 1990



Ken and Mary Rhoads of Peoria, Il



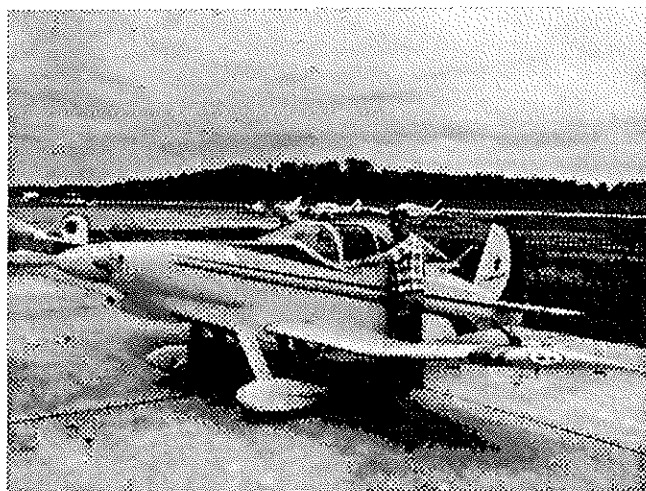
Rich Jones and Jim Paine on a low pass!



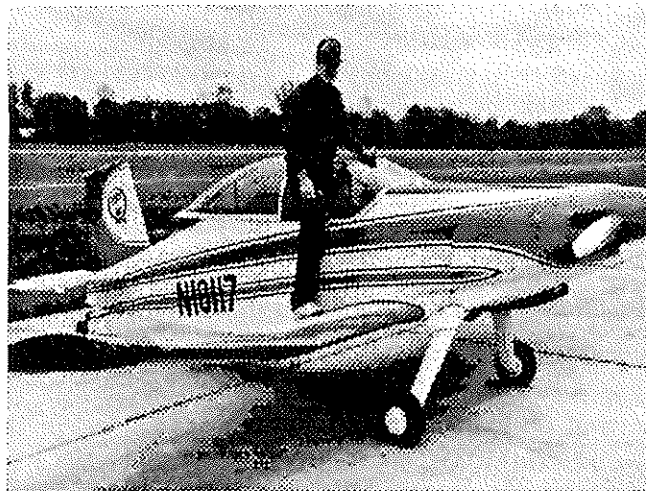
Ed Ludtke of Sioux Falls, SD.



RoxAnne my wife after her first ride in a T-18, look shes smiling!



James Paine of Dayton, Ohio

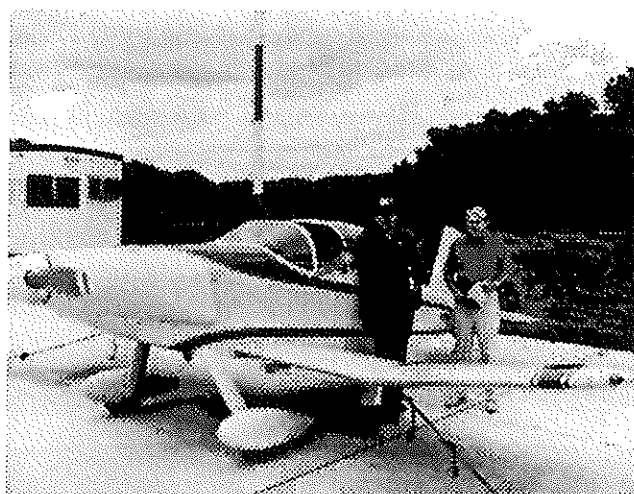


Rick Jones of S. Charleston Ohio! more about this fellow in later newsletters.





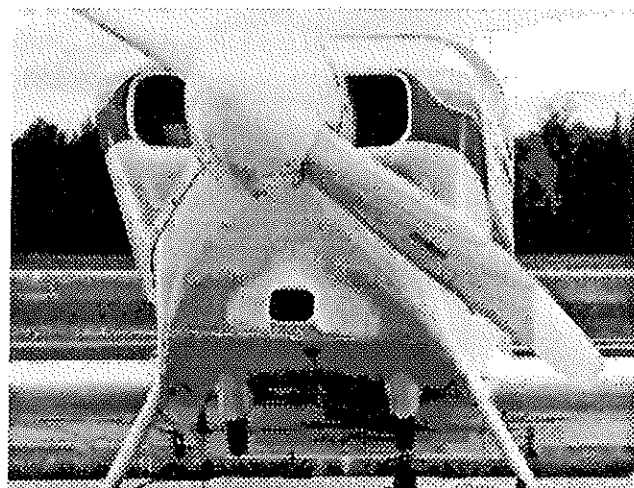
Clif Redden with N18CR of Georgetown , Ohio



Bill Williams and Lee Skillman



Seminar on gear-cracking, by Jim Paine



Ed Ludtke's carb airbox is the tightest installation I've seen on a T-18

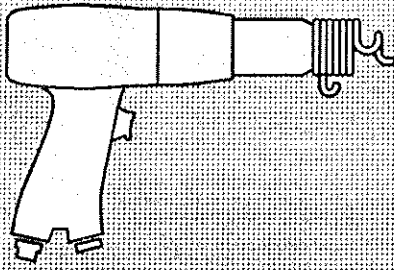


Some of the folks at Sat evening dinner. on the right, Sue and Jim French, and then LouAnn Jones, that fellow across the table is her hubby Rick.



Tom Foster of ElectroProp using an angle level that I am now marketing to homebuilders.

## Builders Corner



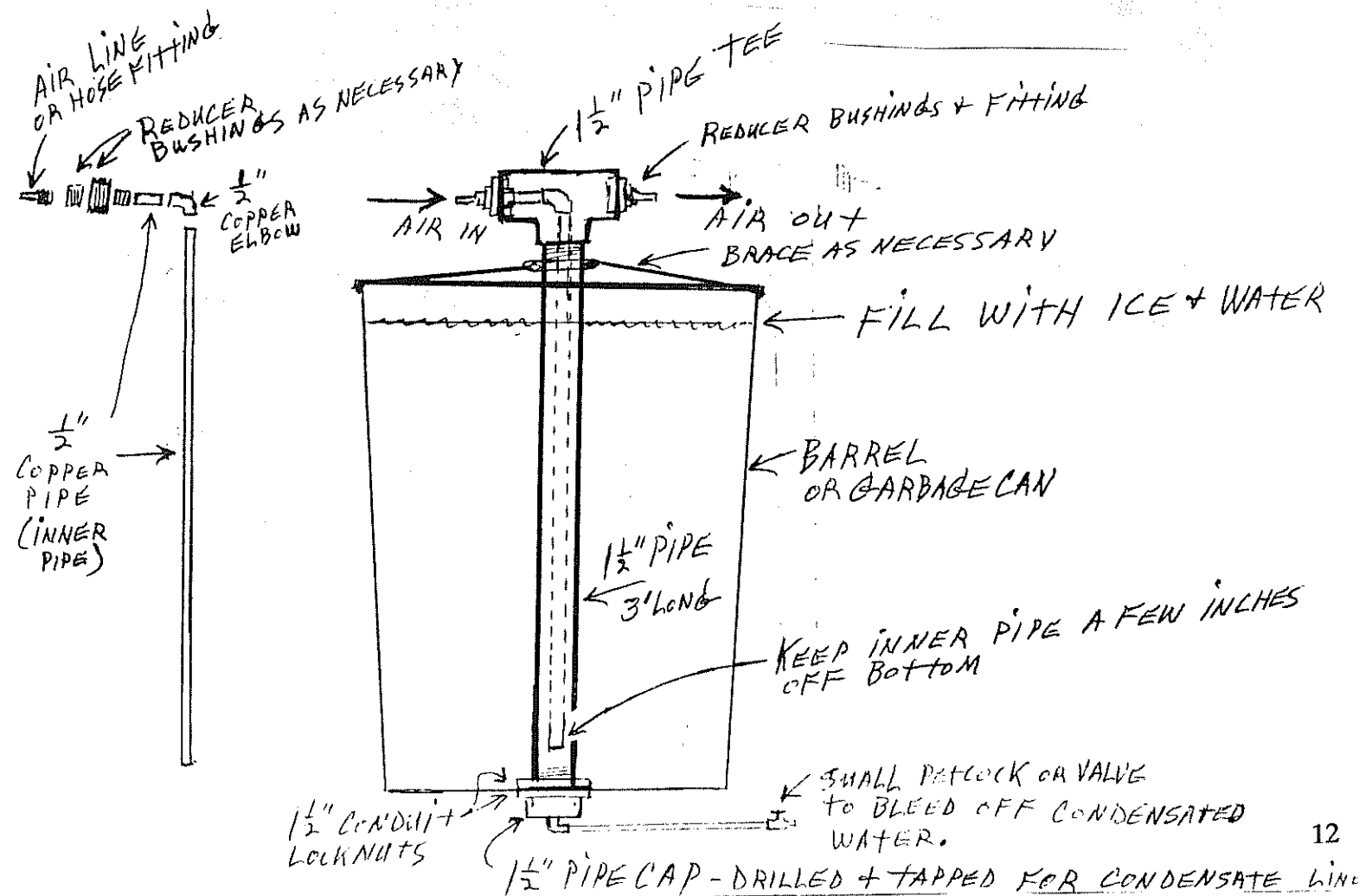
### In this Corner :

Air/Water Separator by Cliff Reddon  
English Roller & Performance Chart  
by Bob Dial  
Ken Coleman's T-18 by Don Ruffner  
Electrical System by Frank Snedeker

DEar Richard,

Enclosed is a sketch of the homemade water separator that I used when I painted my airplane. It is made out of 1 1/2 inch pipe and fittings with 1/2 inch copper pipe and fittings for the inner pipe. The bottom end of the 3 foot piece of 1 1/2 pipe needs to be threaded extra long so conduit locknuts can be used to mount the assembly in the bottom of the garbage can, and have enough threads left for the pipe cap. (seal with RTV at locknuts.)

I sat the garbage cans on blocks so the condensate drain line would clear. Fill the can with ice cubes and cold water, then crack the petcock on the condensate drain line and watch the water sputter out as you are spray painting. This seemed to remove the moisture out of the compressed air adequately for me. Cliff Reddon 8774 Airport Rd. Georgetown, Oh



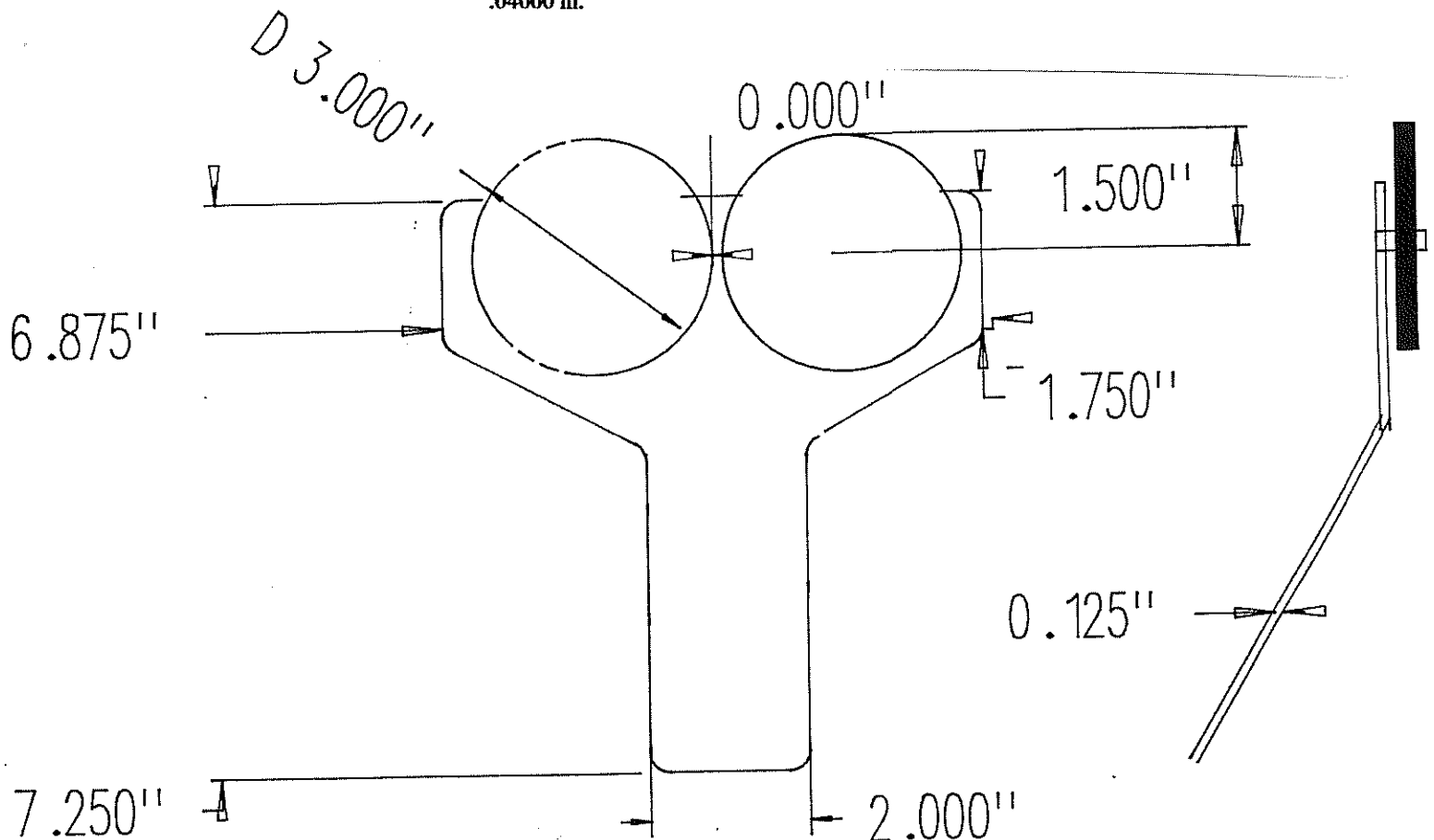
## English Roller & T-18 Performance Chart

*by Bob Dial*

The drawing of the English Roller is useful for rolling the edge of the skin where it goes over the windshield. It is also useful for other roll jobs on the airplane. The dimensions are certainly not critical and it may be too large as shown. It will give a nice, airtight fit to the skin at the windshield and this seems to be something of a problem for some builders. In use you should make several passes, bending the skin upward a little at a time. The skin should, of course, be on the outside of the windshield.

The performance chart is a “howgozit” chart prepared from very accurate data from two different typical T-18s. One airplane is a B.C. Roemers 180 hp fixed pitch prop T-18. It is a clean airplane, somewhat heavy, that won the Lowers-Baker-Falk trophy for the fastest single lap speed at Oshkosh about 5 years ago. The other airplane is Howard Henderson’s lightweight, 125 hp fixed pitch, no wheel pants, T-18. Howard is a retired performance engineer from McDonnell aircraft and he gathered the data from this chart. I find it very accurate and it will tell any builder how his airpoane compares with two tested airplanes and how his airplane should perform if it is typical.

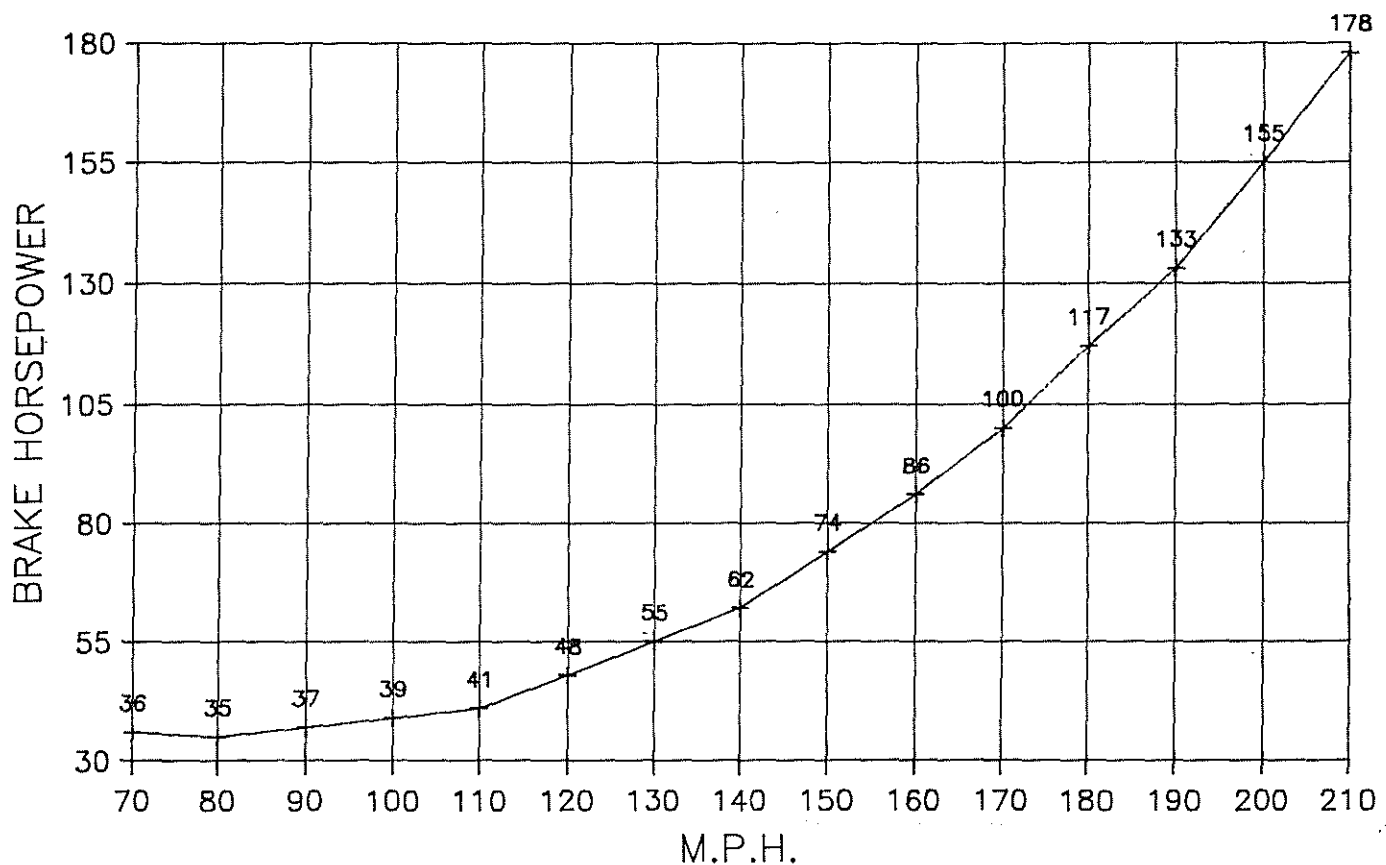
**Note: Dimensions between rollers to be determined by thickness of sheetmetal to be rolled +.01000 in. max thickness tool will roll is .04000 in.**





# T-18 POWER REQUIREMENT FOR CLEAN AIRPLANE

ASSUMING  $CD=.026+.086 CL SQ.$  PROP. EFF.=.85%



## Ken Coleman's T-18 by Don Ruffner

This is what I was able to put together about Ken Coleman's Thorp. I hope that is acceptable and that the content is of value. This article is a result of Dick Cavin trying to motivate some of us new builders to send him material. I do not feel that I am knowledgeable enough to write about my project, so here is my contribution...

As a result of attending an EAA chapter social function, I have come in contact with a pair of super T-18/EAA people. Last August I met Ken and Gladys Coleman at the Chapter 45 (Pittsburgh) picnic held at Rostraver Airport. They have a great Thorp in a hanger there and I have been able to dig some information out of them about their bird. So, the following is a report on N955K.

First of all, Ken was in the U.S. AIR CORPS in WWII and flew C-47's in the CBI theater. He was in the Army National Guard afterwards and he has about 3000 hours flying time. Ken joined EAA and first saw the plans which Ed Burke of Chapter 45 had. Ken was

smitten and he purchased the plans for his Thorp in late 1964. Actual construction started early in 1965 and he finished the airplane in 1970.

Ken installed an O-320 Lycoming with a constant speed prop from an early Mooney. The landing gear is short gear, with extensions, and Cleveland brakes. He originally had installed Rosenhan brakes, but they would not hold during runup. The panel is full IFR with Transponder and Loran. The empty weight is about 943 pounds. Ken stated that he did not need to add any weight in the tail. I might add that this is one of the very early Thorps, and that it has the high back fuselage (behind the seat,) and does not have flaps.

Ken took the airplane to Finleyville Airport which, at that time, had a 2600 ft. grass and gravel strip. He did high speed taxi tests and when he was ready, he flew it with no problems. Ken did relate that his military experience was a help as he had flown many types of a/c and he automatically planned for emergencies. The Thorp has about 800 hours on it and the only problem he has is cracking of the top center piece of the cowling. Ken replaced this piece with 0.040 thick material and there has not been any cracking since.

As with all Thorp people, Ken speaks very highly of his airplane. He said that the Thorp gets off in about 700 feet and climbs out, on a cold day, at about 3000 FPM. The airplane stalls at about 67 MPH straight ahead with good aileron control. He did state that whenever a stall occurs at extremely high nose altitude, the airplane will develop a secondary stall. Ken said that he doesn't really need flaps as the constant speed prop helps slow the airplane down and helps in descending. He lands in a three point attitude with no problems. Air speed checks were accomplished by matching speeds with a Bonanza and he found that the air speed indicator was reading about 145 to 150 MPH indicated while holding 2300 RPM and 21 or 22 inches Hg. manifold pressure and he believes that this is about 65% power.

Gladys, Ken's wife, learned to fly in a Cessna 150 and then he checked her out in the Thorp. She says she has no problems flying the Thorp and thoroughly enjoys the way it handles.

Ken and Gladys have flown to various parts of the country including Daytona Beach, the Outer Banks, and other places. Ken and Gladys are retired from their jobs but not from flying and are still enjoying their Thorp.

Ken also found that the use of FAA approved Microline worked wonders for performance. One quart of Microline is added to the engine and four ounces to fuel. This is a one time application, and it markedly reduced engine vibration as well as helping to improve fuel consumption. He believes that the fuel consumption has dropped to the 7 to 7 1/2 gallon per hour range.

Ken and Gladys have a very nice T-18 and they are fine people who are ready, willing, and have a strong desire to help Thorp builders like myself. I am happy that I have come to know them and look forward to further discussions and visits with them. Don Ruffner, 106 Spring Hollow Rd. Apollo, Pa.

## Electrical System *by Frank (Speed) Snedeker*

My T-18C has a folding wing and also a fold down instrument panel which I developed. These are two important mods that I recommend but any mod makes building more difficult and time consuming. My T-18 is so near going to Arlington for the Testing program that I can taste it. Having the folding wing I can work on the final details at home and then trailer it to the testing area. Having the fold down panel has saved a great deal of energy in tracking down wiring problems. It is never easy to get behind the panel.

Enclosed is a schematic of my electrical system developed as I proceeded. It does not show all wire sizes. Some are indicated on the drawing like a starter cable (#2). Bullet connectors are used in the wing tip connections, the wing fold area, back of the panel, and in the engine compartment. Three plastic tubes, attached to drilled out AN firewall fittings carry wire sets over the main fuel tank to the panel. Tube 1 carries CHT and Tube 2 carries EGT wires. Other engine wires use the same routing. The tubes allow easy running or removing of wires.

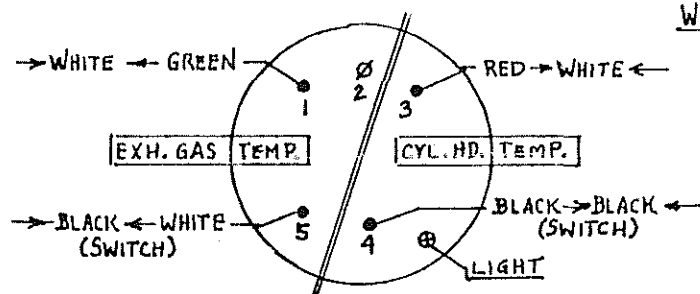
The second drawing enclosed may be helpful for installing EGT/CHT in a single dual instrument. I used a four way switch for each but Westach has a single switch that will do the same. Care must be taken to wire it correctly. Both drawings are for my installation and should be used only as a guide to others to dwell on as they apply ideas to their systems.

One other thing...Cecil Hendricks is a T-18er with years of experience and a technical councilor with Chapter 26. He has been both an inspiration and an instructor to me. I doubt that my project would ever come to fruition without him. Everyone needs someone to 'bounce ideas off of'. I hope that I can be as helpful to other builders.

Frank (Speed) Snedeker 5528 231 Ave. SE Issaquah, WA 98027

### WESTACH DUAL CHT & EGT INSTALLATION

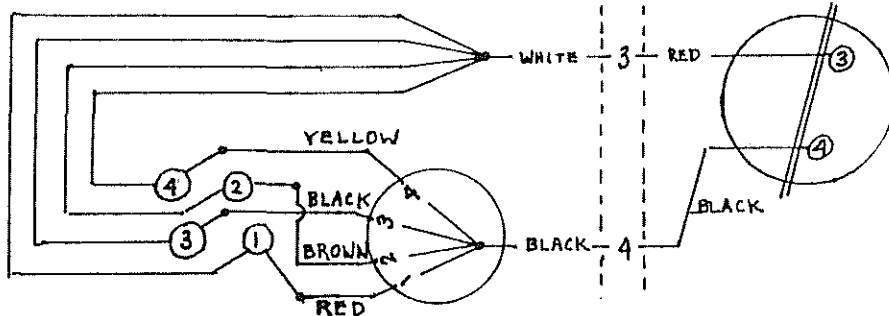
WESTBERG MFG (707) 938-2121



#### SENDERS & SELECTORS

#### CHT PINS

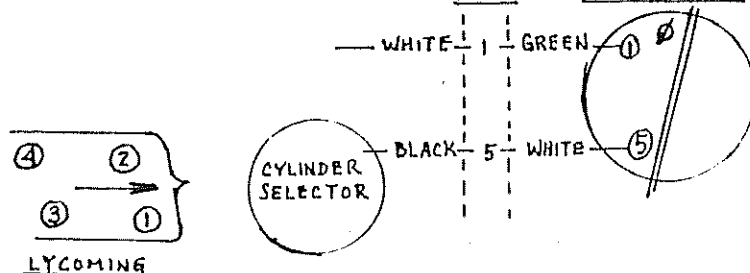
#### INSTRUMENT CONNECTIONS



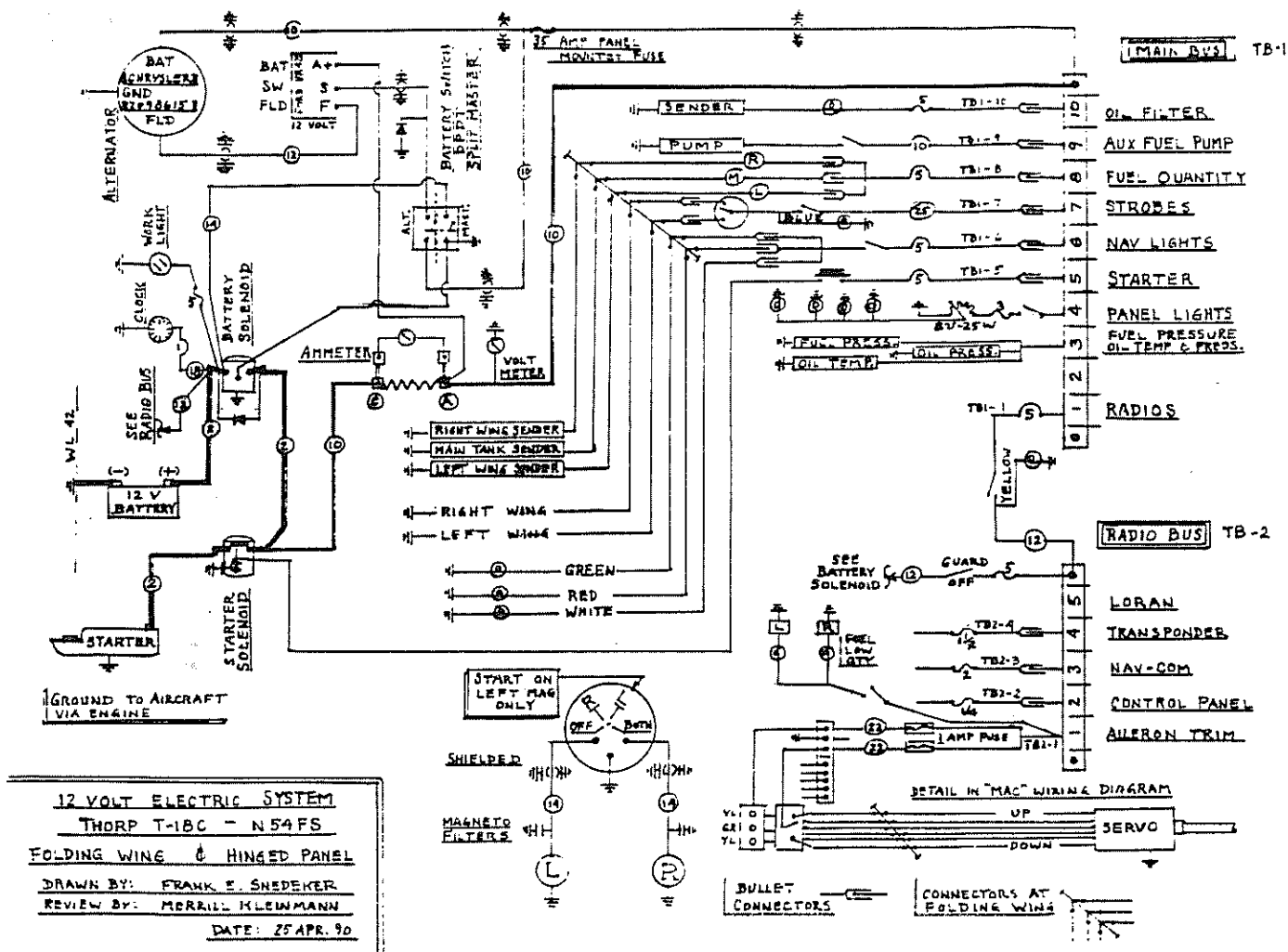
#### EGT HOOKUP SAME AS CHT ABOVE

#### EGT PINS

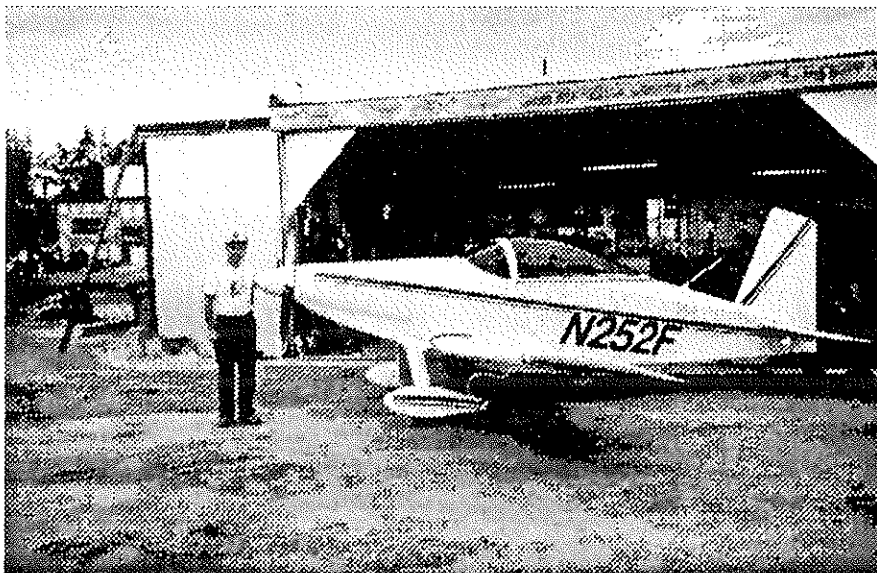
#### INSTRUMENT CONNECTIONS



# Electrical System (cont)



## For Sale Items



Lyle Fleming's N252 F For Sale

For Sale: T-18 CW folding wing --Save Hanger Rent-- includes a beautiful trailer. 0-360 A3A O.S.M.H. DG&AH plus 2 new comm, inter com, encoding trans(King), Narco Loran C, 4 E.G.T., 4 C.H.T. Ellison Carb., Sunderland Wing \$35,000 or best offer. 805-942-2481 (cont)

For Sale (Cont from page 17)

also have T-18 fuselage, landing gear & 4" Prop extention. Lyle Fleming 46035 20th St. E. Lancaster, CA 93535

*Editor's Note: This is Lyle's second T-18 and I understand he is a good craftsman, If you compare what your getting here vs what's available for this dollar amount it's a bargain folks!*

For Sale:

T-18 project, 80% complete, 95% of all parts to complete. All modifications complied with. Flush riveted. No engine or instruments. All assemblies completed. Willing to sell for actual money invested \$6500. Phone 206 392 0607. Wayne Heigel 23023 SE 37th ST. Issaquah, WA 98027

*Editor's Note: Another project for a give away price!! I think we're selling them too cheap guys.*

For Sale:

T-18 on it's gear, everything to complete except canopy, windshield and prop. Most of the instruments, no radio. Lots of extra parts and all in excellant condition, stored in a heated and dry building. Asking \$4000 call 216-428-6194 Dick Lurkenburg 5390 S. Ridge W. Madison, Ohio 44057

For Sale:

0290G, Zero Time with certified shaft, cam, and reconditioned tappets. Will develope 135 HP with D2 pistons, includes crank flange reinforcement, lugs, chrome rings, 0320 sump. Ken Morgan, 922 Simpson Ter. Bedford, TX 76031 817-498-8533

For Sale: Unused Dynafocal engine mount for a T-18 Phone 513-474-5578 Carl Cole 7927 Heather Glen Dr. Cincinnati, OH 45255

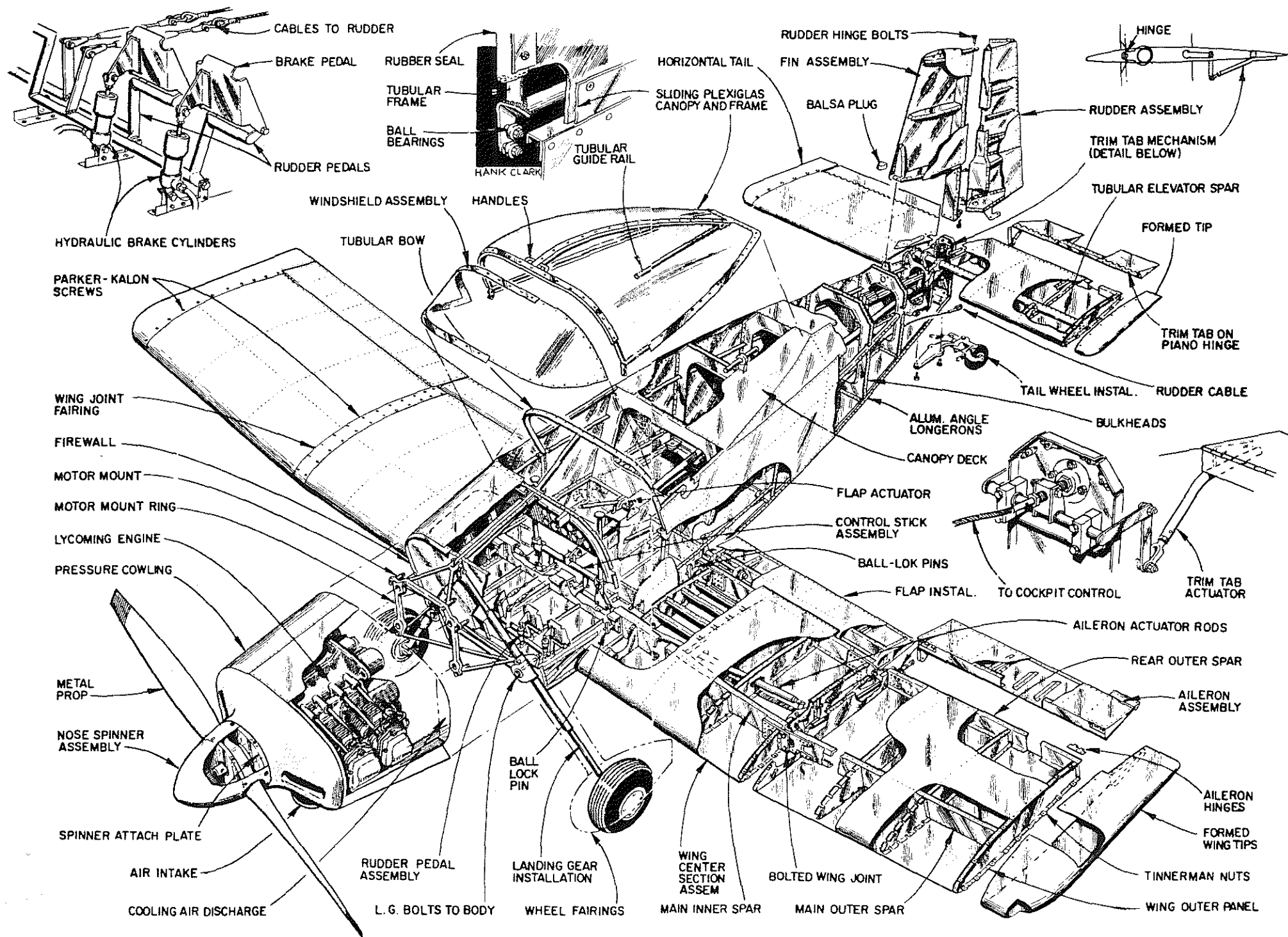
For Sale: Warren Spencer's T-18 CW T-18 with Sunderland's update on airfoil. All parts complete & have been fitted together at one time. Used pop rivets non-flush (each was dipped prior to insertion), canopy needs a skirt to finish it off, no work done on inside. Nothing on firewall. Includes seatframes, engine mount, spinner, metal prop, cowling, all tips, pants, wheels, tires, brakes. Asking \$8000 or \$14,500 for plane and engine. The engine is a completely OH Lyc 160 HP with a flat mount, 0320-B2B, crank is standard, cyl are steel will sell for what I have in it. \$7000. *Warren says he is selling because of health reasons and the craft is well made.* contact Warren Spencer 1512 North Ave Crystal Lake, Ill 60014 Phone 815-459-2578

For Sale: Front and rear spars, main landing gear (2" longer) , windshield frame and many ribs, bulkheads, firewall fittings inst. panel and various fitting for wing and fuselage also 2 sets of plans. Call 412-727-2312 Don Ruffner.

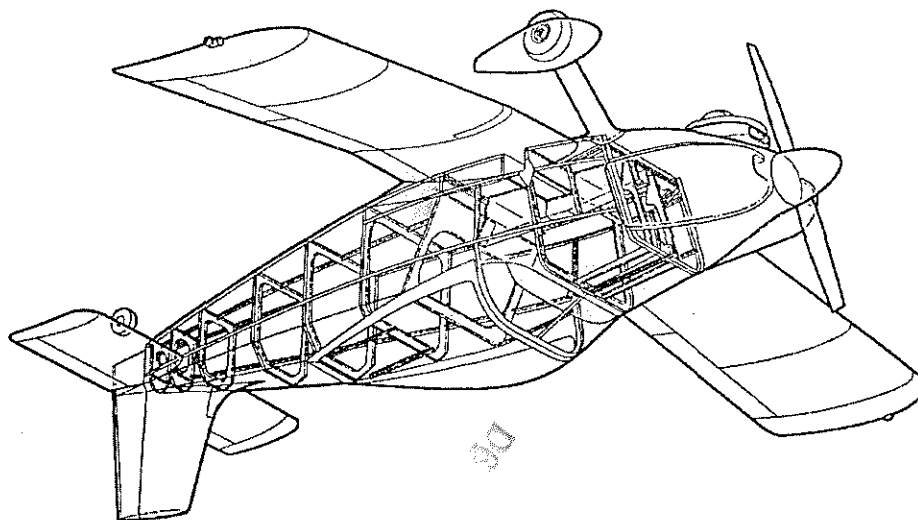
For Sale: Set of ribs for standard wing, excellant workmanship, one Scott 2000 tailwheel-excellent, one set of Rosenhan 500/5 wheels and brakes with axles. Two rattray fiberglass seats. Will take reasonable offers. Russel Ross RR #1 Box 411 Sioux City, Iowa 51108

For Sale 5x5 Goodyear Wheels & brakes Make Offer! R.H. Yeakey 5952 RoyalLn S0226 Dallas, Tx 75230 Day 214 750 7438 after 5 214 348 2947

For Sale: P-Strip to run around the canopy I think it will work well. I'll send a free sample to anyone if they will send a SASE Eddie Eiland 1350 Thunderbrook De Soto TX 75115 214 230 8266 Wanted Wing for standard Fuselage. *(Try Ken Morgan Ed)*



**T18 NEWSLETTER**  
**NO. 75 July 90**

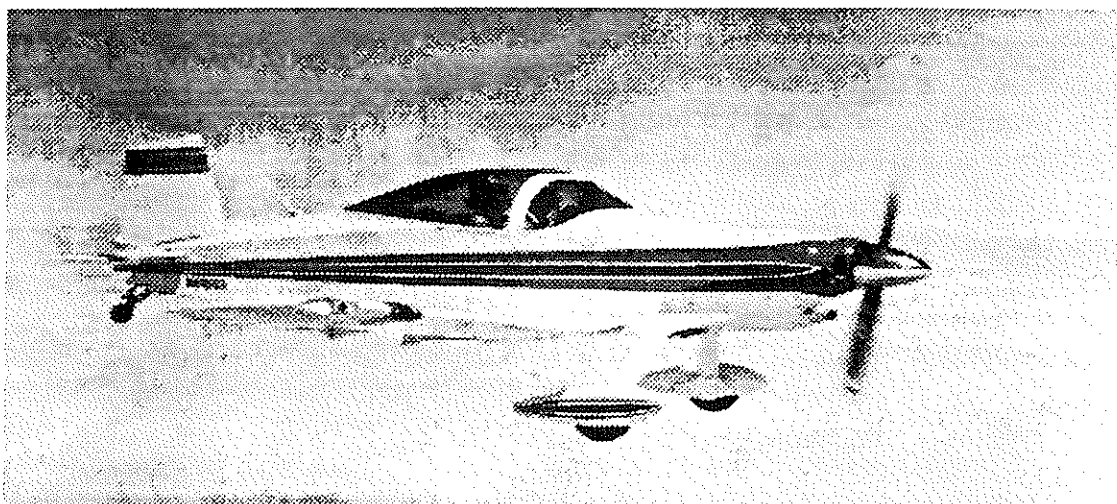


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# T-18 NEWSLETTER

ISSUE NUMBER 76



Wendell Green's 180 hp T-18 (built by John Walton )

## *In This Issue:*

Editor's Trim Tabs

Letters to The Editor

Oshkosh 90

First Flight of the Snedeker Thorp

Grand Prairie Buzz-in by Dick Cavin

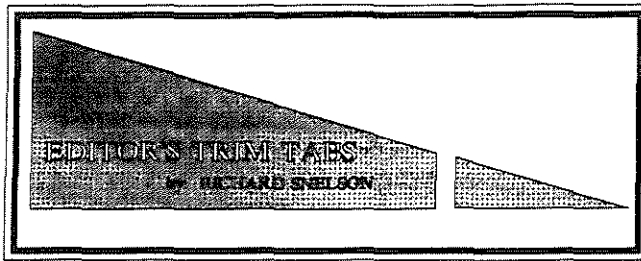
Fiberglass wing tips

How to avoid "Oil Cans" by R. Snelson

T-18 Pilot Report by Alex Sim

*NOTICE: (STANDARD DISCLAIMER) As always, in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.*





I'm trying my best to get this letter out early in Sept so you will know about the get-together at Kentucky Dam in Oct. I talked to Judy Paine and had several people call to remind me that we should call for reservations as early as possible. I've really had a good time at the Ky get-togethers since it gives a lot of time for looking and talking about out projects, and also a chance to get rides! So why don't you fly or drive in for the Oct 5,6 and 7 or whatever part of that weekend you can make it. The phone number for the lodge is 1-800-325-0146. I've included a picture from Patti's Restaurant folder since it shows a small map and also someother places to stay if the lodge is full. Patti's is one of my favorite places, at Ky Dam, they have two inch thick pork chops and some sinful big pies. "Sky-high Meringues and Mississippi Mud Pies too!

Here's an up date on my Project:

After completing the fuselage basic structure I remove the top aft and hip skin because of an oil canning problem. See the article on my new approach to building them. I have installed the trim motor behind the baggage compartment and cut off the top of the tunnel to install a four inch pipe for the horizontal tube cover. I've also built new rudder pedals that extend 1 inch on the left and right sides to take the rudder cables down each side of the fuselage, Dave Eby told me about using Nyloflow tubing as a conduit aft through the bulkheads for the rudder cables, "no pulleys" so I'm looking into this. Still a lot of work ahead, but I really enjoy it. My new shop is great, it's wonderful to be out of the basement. It's 16 feet by 40 feet and air conditioned and heated so the work can go on no mater what the weather.

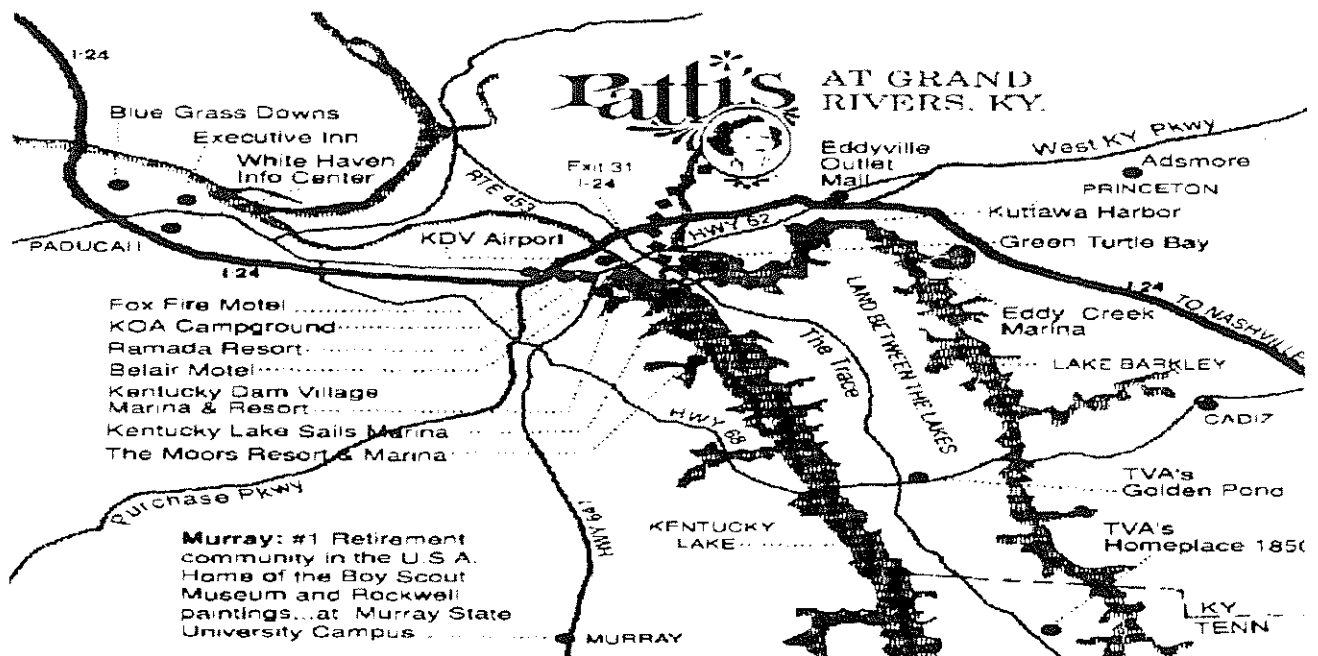
Phil Tucker at Sport Aviation let me know that he now has some one to do his fiber-glass work, he says the first pieces look very good. They are made with epoxy instead of polyester and stronger and lighter.

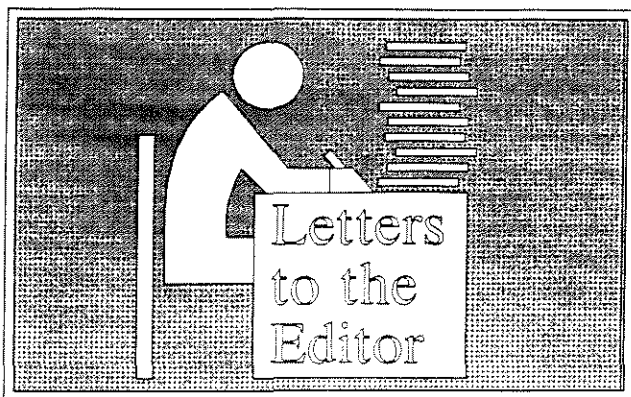
So much for now!

Richard Snelson

RR 3 Box 295

Clinton, Ill Phone 1 (217) 935-4215





The T-18 Mutual Aid Society sent Mrs Cavin Flowers during her illness, I wanted all to read her reply. This lady has done so much over the years in getting out past newsletters that we owe her much thanks!

To All the T-18 Tigers

It only takes a moment to send you thanks-- but then your thoughtfulness will come to mind time and time again. The flowers are beautiful after all this time and I am still very touched to have you all think of me.

It has been a rough go but I hope to make another T-18 Fly-In in about 6 months or so. Sincerely, Lynn Cavin. Mrs Dick Cavin.

Dave Eby sends some Prop Data:

Prop Data

SN 1202 N53PD

0320 D2A 160hp (new)

All speeds MPH-timed on a measured course at 2000 msl

Prop #1 Pacesetter 68/66

Full throttle rpm 3100

Full throttle top speed 186

Prop #2 Sensenich 66/76

F.T. rpm 2950

F.T. top speed 189

Prop #3 Sensenich 66/78

F.T. rpm 2850

F.T. top speed 192

Full throttle at 9-12m 2650 rpm

Sensenich performance charts are accurate.

Dear Richard:

Thought I'd drop you a note relating to some problems I've had during the early flight phases of my T-18 N922H. Like a few who have written earlier about mismatch of carburetor to engine, I had a similar situation ... or so I thought. I changed fuel nozzles in my MA4 SPA 10-3678-32 and found my original nozzle still the best. Still, when flying the plane, it would occasionally miss, especially when changing throttle settings. I checked for induction leaks and found none. Finally, the problem was traced to a loose carb throttle shaft. After changing the shaft and bushings I've had no "missing" problems. Another problem developed when I decided to extend my oil breather tube down to the gear leg faring. I used a bicycle inner tube down the facing and extended it about 7-8 inches past to keep the oil off my wheel pants. Unfortunately, the slip stream bent the tube back in flight and pinched it off creating more pressure in my engine case. I realized the problem quickly but not after developing a few oil leaks in various places. To locate the leaks, I "dusted" the engine with talcum powder after cleaning thoroughly with solvent. I then ran the engine about 15 minutes and the leaks easily showed up. I now have an aluminum tube down the leg faring. You live and learn. I also had problems with my brake lines. I used 1/4 Nylaflo tubing to brass fittings. The Nylaflo slipped over an inner tube machined in the fitting and then was crimped down by a plastic bushing around the tubing. A nut secured it in place. Unfortunately the plastic bushing didn't hold and twice the brake lines squeezed off. I now have the same fittings with brass compression sleeves around the Nylaflo. This seems to work well. My plane has about sixty hours since first flight in July of 1988. I've been learning to fly it since it's completion and hope to solo soon. A lot of time was spent after the first flight dealing

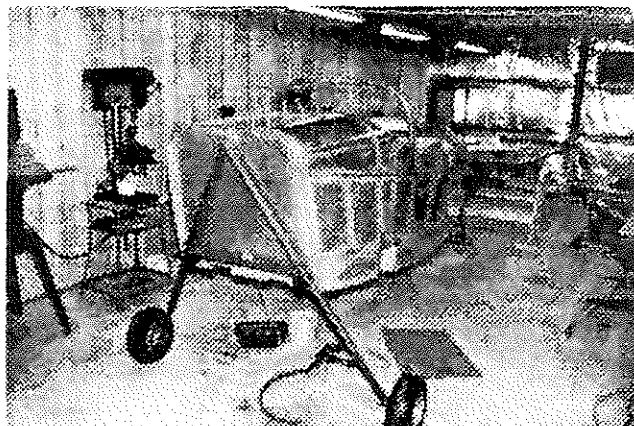
with minor "glitches" along with the problem just mentioned. It seems like I've spent about 3 hours on the ground for every hour in the air during this period. I also had radio and transponder/encoder problems which I won't go into now. It's been frustrating during this post first flight phase, but when I stand back and think about it, I have learned alot more about this airplane through these problems. I also have learned that through perserverence you can eventually achieve what you set out to accomplish. A few of the Portland area builders recently noticed that the prop installation on some T-18s varied as to the depth of the prop bolt from the extension into the engine prop flange, while others fell short of extending completely through the lugs. I've called around and haven't got a definitive answer as of yet. Maybe a reader could help. Thank for continuing the newsletter Richard. Greg Halverson, 2533 North East 11th Ave, Portland, OR 97212



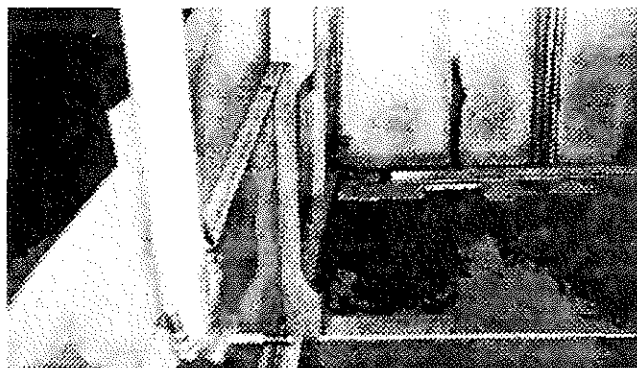
I think I made the same mistake about 20 years ago! Don't drill this fitting and expect the gear to fit later.

## T-18 at Oshkosh 1990

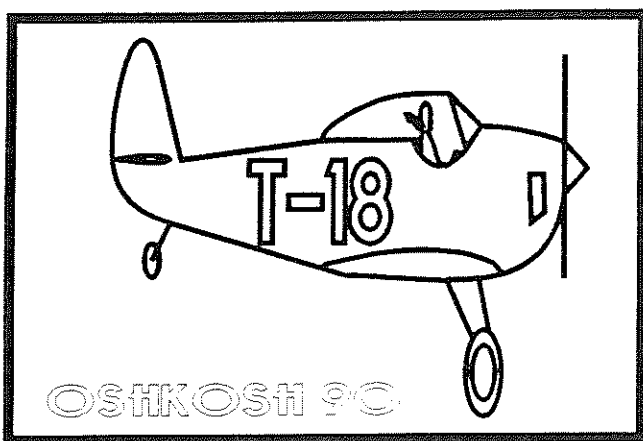
|                    |        |
|--------------------|--------|
| Russ Ross          | N45R   |
| Wendell Green      | N51863 |
| Gayle Lacount      | N5GL   |
| Jerry Stallings    | N1369B |
| Goodman Brown      | N6GN   |
| Dean Cockran       | N11DC  |
| Paul Kirik         | N11PK  |
| Jim Alexandre      | GGEMP  |
| Dave Eby           | N54PD  |
| Mike Wolfe         | N89RB  |
| Gary Green         | N18GG  |
| Gary Cotner        | N304RW |
| Al Cousineau       | N4749C |
| John Olds          | N1051Q |
| Dick Amsden        | N32AH  |
| Max Booth          | N1488  |
| Bryant Rowand      | N66BR  |
| Ron Gerrard        | N586RG |
| Robert Ryan        | N67RJ  |
| 2nd Story Fly Club | N583C  |
| Mike Howard        | N74RC  |



My project in the new shop!



My dash mod to give me more leg room.



My trip to Oshkosh this year was fast, only two days, and just a little too exciting! Arriving Monday morning just a few seconds before the T-18 Forum was to start I was informed a T-18 had just been involved in a "Mid-Air" collision, and no one was sure of Who! or what were the results. This left me speechless and unable to recover my composure until several hours later when the T-18 pilot and passenger, Bryant Rowland and his son, showed up at the fly-in looking for help to get their T-18 out of a nearby field. The other aircraft a Cessna made it into Whitman Field in spite of a 42 inch prop cut that went through his wing, aft of the right wing strut, and some bad dents in his vertical stabilizer and rudder. The T-18 had a badly damaged right wing with the right tip bent up, and the center section looked like crumpled paper. Bryant said he had a very exciting several minutes after the collision, with the T-18 in a tight descending turn wanting to stall at 135 mph. At the last moment he was able to get some aileron control and level the wings to land, resulting in some additional damage to the gear. Wow! Somebody was looking after these folks! This accident doesn't help my case with my wife of wanting to someday fly to Oshkosh in our T-18, but it does demonstrate the structural strength of our fine 25+ year old design. Bryant is a great T-18er, even after all that, and with his bird loaded on a trailer for the trip back to Texas,

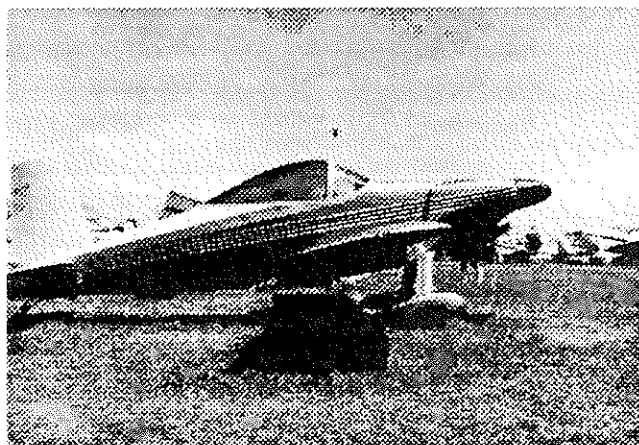
he showed up Tuesday evening for the T-18 banquet. We're glad all were safe!

Now back to the Forum:

About 100 people attended with over 60 builders and owners asking Paul Kirik questions on safety, material sources and flight characteristics of the T-18.

After the forum I spent most of the day on the flight line looking at the T-18s and discussing everything I have left to do on mine. I have a list of the T-18s at the Fly-In but it may not be complete so please don't feel bad if you were there and got left out. See list attached.

Wendell Green of Argyle, Texas was there and mighty proud of his T-18, and very quick to tell me it was built by John Walton. (Pictured on this newsletter cover). N51863 is 15 years old, a standard body with 180 hp and a constant speed. It has a Sky Tech Starter and Wendell recommends it. The plane was built with the Lou Sunderland folding wing and also contains the fuel tanks. The ship weighs out at 1060 lbs empty. Wendell likes the center mounted radios and the full instrument panel, (by the way he also flies for a living). His canopy

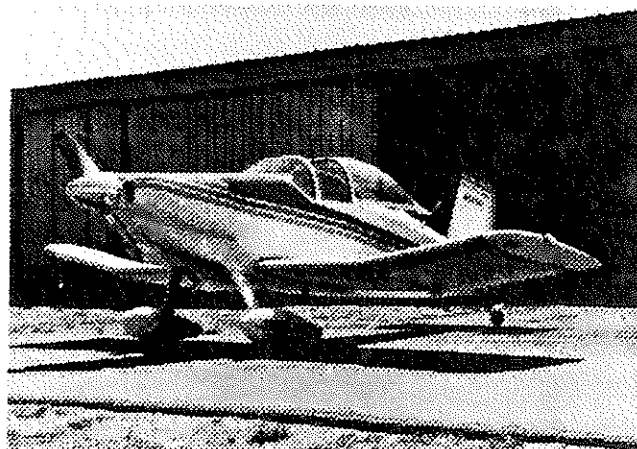


Bob Ryan of Cook MN N67RJ

is raised 1 inch and provides good clearance to tall individuals. In the engine compartment it's all nutplates and bolts so all sections and covers can be removed with out fuss & bother. Clearly a beautiful airplane inside and out.

A new arrival at Oskosh this year was N67RJ, a T-18 built and flown by Bob Ryan of Cook, MN. It first flew on Nov 2, 1988, and completed the required 40 hours on May 21, 1989 (poor flying weather in Minnesota during the winter). To date it has flown 175 hours. Its a T-18 WC with Imron Paint, metallic medium blue gray stripped with metallic midnight blue. It has a 0-320 150 hp with a pacesetter 200, 68X66 propellor, electric flaps and electric trim, Terra radios, dual com and nav and transponder with encoded also has a Apollo Flybuddy Loran. Bob did all the test flying himself, very exciting, but had no problems. He had about 3 hours of dual from Jim Borg of Minneapolis in his beautiful polished aluminum T-18 a few weeks prior to his first flight. Bob is currently flying out of a sod strip as the local airport is under major rebuilding. He states the T-18 handles the short sod well, but he isn't taking an passengers. All in all he thinks the T-18 is a real good airplane. (see photo)

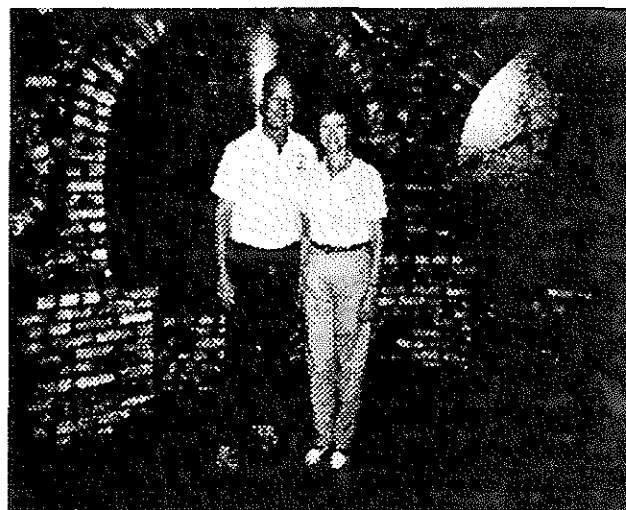
Just a few rows away was Dick Amsden beautiful ship, it is S/N 1268 and was built by Dick and Bill Hair. It first flew in 1983, plans were purchased in Jan. 1978. Dick purchased Bill's half interest in 1983. It is painted with Imron in 1984 and now has over 600 hour T.T. (mostly Autogas time). The engine is 150 hp 0320 E2G turning a Sensenich wood epoxy prop 66 max 76 pitch. Its max speed 187 mph @ 1500 feet 70 degrees. The panel has a Terra radio w/glide slope and a Terra transponder w/encoder. To complete his navigation equipment there's an Apollo Flybuddy Loran and a full instrument panel. The fuselage has .032



*Dick Amsden N32AH first flown in 1983*



*Ed Ludtke 1990 Winner of Best T-18 at Oshkosh*



*Ken and Marie Brock , good program Ken a great adventure we'll all watch for the Sept 15 Special on tv.*

side skins, also the center wing, no tunnel on the front floor, electric trim and elec flaps (Chrysler window motor). A picture of his ship is included.

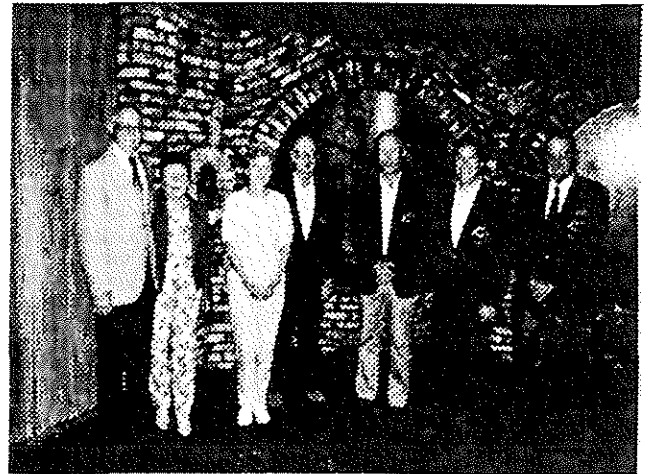
Close by to Bob's plane was another T-18 owned by a fellow that shows up at just about all the T-18 events Ed Ludtke of Sioux Falls, SD. With out question Ed has a beautiful plane, I've mentioned it before when he attended the KY Dam Fly-In earlier this year. I like the tight air box system he built and have talked him into loaning me the molds to make one for my ship.

N89RB parked in the next row was creating a lot of attention since it was for sale! Mike Wolf its' owner had three people looking at it all at the same time! and ended up with a bidding war, resulting in a check for more then his asking price.

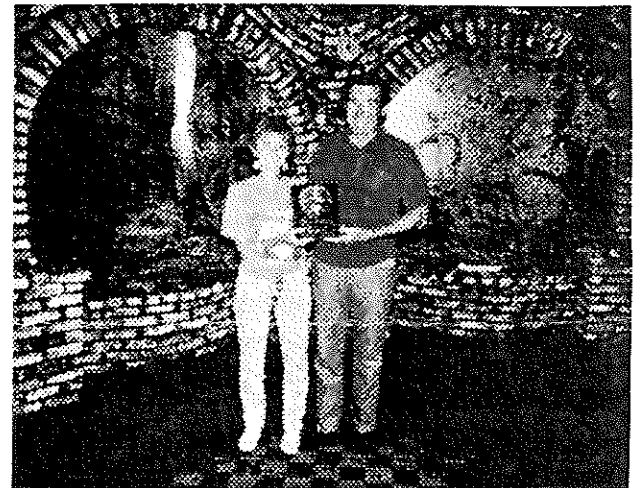
Lots of fine T-18s were there and I don't have enough time to discuss them all in this newsletter, so will try to cover more later.

Tuesday evening at Butch's Anchor Inn over 100 people attended the anual T-18 banquet. This turned out to be a wonderful time with everyone on the edge of their chairs, listening to our guest speaker Mr Ken Brock and viewing slides of his recent trip to Antarctica with the National Geographic Society. "Thanks Ken" we really enjoyed your adventures and are looking forward to seeing the National Geographic Special on Sept 15. with Ken flying his famous gyroplanes. For those of you that don't know, Ken is a T-18 builder/flyer and also makes many of the T-18 parts that are available through Ken Brock Manufacturing, Stanton, California.

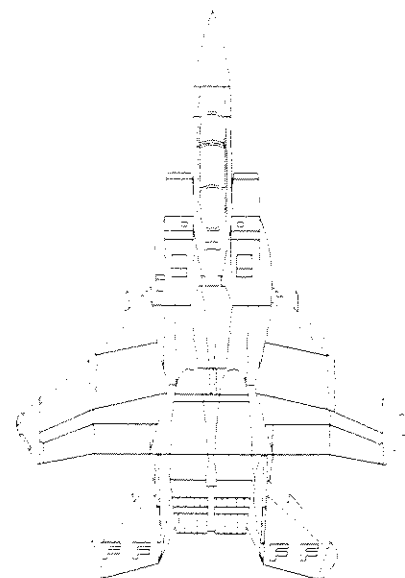
After Ken's show we asked all the former Wright Brother award winners to come up and take a bow. We had quite a crowd! I won't list all the name here since I will have



*From the left the Wright Bros Award winners are Carl & Mazie Lipscom, Gene & Thelma Sloan, Paul & his son Steve Kirik and Dave Eby*



*Ed & Jeannette Ludtke winners of the best T-18 for 90*



*Steve Kirik's flying machine a F-15*

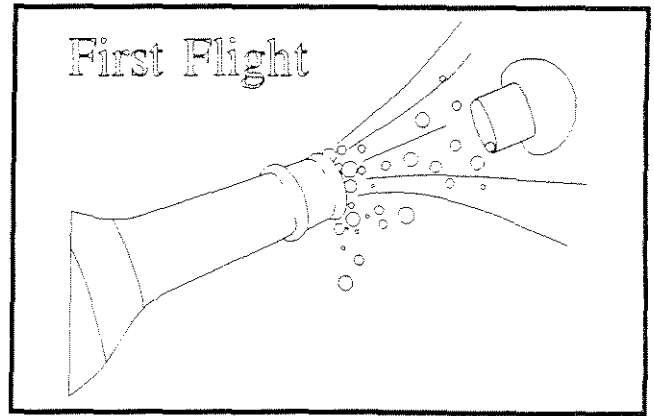
them under the included picture. I do want to mention that this years winner was Gene and Thelma Sloan of Murfreesboro, TN. Congratulations Gene and Thelma it's really quite an honor folks!

This years winner for best T-18 at Oshkosh was Ed and Jeannette Ludtke from Sioux Falls, SD. A picture of Ed beautiful ship is also included in this newsletter.

I want to mention a fine young man that I met at the banquet and later got to know sitting around a camp fire back at the campgrounds. This would be Steve Kirik, Paul's son from Moline Ill. Steve was home on leave from the airforce where he flies F-15s. Get this folks: he planning and looking forward to building his own T-18. Steve flew his dads T-18 back to Moline on Wed (Paul had to drive the Camper "too bad dad"). When Paul finally got to Moline they gased up the T-18 and headed for the east coast and Steves airforce base. Five hours later they were there. A couple days later Steve climbed into his F-15 and flew 14 hours non-stop to Saudi Arabia. Last week Paul called me to get the old news letters to send to Steve as he wanted some good reading material. A day or so later Steve was on the national news "CBS" with Dan Rather in an interview about the FF Squadron in Saudi. I for one am proud to know this fine young man! Good luck and God Speed Home for Steve and all the other fine American Servicemen in Saudi Arabia.

Richard Snelson T-18 Newsletter Editor,  
RR 3, Box 295, Clinton, Il 61727

PS: We were going to have the banquet as Dick Cavin night but Dick had to return to Texas since Lynn was feeling bad. We send out thanks to you Dick and Lynn for all that you did for the T-18 Mutual Aid Society. Hope to have you both at the banquet in 1991.



First Flight of the Snedeker Thorp  
(reprint from "Wind in the Wires" Newsletter  
Chapter 26, Seattle Washington, Frank Snedeker  
Editor)

All first flights are exciting! Many questions will be answered. Anticipation and excitement run high. Expectations become suddenly real and the proof of many years of work is written. Many questions have yet to be answered. This first flight was filled with that excitement and with a measure of high anxiety. After climbing full power (Lyc. 0-360-A3A--wood prop) to 4000 feet the power was reduced to 2450 at which time the engine ran rough. Setting power to 1700 RPM found the engine power bleeding off further to a point of quitting entirely. Power was maintained by actuating the accelerator pump to keep the engine running and an immediate landing was made...total flight time: 16 minutes.

This airplane was designed by John Thorp and it is a pleasure to work with. There is a great latitude for modifying and much of the satisfaction of building her was in this ability. She is a real beauty even though her builder didn't get the skin as smooth as if fiberglass were used, or that her makeup ran in places, but, all esthetics aside, she flies beautifully. The first flight was not exhilarating to me but there was a real feeling of satisfaction, of accomplishment. Even though all of the testing, adjusting, tweeking, massaging were yet to come this



creation of years of work had come to fruition. She was flying.

My Biennial was believed to be out of date, making my 'license' to fly her illegal. Cecil Hendricks, having much experience with T-18's, flew the first flights, with me in the right seat taking notes. The pride of the first flight is not in the pilot but in the airplane. The pleasure of the first flight was in both pilots and those persons left on the ground sharing in it. For the record, those present for the first flight were Sabrina Snedeker, Fanny Hendricks, Bill Moor, Jim and Pat Evans (flew up from Vashon in their Cherokee), John Kenton, and John Ammeter who was just finishing building his RV-6, and John McCornack now flying a Kitfox and is starting an RV-4.

But, back to the flight...N54FS (for Frank and Sabrina) lifted off the 5,334' runway at Arlington, Washington smoothly at 11:00 a.m. on July 8, 1990, climbed rapidly to 4000' and made the first power reduction. With power at 2450 there was a roughness in the engine. It was necessary to determine the stall speed and Cecil proceeded with that process. We had installed stall strips on the leading edge of the center wing sections and they worked better than expected. The center section stalled strongly at 61 knots indicated but with full aileron control, right and left turns were made without diminishing the buffet. After Cecil, I did the same stall and we returned quickly to land sounding like a War One rotary engine as Cecil worked to keep the engine running.

In subsequent flights the same condition presented itself but we knew how to get the airplane back on the ground. After reworking the carburetor (MA-4-5), and cleaning and gapping the plugs, and rechecking the magnetos and several hours of flight checking the answer came during a flight test and as this is being written a fix is slowly devel-

oping in my dreams...ideas...you name it.

The carburetor air filter box is John Thorp design that fits over a well at the base of the carburetor. It has an automotive AC filter. There is a valve that opens the full intake for cold filtered air from the engine compartment. This an excellent system and since each T-18 system installation is different the problem may not manifest in every T-18. On N54FS it may be that the air entering the carburetor is swirling and I may have to design and install vanes to redirect the flow...to straighten it before it enters the carburetor.

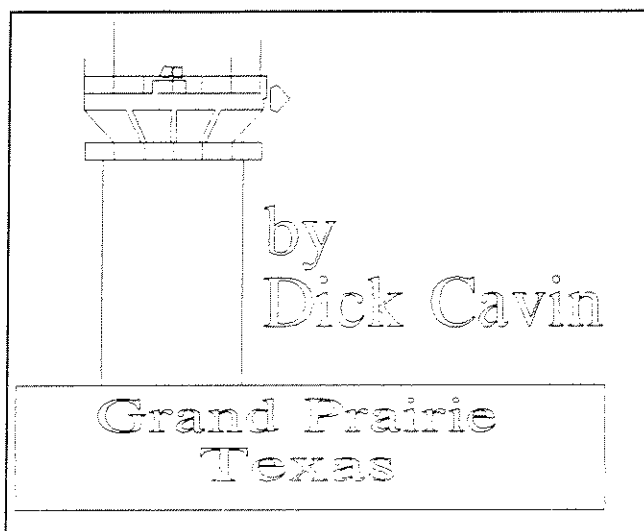
During inflight testing it was determined that with full throttle it ran smoothly (mixture full rich and carb heat cold, of course). With power reduced to 2450, and below, roughness came in and in the lower range the engine power would bleed off possibly to quitting. On applying partial carb heat, at these lower settings, the engine would smooth out. With the control pulled out 1/2" it would be smooth in the range from idle to 2450 rpm. If it were left in that position and full power applied the engine would run rough until Carb Heat was returned to full cold.

Looking into the air intake opening, the 1/2" setting places the valve in the mid position (a 45 degree angle) with half the intake going to the carburetor and half being directed up into the engine compartment past the exhaust pipes. It is an interesting problem. The first mod has been to install a fence in the bottom of the carb box, parallel to the intake including the throat of the carburetor. The situation is improved in that less carb heat need be selected so additional baffling will be installed.

Because N54FS has a wood prop (Ted Hendrickson) forty hours of flying is required within the 25 mile radius of the 'test' airport



so, again, Oshkosh is cancelled for Sabrina and me and this is a disappointment because there will be four other T-18's making the trip, camping out along the way. Our flying is still ahead of us and the FIRST FLIGHT will be well remembered for the friends that were present and that the airplane that I built really flew.



Grand Prairie, TX

T-18 Squadron Buzz-in

About a couple of weeks ago, Ken Morgan came up with the idea of a mini fly-in and brunch for all the T-18 builders and owners in and around the Dallas/Fort Worth Metroplex. Letters of invitation were sent out to some 25 or more T-18 addicts.

The August 11 date was perfect and by 9:30 we had four T-18's parked side by side in front of the terminal building, with 2 more taxiing in. In a few minutes, the 7th T-18 arrived from Wimberly, TX, with Jim and "Sweet Sue" French on board. His T-18 was built in 1967.

The next oldest T-18 was Bob Miller's, built in 1970 and he hangars at Arlington, just four miles west of Grand Prairie. He has about 400 hours on it after 20 years and it

still has its original paint job on it.

Dave Eby came down from Wichita Falls in his bird with John Mihaila riding shotgun. (John's T-18 has about 6 hours on it now.) Gary Cotner came down from Tulsa, nosing out John French by a few miles for the title of longest distance flown. Gary Green and co-pilot Maxine came in from Pecan Plantation, about 35 miles SW of Fort Worth. Marty Sidener had previous plans, so he couldn't fly formation with Gary from Pecan Plantation. Maybe next time.

Leroy Holt didn't make it down from Mc Alister, OK, for some reason, neither did Jim Putney, who lives in Arlington, and is in the process of painting his T-18.

Wendell Green and John Kleber had a 20 mile formation hop from NW Regional Airport (formally called Aero Valley) where they share a hangar. Wendell has John Walton's beautiful T-18 now and he's so happy with it he just stands around and grins and giggles every time he looks at it. John Kleber's T-18 is his second. Like Wendell's, it is powered with a Lyc. 0-360 and has a c/s prop. John also built Dave Eby's wing.

John passed on a couple of good tips (see sketches). He has a sure fire method for getting control surface trailing edges straight. He clamps a pair of 3/4 x 3/4 steel angles on the last 3/8" of the surface, with the angles right up against the clecos in all the holes (almost). He leaves room for the rivet head and uses a rivet set that's ground off flat on one side for clearance. Works beautifully.

John used the new airfoil on his new bird and he says you can't buy wing tips that fit perfectly, so he made his own. (See the photo comparison with it W. Green's) He first stood the outer wing panel on end over a piece of metal scribed around it to make an exact template.

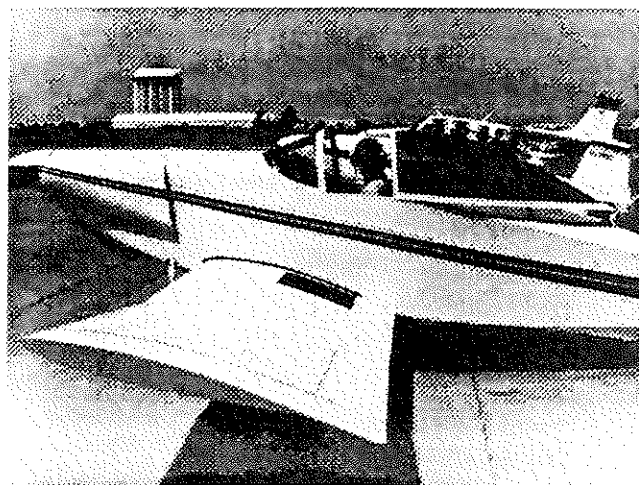
Using that template to make a duplicate tem-

plate, he used the pair to "hot wire" a block of blue foam in the classic Varieze manner. After doing this he wrapped a strip of about 1" wide aluminum from the center of the L.E. to the center of the T.E. (for the bottom side of the tip). Then he used this 1" strip as a guide to hot wire a line from the top of the aluminum strip to the very tip of the flock of foam, which still retained one of the rib templates. (The one inch at the bottom allows for a flat space to attach to the top.) I think the sketch will fill in details.

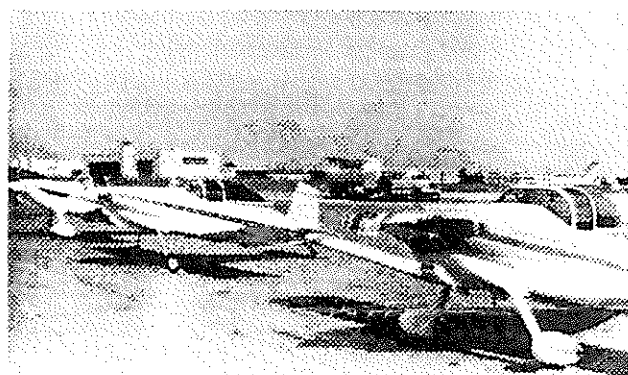
After a certain amount of T-18 ogling we all filed into the Wheels Down Cafe, and had brunch and T-18 talk at a long table.

Others there besides Ken Morgan were Bob Yeakey and Wife, Evan Roberts and wife, along with Eddie Eiland and son. Yeakey just returned from Tuscon where he picked up a Subaru 6 cylinder engine with Ross gear box to go in his T-18 ( which could fly next year). More later on this. Evan Roberts has a T-18 that has flown, but is doing some restoring and modifying on it. Eddie has a T-18 project about 50% done plus a flying Sonerai II. There are a couple more T-18 projects in that area that are well along, in addition to Ken Morgan's two projects, one which has flown. John Austin's T-18 has flown but is down for some re-work on the wing. Bobby Collard has completed a T-18 hull, with no systems installed , but he too, couldn't make it.

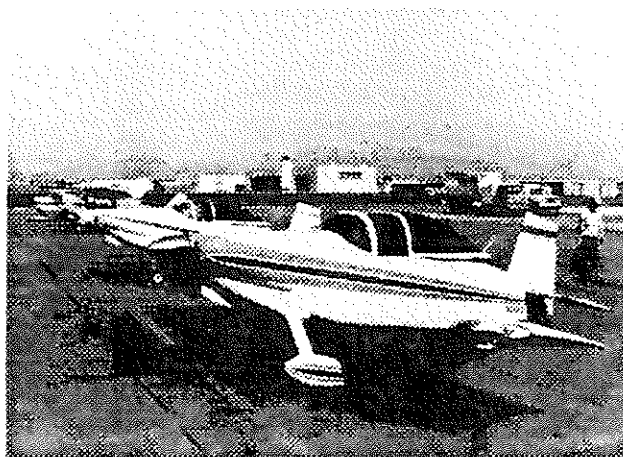
As is usual in these gatherings, there was time for a few buddy rides for builders/ dreamers before it was time for T-18 Squadron #1 to scatter. All in all, we all enjoyed the get together immensely, and it unanimously agreed that we should repeat the Buzz in a month from then, the week end after Labor Day, so stay tuned. Better yet, Come join us!!



*John Kleber's second T-18*



*Right to left Wendell Green, J. Klebers and Jim French*

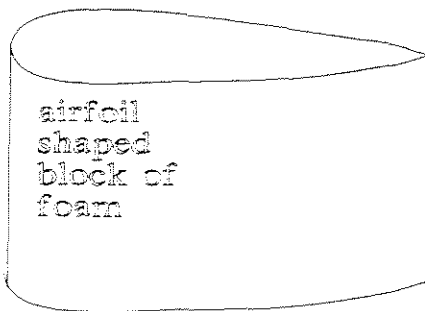


*Wendell Green and J. Kleber*

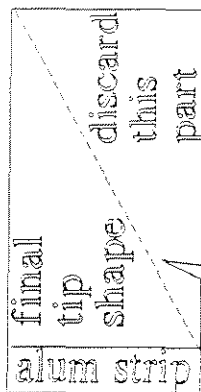
## Steps to build wing tips

1. Stand wing up vertically with outer rib resting on template blank. Then scribe around it and cut out template to exact size.
2. Make duplicate template to use at each end of block of foam as guides to "hot wire" a block of foam for each wing tip.
3. Sculpturing of foam (male mold) to final wing tip shape- Wrap a 1-1 1/2 inch strip of alum. around base of airfoil shaped block to use as cutting guide for both side of wing tip.
4. Cover foam with 1-2 layers of fiberglass and after cure sand to desired smoothness. (use peel ply to minimize sanding required).

1

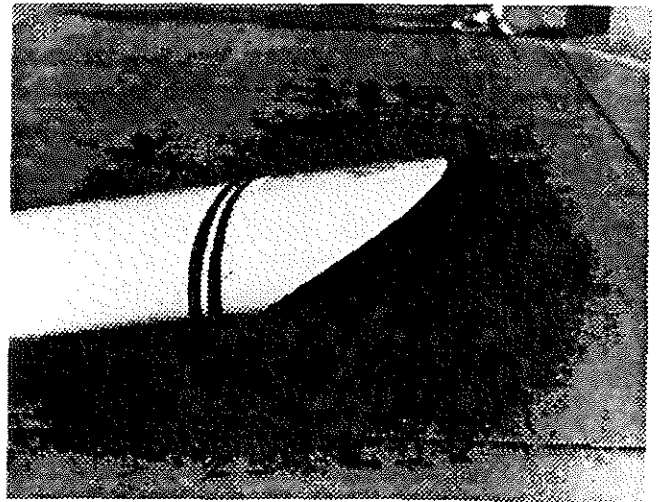


2

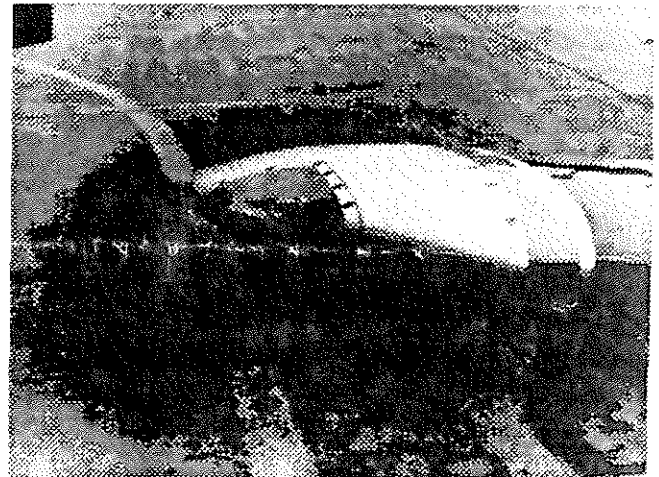


Hot wire  
along this line

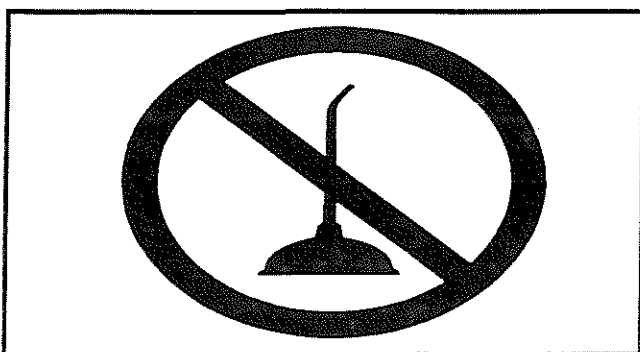
FRONT VIEW



*J. Kleber's new style wing tip*



*Wendell Green wing tip Note the strobe.*



## HOW TO AVOID "OIL CANS"

by

Richard Snelson

After having installed the worst looking aft and hip skins I'd ever seen, and on top of that, having to listen to the sound of my wife's index finger pushing on the nasty "oil cans" every time she came into the shop, it became clear that they would have to come off and new ones installed. I had used a roller to start the bends and then spent hours trying to get them into some sort of flat state, with no luck! Here's my new approach (they are 100% flat with no oil cans"). I did use .032 and am pleased with the results. This is what worked for me:

Starting point for hip skins and top aft skin building.

Either have the fuselage in clecos with bottom skin in place to square up the assembly or start after riveting the side skins to bulkheads and longerons, again have the bottom skin clecoed in place for alignment.

1. The first step is to either make a rough pattern or to get premarked parts, don't drill any holes at this time.

2. Get a straight 2x8 about 8 feet long, and run it through a table saw to establish a 52 degree edge for a bend line, this represents 45 degrees plus 7 more for spring back allowance. Using a small hand plane and a file cut a nice smooth radius on the form block flange. Using this as a form block will

result in a 45 degree flange in both the top aft skin and the rear portions of the two hip skins.

3. Make the top aft skin using either a cardboard pattern or a premarded part. Bend the edges using the form block above, punch no holes in the mating flanges for the hip skins at this time. Now drill the holes for the mating of the top skin to the bulkheads also the cut-out for the stablator attach fitting. Temporarily install it and check the fit at the top corners, they should be tight and flat to the hip skin flanges, correct by removing and bending the flanges with flanging pliers or a bending stick. It also helps here to have left the flanges at least 1 inch long as this will stiffen the sheet and keep it level for the next steps, it will be cutoff later when everything gets trimmed.

4. Now comes the black magic portion of the work, black magic and good luck that is. Using a pattern or a pre-marked part, the rough hip skin is now cutout leaving a 1 inch flange at the bottom and an extra inch or more on the top. Because of this wide flange it's not necessary to be exact in locating the flange bend line, just set the piece on the 2x8 with 1 inch sticking out and bend away using a firm rubber hammer. By taking your time and working back and forth a nearly straight 45 degree bend can be achieved. Only the back part of the hip skin is bent at this time, stop the bend at the tallest point on the hip skin. Another form block is needed from here forward since a slight curve is involved. This curve can be patterned off the bottom edge of the hip skin, again use a 2x8. However save time and cut it at 90 degrees on a bandsaw or with a jig saw, file and sand it to a smooth radius on both sides as it will make both right and left hip skins. Put the hipskin with rear bend complete on the new form block, over lap the bend and place it on the new radius, complete the bend forward with a rubber

hammer, stopping to check for 45 degrees and working back and forth as you go. Holding the flanged skin next to the fuselage note the curvature from bulkhead 572 forward. Mark the rough location of the holes that will be later drilled in this flange, from 572 forward only. Using a pair of crimping pliers put a small crimp in between each of these holes watch the curve form and compare it to the fuselage curvature from 572 forward. The hip skin is now ready for a trial fit test.

5. "This step is critical to a good flat fit for the hip skin".

Test fit the hip skin if the flange is 45 degrees it should lay flat from bulkhead 572 aft.

From 572 forward is not a problem at this point. Be sure there is enough material above the top deck skin and adjust the flange location for a nice even appearance from front to back. Correct problem at this point by removing and rebending the flange for a flat fit at the hipskin, top skin junction, primary from 572 aft.

6. With the hip skin in place drill holes from bulkhead 572 aft and cleco as you go. If the skin is still flat on the top skin its time to locate the top holes. Using a small thin ruler, establish on the hip skin the hole pattern so that it falls correctly on the top skin flange, this is fairly easy as you can lift the top skin and get a reference point on the top skin.

7. Now the hipskin and top skin flange can be drilled starting at the back and working forward, it must be nice and flat to do this. Don't pull down on the top skin, just hold them together for a nice fit and drill and cleco. Work all the way forward to bulkhead 572. At this time the forward portion of the hipskin is still floating and is not drilled. Work forward from 572 and drill the top holes as previously done on the rear, do 5 to 6 holes and then do 5 to 6 on the bottom edge (hipskin to side skin). By working

forward in this manner the front skin should work out with no oil cans or rough spots.

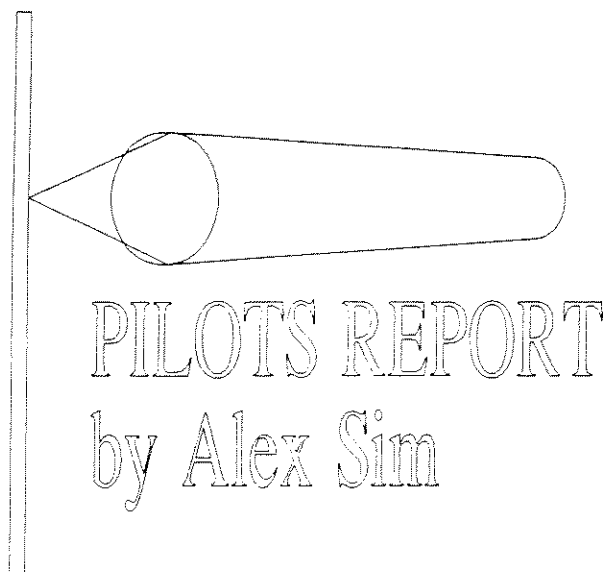
8. The holes from the bulkhead edges can now be located by laying out on the hip skins and lining up with marks on the bulkheads or by backdrill if the bulkheads are drilled. Watch the top corner holes on the bulkheads as they maybe too close to the top edge of the hipskin, by planning ahead this won't happen.

9. Now remove the skins and trim off the extra material on all flanges, deburr and dimple if using flush riveting.

10. As part of the final assembly before riveting check by pushing down on the hipskins at the bulkhead flanges if the bulkheads appear low, install a flat shim to level this area out, it will look a lot better than a sunken rivet line.

11. Follow the same pattern for riveting that was used in drilling the skins working from the tall part to the rear then returning to rivet forward, completing each section as you go.

I hope this helps you to do a better job the first time around and to not have to do it over. Call me if you have a question and you think that I could help. Richard Snelson  
1 (217) 935-4215



I bought my T-18, N512S, in 1984 and have flown it about 250 hours since. My prior 400 hours of flying had mostly been in Luscombes. I have found the airplane to be an honest taildragger on the ground, and an absolute delight in the air. Its builder, Hank Steinginga did an outstanding job on the airplane and was honored in 1981 for having the best T-18 at Oshkosh and with the Wright Memorial Trophy. N512S is a Standard Thorp, O-360 Lycoming, CS prop, Thorp cowl, flush rivets, and a 29 gallon forward fuel tank. It does have .032 skins on the inner wings and fuselage and has an empty weight of 1015 pounds.

I have taken a number of other pilots for rides. They invariably are aware that performance will be good and seem relieved that I insist on doing the takeoff and landing. However, most seem genuinely surprised how good the handling qualities are in the air. To quote one pilot, "the airplane really does have all the accelerations of your own little fighter".

I do not have a good outside air temp. of a Loran and thus do not have a good direct indication of true airspeed. However, keep-

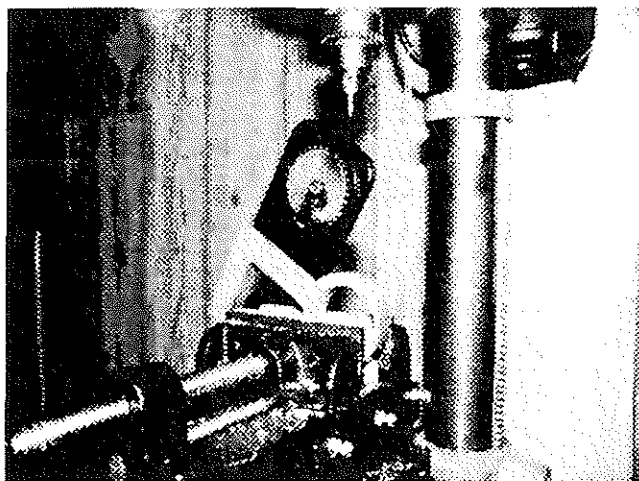
ing track of time and distance, the average speeds (including full patterns, climb, cruise and descent) for flights over 2 hours are around 190 mph at 8.3 gph (68% power) and 200+ mph at 9.5 gph (75%) with cruise near 7,500 to 10,500 ft. I once flew a four hour cross country (one fuel stop) along side a wide body, folding wing Thorp that was otherwise similar (ie. engine, prop, cowl, and passenger load). I seemed to have about a 10 mph advantage in cruise. I rationalized this to be a reasonable increment given the extra fuselage cross section, airfoil mods, and extra wing weight of the other airplane; however, I do realize that one data point is hardly conclusive. If any reader has made a more formal comparison, I would like to read about in an upcoming newsletter.

Back when I initially bought the airplane from Hank, he had placed a bolt through the 40 degree slot in the flap selector. He explained that it is possible to stall the tail with 40 degrees of flaps and a forward cg. The forward cg. condition occurs any time I have full fuel and fly solo--a common situation. Al Chivers, a CFI and T-18 builder/owner checked me out in the airplane and also cautioned me about using even as much as 20 degrees of flaps when on a final crosswind. Although the "old-timers" all seem to know about this, many of the newcomers do not. I have verified the presence of significant tail buffet when slipping the airplane with 30 degrees of flaps and a forward cg. The 10 degree flap position seems to work well on final with gusty winds. When practicing power-off landings with forward cg and 30 degree flaps, I find it is best to be at 90 mph (rather than my normal 80) on very short final to avoid running out of elevator control in the last second of flare. The undersized horizontal tail is not a new topic, just one that receives little mention. It is also very heavily engineered, highly analyzed, and

extensively flight tested part of the airplane that is not to be messed with (something about literally tickling the tail of a tiger).

The Thorp style metal cowl over cooled my airplane. In the winter, my cylinder head temps ran around 310 degrees for the front two and 350 degrees in the rear. In the summer it was 330/370 degrees. I wanted to get them all in the 370-400 degree range. I had too much respect for the metal workmanship to attempt the obvious mod of reshaping the exit area. Thus, I have taken the indirect approach of moving the oil cooler from the front of the engine to the left hand cheek exit blocking off about half of the LH cheek area. Secondary goals were 1) to get the oil cooler off the engine [personal preference] and 2) to switch the original Corvair cooler to an aircraft one. [also personal preference] This mod has raised the summer operating temps to 350 degrees in the front and 370 degrees in the rear and should slightly reduce overall cooling drag. However, the engine cylinders are still a bit cooler than I desire and I may try blocking off some of the right hand cheek as well.

Alex Sim  
HCR1-4460 Knox Avenue  
Rosamond CA 93460  
805-256-4733 home



Angle level at work

## For Sale Items

Building, Testing, and Flying THE ALL-METAL AIRPLANE This is the Revised Edition of T-18 Newsletters 1 through 44 it is indexed so it's very easy to find specific information quickly. \$35. per copy

Newsletter Sets 45 through present  
\$35. per set  
Richard Snelson  
RR 3 Box 295  
Clinton, IL 61727  
1 (217) 935-4215

Phil Mandel had his airplane for sale but he called me before the newsletter came out to say it was sold. Cong. to Walt Cannon The new owner.

For Sale:  
Standard Body T-18  
160 hp engine  
(editors note a beautiful airplane)  
Built by Sylvan Keebler N99SK  
Call Howard Henderson in St. Louis to get the full story on Sylvan's bird  
1 (314) 822-3980

I now have the angle level for sale to T-18 builders. I use it for about everything, from machine work to building rudder pedals, aligning of control surfaces, checking wings and control surfaces for twist as you are building and on and on. The level is oil filled with a ball bearing pivot which it accurate to 1/2 degree. Its now in B&F's Catalog in Chicago and I'll try and get it into some of the other suppliers soon. It's \$38 from B&F however direct from me it will be \$30 including postage. I'll try and write up some of the many uses later.

# THANK YOU DICK AND LYNN CAVIN

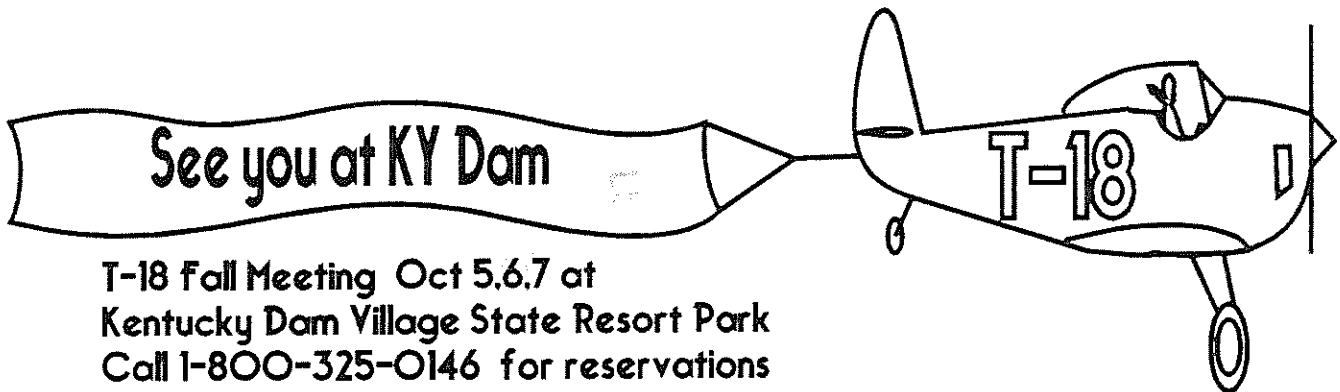
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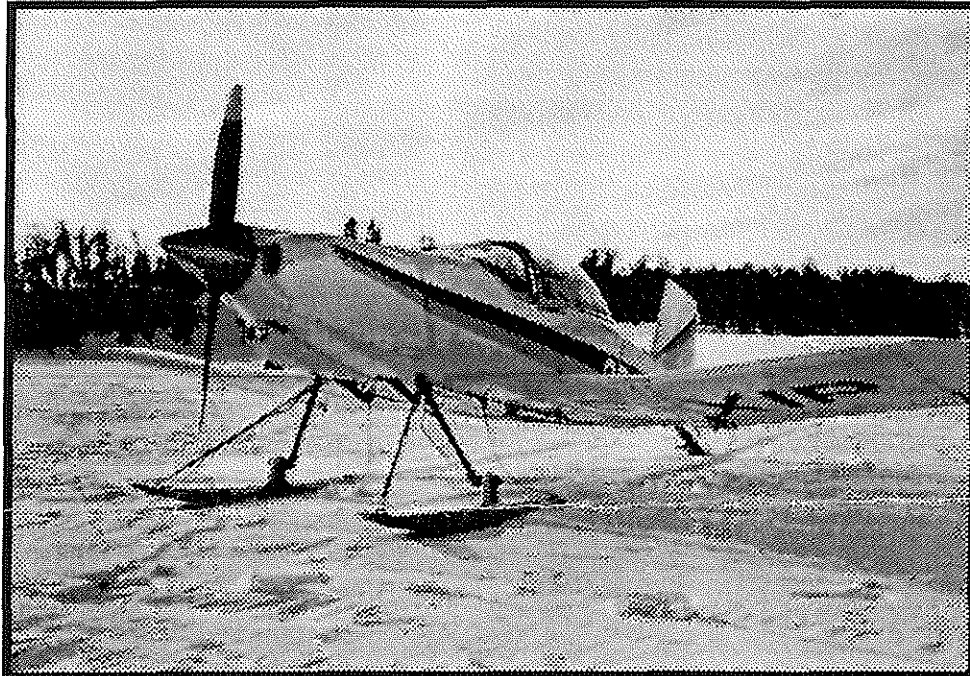


T-18 Fall Meeting Oct 5,6,7 at  
Kentucky Dam Village State Resort Park  
Call 1-800-325-0146 for reservations

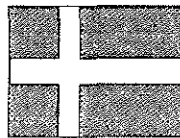
**T18 NEWSLETTER  
NO. 76 Sept 90**

# T-18 NEWSLETTER

ISSUE NUMBER 77



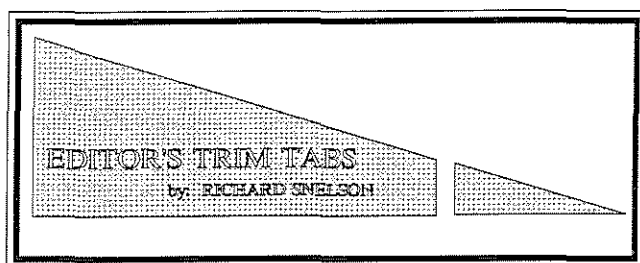
SVEN-ERIK PIRAS' T-18 ON SKIS STROMSUND, SWEDEN



## *In This Issue:*

Kentucky Dam Oct 1990 by R. Snelson  
Gear Up Landing by R. Snelson  
First Flight by John Evens  
The Rest of the Story by Frank & Sabrina Snedeker  
Marking Jig for the Horizontal Tail by R. Snelson  
Travel by Jim Strickenberger  
Lessons Learned

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Editors Column Newsletter No. 77 December 1990

Part of my decision to build a T-18 for the second time was based upon having a set of excellent complete plans and to also be able to build and complete the airplane no matter who goes out of business. I understand there are 300 individuals out there with partial Wheeler Express Kits that would like to be able to say that.

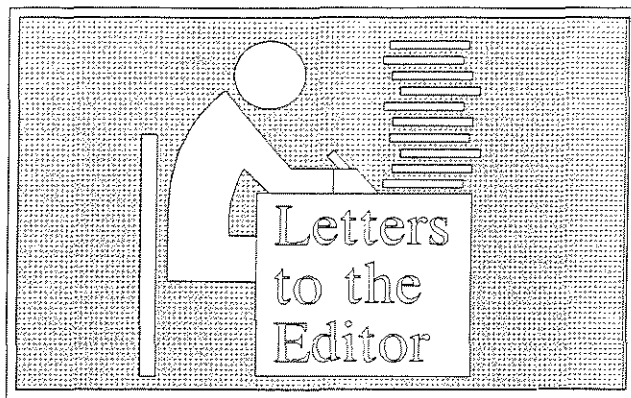
As I read the November 1990 Issue of Sport Aviation carefully from cover to cover looking specifically for any news or information on the "Wheeler Express" situation it became very clear that EAA Headquarters is clearly unwilling to handle the tough issues that face the homebuilt world. I found only one small paragraph stating that Wheeler had closed his doors. Fact is folks that 300 builders have been stranded, and EAA Headquarters prints one small paragraph. One could say that's not their job. I think it is their job and duty to report this and other tough situations that don't always cast a bright shining light on the whole EAA Movement. Sport Aviation has become all glitts and glitter, and reports only the good stuff, they push the tough issues under the covers. To give you some idea of what this is about, US Aviator (Nov 1990) reported on "Wheeler's Problems Worsen", just a few of the details : 300 kits were sold none have been finished, complex parts were deferred by Wheeler to later kits with the possible intention to never supply them, too costly. Both Wheeler's prototype planes have crashed, the second one was on the way to

Oshkosh, killing three. FAA Accident Investigation Form 8020-16 stated possible problems with structural design integrity. Several former employees of Wheelers have come forward with more information, that included falsification of flight time and material used in the kits. What a mess for the 300 builders and EAA members, I wouldn't want to be in their shoes. Yet headquarters puts one small paragraph in our publication and fails to bring this situation to light and support the members left out in the cold. Through the past efforts of our headquarters staff the FAA now puts great reliance in the EAA movement and referees frequently to their publications and help through EAA Technical Counselors etc. in the building of experimental aircraft. If this relationship is to continue it's very necessary for the headquarters staff to handle all issues and report on them fairly. This is only my opinion! What do you think? Could now be the time to start another organization that gets back to the basics of homebuilt aircraft?

T-18 Newsletter Editor

Richard O. Snelson  
Route 3, Box 295  
Clinton, IL 61727  
Phone (217) 935-4215

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### Letters to the editor

Dear Rich: Please allow me to introduce myself. My name is Tim Travis and I just purchased Curt Kreps' T-18 (N118CK). Curt delivered the aircraft to its new home here at Albert Whitted Airport, St. Petersburg, FL, last weekend. The aircraft is in beautiful condition and is presently involved in some avionics upgrade necessary to operate in this local TCA.

My check to join the Mutual Aid Society is enclosed and I look forward to getting the news letters. I am also interested in finding a T-18 Safety Manual and if you can assist me in this effort it would be appreciated.

Any T-18 owners and drivers are most welcome here at SPG, so please pass the word. Sincerely, D. Timothy Travis Director, Airport and Port, Hangar 1, Albert Whitted Airport, St. Petersburg, FL 33701

A letter from Terry Adams reads:

Re: Supplier of plumbing  
One of the best suppliers of plumbing fittings, hoses, oil coolers, etc., that I have found is EARL'S Performance Products, 825 E. Sepulveda, Carson, CA 90745 (213) 830-1620. They have a catalog of plumbing parts they manufacture to AN standards with 37 degree flares in aluminum or steel, forged or bent tube, for all types of hose

installations. As they say "Since 1973 every winner of the Indy 500 used Earl's competition plumbing." They will not sell direct but they have dealers in many larger cities or I ordered by phone from Torino Motor Racing (714) 771-1348 at jobber prices which are considerably less than Aeroquip prices.

As I was visiting Columbia (CA) airport for the Mooney Mite fly-in (I own a Mite) a T-18 flew in. I introduced myself and asked the gentleman for a ride at some time, explaining that through I was nearly completely my T-18 after 15 years I had not as yet had the privilege of riding in a T-18. This particular gentleman declined offering a ride and offered instead to allow me to use his airplane to take dual with his instructor. I was ecstatic, thanks Robert.

Anticipate finishing near the first of the year. Terry Adams, 4364 Boulder Creek Circle, Stockton, CA 95219

Dear Dick,

I have been receiving and have all newsletters from Number 1 on and so far have filled up two loose leaf binders and am about to start the third.

They are probably the best source of help a builder can get. I know in my case I've gotten thru many a tight situation with their help. Dick Cavin did a super job after he took over from Lu Sunderland and now from the looks of your style the excellence is going to continue. Only one problem. Somewhere in the switch from Dick to you number 73 has either disappeared or just wasn't published. To check, on my last trip to see Phil Tucker and pick up some parts, I asked him if he had NL 73. He looked thru his pile and suddenly realized he never got one either. If you will send a copy of NL 73 to me I will make a copy and send it to Phil.

If you would like some info on my project (it's still incomplete) here it is: I picked up plans #836 from John Thorp at his workshop in Sunland, Ca in March of 72 (1972 that is!) and in the space of three weekends used his patterns to layout and scribe all pieces of the airplane. I was an Engineer with the USAF (civil service) then working out of HQ. 15 AF. They transferred me to HQ SAC Omaha, NE in May 72; so I hauled all the pieces with me to Omaha and proceeded to cut them out and drill a zillion holes there. I got transferred back to California in 1978, so I hauled all the pieces back to Hemet, Ca. and put them together here.-- Let me tell you that matched hole technique works because everything is plumb and square. In between spurts of project T-18 work I built a house, rehabed another 2 and just finished painting the one I'm in.

I need an engine & prop to finish. Most of the wiring, plumbing, and upholstery is complete and if I live long enough I'll finish it. Everything is signed off by the FAA and they only want to see it again when its ready to fly. And fly it I will, but for now I would like to get a copy of NL 73. Sincerely Fred Barra 41168 McDowell St, Hemet, CA 92344

Dear Dick, I was pleased to see my photographs from Sun'n Fun in the Newsletter. Enclosed are some from Oshkosh. Use them if you can.

We visited the Cavins on Friday. Dick and Lynn seem very good, are as full of spunk as ever. I showed my pictures to Dick and asked him to confirm my data. He wasn't sure about David Young's dad having the oldest T-18, but Dave suggested you print it anyhow to get some response from the readers. Sincerely, Pat Eby 3206 Marten, Wichita Falls, Tx 76308

# *Pat Eby's Photos*



*David Young left, Gary La Count, Gary has been at Oshkosh 18 yrs in a row. David's dad has Oldest T-18?*



*Dean Cochran N11DC, Broomfield, CO.*



*Dave Eby's T-18 7./26/90 N53PD with Gene and Thelma Sloan (1990 Wright Brothers Award Winners)*

Dear Richard,

Please forgive the long interlude since I last say you! You will be pleased to know that we are progressing on the fuselage that you so graciously donated to Missionary Aviation Technical Training. It made the trip from Illinois to Texas without much incident. I am enclosing a check to cover the cost of the flap handle mechanism and the tool that you are selling.

I thought you might be interested in how we are going to make the splice in the aft fuselage section. We will first level the fuse, (as can be seen in the enclosed pictures), fore and aft, longitudinally and laterally and build a jig to hold the aft section in perfect alignment. Next, the skins will be back-drilled to insure alignment, and riveted in place.

Our new shop is 24' X 45' with central air and heat carpeted floors! (Don't laugh! I got this idea from Dick Cavin who said it is easy on the feet!).

If you know of anyone else that may have extra parts, assemblies, or projects that would like to donate them to a worthy cause, please pass my name on to them. I enjoy the good work you do on the newsletter and look forward to getting mine in the mail! Good luck on your project and Best regards.  
Charles O'Neal, Jr. Southridge Baptist Temple, P.O. Box 817, Mansfield, TX. 76063  
Phone (817) 477-2948

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Your Editor Needs the following items:

Set of good mags. for Lyc 150

Thorp cowling

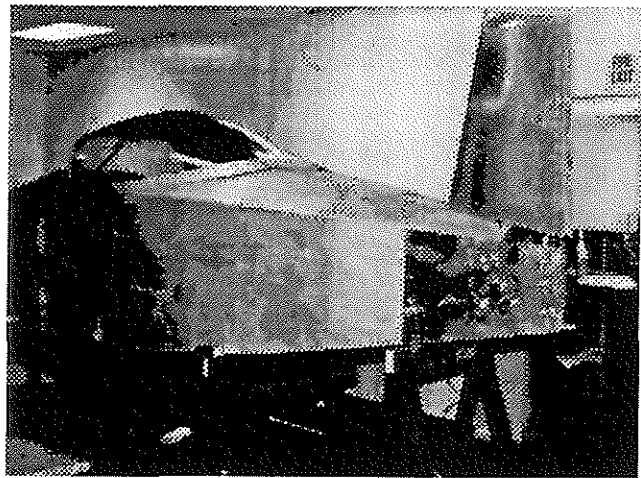
brake cylinders

Oil pressure/temperature

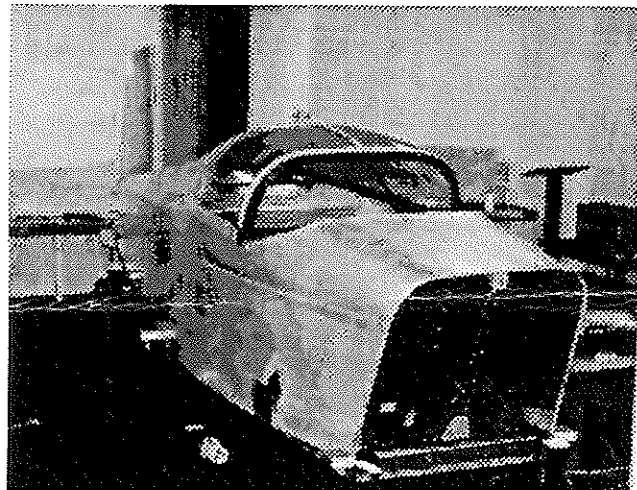
Wheel pants

Radio/transponder

The list goes on! My wife thinks it will never end, call with your price. 217-935-4215



*Missionary Aviation Fuselage in Jig.*



*This is a good cause. If you can help Charles O'Neal please do so..*

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#### For Sale Items

Set of T-18 standard plans  
and a wide body canopy frame

Lee Skillman

7676 Windcrest Dr

Mobile, AL Phone 205-633-3535

Prop spinner

Prop extension

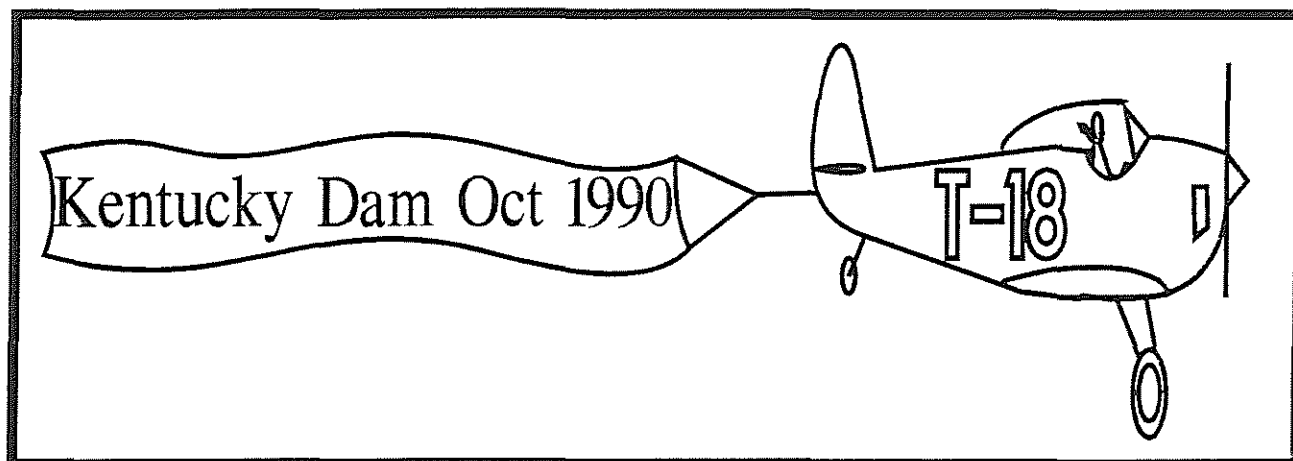
Flat-back motor mount and ring

rudder pedals

rod ends

Richard Snelson

217-935-4215



### Kentucky Lake Fall "1990" Get-together

As always, the tribe attending the Fall Get-together at Kentucky Lake enjoyed lots of T-18 flying, T-18 observing, much talk on building and flying T-18s, a lot of really good eats and some great company. Unfortunately bad weather forced early departures Sunday morning with T-18s leaving at about the same time for all points of the compass.

Most of the group arrived on Friday and spent the evening dining on 2 inch thick pork chops at Patty's Restaurant, I'm sorry we didn't get there until Saturday Morning, as Patty's is high on my list of great places to eat. Saturday turned out to be a beautiful day in Kentucky and with 12 T-18s to look at and ride in, what more could one want? Dave Eby went right to it and put me in the left seat of N53PD for a long awaited opportunity to ground steer "The Tiger". It took several passes up and down the runway but I did start to get the key points of directional control for "quick taildraggers". I think Dave's tip of concentrating on something at the far end of the strip helped most in keeping straight (well almost) down the runway and also to take your shoes off to get a better feel for control inputs. Dave found me wanting to push with both feet a lot of the time it's a little hard to get the thing to turn that way. I must say that I'm

now convinced that a lot of pilot preparation will be necessary for this editor to solo his T-18.

Gene and Thelma Sloan, the 1990 Wright Brothers Award Winners, had their beautiful "RED" T-18 at the get-together. If you want to see beautiful detailing and finishing work, this airplane is the best example anywhere. Anywhere you look, either inside the cockpit, behind the seat, or in the engine compartment, everything is done. In fact this is one of the few T-18s (homebuilts) that can have that said about it "100% finished". In my profession of engineering, one of our goals is to practice careful "attention to detail". This is exactly what Gene and Thelma have been able to achieve with N805GS. I took a lot of pictures of this airplane to use when I get ready to finish my cockpit area, but I really don't think there are enough hours in my day to achieve what they have with their project. Congratulations Gene and Thelma Sloan.

A second red T-18 made a brief appearance at Kentucky Dam on Saturday morning, I missed my chance to get the full story on this new bird, as it left in about 2 hours. It is a newly completed project, the builder is Lewis Avaramovich from Cuyahoga Falls, Ohio. It is a very nice example of what a T-18 should be. Lewis had his flight instructor with him and was quickly off to get

more stick time in his new bird.

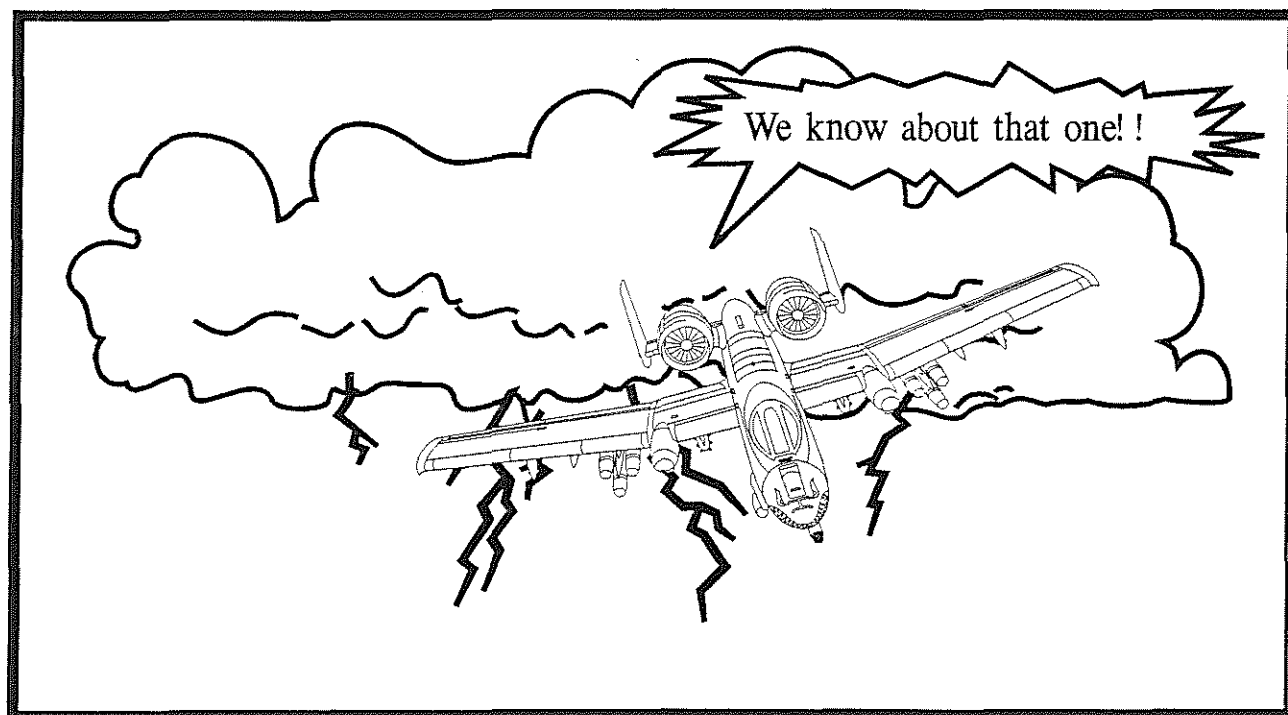
We had a really flashy Father\Son T-18 combination at Ky Dam this year. Leroy Holt and his son Gary had their T-18s on the field. Gary's bird is sporting a nice new paint job that looks just great. Good job Gary. Gary spent more time in the air Saturday then he did on the ground, that's the way it should be isn't it??

I understand from the grapevine that we can expect to see some nice smooth landings from N18117 now that Louann Jones (of Ohio) has soloed it. They tell me that Rick Jones, Louann's husband is great at aerobatics but Louann has it all over him in the landing department. Rick is a great story teller and manages to get at least one out each time I see him in Kentucky.

"Back in the good old days (when Rick was still in his prime, Editors Joke ) Rick and his copilot were flying a jet trainer, one that requires constant attention, through a front with heavy thunderstorms,

at night! With no weather radar they had just popped into a good one, and "Old Brother Lightning" had scored a direct hit! With the flash crossing the cockpit and through their flight suit zippers. What was left of their night vision was history and both pilots could do nothing but sit, blinded hoping the squirly trainer would continue, and end up in some kind of recoverable attitude. Rick asked his buddy if he could see anything and the reply was "Are you kidding". Well, to make a long story short, they got their night vision back and quickly placed a call to Center to inquire about any other cell that might be out there. The controller quickly responded that nothing was in front of them but there was one heck of a cell about 4 miles behind them. Rick lit up as bright as the lightning flash and responded "We sure as H-- know about that one!!!! Are there any others? ".

Saturday continued with Dave Eby and the other T-18 drivers making sure everyone there got a chance to get a T-18 ride if they wanted it. Thanks fellows! Everyone really





appreciated the opportunity.

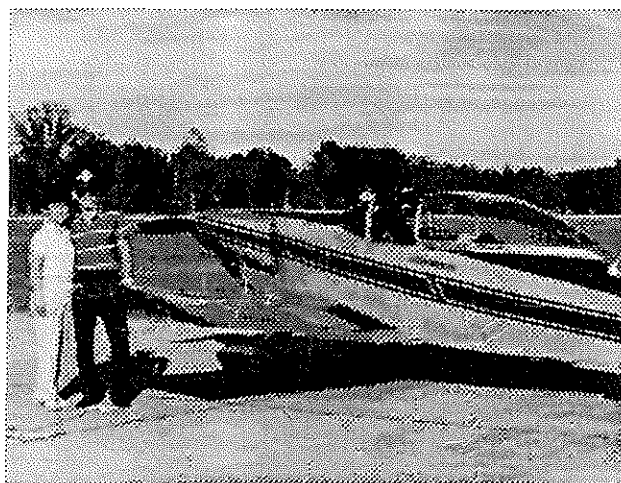
Saturday evening found us all at the customary T-18 dinner, in the Kentucky Dam State Park Lodge. We had a total of 40 people there and the buffet dinner was great. A couple of items of business were discussed and to bring you up to date here they are: The group is planning another T-18 get-together for the Fall of 1991 at Kentucky Dam. A spring get-together is also desired, and will be coordinated by Mary Holt and this Editor. As of late December, we don't have a place. We are looking and thinking about Mexico, Mo. There is an old motel on the field that has been re-modeled. I'll try and check it out early in the year and let you know the results. Best time for the motel would be in June so I was told.

The group voted on how to handle the selection of a T-18 candidate for the Dayton Wright Bros Award. As some of you may know this is usually done by the Aircraft Designer selecting the best example of his aircraft to be placed into nomination for the award. Since Mr. Thorp could no longer do this Dick Cavin carried on the honor in his behalf for some time. Now since Dick no longer writes the news letter a different method of nomination is needed. It was decided that the Newsletter Editor along with two former recipients (to be named at Osh each year) of the award would select the winner from T-18s at the Osh Fly-In. For the current year the group moved that Ed and Jeannette Ludtke of Sioux Falls, S.D., winner of best T-18 at Osh this year would be the candidates for the 1991 award.

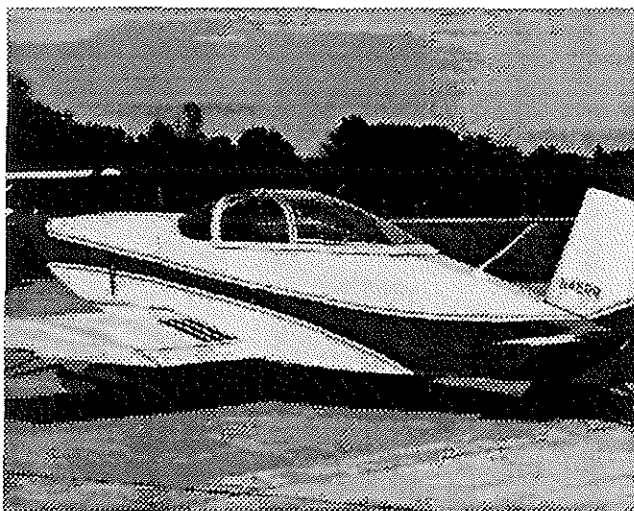
Rick Jones presented a new idea for the newsletter. Anyone that does something dumb while operating a T-18 should write it up and send it to the editor without out a name, address etc. I will start a new column for this important information that will allow our group to share and learn from his



*Gary's Holts fine new paint job!*



*Jane and Don Wolf of Fairborn, Ohio*



*Russ Ross's T-18, he's from Sioux City, IA*

or her experience and maybe save a broken toe or whatever. This same process is used in the airforce and offers a lot of education without any embarrassment for the contributor. (Leroy Holt - "Well finally I'll have something to write up for the newsletter too!!") So if you have a close call or a not so close call write it up and send it to me, with no names please!! I'll put it in the next newsletter in our new section. Any ideas of what to call this column, it must be printable!

Sunday morning found the T-18 airforce with all eyes on the weather. A strong front was across Missouri extending from Kentucky to northern Illinois. Early indications were that our trip north to Decatur Illinois might be possible by skirting the thunderstorms but we had no such luck. We loaded the C-182 with full tanks of gas and headed north around 10:00 am. About 30 miles, out we hit rain and my wife asked one of those questions that she's famous for, always at the right time and with the best of judgment. Honey can you see anything?? My reply was "Sure dear you and the instrument panel" and some bright flashing just ahead. This called for a 180 and back to Kentucky Dam. We got back in time for RoxAnne and Courtney our daughter to get a ride home with Paul and Helen Shifflet from Earlham, Iowa. Thanks Paul. I stayed hoping that the whole mess would get better by evening and I would be able to get the club plane home. By 4:00 p.m. things were getting worse, so I started looking for another way to Decatur. Well folks there just wasn't any. Well almost wasn't any. I finally found an Airport Limo Service in Pudakka, Kentucky that would come after me and transport me to the Pudakka Airport to rent a car. My expenses for this total effort to get home were as follows: Limo Service to Airport \$30.00, Auto Rental \$160, Second Airplane and a friend to fly back for the First Airplane. \$150, for a total of \$340. Oh well,

it's only money and the trip was worth it. I'd even do it again, but with a large uncertain weather system on the way the C-182 would stay on the ground in Decatur, Illinois and I'd drive down since it's only 5 hours from home. I'm sure most of you have had a similar experience while traveling cross country. I do have an instrument rating but don't fly enough to keep the thing current. Wally Hunt and Mike Hernden from Rockford had filled and left Kentucky Dam right after we did so I would like to know what their trip home was like?

#### List of attendees:

Ron & Jane Hayes 3050 N.W. Rd Mize, Blue Springs, MO.  
 Gene & Thelma Sloan 412 Lillard Rd. Murfreesboro, TN.  
 Wally Hunt 1658 Plaza Dr. Rockford, IL  
 Mike Hernden 1809 Warren Rd. Rockford, IL  
 Gloria & Lyle McCullough 1525 Beech Dr. East Troy, WI.  
 Dave & Pat Eby 3206 Martin Bl. Wichita Falls, TX.  
 Harlo & Shirley McKinty 1310 Idylwild Dr, Lincoln, NE.  
 Jane & Don Wolfe 860 Wilderson Rd, Fairborn, Ohio  
 Louann & Rick Jones 7155 N. River Rd, S.Charleston, Ohio  
 Judy & Jim Paine 4240 Wagner Rd. Dayton, OH  
 J.W. & Sue French #52 Woodcreek Dr, Wimberley, TX  
 Edward & Jeannette Ludtke 2300 Partmoor Ave, Sx. Falls, SD  
 Don Warner 118 Faulkner, New Smyrna, FL  
 Clif & Anita Redden 8774 Airport Rd., Georgetown, OH  
 Dwight & Janice Scaggs 3182 Westboro RD., Blanchester, OH  
 Jim & Darlene Perrine Rt. 1, Box 152, Cabot, AR  
 Paul & Helen Shifflett Rt. 2, Box 44, Earlham, IA

Russ & Terri Ross RR #1, Box 411, Sioux City, IA  
Gary Holt Rt. 6, Box 811, Tulas, OK  
Mary & Leroy Holt, Box 238, Savanna, OK  
Richard & RoxAnne Snelson, RR 2, Box 295, Clinton, IL  
Mac Booth, P.O. Box 580 Daleville, AL  
Lewis Avramovich 1962 13th St. Cuyahoga Falls, Ohio

Hope I didn't miss anyone.... Am looking forward to our next get together! Santa brought me a video camera and I can't wait to focus on a T-18.

Rich

Editors Last minute Note: Dec 31, 1990  
Jim Paine is checking on Kentucky Dam for the Spring Get-Together.

"Working on the Newsletter on New Years Eve"

FLASH! FLASH! FLASH! FLASH!  
JAN 3, 1991 JIM PAINE just called and said that Kentucky Dam is setting up a block of rooms for us on May 10 & 11.  
So:

A T-18 get-together is being planned for those dates. More will follow in the next newsletter.

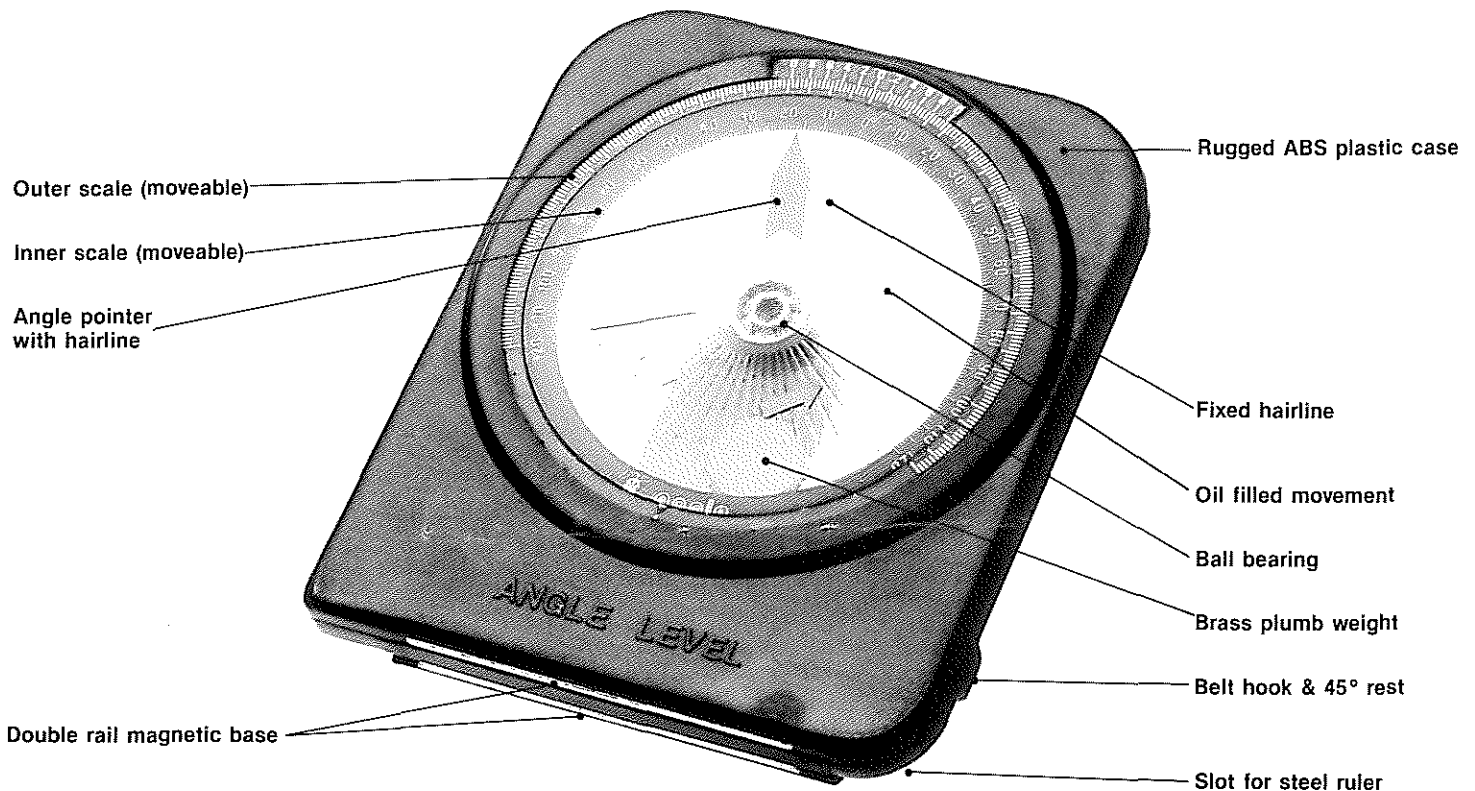


Leveling off at 4000 I tuned my ADF to 407 to track the Veals IAF for a localizer approach to Champaign-Urbana, Ill Willard Airport. It was partial overcast with heavy thunderstorms lighting the windshield every second or so. With the ADF needle center on dead-ahead, it quickly became clear that I needed about 8 degrees of right correction to keep it there. Turbulence was heavy and both pitch and yaw needed constant attention to stay on course. With the Nav 1 set to the localizer frequency of 109.10 the needle started centering just as the outer marker light and sound went off. A turn to 133 degrees quickly established me on the outbound ILS to allow a standard tear-drop procedure turn for my inbound leg. With the tear-drop and a descent to 2573 I approached the outer marker on a heading of 313 for the ILS approach. The descent continued, the middle marker passed and on we went with the runway clearly in sight for our landing. There was only one problem, the lighting and turbulence had caused me to forget to lower the gear, so guess what folks a crash! Oh well now to push the reset button and back to 4000 feet for another try. These computer flight simulators are the greatest.

A non flier in my computer section asked me a few weeks ago if I had tried the new Microsoft Flight Simulator, which I hadn't. After a short check out on my home com-

# ANGLE/LEVEL

## For Precision Angle Measurement to $2/10^\circ$



Model AL-2 shown full size.

For critical projects use the *ANGLE/LEVEL* to accurately set or measure angles. Unlike many products that stick, vibrate and bounce, the *ANGLE/LEVEL* settles smoothly to the angle due to its oil damped, ball bearing movement. The hairline pointers can be precisely aligned and the angle read off to each degree, then divided at the vernier scale to  $2/10$ . A strong magnetic base allows hands off use on ferrous metals. The *ANGLE/LEVEL* also comes with a 6 inch steel ruler which fits a slot in the base for use as a  $90^\circ$  and  $45^\circ$  square.

### PACKAGING

Each piece is blister packed along with a 6 inch steel ruler. Complete instructions are on the back.

### USES

- machining and tool making
- plant engineering & equipment installation
- quality control parts inspection
- setting saw, mill and drill angles
- aligning satellite dishes & home projects
- construction projects & home repair
- welding & fabrication
- fine carpentry & cabinetry

### WARRANTY

One year limited, for home use.



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to make accurate drilling easy!**

## DRIL+LEVEL I

Fits the rear of most drills.  
Front vial shows level.  
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Fits a surface parallel to the drill axis (when the rear is obstructed by shape, switch or handle.) Rectangular vial shows level. Bullseye vial shows vertical.

To get drill press accuracy from your hand drill, attach a **DRIL+LEVEL**. You'll drill horizontal and vertical within 1 degree of accuracy with these inexpensive two-way levels. **DRIL+LEVELs** fit your drill, regardless of size or brand.

## FEATURES

- Guaranteed to fit your electric drill or your money back
- Tough acrylic plastic vials
- ABS plastic case
- Rubber attachment pads conform to drill shape
- Fast & strong attachment with hi-temp adhesive
- Rubber pads absorb shock & vibration

## MOUNTING

Simply hold drill vertical, peel backing off pads, center bubbles in vials & attach (full instructions included).

## PACKAGING

Each piece is blister packaged for rack display.

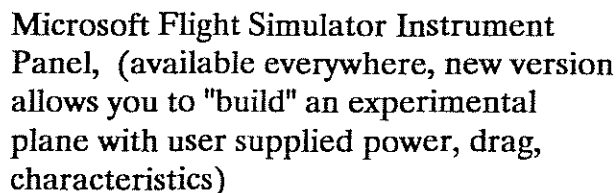
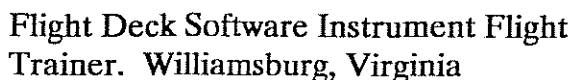
## USES

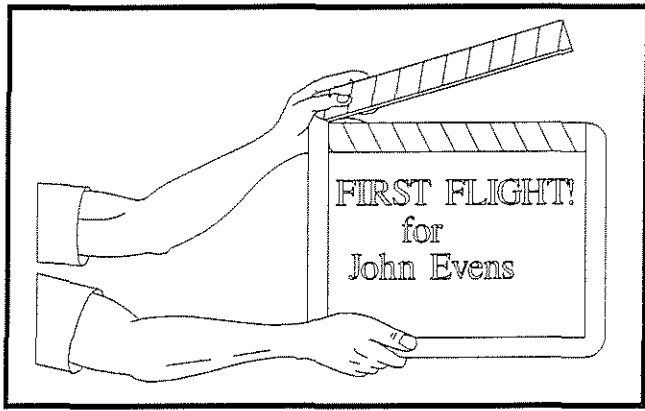
DIY projects, lock installation, cabinetry, shelf building, finish carpentry, auto work, plant maintenance, etc.

## WARRANTY

One year limited, for home use.

The Microsoft simulation includes most of the US. In fact flying it south of Chicago I found Bloomington, IL, going south of there the small 5000 acre Clinton Lake can be seen. That's where I work at a Nuclear Reactor, it isn't shown on the simulation, too bad. South of the lake just north of Decatur, IL two large TV towers are clearly visible. All sorts of conditions can be established for flight practice, several layers of winds aloft can be added with multi-layer of clouds to complicate the simulation. A variable weather generator can be started to make it even more interesting. The plane controls are handled from the keyboard or a mouse, joy-stick or yoke and rudder pedal can be used to provide more realism. I've now added the Flight Deck Simulation Software to my collection, it has hundreds of instruments approaches to practice. How's this for realism, the compass has turn and acceleration errors, its a great instrument practice tool.





Just wanted to let you know that I flew my Thorp, 71JE, for the first time on 10/10/90 WOW - what a feeling!

First, a brief history. I started building my Thorp in September of 1975. I'm 41 now. It was a slow process, with terminal burn out occurring every few years. I took time out to build a house, run my own business, raise family, etc., etc. Once I got stuck on engine baffling and literally let the project sit for three years.

71JE has a standard body, standard wing(with LDS-4-212 airfoil), 160 HP 0-320-D2A, and Pacesetter 200 prop(68 X 66)- one of the last built by the late Bill Cassidy himself before he sold his business. The airplane is fairly standard. I alodined everything inside and out, as well as zinc chromating. I also built my own small tank and power supply, and chromic acid anodized all the small parts, fittings, hinges, etc. I have Cleveland wheels and brakes, Scott tail wheel, and self-modified Scott master cylinders. I have a Harrison oil cooler (mounted left-front), 40 amp automotive Delco alternator and Ford s.s. Regulator. I used high-temp. silicon rubber sheet for my engine baffling (very nice).

I turned my garage into a paint booth, and over a two month period painted the plane myself (another new experience). Used

P.P.G. Durathane (Insignia White with Teal Blue Poly Metallic trim). There is at least one example of every paint flaw known to man on my ship - but I'm proud of the way it came out. After finishing, it was moved to Jefferson County Airport on October 13, 1990.

I bought the engine brand new about ten years ago, through Dick Wagner at Wag Aero for \$5,140.00! After draining preservative oil and filling with straight mineral oil, spinning prop by hand until slight oil pressure indication, and installing top plugs, it started right up after two blades. This was Oct. 18th. We did and elevated nose fuel flow test first, with only two gallons in the tank. We were looking of 17.5 gallons/hr. (approximately 125% of take off requirements), and that was exceeded by a comfortable margin (pure gravity flow system). It was a great feeling to move around under my own power.

The weight and balance came out beautifully. She weighs 894 lbs. empty, and can hold two 170 pounders, full fuel and 77 lbs. of baggage for a gross of 1500 and within CG envelope. Anyway, got final inspection on 10/20. The inspector couldn't find anything wrong (said he might have to just keep looking!) He gave me 40 hours to fly off restrictions.

I'm a low-time "nose dragger" trained pilot, who hadn't flown for eight years, so I got about 12 hours with an instructor in a Decathlon. That was feeling real good, so I took my best friend, Dean Cochran, (11DC), up on his offer to let me check out in his Thorp with a CFI. I can't say enough about all of Dean's help over the years, and this final gesture ranks right up there as one of the most generous things a man could do for a friend-thanks Dean! Well, after two hours and quite a few landings, I had my "type rating".



Next came high speed taxi runs (the first with Dean in the left seat). Then my turn—got the tail up and even lifted off slightly (not on purpose). It was feeling good. I have a slight amount of toe out on wheel alignment, and wanted Dean to compare handling in transition, to his. Did two high speed taxi runs with Dean, then did two more each day for the next two days myself.

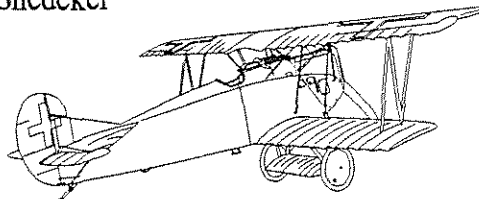
Finally, on October 30th, I was out of excuses, and the weather was perfect. I did one high speed run, taxied back and took off. I lifted off at slightly more than 60 mph indicated and quickly accelerated to about 120 mph. The feeling was INDESCRIBABLE, as all you T-18 pilots know! It flew straight and true, and went up like a bat out of you know where! WOW! I flew for about 20 minutes, then came back and landed unevenly. What a glorious feeling!

I've made two more flights since then. It stalls fairly straight (sometimes drops right wing slightly) indicating between 40 and 45 mph with flaps. Seems to trim out between 170 and 180 indicated at full throttle, and the engine will over rev—needs more pitch. I encountered the infamous “bunt” with full flaps (30 degrees) and almost full tank. Airspeed was gently bled off to below 40 mph indicated, when a very violent break occurred, (-1G on the meter), to straight down of slightly inverted, gradually transitioning to a very steep dive. Speed was increasing rapidly and stabilator control was non-existent (absolutely dead, fore and aft). As soon as I dumped the flaps, the stabilator came back to life instantly! I lost 1500 feet in this maneuver and pulled 4.5 G's positive (ground was approaching). Although it would be very hard to get that slow normally, I intend to avoid 30 degree flaps with forward C.G. from now on. Will send more information, if possible, later.

John Evens 6855 Allison St, Arvada, CO

## Reprint from "Wind in The Wires"

by Frank & Sabrina  
Snedeker



### AND NOW YOU WILL READ ... THE REST OF THE STORY

By Frank & Sabrina Snedeker  
Reprint from "Wind in The Wires" The  
Newsletter of EAA Chapter 26 Seattle,  
Washington

The first flight of our T-18 was reported in the August NL, and in the ensuing six weeks the 40 hours of testing was completed. It was not completed in time for Oshkosh. It is not the sort of thing you force. By early Sept it was ready for a short cross country flight, like a shake-down cruise, and Sabrina and I flew to Thun Field in a loose formation with Cecil & Fanny Hendricks for lunch. Later we took a longer trip to Chehalis to a Fly-In pancake breakfast and airshow weekend where we saw Bill Sjoberg and his Jodel. And, we had the T-18 loaded and ready to fly to Silverwood ID, for a Chapter 26 Fly-In Campout but the weather in the Cascades kept us grounded.

Some statistics on our T-18. Full fuel is a 29 Gal. main tank and 9 gals. in each wing (47 Gals or 282 lbs.). For two souls we can carry 60 lbs of luggage; enough for sleeping bags, tent, some food, changes of clothes and trading items for the natives. Flight planning books and charts and survival/first aid items.



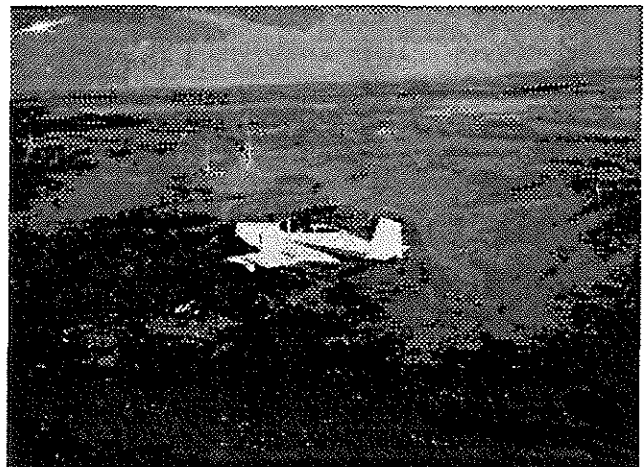
By the third week of Sept we were ready to head for California to visit family. The weather was beautiful. For personal reasons we could not get airborne until 3:30 p.m. so we stopped at Grants Pass (Josephine) for the night. (note) In the mountains night falls with the flick of switch. We had a light tailwind on landing. The left brake line separated at the firewall Nylo-seal fitting. Hydraulic fluid has its' own smell. We secured the T-18 and the airport attendant drove us into town.

The next morning we had the break repaired in less than an hour by Peter Goyen at Grants Pass Aviation. He was helping a builder with his Questair in the hangar. Almost finished... beautiful... and another builder came by with his RV-6.. he's half way through his 40 hour testing. Then we took off and flew past Medford and Ashland, over Shasta Dam and refueled at Red Bluff. Then on south to Orland (Sabrin's birthplace) and turned eastward over Grass valley (home of the Radio Systems Tech...RST Nav-Com which is primary in our airplane) and on into Stockton to visit family.

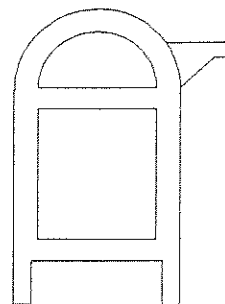
We flew from Stockton to Santa Rosa - then to Modesto and back to Lodi. Refueled to capacity to head home with a planned fuel stop at Ashland. With 47 gals on at Ashland we headed for Arlington. Weather there was not improving. We turned to our alternate at Ellensburg. We landed Monday afternoon.. with 1.5 hours fuel remaining. The Puget Sound area was solid smoke-haze for several days. We took a Greyhound home and this is not so ignominious as scratching the T-18 on a TV Tower. Cecil Hendricks flew me back to retrieve the airplane. During the weather, at 6,500 Ft. it was 60 Deg., at 4,500 Ft. it was 48 Degs. This inversion held the SMAZE down and the smell was noticeable when we finally got 8 to 10 mile visibility. An excellent trip- and an excellent airplane.



*Another photo sent by Pat Eby, This is Paul Kirik and his sons.*



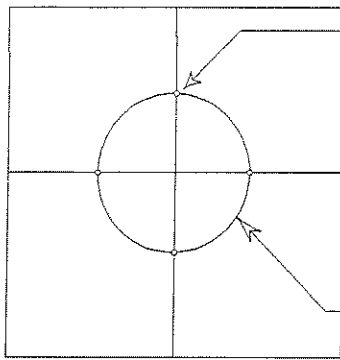
*Our newest member Mr. Brooks Hanna shown flying over SD. near Spearfish, he's asked us to come to Spearfish (Black Hills Airport) for a get-together next year. he's has an auto dealer ship and will furnish as many cars as we need. I like the idea, but think that it would have to be a week long event in order to go there.*



*Let me Know!*

# Marking Jig for Horizontal Tail Tube

- 1 square scrap aluminum plate stock at least .250 inches thick and scribe cross hatch and circle



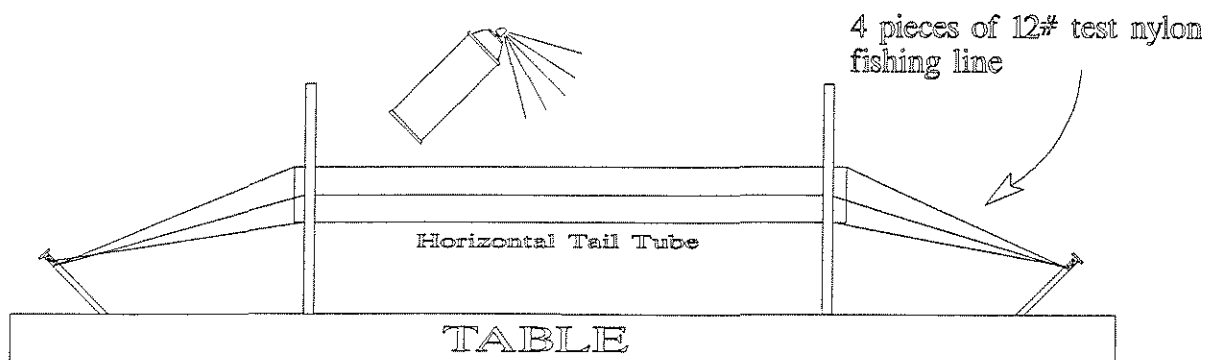
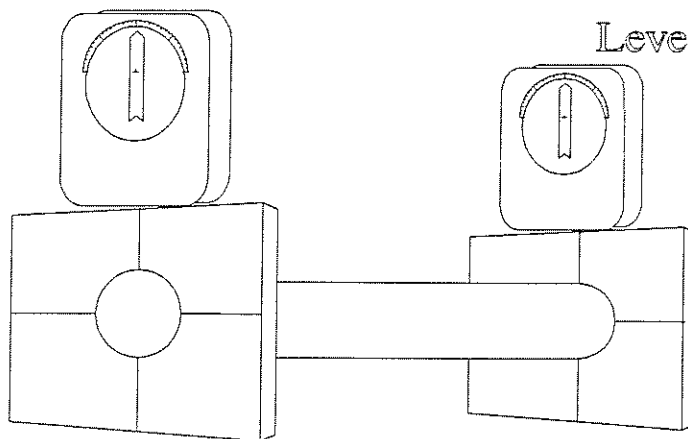
- 2 drill #52 typ. 4 places

Alignment End Plates

- 3 machine to fit horz tail tube

4

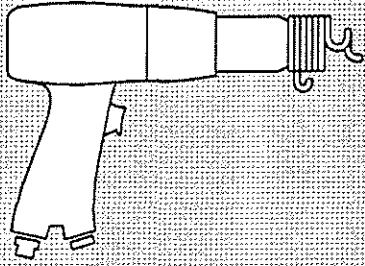
Level both ends



5

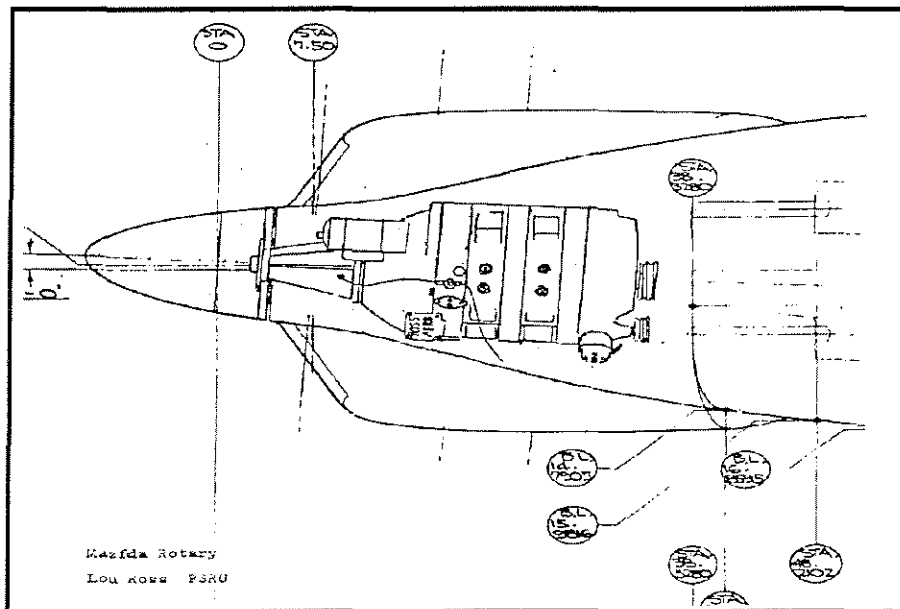
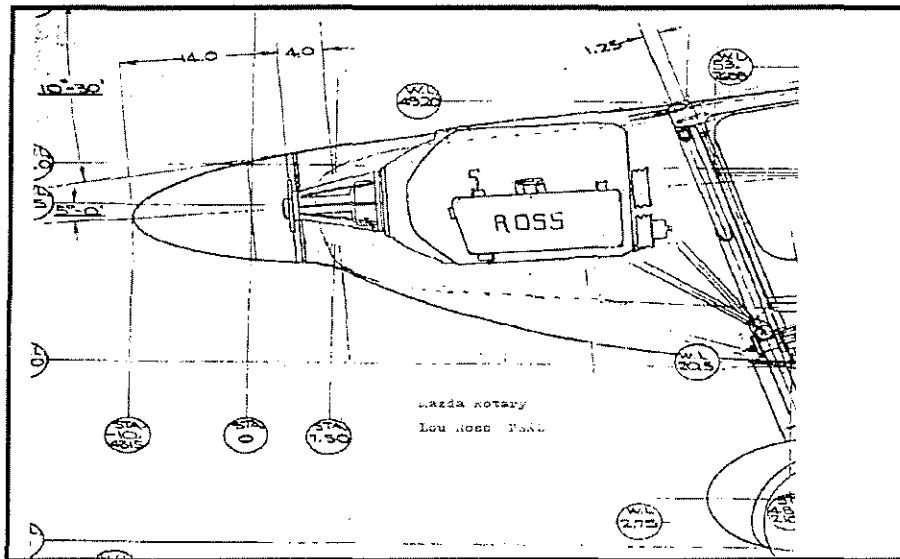
- Stretch the nylon very tightly through the four #52 holes in each end plate then spray them with a light coat of zinc chromate

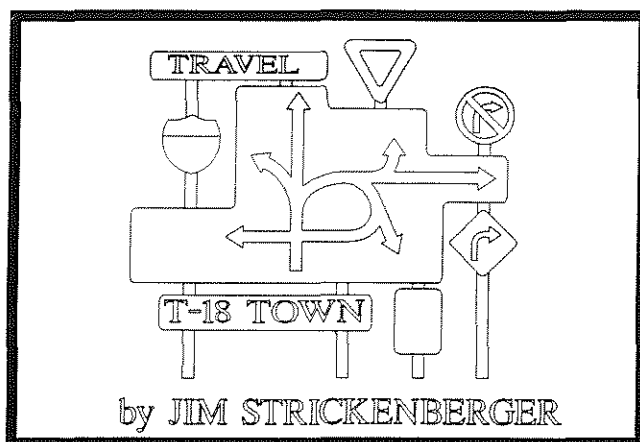
## Builders Corner



## MAZADA ROTARY

Drawings from LOU ROSS  
PSRU





Hope this little report will do something for your next N.L. #77. As I had stated in N.L. #74 I was going to be traveling in the South & West U.S. That we did, and what a time it proved to be. Visited quite a number of Air and Naval Museums. Stopped to see T-18'ers Bob Yeakey; then stopped to look at his engine project at Ross Aero in Tucson, AZ; talked to Dick Cavin but unable to see him while in Dallas, stopped and spent a beautiful afternoon with Robert Praker in Scottsdale, visited for spells with Bud Wight & George Truven plus others in the San Diego area. While out there, G. Truver, who is originally from this region of PA., told me about a project he saw for sale in N.L. 75 that he was sure would be only about 50 miles from my home. I checked into it when I got home and eventually bought Dick Turkenburg's partial project of Madison, Ohio. It appears the original buyer, per John Thorp's letter of 25 May '72, was a "L.C. Cunningham" of Oklahoma City (S/S of plans 848) and the fold wing plans (T18C wing S/N 41) per L. Sunderland of Aug. 1, 1975.

I had bought my own plans from John and Lou in 1982 so I will no doubt use my S/N for each in continuing the building.

My T-18 plans from John Thorp are 1453. My T-18C fold wing plans from L. Sunderland is 327. For the sake of clarity and

updating of your files, you could remove Thorp plans #848 and Sunderland plans (T-18C fold wing) #41, until such time as I may be able to sell them.

So far, most of my time has been spent inventorying the parts and bringing myself up to the level of completions and where to begin on what. At the present I'm recuperating from a knee operation, but after the holiday season we are now in, I hope to get underway.

I've also been reading and re-reading the previous N.L.'s (and I thought I'd done that when they first arrived) but each re-read point out something more interesting.

I've had my mind set on Dave Blanton's V-6 conversion (never was to impressed with air-cooled engines anyway - and that's from clear back in WW II) so I would like to get some letters off to some of those who are also on that program.

Sorry I was unable to make the two 1990 Kentucky State Park get togethers. Having had made the Oct. 89 one, I was hoping to do so in '90 but what with our traveling time in July, Aug, and Sept and other commitments prior to and following these months it just didn't work out that way. I did get one tape copied and sent to Dick Cavin and tho' I indicated to some others I'd try to do the same for them it just never worked out. Sorry about that.

Well, Richard I'm sure this will be late for the Christmas date but hopefully prior to the New Year, so hope you and yours had a joyous and holy day and that you will be blest throughout the New Year with happiness and progression. Take Care, Jim Strickenberger 4344 Gem Court, Erie, PA 16504 EAA 123426

# LESSONS LEARNED

## "the hard way"

*This new newsletter section will contain lessons learned, submitted from our Mutual Aid Group. Send your "Lessons Learned" to the editor without your name or address. I will publish without comment or clue.*

Pilot: 4000 hr ATP, 150hr taildragger experience 5 years before.

Bought "new" used Thorp having never talked to anyone that had ever built or flown one - after 5 landings supervised by the seller, I took my new toy on a 1100 mile cross country to my home strip. The three enroute stops at 4000' runways did not prepare me for my 1700' grass strip even though I practiced "short" field landings at each stop. I was surprised at my first landing attempt at my strip - couldn't get it down in time to stop before the end fence. Better airspeed control and putting it on the first brick (grass blade) on the second landing provided a stop prior to the fence.

Later that night I read the early Thorp Newsletters about landings, simply said you should use a minimum of a 2400' strip until you are comfortable, then 2000' is the absolute minimum - I totally agree with these numbers!

Bad:

Buying an experimental aircraft with NO knowledge of the type short check-out from an owner who had only owned the aircraft for one year and not overly comfortable with it himself.

Long cross country immediately after purchase.

No real short field landing practice prior to attempting landing at a short strip.

Good:

Went around from first landing - realized I couldn't get it stopped in time.

Contacted someone familiar with Thorps.

Read old newsletters and joined the Newsletter.

T-18 Engine Experience

Had low compression on all four cylinders at 700hrs

SMOH. Decided to TOP the engine. Selected the

"BEST" rebuild shop in the region to rebuild and provide

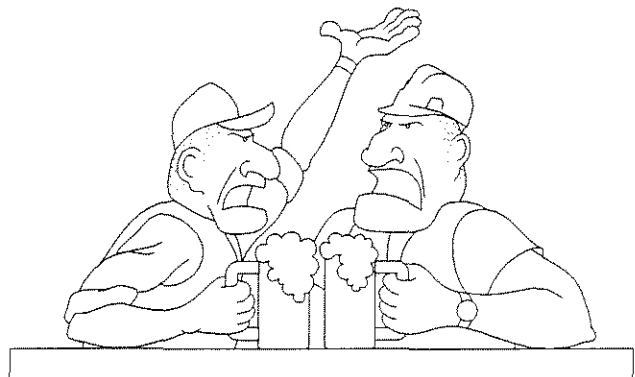
4 yellow tagged to new tolerances cylinders.

I installed the first cylinder without removing the cosmo-line type preservative. I installed the remaining 3 after "degreasing" the cylinders. I then decided to remove the first cylinder and discovered the oil ring was crushed into a fine white powder and the cylinder was scratched to the point of salvage. The cylinder had been choked with TEN times too much choke, resulting in the total compression of the oil ring. I trusted the rebuild shop to deliver the parts within tolerance. Excessive downtime - I removed the rest of the cylinders and checked the tolerances prior to start-up. They were OK. The shop replaced the cylinder and ring at no cost to me. I learned a life-long lesson - no matter how reputable the supplier - CHECK THE TOLERANCES YOURSELF .

Editor's Note:

Thanks fellows for the above articles, I'm looking forward to at least a couple contributions for this column each month. So FESS UP GUYS!

" I'll never tell "



I heard it over a beer!

# NEWS LETTER RENEWAL

Dear T-18 Mutual Aid Member:

To all of you that have sent letters and articles for this newsletter I want to thank you and ask that you continue to contribute to this forum and source of knowledge for that airplane we love and admire. It's been a great year for me, I've enjoyed the opportunity and experience of making a great number of new friends and renewing some friendships that date back to the days of my first T-18 started in 1964. I'm about to finish my right wing flap, which will complete all the structural components on the new bird, and I must tell you that "everything" has not been written about how to put this thing together. For example I've worked out a simple method of bending the flap skin that allows it to fit across the top spar without all the hassle of pulling and sweating. I'll write up my flap assembly article in the next newsletter so the method can save time and problems for the next guy. "Get the Point". Pickup the pen and write down how you went about it! We have a lot of builders out there that need and want your help.

Please send those articles, on any subject that you think the group might like to share in. I'll polish them up (if you want) and get them in the next newsletter.

I planned last year, so that all memberships would come due this Jan. That's about the only way I can keep track of this and still have "spare" time to build. The dues are the same as last year \$25.00 for U.S. members. I've added some new software to my publishing computer and have started to learn how to draw with it. How's the new T-18 drawing on the back cover?

I purchased two dozen of the angle levels for the T-18 builders and have several left, but this is the last chance for you to get one from me since I just don't have time to do mail order and get the plane flying by 1992. I've included a color brochure about this useful building tool. The price is \$30 including shipping. I still have some copies of the indexed book that covers newsletters 1-44, I also have sets of newsletters 45-to present. These are \$35 each. I hope you like what I done this year, and will continue to support our Mutual Aid Group.

Your Editor, Richard Snelson

## Renewal for 1991

Name \_\_\_\_\_ Aircraft N# \_\_\_\_\_  
Address \_\_\_\_\_  
City, State, Zip \_\_\_\_\_  
Currently flying? \_\_\_\_\_, Hours on T-18 \_\_\_\_\_  
Current Status of project \_\_\_\_\_

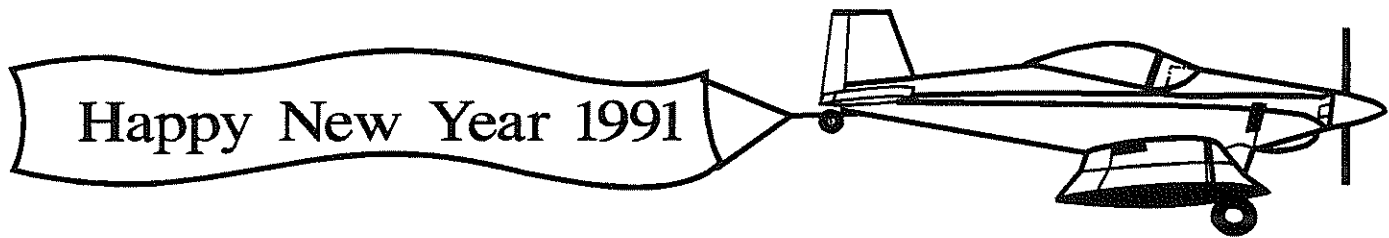
Please include a check or money order for \$25.00 My address is Richard Snelson  
Route 3, Box 295 Clinton, IL 61727 Thanks!

TX

[REDACTED]

Bulk Rate  
U.S. Postage  
Paid  
Permit No. 137  
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T-18 NEWSLETTER  
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CLINTON, IL 61727  
1-217-936-4215

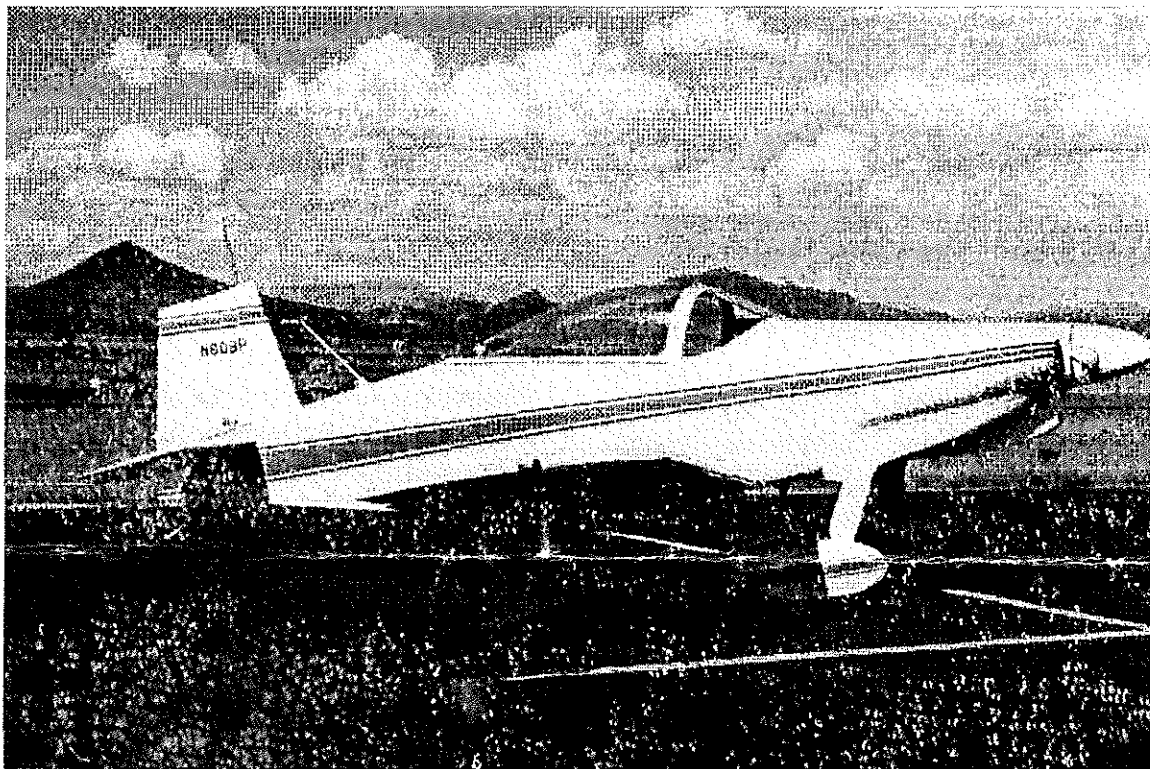


See inside for newsletter renewal  
information. Thanks for your support!

**T18 NEWSLETTER  
NO. 77 DEC 90**

# T-18 NEWSLETTER

ISSUE NUMBER 79



*Edwin Poe's Beautiful N808P of Phoenix, Arizona*

## *In This Issue:*

Editors Trim Tabs

Letters to The Editor

T-18s of Pheonix by R. Snelson

Patter From Pat by Pat Eby

IFR in a T-18 by Harold Thompson

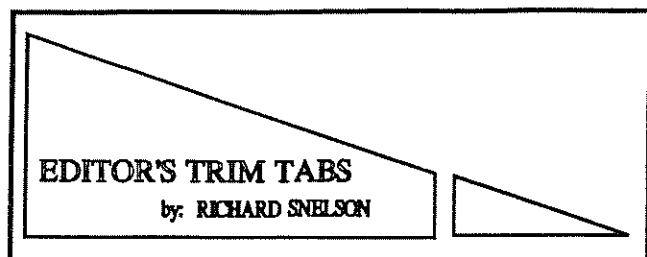
Builders Corner

Flight Safety by Lee Skillman

Lessons Learned The Hard Way

*NOTICE: (STANDARD DISCLAIMER) As always, in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.*





I've promised myself to get this newsletter into the mail so you could have it before the Oshkosh Fly-In. So I'm taking a portable computer with me on a business trip to Phoenix and plan to work on it in the evenings while I'm there. With my T-18 nearing completion it's gotten even harder to work on the newsletter at home and I thought we needed number 79 out early to pull together our Banquet on the first Friday night of the Fly-In, especially since I had the wrong date in the last newsletter. (I have to tell you it caused Lee Skillman "near heart failure" since he had non-refundable airline tickets to Oshkosh and he thought he had purchased them for the wrong week! Sorry Lee I goofed!) Our guest of honor, at the banquet, this year will be Steve Kirik. Steve fought in the Gulf War in The First Fighter Wing, flying many combat missions in his F-15. I'm sure Steve will have some very interesting stories to relate to us after dinner. He will also be an honored guest of The Fly-In, with plans to arrive with another member of his squadron in their F-15s. Steve is a T-18 builder, having worked many hours on N11PK with his dad Paul Kirik of Moline Illinois. Steve requested all the old T-18 newsletters, to read while in Saudi Arabia. I believe he maybe planning a T-18 of his own. "Glad your back Steve" and I'm looking forward to seeing and talking with you at Oshkosh. Lee Skillman is returning to the T-18 fold, he's building another one folks, and will help me with the MC duties at the banquet. Let me know if you plan to attend the dinner as soon as you know, call me at

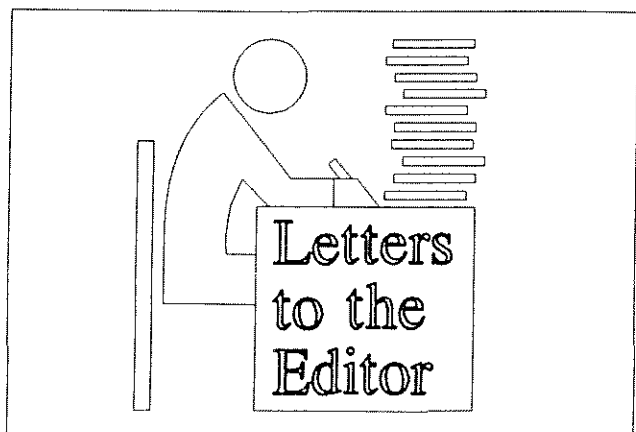
217-935-4215 or be sure and sign up on the flight line Friday during the day.

My current plan is to arrive in Oshkosh on Thursday, and stay on our restored "wooden cabin cruiser" at the Pioneer Inn Marina. If you have a car and can get over there please drop in as we will be there most evenings and would like to sit and talk airplanes with you. The boat is a "Carver" 24 foot cruiser, painted white with maroon trimmings. If I have time to do a good tune up on the engine before the fly-in we might try to give some rides. It's really fun to watch the war birds circle up over the lake. I swear some of them are trying to get their guns aimed at us on the water.

In my workshop the bird continues to take shape, last week I cut the windshield and canopy, that went well with the help of air tools and a great drilling tool called the unibit. This little tool drills 1/2 inch holes in Plexiglas as fast as you can go with out any signs of cracking. All you need is a 1/8 in pilot and the unibit takes it from there. The bit goes from 1/8 to 1/2 in steps, and will also drill the pilot hole.

I have some of the engine work done, alternator wiring, vacuum pump plumbing, and a start on the baffles. My crossover exhaust system has arrived from Custom Aircraft Parts, in San Diego and after one small fitting adjustment on the left rear cylinder it looks great. It's about as tight as you can make a T-18 exhaust system. I need to get the instrument panel painted next so I can mount the instruments and do the wiring and plumbing behind the panel. I'm planning on a bright yellow paint job and my wife is about to throw-up over this!

----- I've been in the Phoenix now for several days and have met some very nice T-18ers. See the story in this newsletter.



My name is Charles Kenny and Fred Hartman of Delray Beach, Fla. is a friend of mine. I have flown in his T-18 and I know it is the plane for me. I do have a Piper Arrow, however I am looking for a T-18 either completely built or at least mostly finished. I live in Mohtauk Point Long Island so I am looking for something up that way. If you should hear of any drop a line. Just came from Sun & Fun and saw Dave Eby's beautiful T-18. My address is Charles Kenny P.O. Box 0, Mohtauk, N.Y. 11954. Thanks C. Kenny

Richard, Thought I'd better tell our guys to save our slips that we get from buying parts, for the feds need to see if you've paid tax on that new plane you just built. ----- Enjoyed Ken Morgan's article on the 0290 GPU, as well as the rest of the N.L. Nicholas Shewalter, 4250 New Lathrop Rd. Corunna, Mi 48817

*Editors Note: The tax thing is news to me. I'm not sure if payment of state sales tax is any of the FAA's business! However why would they let that stop them? Anyone else have this problem or question raised by the FAA?*

Dear Richard, Up to the the present time, I have put in about 7,500 hours on my T-18 project. Cost thus far has been in excess of \$63,000.00 -- This is over a period of about 9 1/2 years.

I guess it is about 85% to 90% complete. Some people say that airplane building is fun! Do you know where the fun part comes in? Also, do you know of anybody that in the Phoenix area that works cheap? I sure would like to hire somebody to help finish this damn thing -- but, I can't afford to pay the \$15 to \$20 an hour that most people want (some even want as much as \$40 an hour). Bob Praker, 6519 W. Aire Libre Ln, Scottsdale, AZ.

*Editors Note: See my article "T-18's of Phoenix" in this newsletter for photos and short story on Bob's project.*

Dear Dick, Let me start by introducing myself. I'm Harold F. ("Tommy") Thompson. I recently purchased Dan Derby's Thorp serial number 1423, N444DD. It is my second one having purchased Herman Rassler's N4083B many years ago. I sold N4083B and after many airplanes since I finally got back into a Thorp. I'm sure you and many other of the T-18 owners know of Don's Thorp. He has been at Oshkosh 3 times I think. ----- I just called in my reservations for the Kentucky Dam fly in May 10-11. I plan on arriving Fri. around noon and leaving Sunday morning. Its quite a distance from Las Vegas NV to Kentucky but by strapping on oxygen and going high it should be a fun trip. See you and all the others there with a little cooperation from Mother Nature. Harold F. Thompson 3123 Valleywood Rd, Henderson, NV. 89014 Phone (702) 454-6244

*Editor's Note: He got there, without the cooperation from Mother Nature. See his second letter in this newsletter "IFR in a T-18" Tommy is a swell fellow! I Really enjoyed talking, visiting and flying with him.*

Richard, .... I really enjoyed working with you on your T-18, not to mention returning home with a few new parts for my project.

My name is Roy Farris, I grew up around the local airport and my father has been a pilot since I can remember. I began taking dual instruction when I was fourteen, using my dad's Piper Colt, and soloed in six hours. From then on it was a slow process, but I finally got my private at age twenty three. I bought a Colt and had a ball for three years, until financial problems forced me to sell it. Karen, my wife, on the other hand had never been in or around airplanes until we met. I gave her, her first ride and she loved it. She couldn't believe I was actually going to build an airplane. She had seen my pile of parts and just shook her head. It wasn't until she saw T-18's at Kentucky Lake last fall, and saw Richard's project, that she really began to believe. Now she is almost as excited as I am.

My T-18 project was started in 1968 by a close friend of my family. I can remember as a youngster seeing all those airplane parts in this guys basement and hearing him and my dad talk about it. I would have been twelve at the time. The project got moved a couple of times, went through a fire, and was finally stored in a basement. I had forgotten all about it.

I began looking for an airplane to build. I have been into serious R/C modeling for fifteen years, and decided to just try my hand at something a little larger that I could ride in. I looked at KR-2's, RV3 and 4's, Midget Mustangs and a few others. One evening while scanning an issue of Sport Aviation I came across a picture of a beautiful T-18 with its owner Cliff Redden of Georgetown, Ohio. I picked up the phone and gave Cliff a call. I told him of my desire to ride in a T-18 and his immediate yes answer found myself and a friend (Wayne Hahn) on our way to Ohio.

Wayne and I spent all day Sunday looking and asking questions. Cliff had told Jim Paine of Dayton, Ohio of our visit and he and his wife Judy flew down. Not only did I get a ride, I got rides in two T-18's. Wayne even got one. Jim showed me the do's and don'ts of the T-18 and I got to fly both airplanes from the right seat. As you that have flown a T-18 well know, I had decided to buy my friends project before we landed.

When I arrived home I gave my friend a call & discussed all the details, and two weeks later I unloaded the project into my house. (It was the only place I had) since then, I have gone over the plans, read all the newsletters, and took inventory. I'm getting ready to build a workshop and I'll be ready to begin construction soon.

I really want to thank all the really great people who have helped me over the last year. I especially want to thank, Cliff Redden, Jim Paine and Richard Snelson. I would also like to thank Rick Jones of S.Charleston, Ohio for the most thrilling ride of my life. For those of you who know Rick, well lets just say that our wings weren't level for very long at a time. I met Rick at the Fall get together at Kentucky Lake last Fall. Thanks again Rick, I'm ready to go again.

Guess that sums it up, except to say that any of you T-18'ers out there that have any parts for sale I sure would like to talk to you. I'm in the market for lots of parts. Give me a call. Thanks Karen and Roy Farris (618) 723-2594

#### *Another letter from Roy*

Richard -- Karen, Chris and I had a wonderful time at Kentucky Dam. Karen wants to say thanks to Jim French for her first T-18 ride. She loved it! She is really sold on the T-18 and is pushing hard for us to get busy on ours. I want to thank Cliff Redden for the

use of his plane, and Jim Paine for flying with me, I had a great time.

As we all know sport flying is on the decline nation wide. In my area it is practically non-existent. Our local airport has only five privately owned airplanes, and our area has only one homebuilt. It's a Skybolt but it is based at a neighbors airport. On a good Sunday afternoon you might catch one or two guys out flying but you'd have to be lucky.

The Olney area Pilots Association (OAPA), is trying to get some interest generated. Hopefully we can get some students started and some licensed pilots out flying again. The OAPA is organizing a fly-in, drive-in open house on Labor Day, Monday Sept 2nd.

This is an invitation for all T-18'ers to fly-in to Olney, Illinois and show what sport flying is all about. Come on guys, help show the Olney area what it is that we are all so crazy about.

There will be a trophy for the best home-built, best antique and fly-bys are welcome. I am looking forward to seeing some of you at my home field. Olney Noble Airport (OLY) is located 110 miles east of St. Louis, Mo. on Ill. Rt. 50, 17 miles from Samsville VOR @ 343 degrees.

The OAPA will appreciate all the help we can give them. I'll guarantee a free meal to any T-18'er that fly's in. Call (618) 723-2594 for more information. Thanks Roy & Karen Farris

Dear Mr. Snelson, .... also 2 requests, First, I would like to find the co-ordinates for airfoil GA(w) -1. I can not seem to find them here.  
Second could you send a list of the material

used in the S-18, when scratch built. Such as how much sheet metal, extrusion angle, metal for landing gear and etc. Thanks Richard Taylor 185 Monteray Dr. Nepan, Ontario.

*Editors Note, We'll see if someone can help on this. I can't remember a material list in the newsletter.*

Dear Richard, ..... Since I talked to you and ordered the newsletter and back issues, I purchased a beautiful T-18, N312LL, from J. Paul Warren. My real name is Paul J. Warren. As far as we both know, we are not related. It was built by Lawrence Larcom and first flown in 1969. Total time on the airframe is just over 600 hours. I have 50 hours in it would have more but for some schoolin, the winter weather and shoulder surgery in February. The airplane had been damaged and was being restored by Nick Seraphinoff, T-18 N11101, when I discovered it. I helped, in a very minor capacity when I could get over to Detroit from Minneapolis, to reassemble it and got a good chance to view the excellent workmanship by Mr. Larcom and Nick.

Everything that I have heard about the Thorp is true. If it were any more fun to fly, the government would make it illegal. The powerplant is an 0320-150. Cruise at 2450 RPM is about 160 MPH (airspeed indicator reads low - stall indicates 43 and altimeter drops about 150 feet from ground to flight, I suspect a slight pressurization of the static system). It includes a full panel, Narco Com-200 com/nav w/glideslope and AT-50 w/mode C. I have wheel pants - painted but not yet installed and strobes - power supplies purchased but not yet installed. I also have a second com set, an RST audio panel/intercom/marker beacon that I built and an accelerometer, all not installed. My intention is to rebuild the entire panel and include a loran, some decent engine monitoring instruments and a fuel quantity indicator which I am

currently sans (top off before flight). The canopy fit needs improvement, too. There is no hold-down mechanism for the back; it's too drafty in the winter but ventilation for hot weather improved. There are a number of other problems/improvements that should be attended to, and that sounds like a lot of complaint, but in fact I am delighted with the airplane and just look forward to making it even better.

I'm still working my way through the back newsletter issues. They have been of great help to me. I highly recommend them to anyone either building or purchasing a T-18. Thank you for your efforts to keep the T-18ers informed and in contact. Sincerely Jack Warren, 2887 Lakeshore Ave. Maple Plain, MN 55359

*Editor's Notes: I have the RST Audio Panel completed also. I'll try and put together an article on building the unit for a later newsletter. The cost for the kit is around \$300 less than the other completed units on the market. Quality is excellent, and goes together in a couple of days. Pretty good pay for two days work!*

Richard, ..... You ask if I'm interested in serving as a focal point for the T-18 events and builders help in my area. I am not certain what I would be responsible for, but if it is just promoting the T-18 and helping builders where I can, I am willing to do that. I have served this area for years as a Chapter Technical Advisor. In fact, I have been helping builders solve all kinds of problems on a multitude of homebuilt designs for the past 15 years. In addition to the mechanical and technical assistance, I've test flown a local T-18 and checked out two other T-18 buyers in still another newly acquired T-18 aircraft. I do feel somewhat qualified to help builders with the final phase of construction as well as that emotional first flight. I am more that willing to help T-18 builders where I can. Go

ahead and list my name and phone number as a contact for technical and other questions.

I'm cleaning up the writing on my T-18 wing construction sequence. Please list it's availability in the newsletter. I'm certain it will be of help to those who request it. I'll send you a copy when I finalize the writing. Looking forward to meeting you at Oshkosh. Best regards.. Joseph Gauthier 9 Kowal Dr. Cromwell, CT 06416 Phone (203) 635-4058

*Editor's Note: Thanks Joseph, that's about what I had in mind with the T-18 support and help in your area. I think you also have enough T-18s out there to have a get-together. It would be great if a couple of you fellows could find a place, much like Jim Paine does for the Kentucky Dam gathering.*

Dear Richard, ..... I bought serial #927 N927AS one month ago. It was completed in 1981 by A Silvasian. The plane has 600 hrs, 180 Lyc. C/S prop. I've got 24000 hrs, 5 in T-18.

A set of newsletters, 1-77, arrived yesterday. A most valuable collection. I've been looking through them for limitations. (I have nothing) and so far found them very useful.

I don't want to miss any issues so please start me with #78. Thank you for your effort & dedication. Harold J. Ballatin 3535 Heroic Drive, Rancho Palos Verdes, California 90274. Phone (213) 377-1410

Dick: I ran into a problem I have not see addressed in any previous newsletters, after engine installation, 0320 E2D, the oil sum was pressing against the lower left cross member of engine mount (Dynafoal - Brock). Rubber mounts were new, engine off-set OK, no engine sag. Several design people, A&E people, other builders, etc. looked at the difficulty and an scratched

their heads. Answer came from local engine guru.

Engine was lifted sufficiently to take weight off mounts and one at a time mount bolts were removed and used washers (taken from old mounts) one for each cup were slipped between engine flange and inner rubber cup. I now have about 1/4 in. clearance which hopefully will be sufficient.

This may be common knowledge to everyone except this select group of dummies in outer San Diego.

Does anyone have a really good throttle, mixture, carb heat cable support system firewall & carb? I have run the carb heat cable to an attach clamp on the rear of the carb box which I am satisfied with. The throttle and mixture cables are clamped to the engine mount cross member which seems to be satisfactory but it is my unique solution to this problem. Has one consensus way of doing this involved when carbureted engines are used? Thanks for any & all help. Larry Whetzel. 15621 Calistoga Dr. Ramona, California. 92065

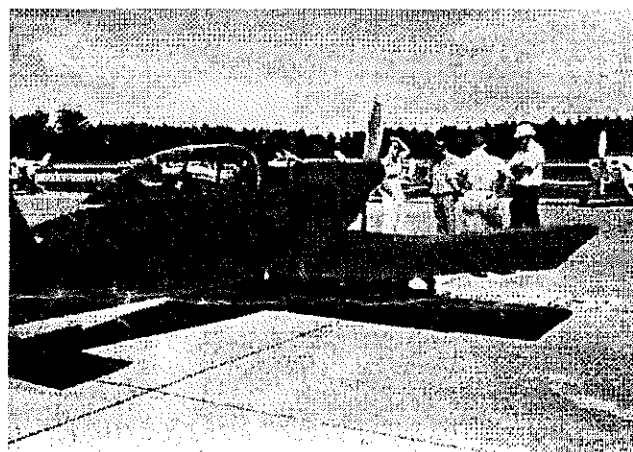
*Editor's Note: Don't know if I can help on this problem, I'm working on a clamp for mine now. I've looked at a number of engine installations and I can't remember any two being alike on cable clamping.*



*Bad Weather T-18  
EAA T-18 PLATES*



*George Truver new T-18, we will have a story by Wally Hunt and more photos of George's airplane next newsletter .*



*Lewis Avramovich's N67LA 10/6/90 at Kentucky Dam*



*John Mihaila's and Dave Eby's twins, soon to be triplets 2/25/90*

# FOR SALE

For Sale: (1.) T/s-18 Horizontal Stabilator, internal counter weights, skin SS pop rivets - rest solids. Workmanship - "8" \$500 OBO (2.) S-18 Ailerons, 2 ea. flush solid rivets. Workmanship - "9". \$250 set OBO. (3.) Escort 110 w/antenna and tray, "Servicable" tag, \$200 OBO. (4.) S-18 Plans w/ Sunderlands's book, \$150 (5.) 180 HP '63 Olds Aluminum V-8, professionally rebuilt, ready for reduction unit and accessories. \$2000 OBO. Alan Reich 2161 Gazebo, Idaho Falls, ID 83402 Phone (208) 522-3191.

For Sale:

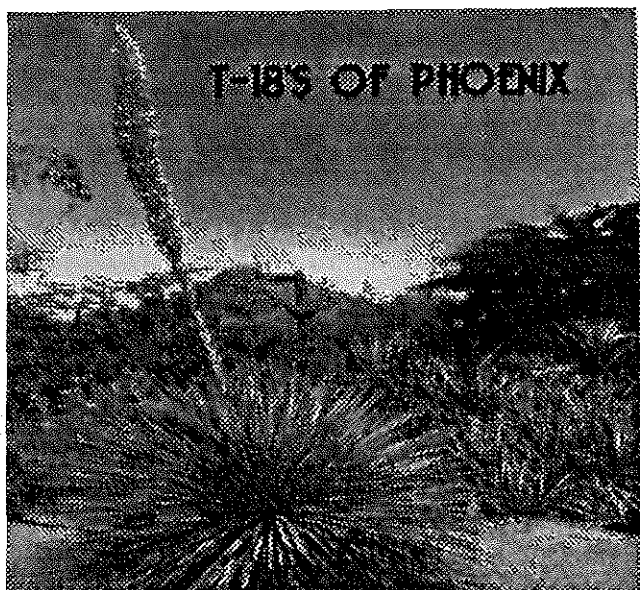
1. 539L -1 L&R outer wing skin, Net trimmed; center punched under Johns template
2. 544-1&3 outer wing L.E. ribs formed over Johns tooling
3. 540L R&L wing tips .025 & .040 (MFG. to DWG. except W.S. 113.875 is not trimmed to net
4. 580-1 fuselage skin material .032 x 5FT. x15FT. 2024 T3 not perfect
5. 865 Main gear leg fairings & retaining clamps (trimmed but not drilled).
6. 796 pitot/static tube assy. (polished)
7. 514 fuel tank assy. (modified for filler neck location on Fus. flat area) (BL 3.500)
8. 640 spinner assy. (constant speed)
9. A-596-1 bulkhead, Fus STa 94.286
10. 532-5 center wing closure
11. Maule tail wheel assy.
12. Master brake cylinders (Gerdes Model A-049)
13. Fuel shut-off valve (Imperial 104-HD 3/8 x 3/8 female)
14. Electric fuel pump 12V Facet 478360 Neg. Grd.
15. Fuel transfer valve 12V Neg. Grd. (used excellent condition)
16. Transponder/DME antenna
17. Oil pressure gage 0/80 psi. (back lighted 2.150 dia. hole)
18. Lyc. Ex. Flange Gaskets (copper) P/N 65321
19. Lyc. oil filler tube & dip stick 12 1/2 in.
20. Main gear axle nuts, (suitable for attaching wheel fairings)
21. Red Flex ducting 1 in. x 36 in. Hi-temp.

Make reasonable offer plus shipping To: George F. Truver, 727 Blackthorne Ave. El Cajon, CA. 92020 (619) 463-8744

## "THORP METAL COWL"

Built in John Thorp's shop, SN 32 with Cam Locks installed, and never on an aircraft also a set of metal Horiz Tail Tips. Will exchange for 1st run out 0-320 engine (dynafocal mount) with all accessories, no damage history, log books required. Call Lee Skillman (205) 633-3535 evenings or write 7676 Windcrest Dr. Mobile AL 36695

For Sale: Wooden Prop W66LM 78 Call R. Snelson (217) 935-4215



### The T-18's of Phoenix

With phone calls to the two T-18 Mutual Aid Society members in the Phoenix, Arizona area, an early morning meeting was arranged at the Deer Valley Airport north of Phoenix. Edwin Poe was there first and had his beautiful white with blue trim N808P (our cover photo) waiting on the ramp. For a few details about his bird, Ed built it during the 1975 to 1986 time frame, it has an empty weight of 943 lbs, it's powered by a 0320-D2A 160HP Lyc. that Ed purchased new from Wag Aero for \$7500 back a few years ago. I'll bet it would bring that to day or more! "How's that for a good investment". The smooth running Lyc is driving a 68 X 66 Pacesetter Prop that Ed says may be a little underpitched for the engine. Performance at 8,000 to 10,000 feet is around 165MPH. The airframe is a narrow body with standard wing using the Sunderland airfoil. It has the tunnel bent at 45 degrees and by using Temperfoam seat cushions (purchased from T-18er Harlo McKinty) provides a very comfortable fit even for a big guy like me. The planes cockpit area is covered with cloth backed aluminum tape and the 1/4 foam backed aluminum tape sold by Phil Tucker. The workmanship on his airplane is

excellent, Ed painted it using Imron and did a beautiful job. He did warn about using Imron, he said a clean air source is necessary, since he got sick using a charcoal filter type and decided upon some professional help to finish it. I know there are two schools of thought on using body putty to finish the hip skin areas and to smooth in rivet dimples, Ed doesn't believe in it and his workmanship produced a fine looking job without the stuff and all the extra weight it adds.

Ed is a retired Honeywell Electrical Engineer and has designed and built a digital fuel flow indicator that I like and plan to add to my T-18 later. A simple fuel flow transducer is added to the fuel line and as the fuel passed through, it produces electrical pulses, by calibrating a digital counter you have a very fine simple display that reads the fuel used. The gas gauge become a back up and we can stop fussing that the darn thing never worked right anyway. Ed is going to clean up his schematic for the unit and send it to me with a description for a later newsletter. Ed's electronic consists of a Nav/Com, a Com, transponder mode C, Loran and a new panel mount intercom with a squelch for pilot and passenger.

Ed has flown his T-18 over 300 hours and is a very competent experienced pilot. On a trip last year he flew it to 34 different states in a 10 day period, 3 of which were down time due to weather. This makes a total of "48" states for Ed and N808P during it's flight-time. Goes to prove what we've known a long time "The T-18 is one fine cross country Airplane".

Ed has produced a fine Users manual for his T-18 and upon my request gave me a copy to use in planning my own. He has prepared it for the next fellow that might own N808P, and from talking to several new owners of T-18s without any documentation of any kind it will be most valuable to the next guy. The



manual covers Aircraft Description, Construction Details, Maintenance, and Drawings.

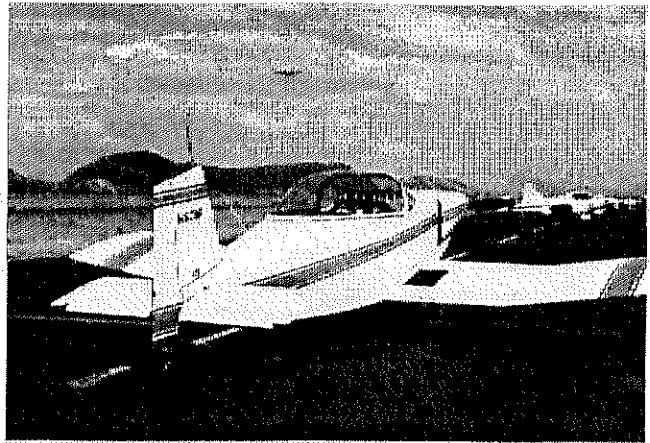
Thanks Ed for the vist and flight in N808P over the North Pheonix area. I have Ed's diary of his trip to 32 states and found it fun to read so I'll try and put it in a later newsletter. (Ed please send ASCII file on disk.)

Soon after we (wife RoxAnne and Courtney our daughter) arrived at the Deer Valley Airport another T-18 builder arrived and spent the morning with us. This was Bob Praker of Scottsdale, AZ. Bob really had my curiosity up with his letter telling about his \$63,000 investment in his T-18 project. After 9 years of building Bob got out all his cancelled checks and actually added up everthing he'd spent on the project. Including many, many tools and about the best of everything he could get. This came to \$63,000 and continues to grow. You've got to give this guy credit he's honest! I'm not about to add up what I've spent over the last 2 years on my project! My wife would go out and buy two more Arabian horses on her MasterCard, if I did that!

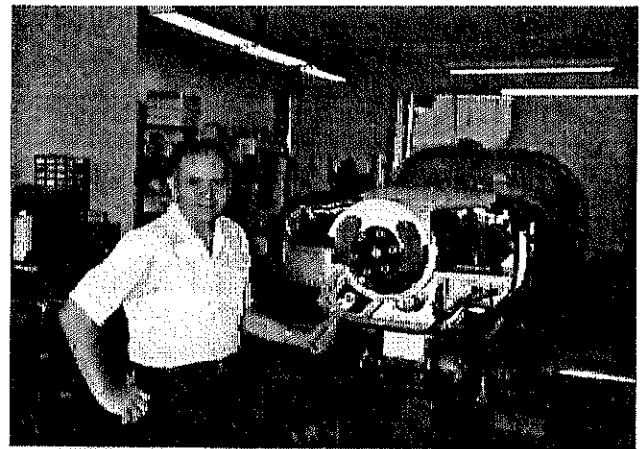
Bob has his 180HP engine installed and is close to completing the engine compartment details. He has a SS exhaust system with mufflers, purchased from Aircraft Spruce. His panel is done and looks great, painted a nice beige color. Each instrument has it's own postlight. The airframe is a widebody, with folding wings.

Again being an honest fellow, Bob admits he needs help to finish the bird and get it into the air. So if anyone knows of someone that could give Bob some support please give him a call. He said several people including Ed Poe have been doing that. Bob's phone number is (602) 951-0247

Our thanks to Ed, Bob, and Bob's wife



*Ed Poe's N808P*



*Bob Praker "The only honest T-18 builder in the world" Just Kidding Bob!*



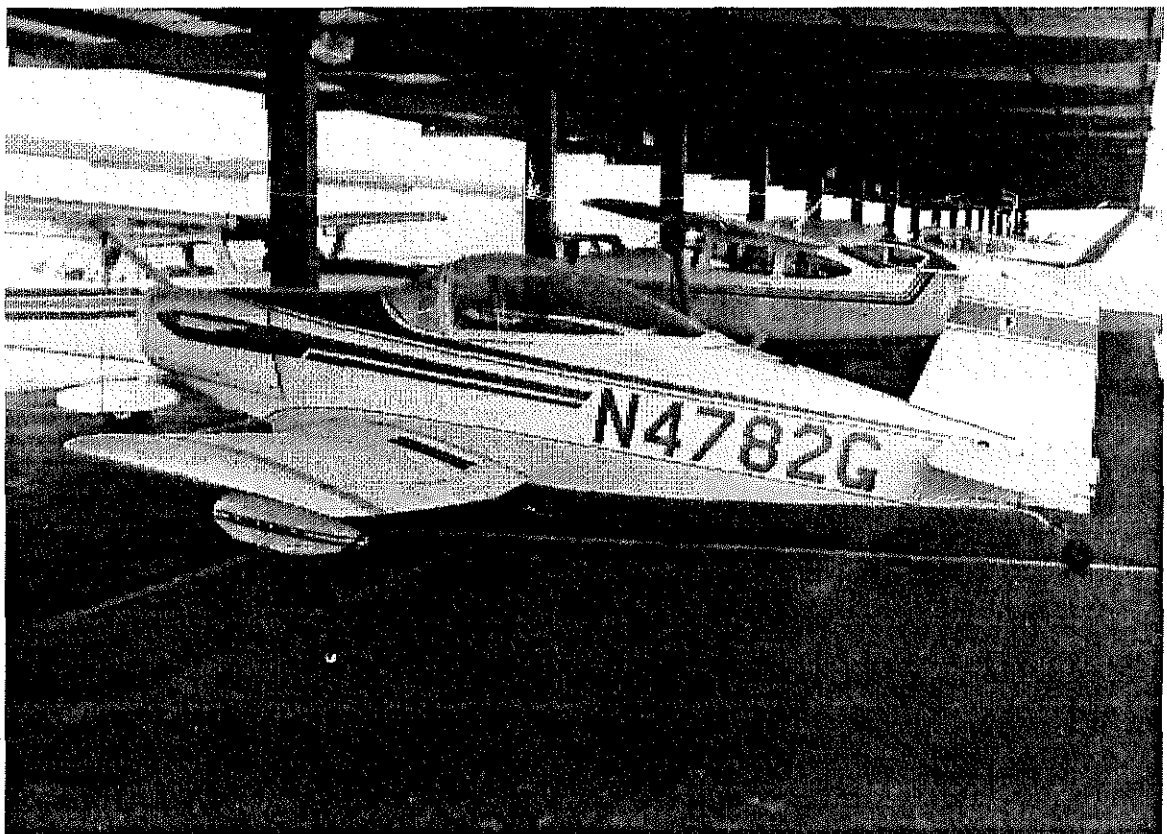
*Bob's wife Audrey and Courtney*

Audrey. My wife had heard me speak constantly of the fellowship and great folks of the T-18'ers and has always enjoyed your company & phone calls - but she was amazed at Audrey - she spent the whole next morning taking them on a great tour of the Phoenix area. Thanks so much!

One final note on the Phoenix area, Ed said there are several other T-18s in the region but I didn't get any names. Sitting off quietly in the corner of Deer Valley Airport is one of the best known T-18s. N4782G built by Lou Sunderland. Ed said it belongs to his son, and although its not for sale, its never flown.

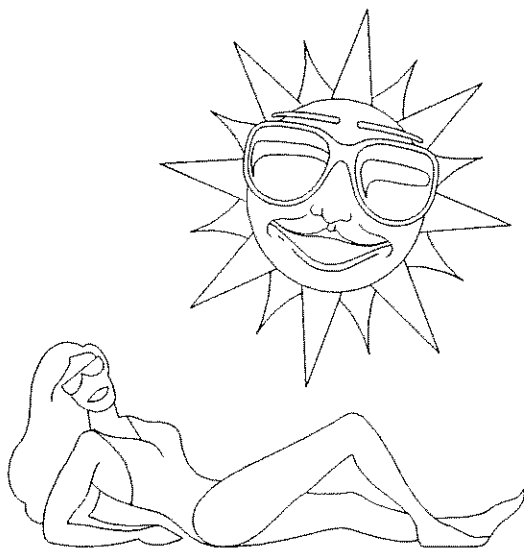


*This young fellows lives in the Phoenix area in a park called Out of Africa. This was part of the tour that Audrey took us on. You actually get to pet this little fellow!*



*Lou's Sunderland's Folding Wing T-18 at The Deer Valley Airport.*





## **Patter from Pat**

### **by Pat Eby**

### **Sun'n Fun 1991**

Dave and I had a great T-18 trip to Sun'n Fun in spite of going around weather both ways.

Sunday, April 7 I talked to the Tindells from Pansy AL near Dothan. They were at Kentucky Dam fall of '89. He is building a T-18, also Les Conwell of Lutz, FL. Les told me, Marge is going to Ground School for her Private Pilot license, and he is sitting in on the classes.

John Warner of FL and CT is building, and Dave Goff from St. Augustine, also Jim Perrine who lives near Little Rock. All were there with questions.

John said Jim French was at Sun'n Fun

briefly Saturday. Sure enough, he showed up again Sunday with Maizie and Karl Lipscombe's T-18. Jim moved near Lakeland the week before.

Bob Highley's plane was parked next to us. He appeared later and told us about just getting back from Saudi Arabia - ask him about that assignment!

A lady with a biplane hat walked by and I had to get a picture of her and her husband. They are the Lovelys from St. Petersburg, live on Paradise Street, Treasure Island. Likely story, but then we tell people Dave is from Paradise, PA and nobody believes us either.

I saw Wendell Green's T-18, and Ralph Powell's. At lunch a man had T-18 N1101 on his cap, said he drove from Michigan. Someone said the Culhanes had their T-18 in the camping area.

Dave wasn't in the Air Race this year, but coached our friend Claudio Tonnini with his RV-4, only fair after beating him last year. Claudio improved his airspeed 16 mph. Bill Shepherd raced his T-18 with single place, retractable gear. He clocked 222 mph, had a 150 hp engine.

The forum was busy with much interest shown by many. Lee Skillman, Bill Williams and



*Les Conwell, Sven Pira, & Bob Highley*

John Starr led the discussions. One of the items brought up was that Phil Tucker can photocopy drawings needed and he has T-18 parts available.

Sven Pira was there from Sweden.

One gentlemen is a master welder, started flying in 1935. He said the T-18 is the most fun flying he's ever done. I didn't get his name, will have to go back.....

We counted 7 T-18s at Sun 'n Fun. Four of those pilots were at the forum.

My Kentucky Dam fall of '90 photos were good, but I couldn't identify the planes. This time I got the tail numbers for sure, but see that I don't have a name to go with N76KC.

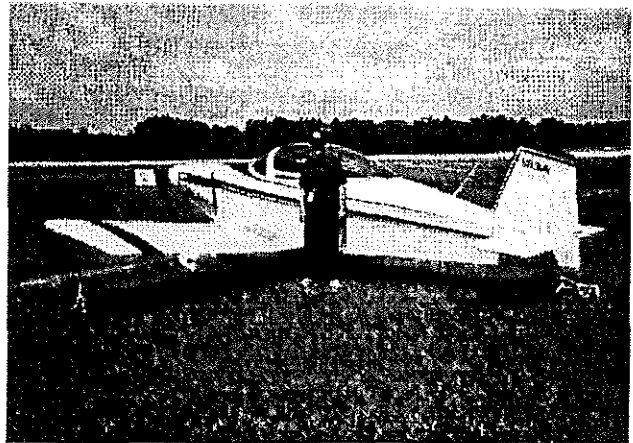
John Kowalski, Rt. 3 Vinton IA 52349, is building, wants newsletters and notices of T-18 gatherings.

Lee Skillman said there were 356 T-18s seven years ago, would estimate 450 to 500 now.

This was the Sun part. The Fun part for me was playing the piano at the Sheraton three evenings. Join us next year. We're looking for musicians. We know the Holts have a Casio, and Dick Cavin has an accordion.

Pat Eby

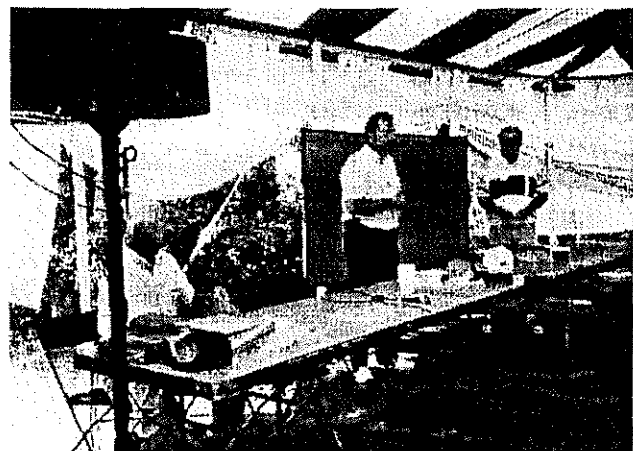
Editors Note: Thanks for the good work Pat. Please keep up the good work, and I'll make it a regular feature of the newsletter.



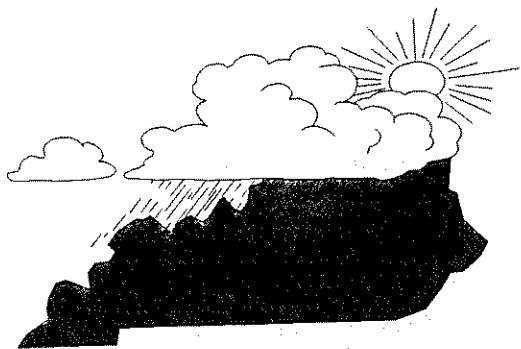
*Jim French at Sun'n Fun '91*



*T-18 Admirers at Sun'n Fun*



*T-18 Forum, left to right, John Starr, Bill Williams and Lee Skillman*



## KENTUCKY DAM SPRING '91

I think the best way to describe how bad the weather was for our Kentucky Dam Get-Together is by telling about Jim and Judy Paine's "drive" from Dayton, Ohio. Judy described the first fifty miles out of Dayton as pure hell! Jim was in a terrible mood griping about why he wasn't flying, since the weather there wasn't too bad, just overcast and no rain. As they proceeded the weather got progressively worse and Jim's mood got progressively better. By the time they got to Kentucky Dam and Jim saw the low overcast and rain Jim was in one heck of a good mood and ready for a fine dinner at "Patty's".

It was too bad the weather went sour on us as my indications were that we could have had a record crowd. In stead only four T-18s arrived, with those brave souls facing some low flying and dodging of thunderstorms to get there. Having driven from Illinois to Ky Dam on Friday, I was in one of those Jim Paine mood's also because by this time I was certain that I would spend the weekend with out seeing a T-18. However my luck would get better. First to arrive was Tommy Thompson, all the way from Las Vegas, Nevada. A long trip for a weekend fly-in. However Tommy has a son in Missouri and made double use of the trip by spending the night in Joplin. (For a description of Tommy's IFR trip back home see the article "IFR in T-18") Next to arrive was another long distance

travler, Jim French in his newly purchased N83MK. Jim has moved from Texas to Florida and made the trip from Ft. Meyers. Cliff Redden called the lodge from about 90 miles away saying he wasn't sure that he would be able to get in but he would try later in the day. Well he finally made it and I was sure glad to see him slip in under the low celling. Cliff got out and kissed the ground. Must have been a tough flight Cliff? We had one other plane that made a short stop in. This was Steve Hawley and his wife from Tuson, Az. He didn't stay long just pointed the bird west and headed home after a couple of hours.

The rest of us spent Saturday going over the three remaining airplanes looking for building ideas and learning where to place this or that on the firewall etc. For the afternoon, the sun came out and Oh! Boy! the fun started with Gentlemen Start Your Engines. I don't know how many rides were given, but no one missed getting one this time. Tommy, Jim and Jim Paine who got to fly Jim French's bird spent the afternoon taking the whole bunch up. Thank's guys. This really means a lot to a builder. It shows that the whole thing can really come together and sometimes provides just the right inspiration to keep us going on the project for yet another Year!.

Following the tradition of previous T-18 meeting, Sat night was the banquet meeting. After dinner a short business meeting was held. Jim Paine anounced that there would be a T-18 Dayton Award winner for 1991. As decided at previous Ky Dam meeting this award would go to Ed Ludke of Sioux Falls, SD. We were all sorry that Ed and his wife weren't there. Hope they can make the Dayton Fly-In. After a discussion of other possible meeting locations with no good suggestions Ky Dam was chosen for another try in the Fall 91. It really is a nice place, and if the weather will give us a break we should have a good turn out.

Kentucky Dam Attendees

Dwight & Janice Scaggs  
3182 Westboro Rd  
Blanchester, Ohio 45107

Clif & Anita Redden  
8774 Airport Rd  
Georgetown, Ohio 45121

Jim & Shirley Shilling  
317 N. Hillsdale  
Homer, MI 49245

Paul & Helen Shifflett  
Rt 2 Box 44  
Earlham, IA 50072

Bill Williams  
8304 River Oaks Ct.  
Tampa, FL

Harold "Tommy" Thompson  
3123 Valleywood Rd  
Henderson, NV 89014

Max E. Booth  
P.O. Box 580  
Daleville, AL 36322

Jim & Jean Strickenberger  
4344 Gem Ct.  
Erie, PA

Jim & Judy Paine  
4340 Wagner Rd  
Dayton, OH 45440

Roy, Karen & Chris Farris  
Box 182  
Nobie, IL 62868

J.W. French  
2022 Hendry St  
Ft. Meyers, FA 33901

Ron & Jane Hayes  
3050 N.W. RD Mize RD  
Blue Springs, MO 64015

Steve Hawley  
7300 N. San Anna Dr.  
Tuson, AZ 85704

Kim Nack  
2940 Devonshire Dr.  
Florissant, MO 63033

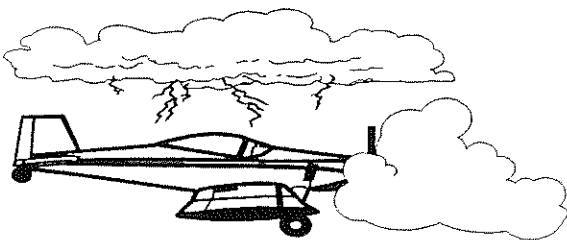
Richard & RoxAnne Snelson  
Route 3, Box 295  
Clinton, IL 61727



*The Hawleys of Tuson, Arizona*



*Tommy Thompson from Henderson, NV*



## IFR in a T-18

I would like to submit an analysis of my sojourn to Kentucky Dam for the benefit of those who would like to have some idea what to expect in the way of performance, fuel burns etc. This is of course information for my particular Thorp, eng, prop combination but should be close to others. Also the accuracy is strictly based on my own computations and aided by the Flitestar flight planning computer program on the IBM Clone.

By adding up all the fuel receipts, I burned up a total of 172.7 gals, flew 2952.5 miles with a hobbs time of 24.1 hrs. I figure an average fuel burn of 7.2 GPH with power settings ranging from 45% to 70% for the various legs and altitudes that I flew.

To start, the leg from my home airport 3L2 Sandy Valley Nv. 29 air miles SW of Las Vegas to LVS Las Vegas NM was flown at 15500 using oxygen and a 45% power setting, 14.4 inches 2450 RPM burning 5.9 GPH. Next enroute to JPN Joplin Mo. again at 15500 same power settings, I had to divert to DDC Dodge City KS from over Ponca City OK. Due to the starter drive problem and weather. I would highly recommend Dodge City as a fuel stop or overnight. A courtesy car is available at no charge and the service and personnel are superb. Next morning on to JLN at 11500 64% 18.4/2400 with a fuel burn of 7.5GPH. After overnight on to Kentucky Dam at 11500 same power settings. I finally arrived in the middle of a rain shower,

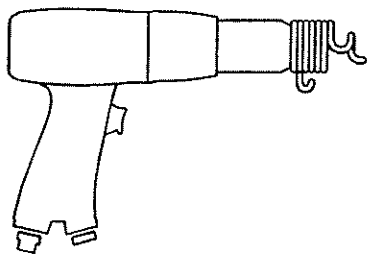
lots of rain, low ceiling and several 180 turns to stay VFR. I haven't seen weather like that in years as Las Vegas just doesn't have it. It is not uncommon to be able to see 200 miles in any direction most of the year.

On departure from Kentucky Dam on Sunday, Paducah was reporting a 7500 ft ceiling and 3 miles. I shot up through a hole on departure and found the tops of the lower deck to be 2300 MS. . On the way to the CNG VOR, I could see that weather was again going to be a problem so I wised up and landed at Paducah, bought some IFR charts and approach plates, filed IFR and departed for PWA, Wiley Post in Oklahoma City to spend the night with a friend. Enroute I had 25 Kts on the nose so I had to land and refuel at Hatbox in Muskogee OK. That leg was flown at 10000 IFR, 19.4/2400 70% AND 8.4 GPH. Final leg that day was flown to PWA at 6500 23.4/2100 72% 9.0 GPH.

The next morning was IFR so I filed to Double Eagle in Albuquerque at 10000, 19.4/2400 70% 8.4 GPH. From Double Eagle home I really got beat up from the Thermal turbulence and the unstable air on the back side of the frontal system I passed around Amarillo TX. This leg was at 10500 19.4/2400 70% and 8.2 GPH. Made it home OK but with bugs all over the airplane. It seems the Monarch Butterfly also likes to fly at 10500. Big Yellow globs of mess covering the whole front of the airplane. It sure doesn't match the paint job.

Thanks for putting on a good show, and affording me a chance to meet some very fine folks who I certainly hope to see again. Keep up the good work and continue to foster the Tiger movement. Every group of type owners should have the enthusiasm that I saw at Kentucky Dam. Harold F. Thompson (Tommy) 3123 Valleywood Rd. Henderson NV., 89014

## Builders Corner



A little progress on # 1158 and a report on a snag which just might help someone else. Note that 1158 is the basic, solid wing version.

I built up the center section main beam, then remembered an article in NL 49 which recommended addition of web stiffeners. So I found the newsletter - fabricated the stiffeners per the drawings - and then the problem emerged.

The problem, and the fix, is outlined below.

\*. The problems were three-fold:

1) With the stiffener dimensions given, a rivet could not be set 2\* diameter from the edge:

2) The stiffener encroached upon adjacent rivet heads (AN 470 type): and

3), my universal rivet set has a shank diameter of 0.50" which forced rivet centers to be at least 0.25" from the inside of the angle - preferably a bit more, such that the set would not dig into the angle inside radius.

\* The fix was as follows:

1. Rebuild the stiffeners, per the attached sketch. Draw a line, centered between the edge and the

inside radius of the angle stock, for rivet centers.

2. Drill out five rivets, centered about the stiffener location. Replace those rivets immediately adjacent to the center with AN-426 rivets. Then, replace those outer rivets drilled out with AN-470s. The reason for doing this is that, unless that additional space is allowed, the flush head rivet set will deform the adjacent rivet factory heads.

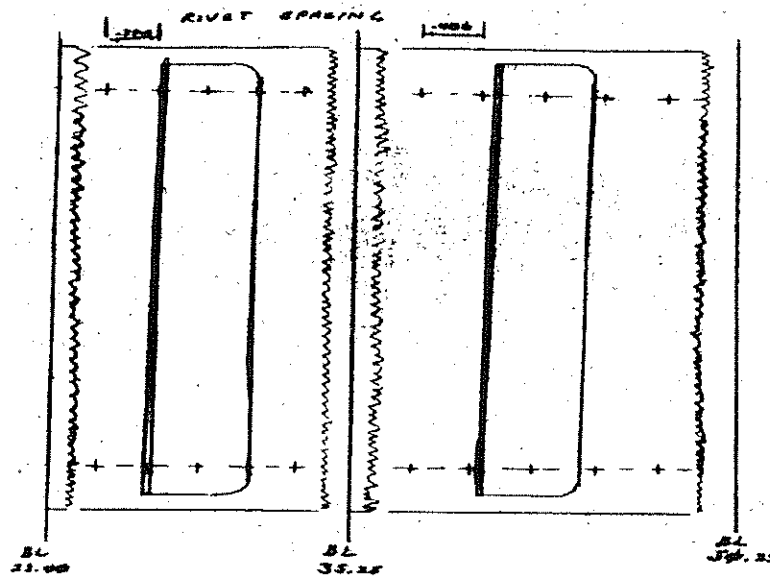
3. Now, the stiffener has a flush surface to set on. Rivet it in place using AN-470 rivets.

Of course, this could all be avoided were one to plan ahead, which I failed to do. The fix is applicable were one to perform a retrofit.

This fix was recommended by Ray Vogle, Technical Counselor, Chapter 58 EAA, Ogden UT and typifies the help a builder can get from those guys.

Sincerely, Floyd Myers 5170 Sunset Dr.  
Ogden, UT 84403





Layout for stiffener spacing dimensions

### The Ins and Outs of Insulation Installation

After an absence of nearly a year, I recently re-acquired Apprentice status, working under a Master T-18 builder. As one of my first jobs I was given the task of installing heat and sound insulation in the cockpit. What appeared to be a fairly simple job provided initial results that were less than satisfactory. After working out some of the problems, results have improved considerably.

In order to help other readers avoid some of these same problems and to avoid the waste of some rather high priced insulation, I am offering a few tips.

The product consists of one layer each of aluminum foil, foam and an adhesive backing. The adhesive is covered with a coated paper which is removed prior to installation.

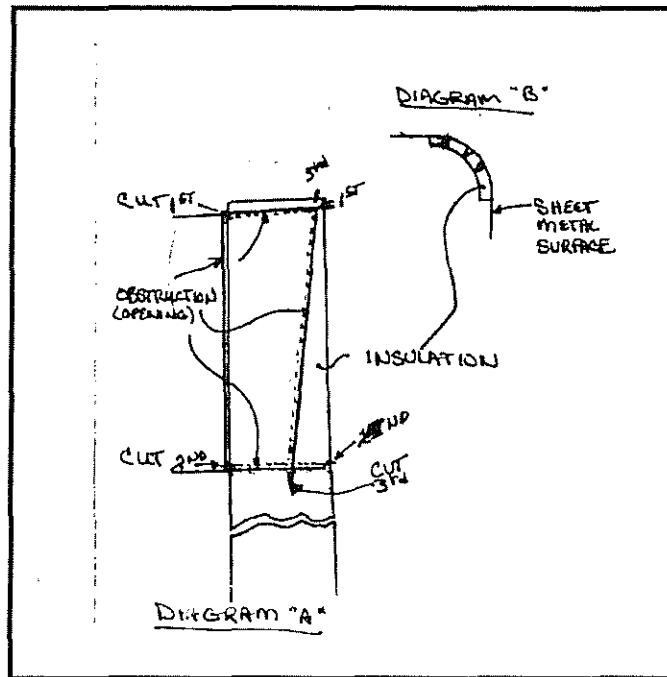
Covering some rather complex shapes, curves and angles has provided the greatest challenge. I have found that having the right tools has helped. I used a single edged razor blade to both cut and mark the bulk insulation. Cutting is done in three steps. First, cut through the metal layer, guiding the blade with a metal straight edge. Second, bend the foam back and cut this layer freehand. Third, maintaining the bend, cut the paper backing from behind.

I have found that the razor blade also works well for marking. I simply hold the insulation over the area to be covered and slit the foil surface at the ends of the cuts. The marking sequence is interrupted by cutting when the end points are hidden. See diagram "A".

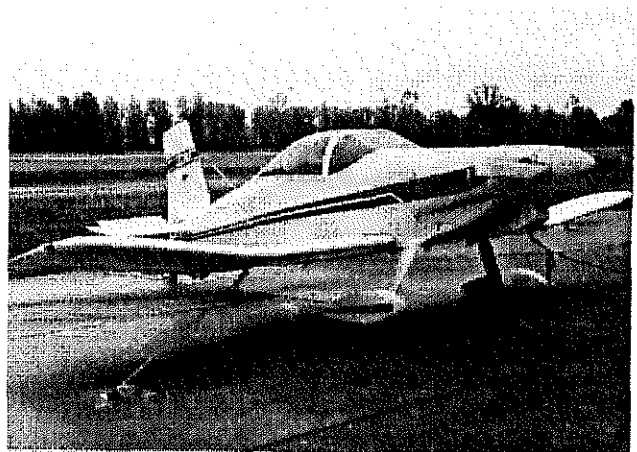
Perhaps the most difficult installation was on the inside of a 90 degree curve with a 3" radius. See diagram "B". This was above the gas tank area. There, I used a technique commonly used to bend plywood. It involved cutting parallel lines, approximately 1" apart, through the paper and the foam, stopping short of the foil. This allows the insulation to conform

to the inside of the curve without wrinkling the foil or placing undue pressure on the adhesive. I had previously cut the piece to the approximate dimensions of the opening, added the slits and then re-cut to size using the technique described above. The end product is as neat and gap-free as on any flat surface.

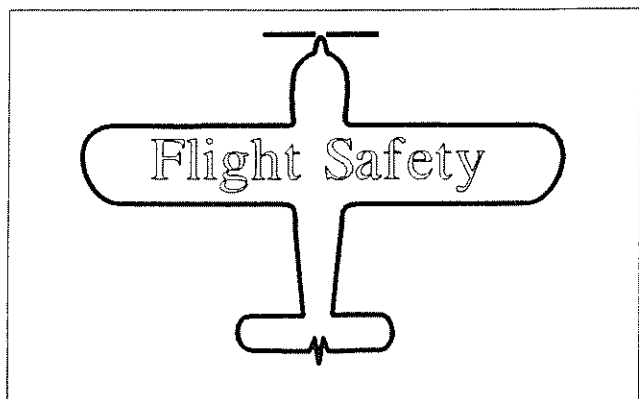
I am always amazed at how much pride one can derive from doing even simple tasks well.



*Paul Rendel's T-18 from Pittsburg, Pa*



*Cliff Redden's T-18 at Kentucky Dam 91*



In reference to Gary Green's letter (NL 78) regarding the free play (slop) at the main spar fittings on the convertible wing. Gary-maybe not intentionally-made this sound as if it was a new discovery and a reinvention of the "horror story."

I strongly believe that all of us who build homebuilt aircraft or purchase an airplane (spam-can or homebuilt) owe it to ourselves to obtain every bit of literature that has been published in reference to that particular aircraft. (Plans-Building Instructions-Newsletters-Owners Manuals-Log Books, etc.) These should be read and understood before the engine is ever turned over for the first time let alone flown.

**"Stop the Sermon--Get to the Point."**

In the early days when John was still selling plans, you could buy the T-18C drawings from Lu Sunderland but to actually build the wing you had to have a set of T-18 drawings from John to build the T-18C wing. Along with the T-18C plans Lu provided to the purchaser a manual "Building the T-18C Wing" and a "Wing Inspection and Maintenance Manual for T-18C."

To save space I will only "quote" the pertinent parts of the maintenance and inspection manual.

## **PREFLIGHT INSPECTION**

If the wing has not been folded since last flight...

(5) Lift on each wing tip to check for excessive free play at all joints.

If wing has been folded since last flight...

(7) Lift on each wing tip to check for excessive free play at all joints.

**100 Hour Inspection (or annual-writer's addition)**

(3) With outer wing panels installed, check for free play at main spar pins. If the free play in the main spar joint exceeds .100" as measured at the wing tip, new 231 pins should be made.

It is obvious that Lu and John would have had anticipated that wear at the main wing joint would be normal. They not only provided for the inspection procedure but also the fix. It is apparent that we can take Ken Knowles off the hook for having made fittings with "a poor fit." Had the previous owner(s) or had Marty at time of purchase, made this inspection nothing would have come as a surprise to anyone and the fix would have been accomplished before it became such a major concern. There is no need to add this to your annual inspection--it's always been there.

Lee Skillman  
7676 Windcrest Dr.  
Mobile, AL 36695

# LESSONS LEARNED

## "the hard way"

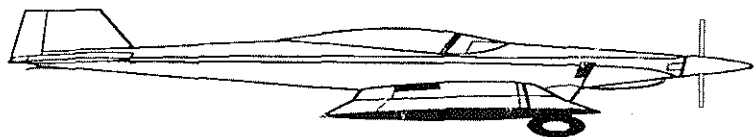
### T-18 Experiences "Horizontal Tail Flutter"

Since I've (Newsletter Editor) been involved in the last few days with several phone calls about the above Tail Flutter incident, I thought it important enough to go ahead and write this up now, and get this situation known to the membership. I do so, without using names, even though two of the people involved didn't mind their names being used.

Here's what I know from the above calls: A new T-18 owner was at cruise 2400 rpm and indication around 165 mph, level flight around 1000 ft. agl. Without any power reduction, a dive was made to 100 ft agl. At that point the pilot said the airspeed indicator read 175 mph., along with that came a heavy vibration of the control stick. The pilot cut power and pulled the plane up, slowing down and stopping the flutter. The tail vibrations were confirmed from the ground, by another T-18 pilot. Later inspection of the tail found loose rivets in the inboard rear ribs of the horizontal tail, and both servo tabs were badly bent.

More facts: Pilot was a retired airline Captain, and had just purchased the T-18 from it's second owner. He had no drawing, newsletters or owners information manual on the airplane. The plane is very well built and a former award winner.

Here's the Question T-18 Pilots: *How fast do you think the T-18 was really going?*



The pilot stated that early indications are that the 2nd owner modified the airspeed system some time last year and there is some problem in it. No calibration of the system or check of the static system was done after the changes.

There are several "Lessons Learned the Hard Way" in this situation. All of us need to stop and think about them. I would like some response from you for the next Letters to the Editor Column. I'm not the world's expert on this airplane but I think it was going "real fast", what do you think? What would help to avoid this situation in the future? Better documentation, inspections? What do you think?

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# OSHKOSH EVENTS

FRIDAY NIGHT July 26

Banquet at Butch's Anchor Inn

Call (217) 935-4215 now for  
reservations

T-18 Forum is Monday July 29

Tent #6 at 11:30 AM

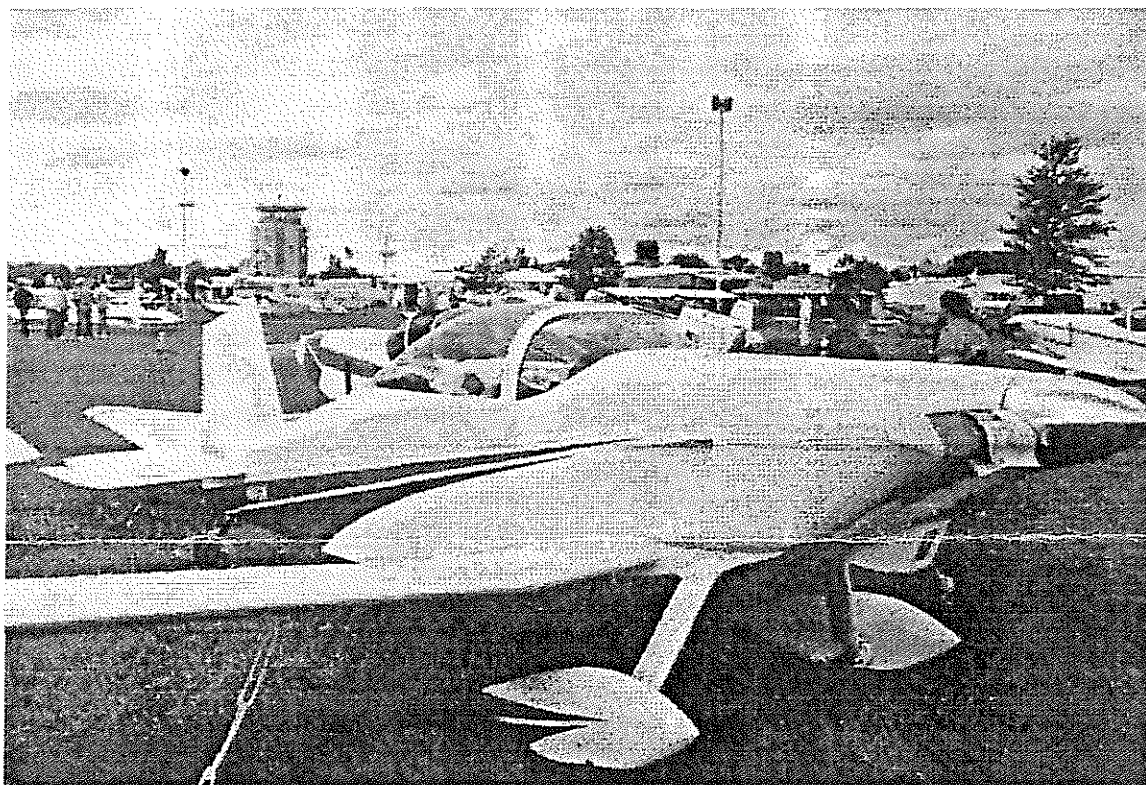
T-18's park in rows 10 & 11

Next Issue: T-18 Newsletter Index

**T18 NEWSLETTER**  
**NO. 79 June 91**

# T-18 NEWSLETTER

ISSUE NUMBER 80



*Brooks Hanna's T-18, from Spearfish, SD*

## *In This Issue:*

Metal Props - Lyle Trusty, John Austin & John Thorp

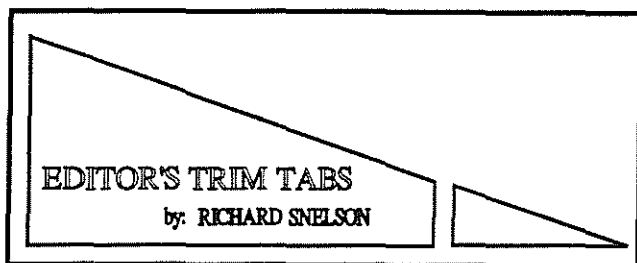
Builders Corner - RV Newsletter Items

Oshkosh 91 - R. Snelson

Oshkosh Photos - Dave and Pat Eby

Ladies First - Our Roving Reporter

*NOTICE: (STANDARD DISCLAIMER) As always, in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.*



## Summer 91'

One thing that always occurs right after Oshkosh, is the end of the summer. Have you noticed that? Oshkosh has become the signal at our house that soon the kids will be back in school and the teachers, which includes RoxAnne my wife, will be back in their classrooms. This year Oshkosh and the realization of another summer passing seemed to come very quickly. That's what happens when you have a lot of irons in the fire and you're happy with what you're doing! In spite of summer never being a very productive time for me with the T-18 project, I did accomplish quite a lot during this one. My new epoxy cowling has been drilled and fitted and it looks great. It's strong and lightweight with an average thickness of about .050 inches. It's an improvement over the first ones from Sport Aircraft. Good job on the cowling Phil. (Sport Aircraft, 104 E. K-4 Unit G. Lancaster, CA 93535)

My first T-18 builders workshop, here in Clinton, Illinois went well. We had people from four different states. I think we were able to jumpstart several builders and give them some good tips on just where and how to start a T-18 project. I want to thank Don Thompson, Kokomo, Ind. for coming over and giving me some help. Don was here for both days, in spite of quite a long drive to get here, and took on several parts of the training and demonstrations. Thanks Don! If we have enough interest we'll try and do it again next year.

We had a great time at the fly-in and you can get some of the details in the write up "Oshkosh 91". Also Pat & Dave Eby sent in a

great bunch of pictures from Oshkosh!  
Thanks Guys!

During the past year I've received several T-18 Operators Manuals but never any as complete and detailed as the one Tom Kerns just sent me. He has put hours of work in it and has covered all aspects and flight conditions for the T-18. By starting with his manual, anyone could customize it for their specific T-18, with just a little work. Tom is making it available to us either in hardcopy or on computer disk for a small cost. See his letter in the "Letters to the Editor" section, this issue for details.

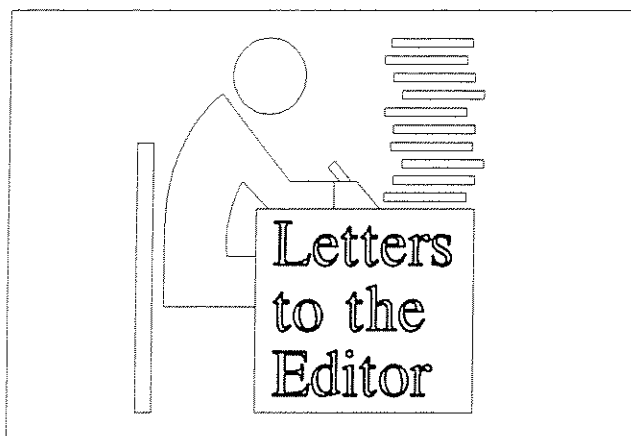
We have several letters from members, on the subject of the prop failures and the problem experienced by the T-18 with tail oscillations, described in Newsletter #79.

I'm looking forward to good weather and a chance to see a lot of you at the Fall Meeting at Kentucky Dam on October 11, 12. You should call for reservations at Ky. Dam as soon as you get this letter. Ask for the Paine Party and you may still get the lower room rate. The phone number is 1-800-325-0146

There are still over 100 people out there building T-18, so we still are in need of more articles on building for the newsletter. As you work out problems and find a better way to build an assembly, jot it down and share it with the other folks getting this newsletter. I have the newsletter index just about ready and it will be in the next newsletter. Sorry for the delay, but this one got too big to include all the index.

Regards, Rich

Richard O. Snelson  
Route 3, Box 295  
Clinton, IL 61727  
Phone (217) 935-4215



Dear Richard;

I thought I would send you a note expressing my thanks for a very interesting builders clinic. I do wish I could have stayed for both days but family harmony is also important if one expects to embark on a building project in the near future. I was amazed at the knowledge required to do something as seemingly simple as drilling and dimpling aluminum. I am sure Sunday's class on forming aluminum and using a brake was just as informative. I do hope that my future project will show just a portion of the workmanship displayed in your T-18. Truly top notch! I'm sending along a couple pictures I took of the class hard at work. It's also interesting to note the attendance covered people from four or five states. NOT TOO BAD!!!

Again thanks for the invite. Rosie's potato salad Saturday night was delicious. I do believe a good time was had by all.

Sincerely yours, Dean Olson Hudson, IL

*(Editors note: Response to Mr Taylor letter in Newsletter #79)*

Dear Richard Taylor,

I read your letter in the T-18 Newsletter and immediately sat down to write this letter. DO NOT put a GAW-1 or 2 airfoil on a T-18!!! Whitcomb was a great aerodynamicist - he discovered the Area Rule for tran-

sonic flight, but he really screwed up on those airfoils. The Piper Tomahawk uses the GAW-2 and it is a dog because of it. The problem is that the airfoil has a very large pitching moment. You lose all the benefits of the laminar flow due to the induced drag caused by the large down lift required from the tail.

I am an aeronautical engineer (30 years with Lockheed) and I have access to NASA AMES library. I have the coordinates you want, but I hesitate to send them to you for the fear you will use them for your T-18. Instead, let me suggest you use a modern computer generated airfoil with a low pitching moment coefficient. The T-18 has a marginal horizontal stabulator - you probably have read of the bunt problem with high speed flap deployment, and should benefit from the low moment. One source for airfoils is: Harry Riblett 416 Riblett Lane, Wilmington, DE 19808 Phone (302) 994-0479

I am going to use his GA 35U-A312 airfoil on my T-18. He sells his catalog of airfoils for \$12.95 and it is very informative reading. He has also written an article on airfoils for the T-18 which you should request.

Good luck on you project. Now I will go back to reading the rest of the newsletter.

Sincerely, Harvey Mickelson 1007 Persimmon Ave. Sunnyvale, CA 94087

Dear Richard, Please find my dues for the newsletter included herewith. I'm sure all us T-18 nuts look forward to the newsletter with great anticipation.

I won't make it to Oshkosh but have every intention of coming to the next meeting at Kentucky State Dam. It was good to meet you last May. I wish the weather could have



been better. We tried to get into the Kentucky Dam State Park Airport from noon on Friday but turned around two times and went back. We spent the night in Bolling Green. We tried once more on Saturday morning and had to land at a little airport about 70 miles SE of where you were. As you know, we finally made it at noon on Saturday. By this time we were getting concerned about getting home by Monday! When we saw what looked like clear weather to the west, away we went. Spent the night in Muskogee OK and started from there at 7 AM Sunday headed for Tuscon. Had to divert around some violent thunder storms across OK. Tucked under some clouds in western OK and kept getting lower and lower ceiling the further west we went. When we only had about 150 feet left I decided it was time to quit! I landed on a dirt road somewhere about 50 miles NE of Amarillo and spent 2 and one half hours with a delightful cattleman and his family. Boy were they surprised when they looked out their window and saw a little sharp nosed airplane on their front lawn. The weather finally cleared and the rest of the trip home was uneventful except for the usual 40 mph headwind in that part of the country.

We now have 670 hours on N9008Z (Serial 810) and it runs better all the time. We use the T-18 mostly for cross country. We have a beautiful J3 Cub I restored several years ago. That is our "fun" airplane. Really, the T-18 is more fun to fly, it just costs about 5 times as much per hour. Looking forward to next October (and better weather) Steve Hawley Tuson, Arizona.

Dear Richard: Just wanted to drop you a quick note reference on an item in issue #78. One way to solve any and all brake fluid problems is to use Dot "5" Silicone brake fluid. Silicone brake fluid is chemically inert, and does not absorb moisture. It is compatible with all types of brake components, and

you never have to worry about internal corrosion. It is especially good for vehicles such as collectors cars and airplanes that sit for long periods of time in between use. I have been using it in my Supia for about two years with no problems. You must take care that all the old brake fluid is purged from the system if you are installing it in a system that is already in use. I did this by pouring laquer thinner through the brake lines, and then drying with compressed air. It is available in auto parts stores for about \$15.00/qt. If unable to find it, try:

The Eastwood Company  
580 Lancaster Ave  
Box 296  
Malvern, Pa 19355  
1-800-345-1178

Another plus with silicone fluid is that it does not harm painted surfaces, so if you spill some, just wipe it up! Hope this helps. I plan to use silicone brake fluid in my T-18, MGB, and Cessna. It is the greatest idea since canned beer. Keep on Flying, Bob Hartmaier, 8 Holly Rd. Jamesburg, NJ 08831

Dear R. In the nine years I have been flying N10TK, I have had the opportunity to check out a number of pilots in the T-18. The lack of any written documentation for aircraft check out has been embarrassing. Verbal description and a quick demo will not stay with a pilot as long as the same training with a written description of technique which may be read preflight and kept for reference.

I have assembled a 50 page pilots flight manual for my T-18 covering operating limitations, emergency procedures, normal procedures and piloting techniques, cruise performance, weight and balance, aircraft systems description, servicing requirements, and a section of cautions regarding differences between my own T-18 and

other T-18's which a pilot may fly.

Preparing the manual took 9 months of off and on work, but I am happy with the result.

The manual should provide a good starting point for other T-18 builders who wish to produce a set of documentation for their own aircraft. The sections on piloting procedures and technique will be useful as a starting point for new T-18 pilots checking out in the aircraft.

I have enclosed a copy of the manual for inspection. I will print and mail copies to anyone who is interested for \$13.00 (Editors note, also available on computer disk for \$15.00) My address is 7033 Autumn Terrace, Eden Prairie, MN 55346 Sincerely, Tom Kerns T-18 N10TK, S/N 71

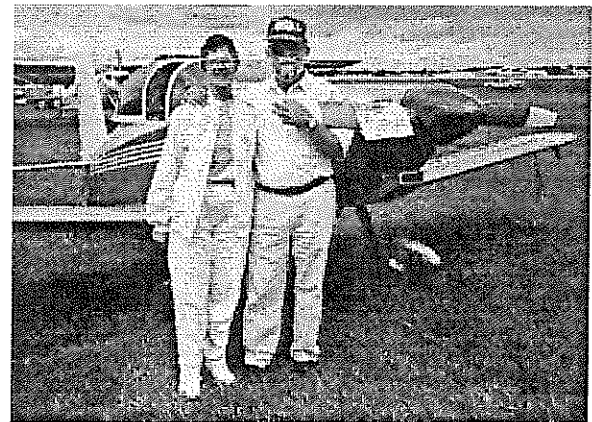
Dear R. \*\*\*\*\* I really value the T-18 newsletter, especially as I'm putting the electrical & fuel systems in on my project.

As you might remember, my daughter and I made the sprint t-18 Kentucky Lake Fly-In this year. We had a wonderful time especially seeing the weather conditions that discouraged the hope of flying. We spent only (4) hours at the fly in but, in that time met you, your wife, & many pilots, owners & building enthusiasts. Unfortunately I was too big at 6' 6" & 240 lbs to fit for a ride, as my knees & the lower instrument panel both did not fit together. My instrument panel is smaller & mounted higher, plus the seat is lower & as far back as its possible, against the canted seat bulkhead. But, fortunately, an offer to give my 10 yr old daughter a ride was made. She was very pleased by the experience, as she was treated royally by Jim Paine flying Jim French's T-18. On her return to earth she expressed great pleasure at the sensations & sights on the first airplane ride of her life. As she disembarked, a T-18 enthusiast's wife presented her with a handmade teddy bear-music

box momentoe! She wasn't ready for the ride to end & is ready to go again. She also said that now she understands what that thing in the garage is for & wants me to get moving on it! She is the oldest of (4) kids so 'moving' may still be some form of slowly. We had a great time at the fly in! Sincerly & thankfully Kim Nack 2940 Devonshire Dr. Florrissant, Mo. 63033



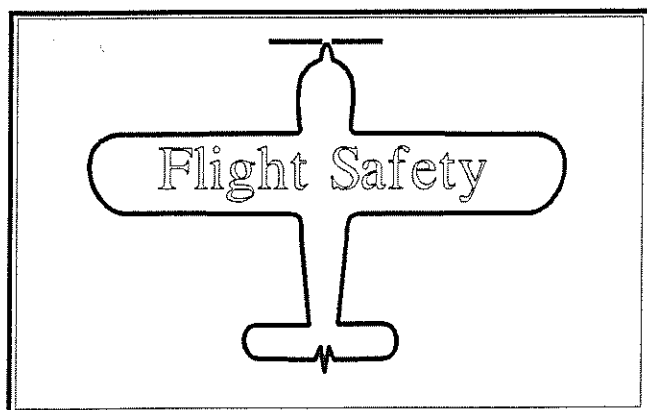
*Tom and Betsy Kerns N10TK*



*Juanite and Bob Ryan N67RJ*



*Pat and Dave Eby N53PD*



**Metal Props Problems  
Horizontal Tail Oscillations  
Engine control cable mounting  
by Lyle Trusty**

**More on Metal Props  
by John Austin**

**Metal Prop Failure, Dec 89  
sent in by J. Hockenbrock**

14 July, 1991

Lyle Trusty  
1665 West Newgrove Street  
Lancaster, CA 93534  
(805) 949-1131

Dear Richard:

I've been meaning to write you about a couple of things but have put it off to get ready, then go on vacation.

My wife and I just returned from a 17 day "Kid Trip" that took us from Southern California to Texas, Florida, Virginia, North Carolina, Arkansas, New Mexico and Home. We flew 36 hours and covered 5600 nautical miles, stayed from 1 to 3 days at each place and caught up on our rest as well.

Last year we covered the Northwestern US and Western Canada in a similar fashion, stopping in the San Juan Islands, Victoria, B.C. Lake Bowran, B.C., Fort Saint Johns, B.C., Peace River, B.C., Calgary, AB, Baanf, AB, Lake Louise, AB, Cody, WY, Yellowstone, MT, Albuquerque, NM and Home.

We also take "week-enders" occasionally, since it's possible to go 600 nautical miles comfortably in about 3:10. We can spend a week end in Tucson for a hundred dollars less than what it would cost to go there in a car! I cant imagine what it would have cost us to go on our kid trip on the air-lines.

I'm getting carried away, so to speak. Better get to the more important stuff.

Newsletter Number 78 contained a copy of FAA AC 43-16 3/91, concerning failure of a Sensenich Model M74DM060 Propeller installed on a Thorp T-18. This accident could have been avoided since information about this problem was developed many years ago by the T-18 Mutual Aid Society that would have precluded it. Bob Dial contributed a great deal by using his airplane in a flight test program conducted by Hartzell Propeller Co. in 1972. They published a report following that test program: I will include a copy of it with this letter, which you may wish to publish in a future newsletter.

The title of the report is as follows:

**ENGINEERING REPORT NO. 317  
July 19, 1972**

Vibratory Stress Levels of Sensenich Models M76EMMS-6-73 and M74DM-0-76 on Lycoming Model IO-320-B1A Powered Dial Thorp Model T-18 Using Thorp Thin Wall Extension, Thorp Thick Wall Extension, and Hartzell Extension

A summary of the results of that test program was as follows:

The best cut-down propeller for all large 4-cylinder Lycoming engines (O-290 through O-320) is a 76EM (old model, no K after the serial number) cut down to 70 inches' length. Pitch can vary from 65" for the O-290-G to 73" for the O-320 or, the thinner late model 76EM with a K after the serial number can be cut to 68" length.

At that time Sensenich did not recommend a fixed pitch propeller under standard 76" length for the O-360. The best experience then available showed a cut down constant speed propeller had the best service record with 1,000 hours on Doc Cottinghams 67" model.

Lou Sunderland wrote an article about this test program that was published in SPORT AVIATION's November 1972 edition. It was called "PROPELLER FATIGUE" and provided a good summary of the existing knowledge about the "propeller problem".

Since that time, Sandy Friezner, President of Specialized Testing Service in North Hollywood, CA has become the last word (virtually) on doing propeller vibration surveys. My propeller, Model Number 76EM8-8-85 SN 19706K (68 inch dia, 85 inch pitch) was tested by Sandy before I installed it on my O-360 in 1979. I have almost 1,000 hours on it now. The results of Sandys test were as follows:

Non rotating frequencies:

1st mode 4410 CPM

2nd mode 13968 CPM

3rd mode 26466 CPM

Rotating frequencies: Critical  
assume 4 cylinder engine

2789 RPM 2N of 1st mode  
2774 RPM 10N of 3rd mode

This propeller should not be operated continuously between

2725 and 2840 RPM

A 6th order of the 2nd mode occurs at 2488 RPM but is not considered a problem order.

As an aside, I also learned that Tachourmeters can often be in error by 150 RPM. I have replaced three of them in 1845 hours because of gross RPM errors. I strongly suggest a tach check with an electronic tach checker or strobe whenever installing a new or reworked propeller or doing any performance testing.

On the subject of "Horizontal Tail Flutter" mentioned in newsletter number 79.

Upon completion of the instrumented flight test program John Thorp did on his own airplane, the horizontal stabilizer, by analysis, was cleared to more than 500 MPH. (530 as I recall) However, he limited the airplane to 210 MPH Vne, which is demonstrated Vmax minus approximately 10%. This was because he had not instrumented the rudder or ailerons and did not know at what speed they would flutter. Several changes were made to the Installation as testing progressed, with only small results until an .040" stainless steel stiffener was added to the anti servo tab inboard rib installation. As I recall, it goes from the aft edge of the rib forward to the nose of the rib then outboard for 3 inches or so. This stiffened the anti servo tab and made a very significant difference in its response to excitation. The newsletters had that modification in detail.

Second, the aircraft apparently experi-

enced what is known as a sustained oscillation, not flutter. Flutter, by definition, is a rapidly diverging oscillation resulting in catastrophic failure of the control surface. Flutter happens so fast that structural failure occurs before the pilot can take any corrective action. Sustained oscillation reaches some amplitude where the loads are less than ultimate and stabilizes until the cause of the oscillation is removed. (Usually power off and pull up is all you can do)

I have flown several first flights on T-18's and have learned to pay special attention to the horizontal stabilizer and anti servo tab rigging. Quite often the anti servo tab control arm is improperly bent with the consequence that the tab rigging is way off with respect to the stabilizer rigging. I check that the stick throw and the stabilizer throw are correct then check the anti servo tab throw and trim travel against the installation drawing. The symptoms of this improper rigging have shown up as inadequate forward trim as you accelerate past climb speed towards cruise speed. You find yourself pushing very hard on the stick to keep the nose down as you gain speed. The opposite of that is not having enough nose up elevator available to flare on landing. The only thing you can do there is to keep enough power and speed for control and fly it on.

There is one more thing I thought I would pass on before ending this epistle. The engine controls, carb heat, mixture and throttle must be anchored to a point common to the engine. Securing them to the engine mount is a definite NO-NO. The reason is easy to see if you realize the engine moves around inside the mount. Any movement as a result of the engine rotating around the point where the dynafocal mount angles converge in the center of the engine has a forward-aft component that will pump the throttle,

mixture and carb heat levers if they are secured to the engine mount. The symptoms are the engine starts running rough, then rougher and rougher until you pull off power and reapply it. Then it runs okay until you hit some turbulence to start the whole process over. It also wears out the carburetor throttle shaft, etc., rather fast.

I fabricated an attach point for the engine control cables by using half inch thin wall steel tubing flattened on the ends so I could drill holes in them. I then bent the ends over so I could attach two to pan bolts and one to a carburetor mount bolt. The lower ends were then cluster welded to form an upside down tripod. I then welded a flat .060" plate to the bottom of the tripod at about the level of the mixture control lever. I made it big enough to serve as a base for securing all the cable housings in the proper position to line up with the control levers on the carburetor and carburetor air box.

I'm glad to see you pick up the newsletter reins from Dick Cavin, you are doing a fabulous job of putting this all together for us and I appreciate it. I have been flying my airplane since August 1974 and have learned a great deal from the information in the newsletters. Much of it safety related. In addition, I have been able to upgrade my airplane as a result of the knowledge I've gained over the years until it is competitive to all but the most sophisticated equipment at many times the cost. It has made flying my own airplane practical and allows my wife to enjoy it with me in safety comparable to standard aircraft. I suggest that we ship a copy of our newsletter off to EAA Headquarters Chief Technical Counselor each time it's published so they can put out the "word" to all the Chapter Technical Counselors. I was a Designee and Technical Counselor for almost twenty years and know they are

eager to get this kind of information.  
Thanks again for all your efforts.  
Sincerely  
Lyle Trusty

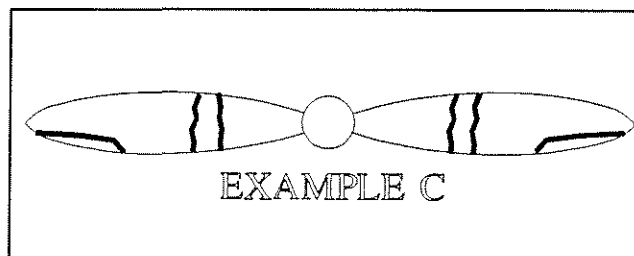
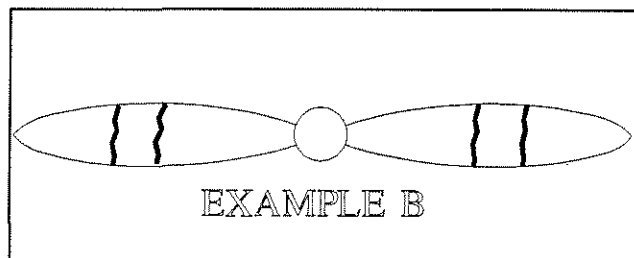
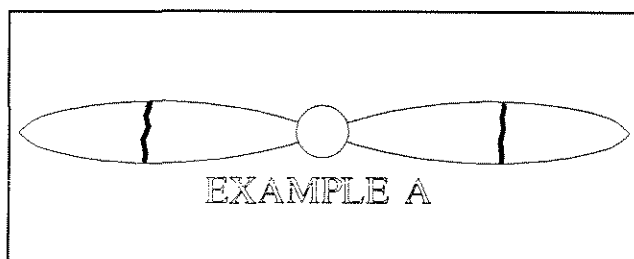
Dear R. I was sorry to hear about the accident reported in the last T-18 Newsletter concerning prop failure. I'm assuming you have the propeller test data from your response in the NL. If you don't I'm enclosing a copy of same.

I did some rudimentary prop tests when this was published along with some of Lu Sunderland's note and it was enough to discourage me from using any metal prop that has been modified. As I said my tests weren't very scientific, however they convinced me that without precise control we do not know what we are doing when we modify a prop. By cutting it down we change its physical dimensions and therefore the fundamental frequency. I would have written sooner, however I have been unable to find my previous work, so will let you know generally what I determined.

I had a prop \_\_\_\_ (sold so don't have # anymore) that was modified by XXXXX in San Antonio. I put it on a bicycle tube bungee between two sawhorses. With only a 12 watt audio amplifier to drive an old outdoor speaker it was necessary to set the speaker on the prop hub in order to get enough energy to excite the prop. Now the total mass includes both the prop and speaker or some combination thereof. An audio oscillator driving the amp was wired to tune the system. It was possible to induce several standing waves into the prop by varying the frequency. Floor sweep was sprinkled into the blade and as it vibrated these standing waves were quite apparent. As I recall there was a fundamental node at mid blade as per Example A. Then as the excitation frequency was raised the node would move

away from midpoint then later reappear as per Example B. With a final one that really convinced me to abandon metal props as Example C. As I recall using Lu's notes this calculated into a no-no rpm of about 2650. This Lateral running node near the tip was readily apparent and easily reproduced. I gave a program on this as a demo at Chapter 68 Meeting the Midland Odessa Chapter.

I'm sorry I no longer have the documentation, but I must have misplaced them after 15-18 years. Due to the low power and coupling problem this data could be way off base so far as the rpm number is concerned, however it convinced me that I did not want anything to do with a modified metal propeller. Sincerely John Austin.



Article submitted by Jim Hockenbrock:

THORP T-18, AUSTIN, NEV., DEC.

15, 1989- A Thorp T-18 homebuilt crashed about 15 min. after taking off following an unscheduled landing during which the pilot expressed concern about a vibration the aircraft was experiencing. The pilot was killed when the aircraft crashed about 14 miles from the airport.

Examination of the wreckage of the Thorp (N111GC) revealed that one of the two propeller blades was broken. An outboard section of the broken blade was missing and was not recovered. Based on the length of the unbroken blade, the National Transportation Safety Board determined that the diameter of the propeller was 68 in.

The propeller was manufactured by Sensenich Corp. as a one-piece, fixed-pitch, two-blade Model M-74DM, with a 74-in. diameter. Originally purchased by Piper Aircraft Co. in 1965, the propeller was installed on N111GC in August 1979. At that time, the Thorp was equipped with a 135-hp Lycoming O-290-G032K engine. That engine was later replaced with a 160-hp Lycoming O-320-E2A. At the time of the accident the propeller had an estimated total flight time of 1,579 hr; less that 20 hr was on the higher horsepower engine.

According to NTSB, fracture of the broken blade occurred near the middle of its length, about 17 in. from the tip. Examination of the fracture surface revealed characteristics typical of fatigue cracking throughout 85 to 90 percent of the blade's cross section. The fatigue crack originated on the cambered side of the blade at the point of maximum camber.

The propeller failure was consistent with previous occurrences. According to the Board there were at least "two other instances of propeller blade failure on the same basic model propeller installed on homebuilt airplanes." "In both cases," the board said, "the propellers were powered by O-320 series Lycoming engines and their diameters had been reduced to 68 in. In both cases, failures

occurred by fatigue that originated 17 in. from the tip of the blade, on the cambered side, at the point of maximum camber."

The Board concluded that the failure of the propeller blade on N111GC was caused "by high cycle fatigue stresses induced by a resonant vibration of the propeller." As further evidence of its conclusion, NTSB cited in-flight testing performed with a Thorp T-18 powered by a Lycoming O-320 engine on which the M-74 propeller had been cut to 68 in. in diameter. The experiments showed that when the propeller operated above 2,500 rpm, the actual vibratory stresses at a point located 17 in. from the tip of the blade exceeded the allowable level by more than 2,000 psi."

The Board pointed out that due to the complexity of a propeller design and the susceptibility of a propeller to failure when operated at speeds that excite resonance, propeller manufacturers ordinarily determine the vibration characteristics for each of their propeller designs. "When the propeller diameter is changed, the propeller's vibration characteristics are also changed."

The type certificate issued for the original M-74DM Sensenich propeller, specifies a minimum propeller diameter of 72 in. for both the Lycoming O-320 and O-290-D, -D2, and -D2B series engines. "Further more," the Board continued, "the TC states that from a vibration standpoint, No reduction below the minimum diameter listed is permissible."

Concerned that other homebuilt aircraft might be equipped with the same combination propeller and engine, the NTSB has recommended that FAA "notify owners of homebuilt aircraft.... about the potential danger of combining a Sensenich-manufactured M-74DM propeller with a Lycoming O-320 or O-290-D, -D2, and -D2B series engine when the diameter of the propeller has been reduced below 72 in." It went on to recommend that any airplanes having this combination of propeller and engine, be removed from service.

And to conclude the subject of Metal Prop failures a warning from the past that some folk still fail to acknowledge and take action to get the M74's off T-18s.

## **THORP** Engineering Company

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P.O. Box T, Lockeford, California 95237

1 JULY 79

DEAR DICK

WE SHOULD GET A NOTE IN AN EARLY ISSUE OF THE NEWSLETTER, WARNING AGAINST THE USE OF THE SENSENICH M-74 PROP. ON THE T-18

JOHN FOY'S T-18 WAS LOST UP NEAR YACKIMA, WASH. DUE TO A BLADE FAILURE OF AN M-74 PROP. BOB DIAL HAD A BLADE FAILURE. BOB COOPER WAS LOST DUE TO A BLADE FAILURE. THESE THREE WERE ON 160 HP. LYCOMING, BUT I SUSPECT THAT IN TIME THE M-74 WOULD FAIL ON A G.P.U.

SO FAR THERE HAVE BEEN NO PROBLEMS WITH THE M-76.

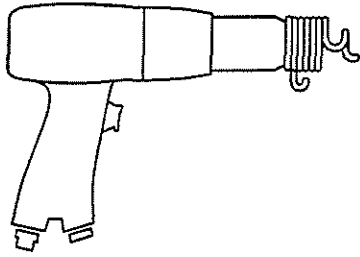
I AM GLAD THAT YOU AND KEN WERE ABLE TO GET UP TO MY BIRTHDAY PARTY.

BEST REGARDS,

*John*



## Builders Corner



*Reprinted by permission and cooperation with Van's Aircraft, Inc. from the RV Newsletter "The R Vator" Issues March 91 and June 91*

### SENSENICH FIXED PITCH METAL PROP: March 91

As reported in the Dec. '90 RVator, we had performed the initial flight testing of the latest variation (3rd) of the new Sensenich 0-320 fixed pitch metal prop. We were satisfied with the overall performance and Sensenich was about to do the in-flight vibration testing necessary before entering production. That's all that we can report at this time; we're still waiting for them. Until we have more information, we cannot accept orders.

**SENSENICH FIXED PITCH METAL PROP: NOT QUITE YET, YET AGAIN.** Well, we thought we had the good news so many had been waiting for. We had the exuberant press release all written, and news of the new prop's availability had already appeared in at least one aviation publication. Now it appears that various factors in the testing program at Sensenich have taken longer than anticipated. We know this is frustrating, and want to assure you that just as soon as we know something definite, we'll let you know. Those in need dire need of making a prop purchase decision can give us a call anytime after

July 7th. By then we will have good news from Sensenich. It says here.

*T-18 Newsletter Editor Comment: I have talked to Sensenich and in fact sent them the old prop test data from the T-18 study, at their request. They think the RV Sensenich Prop can be pitched and used for the T-18. They may be looking for a T-18 on the east coast to use in their instrumentation test of that prop. I'll let you know as this develops. Rich*

### More RV Info:

Just as we were going to press we received a faxed report from Arnie Clarke about the inflight failure of his LectroProp. At 10,500 feet over the Cascade Range east of Seattle, both blades left the airplane. Arnie managed to get the airplane down through broken cloud deck, find an airstrip and land with no injuries and only minor damage. (nice flying!) We haven't seen any photos or spoken directly with Arnie so we don't know the exact nature of the installation (10 hours old) or failure.

*T-18 Editor Comment: Those of you with shoulder harness connects to points other than the front of canopy rails, should read the following. from the RVator.*

### RV-6 SHOULDER HARNESS RE-DESIGN

The RV-6 shoulder harness design using a long length of nylon webbing attaching far aft in the fuselage was selected because of its load path alignment and simplicity. Data available at the time indicated that a 20 G impact would stretch the long webbing only 2 inches which we felt was an acceptable amount. More authoritative data now available indicates that the stretch would be much more; somewhere around 10 inches. While the stretching would reduce the shock, it would also permit the occupant's head to

get just that much closer (or into) the instrument panel. As a result, we have re-designed the shoulder harness installation to one which uses a cable to connect a standard "Y" shoulder harness with the aft anchor point.

#### BALANCING WHEEL FAIRINGS:

Charlie Haynes recently noticed an article in the American Yankee newsletter about balancing the main gear fairings on the little Grummans. A Yankee owner had upgraded to new fiberglass fairings. The new fairings did not have the lead weights in the nose that the original ones had, which pleased him, since he never could figure out what those weights were for and was tired of hauling them around. The reason became apparent on the first flight with the new fairings, as the airplane had a new "shudder" on the take off and landing rolls. Some research uncovered the cause - the new fairings were out of balance. Small bumps are always being transmitted up the gear leg to the fairing. The fairings are centered on the axle, so if one end is heavier, inertia will tend to keep the heavy part in place while the light end moves. It doesn't take long to set up a very noticeable oscillation. When the new fairings were balanced by adding weights inside the nose, the shudder disappeared.

Charlie had been bothered with occasional wheel shimmy in his RV-4, so he decided to this new trick. He removed his fairings, and by balancing them on a horizontal rod, found they were tail-heavy. He taped a baggie to the nose and poured in lead shot until they balanced, then mixed the shot with epoxy resin and poured the resulting slurry into the nose of the fairing. A couple coats of fiberglass finished the job. Total weight gain was about 6 ounces per fairing. the results, says Charlie, were dramatic. Wheel shimmy was almost completely eliminated.

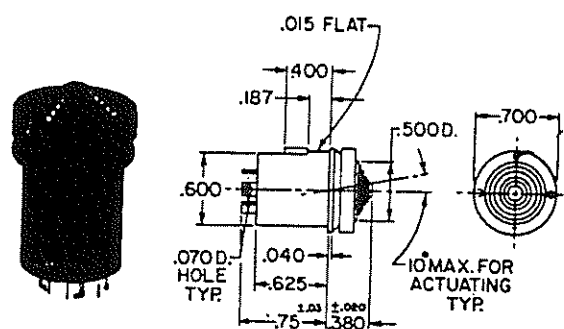
COLUMBIA AIRMOTIVE, PO Box 428 Troutdale OR 97060 has over a thousand sets of **bucking bars** for sale at \$50/ set. There are nine bars of 4040 steel to a set. These are an overrun of an order made for Boeing. 503-665-4896 9-5:30 M-F, Sat 9-1

*T-18 Editor. This was picked out of the RV Classifieds, I purchased the set of bars and they are really excellant, and represent a very good assortment and boy is the price right!*

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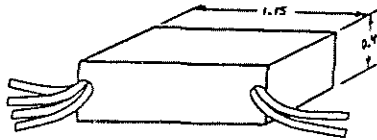
*Electric Trim Systems. Here is some information I picked up at Oshkosh on Mac Trim Systems. Mac is supplying the thumb switch Gary Green used on his trim system. (described in an earlier issue of this newsletter.) Rich*

Menzimer Aircraft Components, Inc.  
1966 Vineyard Ave., Vista, CA 92083  
Phone: (619) 598-0592



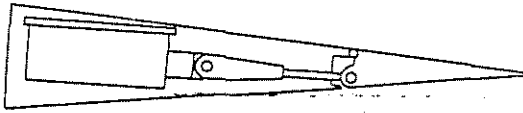
4-WAY SWITCH \$35.00

THIS COMPACT MULTI-ACTION SWITCH CAN BE INSTALLED INSIDE YOUR CONTROL STICK GRIP TO ACTIVATE BOTH ELEVATOR AND AILERON TRIMS. YOUR THUMB PRESSURE IN ANY DIRECTION IS ALL THAT IS NEEDED TO CHANGE THE TRIM SETTINGS. THIS SWITCH HAS A SPST ACTION SO IT MUST BE USED IN CONJUNCTION WITH A RELAY DECK, AS SHOWN BELOW, TO OPERATE MAC SERVOS.

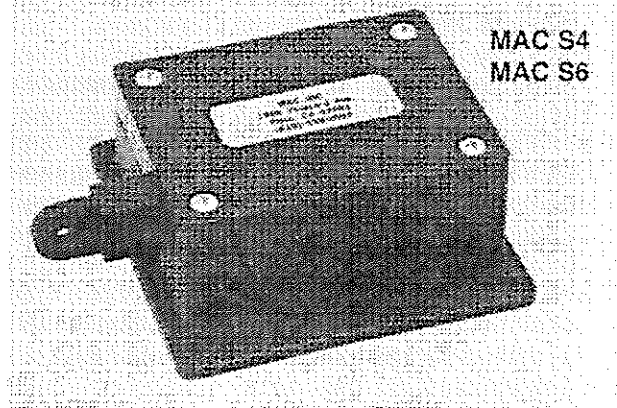


SERVO RELAY DECK \$25.00

THIS DEVICE CONVERTS THE SPST MOMENTARY CONTACT ACTION OF THE ABOVE 4-WAY SWITCH, OR ANY COMMON PUSHBUTTON SWITCH, INTO A DPDT ACTION THAT IS NECESSARY TO OPERATE MAC SERVOS. YOU WILL NEED ONE OF THESE FOR EACH SERVO IN THE INSTALLATION.



Use a **MAC S4 SERVO** for installations having a short ( $\frac{1}{2}$ " to  $1\frac{1}{4}$ " control horn.



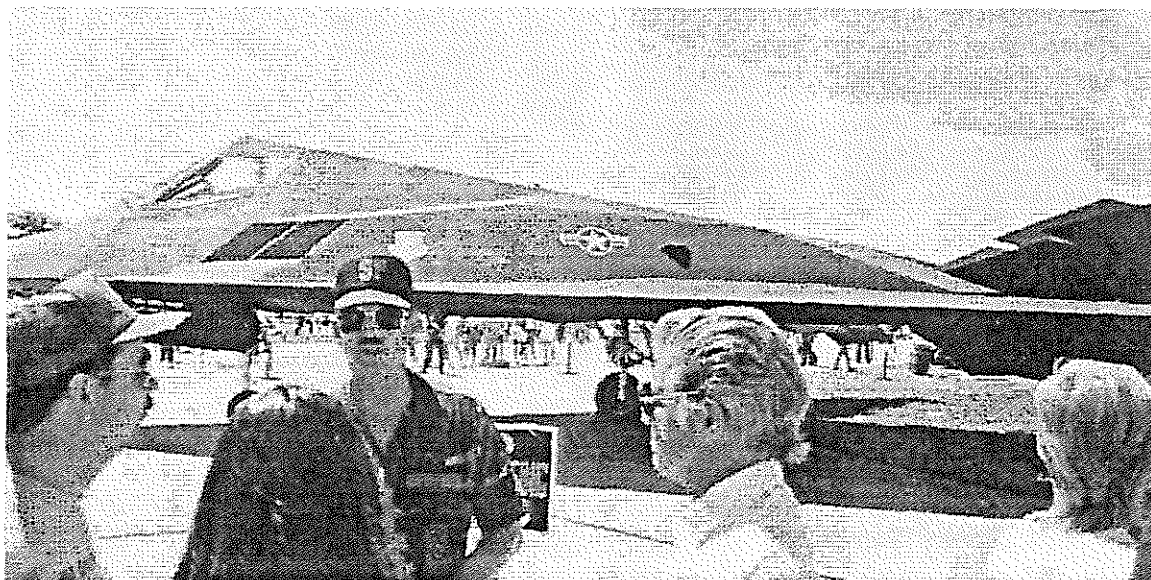
## For Sale

Original Thorp Plans, never been used and Old Newsletters  
\$150 for everything. David A. Johnson 2212 East Admiral DR.  
Virginia Beach, VA 23451 Phone (804) 481-6133

Project for sale due to health reasons for details contact Scott Covington  
1550 River Bend Pl SE, Decatur, AL 35601

T-18 Convertible Wing Parts, including skins, ribs and wing beams. Main beams are fully assembled (by Ken Knowles). Aileron parts including skins, ribs and control parts. Walking beam assembly. Flap parts including all parts and springs. The nose ribs are .032 for wet wings. LDS Airfoil. Price is \$2,500 Contact Barrett Kemp 4018 Quiet Knoll Court, Houston, Texas 77059 (713) 280-8156

# OSHKOSH 91



We made it to Oshkosh again this year with our "wooden boat" and enjoyed our tie up on Lake Winnebago at Pioneer Harbor. We had dinner the first evening with several of the EAA staff members, including Pat Patterson. Pat is the artist that has done all of the exhibits in the EAA Museum. His last day with the EAA was that Friday as he is retiring. His work is wonderful as anyone can see by visiting exhibits like the large mural in the Eagle Hanger. My wife and I were invited to the dinner by the past staff member and EAA lawyer C. R. Wellman of Rockford, Illinois. "Chet" Wellman is a T-18 builder and a member of our T-18 Group.

The Friday night T-18 banquet was well attended with over 125 people, a number of them commenting that they weren't able to attend before, because of having to return home for the work week. It was great to have Lee Skillman back in the group and I thank him for performing the master of ceremonies job. It was good to see a lot of friends there including Dick Cavin and his special guest Vern Peppard. Vern printed the newsletter for us for many years and we owe him a special thanks. Vern has one heck of a sense of humor and in just a few lines had everyone in stitches. Our guest speaker was Steve Kirik, a T-18 builder and a F-15 Desert Storm Pilot. His talk was excellent and really told us about what it was like during his tour in Saudi. The T-18 Mutual Aid Society was very proud to have Steve as our special guest and speaker. Thanks Steve.

Things went well in getting the T-18s into rows 10 and 11, my thanks to Dave Eby and crew for getting there early to set that up. My count of T-18s on the flight line was 18. With over 500 T-18s out there in the U.S. and Canada it surprises me that we don't



*Dick Cavin, Steve Kirik and Vern Peppard at the Friday Night T-18 Banquet*

get a larger representation of "The breed" at Oshkosh. Any comments folks? Can we do better than this?

I think that the fly-in volunteers and EAA Headquarters staff did a fine job with the whole operation. However I must state one disappointment: The homebuilt fly-by. Or should I call it the fly-around! Each homebuilt in the fly-by got to take off and fly around the pattern and land. Period.... No chance to see the planes in a direct low pass over the field. When I asked about this, the reason that I got from the flight line was that there just wasn't enough time! That's strange since there's always enough time for commercial products like Turbo DC-3 and STOLs to make fly-bys, fly-bys, fly-bys and fly-bys. I need to face the fact that our organization, the EAA, has become so diverse that its very difficult for the staff to balance the attention and interest for each segment of aviation.

Our representative in the fly-by was Tom Kern and his "Best of Oshkosh 91" is a beautiful airplane Tom! Congratulations! Tom received that award during the T-18 forum on Monday morning.

The T-18 forum focused on safety this year and the topics centered around "metal props failures" and the horizontal tail problem discussed in newsletter #79. I must thank one heck of a fine fellow for telling us his problems in that circumstance. Tom Waage of Chatham, MA held nothing back and we appreciate his frankness and straightforwardness about what happened. I think we had a general agreement that the airplane did not experience "flutter" but was subjected to oscillations brought on by possible previous tail damage or wear. See Lyle Trusty's letter in this issue for his explanation of the problem.



# LADIES FIRST

by our  
ROVING REPORTER  
Anonymous

"We came, we saw, we conquered" expresses the feeling experienced after Oshkosh week. Leg cramp, dehydration and sunburn go along with survival. With miles to go to see it all Oshkosh is a test of endurance.

But it is a Mecca for those with an avid or remote interest in aviation. All those 800,000 people couldn't be wrong. There is an attraction for everyone.

This year the candy cane effect around the parachutists was appealing. The aerobatic trio of Christen Eagles is a favorite act, always refreshing even after 21 years with the same pilots, many of those early years in the Pitts biplanes. Missing this year was Jimmy Franklin's black Aerostar, a crowd pleaser with mood setting music accompaniment. Thankfully it was a safer year. Where were the women?

George Copland's daughter's wedding was the afternoon of July 24, a busy time for his wife, at the arboretum in Oshkosh. Of course, the bride has a Cessna 195. Maxine Green was away at market selling baskets wholesale with her sister. They work for a company in Bridgeport, Connecticut, have been to Dallas, Atlanta, Chicago, New York and Connecticut. Gloria McCullough spent her days at gate 13B N. 40 registration, has done this for years.

Many women never go to the flight line. Actually, the "flight line" for them is getting on the tour bus. Try making sandwiches at 7:00 am. every morning for Operation Thirst. The women there are "family" for Oshkosh week, all you need.

Tom Kern's daughter Betsy, age 10, found the craft tent to be an alternative to boredom, painted and glued until she was pleased with her silver moon pin graced with a star. A three year old there was painting a wooden bear.

Juanita Ryan was happy with her T-shirt purchase. A first-timer at Oshkosh, she found it to be a shopper's haven.

Margie Conwell enjoys a variety of volunteer work, Beverly Giffin was busy helping to organize at the Women's Activity Tent.

The Visitor's Guide told of a free tour of Neenah, sponsored by the merchants there. The tour of 25 Victorian homes at nearby Berlin was tempting, and the free shuttle to Oshkosh B'Gosh.

But back to the reason for being there and the opportunity to find your favorites out of 15,000 airplanes. We won't mention the lure of the many excellent restaurants in Oshkosh.

Staying in the dorm is a convenience. Or find a pad like Claudio Tonnini did, with only 50 others in someone's garage....

Contentment for some was sitting beside their airplane, doing cross-stitch and visiting with the spectators. See you next year.



## Tales and Tails

Lloyd Toll was there. He welded 16,000 pounds of steel to make 40 poles for loudspeakers, a better sound system this year. He finished his Thorp, N12LT, 19 years ago.

Bob Clayton of Salt Lake City has been building for 18 years, gets to Oshkosh every four years.

Tom Landham of Arlington, Texas, bought Bob Miller's T-18.

Tom Kerns has written a flight manual for the T-18.

Tom Scaggs of Lanchester, Ohio, has two rebuilds T-18s. One was John Walton's. The other is in pieces.

Brooks Hanna from Spearfish, SD bought Glenn Morris's Thorp. It was built by A.C. Vors.

Tom Waage was there with Lee Skillman's plane, M221DP. Tom is the new owner.

Paul Kirik had every right to be proud of son Steve landing his F-15 at Oshkosh Thursday, July 24. Steve told of his Desert Storm Experience at the banquet Friday evening.

Ed and Jeanette Ludtke, 1991 Wright Brothers Award recipients, were pleased with their stay at Dayton the week before, enjoyed seeing Hawthorn Hill and the AF Museum.

Stash and Gladys Simpson had N85FT at Oshkosh. It first flew June 27 of this year.

J.P. Ferko had 275 hours on his Thorp when he sold it to a fellow in Texas. It took him less than a year to build. He said with access to tooling the tail is better, a tube within a tube.

Nick Seraphino from the Detroit area has 1400 hours on N1101, distinguished by the logo of the "Tiger through the Ring of Fire," It is 20 years old.

It was good to see Walt and Beverly

Giffin again, also Ken and Mary Rhoads. Pat and Mac Booth left N1488 at home in Alabama.

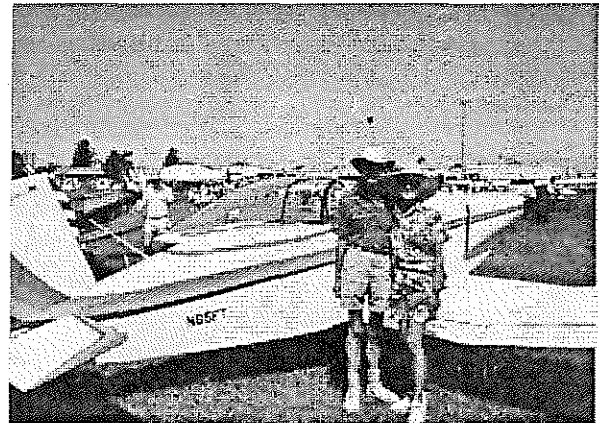
With Dick Cavin and Lee Skillman at the banquet, the week was complete.

A picture of N88ET, Bill Hall's, was seen at Russellville, Arkansas. The plane is now in Pueblo Colorado.

Your Roving Reporter



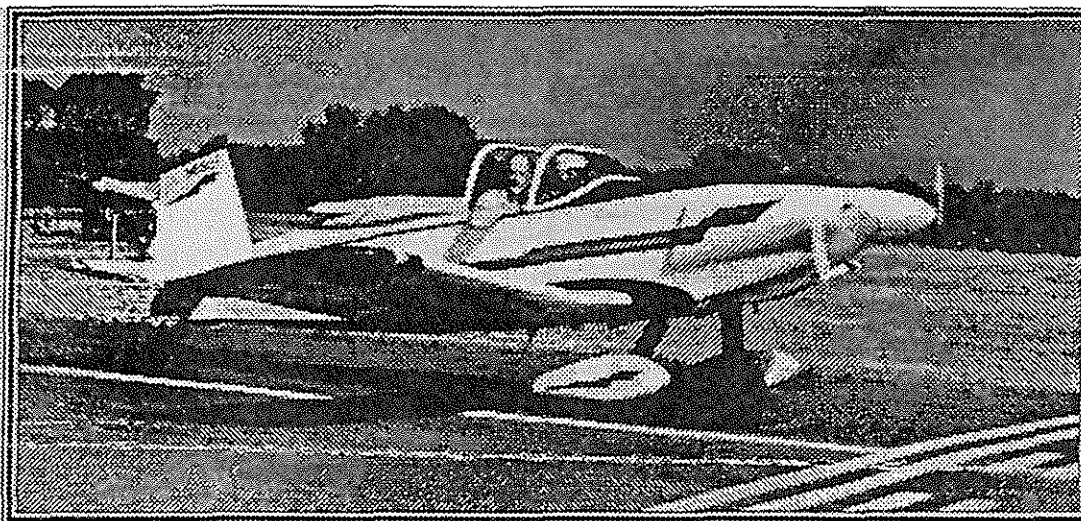
*Steve Kirik and his Squadron Commander*



*Stash and Gladys Simpson*



*Lee and Elaine Skillman, Paul Shifflett*



**T-18 FALL MEETING  
KENTUCKY DAM VILLAGE STATE RESORT PARK**

We have been asked to arrange the Fall 1991 T-18 weekend at Kentucky Dam Village State Resort Park. Reservations are made for October 11 & 12. The private dining room has been reserved for Sat. October 12, at 7:00 P.M. We will again use the buffet.

MAKE YOUR RESERVATIONS WITH THE PARK DIRECTLY. YOU MUST SPECIFY YOU WANT THE PAINE PARTY IN ORDER TO GET THE QUOTED RATES AND A ROOM, AS THE LODGE MAY BE FULL OTHER THAN THE ROOMS THEY ARE HOLDING FOR OUR PARTY. RESERVATIONS WITH THE PARK MUST BE MADE BEFORE SEPTEMBER 11, 1991 AND THERE WILL BE A \$10 SERVICE CHARGE FOR CANCELLATIONS MADE AFTER THAT DATE. RATES ARE: \$43.19 (single), \$52.38 (double)

**KENTUCKY DAM STATE PARK  
P. O. BOX 69  
GILBERTSVILLE, KY  
42044  
1-800-325-0146**

Camping is also available on a first come, first serve basis as well as cottages. Contact the resort for information.

Kentucky Dam State Park Airport is 30 miles east of the Cunningham VOR (Paducah) on the 90° radial, 8 miles south of V178. The runway is paved, 4,000 feet long. The Airport is approximately a mile from the resort, however transportation is available for those who do not wish to walk.

**BRING YOUR OWN TIE-DOWNS.**



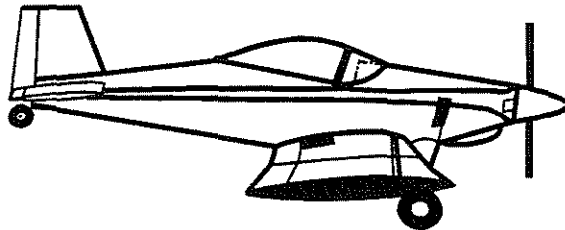
Bulk Rate  
U.S. Postage  
Paid  
Permit No. 137  
Decatur, Ill.

T-18 NEWSLETTER  
ROUTE 3, BOX 296  
CLINTON, IL 61727  
1-217-935-4215

Please help other builders and flyers by telling them about your experiences with the T-18.

We need:

Lessons Learned the Hard Way  
Builders Corner Items  
Flying Info

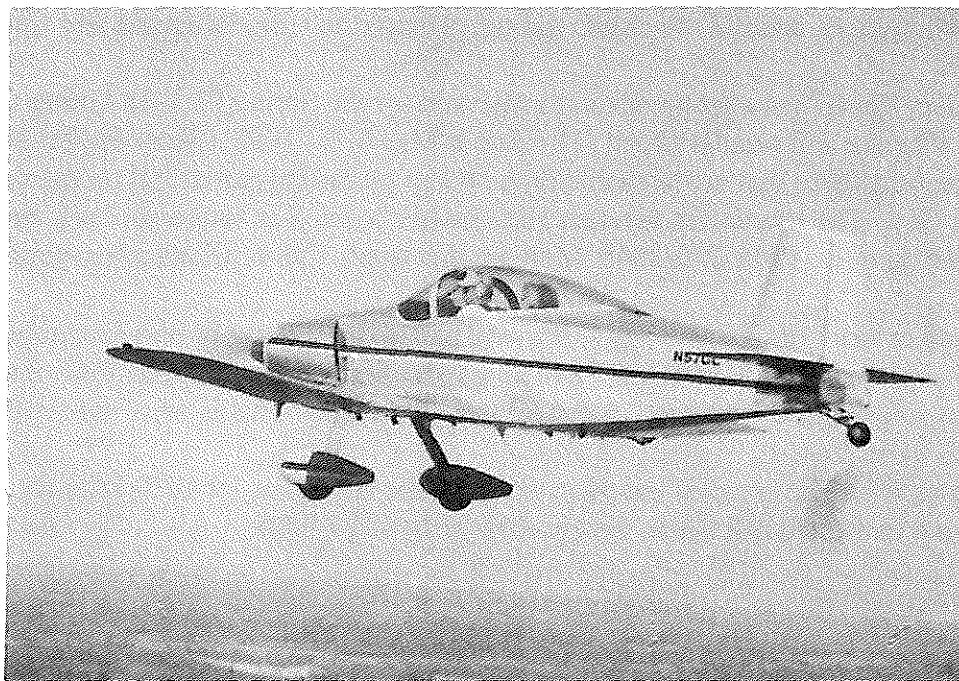


T-18 Newsletter Index  
in next issue

**T18 NEWSLETTER**  
**NO. 80 August 91**

# T-18 NEWSLETTER

ISSUE NUMBER 81



*Gary Cotner's T-18 from Collinsville, OK*

## T-18 NEWSLETTER INDEX

by James J. Strickenberger

## T-18 MEMBERSHIP LIST

NOTICE: (STANDARD DISCLAIMER) As always , in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.

### A note from the editor:

A number of you have asked for a list of members, so after several days of trying to get a transfer made from my computer data base file to the publishing software, I got it right! I hope you find it useful and it will help build relationships with new friends that you didn't know were out there.

The T-18 Newsletter Index was sent in by Jim Strickenberger of Erie, Pa. A big thanks to Jim for his great effort. I trust that we will all find it useful in finding that special topic or building idea that we remember but can't quite put our finger on when we need it. My wife and daughter also deserve a big Thank You! since they typed it twice (since I lost the data file in changing to my new "486/33 computer) and did the proof reading. Thanks! to Jim, RoxAnne and Courtney.

Gary Green has a group of rooms reserved for the Spring 92 T-18 Group Get Together. It's at a new location and sounds Great! The date is May 8, 9, 1992. (Sorry but it's Mother Day!) Seems the only dates that are available in the better places happen to fall on special weekends like Mother's Day. The location is Western Hills Lodge, located at Sequoyah Park near Wagoner, Ok. The phone number is 918-772-2545 More on this later! Call now and setup your reservations.

I've started to work on the next newsletter and plan to have it out in mid-December. Talk about some good material! I have at least five articles, submitted on computer disk, that cover some important subjects and material. Keep up the good work! This is what will make a good newsletter great!

Mrs John Thorp called me this week with the news that John's T-18 is for sale. She asked that anyone interested call her in the evenings at 209-727-5708

### FOR SALE



John Thorp's T-18 Call 209-727-5708 for details

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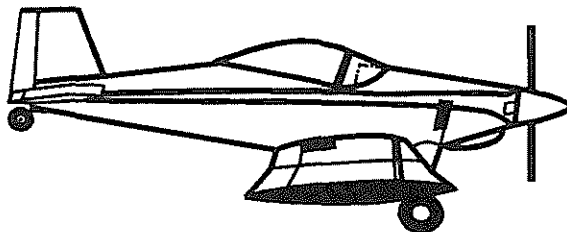


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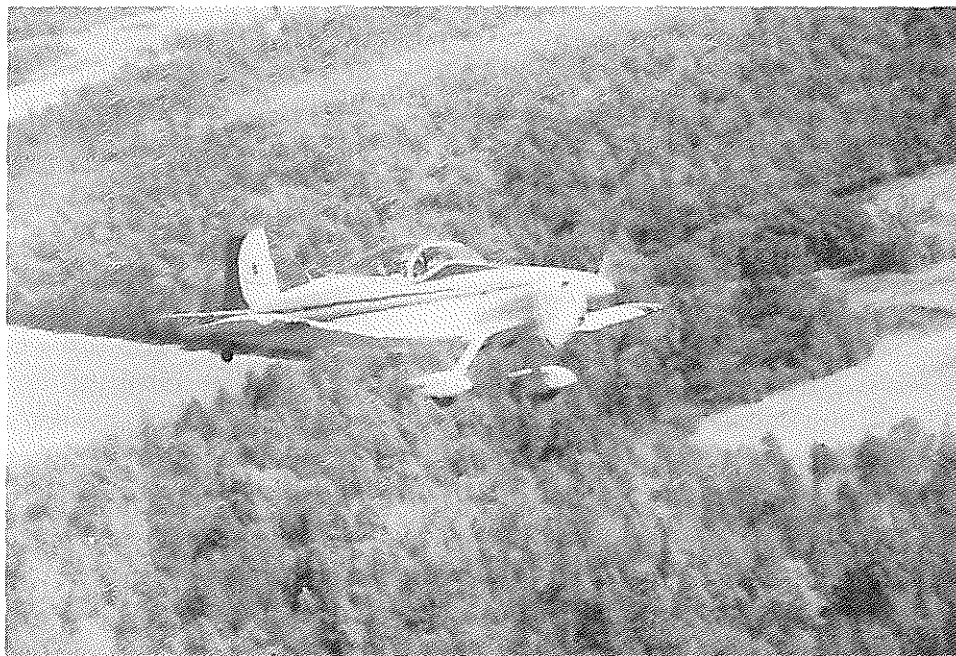
## MEMBERSHIP LIST AND NEWSLETTER INDEX



**T18 NEWSLETTER**  
**NO. 81 November 91**

# T-18 NEWSLETTER

ISSUE NUMBER 82



Jim Paine with his passenger Lee Skillman at Kentucky Dam Fall 91

## IN THIS ISSUE:

**STALL STRIPS** by Tom Kerns

**SPINNER & OTHER T-18 TIPS** by Bob Highley

**FUEL FLOW TOTALIZER** by Edwin Poe

**T-18 FLIGHT TO 48 STATES** by Edwin Poe

**TRAILING EDGES** by Floyd Meyer

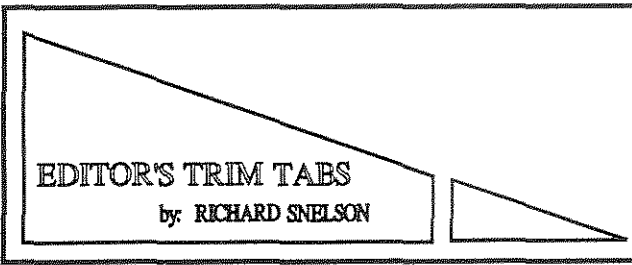
**KENTUCKY DAM FALL 1991**

**DID YOU SHAKE YOUR TAIL TODAY** by Walt Griffin

**CRANKCASE BREATHER** by John Evens

**BUILDING TIPS AND TECHNICAL TIPS**

*NOTICE: (STANDARD DISCLAIMER) As always, in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.*



To our members:

I hope that after reading this newsletter you will agree that it contains some fine articles. That is certainly my conclusion! Thanks! to the folks that sent them, for putting together some good material. As your editor, I have always felt that the real success of this newsletter and the T-18 Mutual Aid Society rested in it's membership and their willingness to write and tell about their building and flying experiences. Keep up the good work! Yes, we are succeeding!

The last issue, Number 81 contained an index for all the old newsletters and a Membership List. I've had a number of phone calls from all over the country about how much everyone liked both of these items. One call explained that the member had no idea that there were five other T-18ers around the state. Great! That's exactly why I put the list out. If you have any corrections please include them on the enclosed renewal form so they will be included in the next update.

I need your help with the renewals! Last year I spent a good deal of postage with second and third follow ups to get everyone signed up. Please renew now so I have the total number of members and can plan the printing and mailing arrangements. I would much rather use that postage money on better quality printing like we had for the last issue, Number 81. If you noticed the publication was in a book format and the whole piece was typeset, which makes for much better quality of print and photos. The cover photo was shot with the typeset camera and really looked good compared to some of the last newsletters which were printed on a zerox. There is no change in the dues, still \$25 dollars

per year. . By working altogether we can preserve our fine airplane and the knowledge it takes to fly and maintain it.

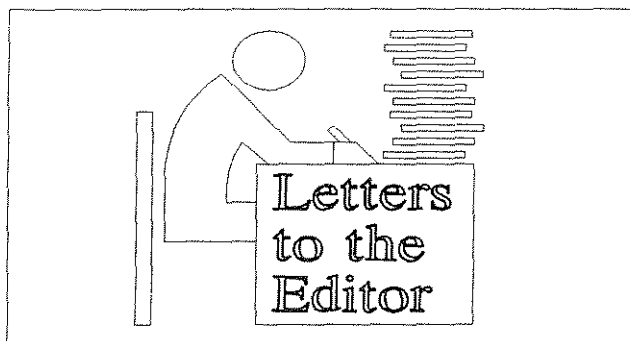
May 8, and 9 are the dates for the spring get-together at Western Hills Guest Ranch in Wagoner, Oklahoma . Be sure to read Gary Greens letter about that meeting, (in this newsletter). We all thank Gary for helping with the arrangements there.

I didn't write a specific article on the Fall 91 trip to Kentucky Dam because we're short on space for this letter. I did include a list of attendees, in this letter, and I wish to thank Jim and Judy Paine for their help in arranging that meet.

A quick status report on my ship, N295RS. I'm now installing a Terra Nav/Com with glideslope, Terra Transponder, and a Escort II for my second radio. Plans call for a Flybuddy later.. I called the airport last week and reserved a hanger for March 92 and will be working like the dickens to make that date for the first flight!! Still have a lot of finish work and detailing to complete.. and it may not be painted. But it's going flying by-gosh! I've bugged several of my T-18 buddies to death with questions, and still wind up having to do some things over by not completely thinking things through. My thanks! to those guys, they know who I mean.

Richard O. Snelson  
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**For Sale: Thorp T-18 Metal Cowling \$2500**  
**Set of wing tips \$120, wheel pants \$110,**  
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Dear Richard:

If you recall, I had a minor problem with the starter drive being chewed up when I was at Kentucky Dam. Well after much head scratching and replacement of the starter solenoid, it was the ignition switch. The switch had an intermittent short and would try to start the engine in flight consequently chewing up starter drives. Since replacement, no more problems have occurred. The airplane is flying well, I have attended most of the fly-ins around the West Coast this summer and have really enjoyed them. The airplane won "Best Thorp T-18" at Merced. I am proud.

By the way, I have been using Auto gas for the 140 hours I've put on the airplane this year and have had absolutely no problems. I routinely fly as high as 17500 on long trips. I use Major brand 92 octane super unleaded and from Oct. 1st to March 15th they require Oxygenated additives for the air pollutions. The brand I use has MTBE added. Again no problems, It just smells bad. I haven't had to clean the plugs at all so far, which wasn't the case with 100LL. I had to clean them every 20 hours or so with that. I have 91/96 engine. The \$1.00 per gallon savings adds up over a long period. Well take care, get that airplane flying soon. Harold F. "Tommy" Thompson, 3133 Valleywood Rd. Henderson, NV. 89014

Rich, Going to Oshkosh this year (my 19th consecutive trip in my T-18 my Sensenich wood prop worked slightly loose. It had 84 hours on it since being torqued April 1. Sensenich was very good to recondition the prop free of charge. However I feel the 100 hours between torques,

as recommended by Sensenich, should be 50 hours. Sensenich was going to issue a statement on this but has not done so yet so, you might want to comment on this in your newsletter. Could you advise me on which wood prop you would buy for the 0-360 180hp? I'm considering another wood prop so that the down time can be eliminated in case I damage my prop. Several people have mentioned the Pacesetter. I'm not opposed to the Sensenich. Thanks! Gayle LeCount N5GL #719 serial.

*Editors Note: You might like to write for Sensenich Bulletin #212 on Wooden Props. It's shows a W68LY68 for the 0-360 series. It's also states a Special Flanged Adapter is required for fixed pitch wooden propeller on engines of that peak torque.*

Richard, Here's the \$25 for the newsletter, which will be immeasurable help in finishing this aircraft up. I still have quite a bit to finish and the information is vital so I don't have to redo some of the work and get it correct the second time.

The A/C I purchased is build from Plan 732 and has a N-number N174P, with a 150 hp Lyc. The individual who started working on it was stationed in Japan at the time and did all of the work there and when he returned here in 1972 brought it back and it remained in a barn until he (Al Pitts) sold it in 89. The two Guys who purchase it didn't do anything on it and so sold it to me in July 91. There was some info on this A/C published in Newsletter #34. Fortunately all of the modifications were made on the fuselage and the Horizontal Tail and the landing gear is extended which I understand makes it somewhat less prone to ground loop.

While I did purchase an aircraft which has most of the hard work done I still have to finish quite a bit as you can see by the photo. Hopefully will get this finished some time soon and may get a chance to meet you in person one day. Regards Paul MacMichael 4222 Juniper Dr, Tacoma, WA



#### **N10TK FLIGHT MANUAL:**

I am surprised at the demand for T-18 flight manuals, and by the LACK of information some recent T-18 buyers have on their airplanes! The note on manual pricing in the last newsletter was misleading, I am printing, binding, and shipping the manuals for \$13.00, with an additional \$2.00 charge to include a computer disk. The disks are IBM compatible with a Wordstar Professional file and an ASCII file which should be readable to any IBM based word processor. Anyone who received an early disk without the ASCII file should let me know if they need it.

#### **STALL STRIP EXPERIMENTS:**

I have been experimenting with stall strips on my T-18 and am amazed with the results. John Thorp recommended strips made from 1/2" X 1/2" aluminum extrusion 8" long. John mounted them half way out on the wing center section leading edge. I tried these and was amazed at the overwhelming pre-stall buffet and the complete elimination of any stall break!

I experimented with different stall strip sizes and locations to develop the smallest possible set which yields a gentle stall at any C.G. without noticeably increasing minimum controllable airspeed. The resulting strips are 5-1/2" long and 3/8" by 3/8" in cross section. The strips are located mid span on my center section (non-folding wing) and 3/16" above the wing chord line. Positioning tolerance is not critical, vertical movement of 1/8" or more is required to produce noticeable change in stall behavior. Balsa wood and Duct tape were used for the test

strips.

The strips stall before the rest of the wing, resulting in partial loss of lift which drops the nose. The span-wise location of the strips is ahead of the horizontal tail. When the stall strips trigger a local stall, the horizontal tail is flying in the resulting turbulent wake. The turbulence results in very strong stick shake to provide warning of impending stall, and the interruption of smooth wing downwash on the tail reduces tail download and lowers the nose. Pulling back harder on the stick drives the stall strips deeper into stall further increasing buffet and increasing the pitch down (recovery) tendency.

The stall strip effects are C.G. dependent. I have tuned mine to yield fairly gentle behavior at aft C.G., which yields VERY gentle behavior at forward C.G.. At forward C.G., power off and flaps up, the aircraft will decelerate to heavy buffet at 65, slow to 63 as the stick is pulled aft, then drop the nose slightly and ACCELERATE to 75 mph as the stick hits the aft stop. With full aft stick the aircraft buffets and descends at 75 mph and 1200 fpm in full control. Flying 45 Degree banks and abrupt maneuvering are no problem and easing the stick forward one inch results in instant recovery to a normal 75 mph glide at 800 rpm.

All other stalls are more "normal" and very gentle. The following are excerpts from a portion of the pilot card I flew to test each stall strip configuration:

SOLO (Forward C.G.)

#### **FULL POWER, CLEAN**

Lots of buffet, nose bobs up and down with full aft stick, can be made to break right if controls are abused.

#### **POWER OFF, CLEAN**

Lots of buffet, can be maneuvered with full aft stick in a

1200 fpm descent. Crossed controls no problem.

#### POWER OFF, FULL FLAP

Nose bobs up and down with full aft stick. No break occurs, all controls effective, crossed controls no problem.

#### POWER OFF, FULL FLAP, FULL PEDAL FORWARD SLIP

Buffet increases with aft stick, rudder overpowers the ailerons and the aircraft rolls gently towards wings level. Releasing back pressure yields instant recovery.

Buffets at 65, drops nose and enters steady descent at 75 mph and 1800 fpm. Can be maneuvered, but can be made to break with control abuse.

#### POWER OFF, FULL FLAP, FULL PEDAL FORWARD SLIP

Buffet increases with aft stick, rudder overpowers the ailerons and the aircraft rolls gently towards wings level. Releasing back pressure yields instant recovery.

Partial power stalls are similar, all stall conditions were tested with at least one ball deflection right and left skidding flight.

Intentional spins have not been flown in N10TK with or without the stall strips.

The stall strips produced very similar results when installed on Jim Borgs T-18 N80RG.

#### AFT CG:

##### FULL POWER, CLEAN

LOTS of buffet, will break right if pilot persists and the stick is pulled full aft. Ample warning provided.

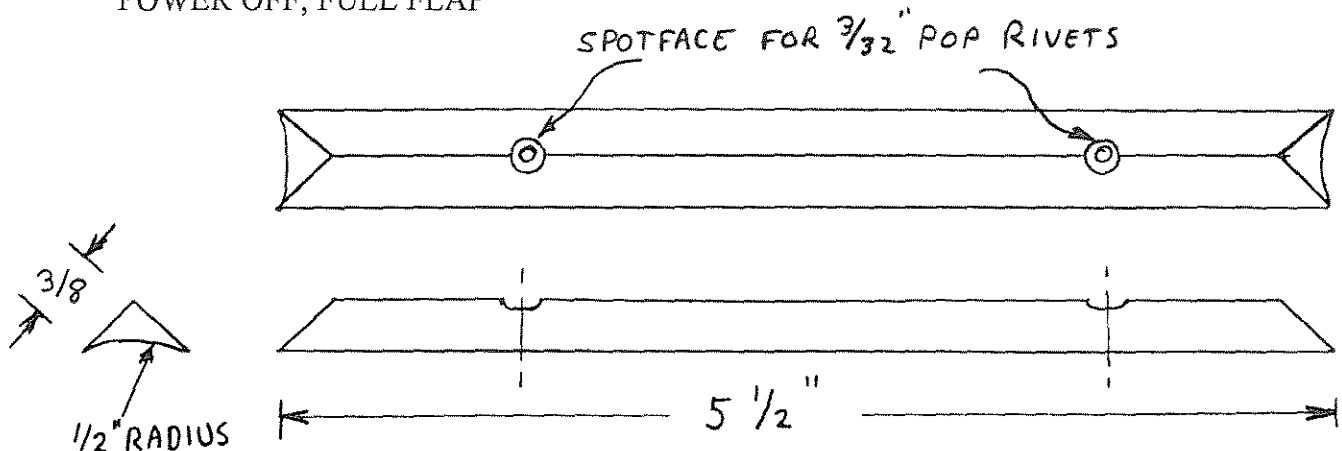
##### POWER OFF, CLEAN

LOTS of buffet, can be made to break if controls are abused at full aft stick.

#### CONCLUSIONS:

Three other pilots have stalled N10TK with and without the stall strips. The consensus is that without the strips, N10TK stalls sharper than any factory builds we had flown and provides very little buffet warning. WITH the stall strips, the stall is extremely benign with ample, strong warning. Configured with stall strips, there is virtually no chance that a pilot would unknowingly pull the aircraft all the way to a stall, and if the stall is actually reached, the stall is benign and does not constitute a hazard.

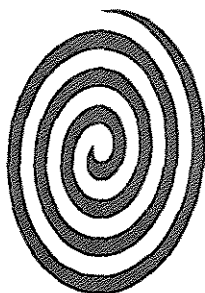
#### POWER OFF, FULL FLAP



# SPINNERS

## & OTHER T-18 TIPS

by Bob Highley



What a great time we had at the 1991 Fall T-18 gathering at Kentucky Dam. My vote is that we do it there in the Fall next year over the same three day weekend.

Here are some of the "How I Did Its" I promised you at the Fall Happening.

**SPINNER** I have a Hartzell constant speed prop with one of Ken Brock's spinners. It was originally installed per his instructions but at about thirty-five hours it developed some cracks at the mounting screws that then started going around the circumference from screw to screw. The spinner had no wobble and the backplate seemed secure. I discovered later that my tach read 175-200 RPMs low and I had previously adjusted the prop stops to get proper take-off RPM. I suspect a combination of high RPM and the rather large blade cutout holes were too much for the spinner. (Yes Virginia, I did talk to the prop man and found that I had come close to prop overspeed but had not exceeded it.)

On to the fix. I cut about 5/8" off all the way around the spinner shell and punched new holes. With the cowling removed, you can position a "one-handed" center punch through the existing nut plates and make a mark. Then, using your Whitney punch, make stress-free holes for the screws. Next, I made gap fillers for the blade holes out of .63 alclad. These just slip between the spinner itself and the backplate. They have a couple of nutplates on each side and also catch the end holes at the cutout in the spinner. A 10/32 screw and nutplate centered on the backplate behind the blade completes the installation. (See drawing #1.)

Then, I decided that a front bulkhead was neces-

sary. Locating where the prop hub is inside the spinner is a MAJOR pain. I took some rough measurements of the inside of the spinner in the vicinity of the hub when installed and turned a male form block on my Shopsmith. A back-up block was also turned. I chucked up a round piece of .040 6061 T4 and began to learn the fine art of aluminum spinning. (My hat is truly off to Kenny Brock, now.) I found the trick here is to anneal the piece often as you go and the flange you are forming will lay right down. In this case, I used a welding torch set rich (black smoke) and played it on the piece while it was turning. Ultimate strength is not the object here, shape is. The formed piece now looked like a pie plate that just fit into the spinner at the location of the prop dome. The next part is the real trick to this whole thing. I got some heat formable ABS .190 plastic (Kydex) sheet and formed a sleeve with a flange that slips over the end of the prop dome. This involved a holding fixture and a male plug all made out of wood on the Shopsmith. This was then riveted to the pie plate. (See dwg #2.) The whole thing was then epoxied into the spinner with a stuff called PC-7. Available in hardware stores, this comes in what appears to be two 35MM film cans held together with a paper tube. I have used PC-7 all over the airplane to include holding the vent tube on my fiberglass gas tank. The spinner now has over 535 hours with no sign of problems.

**ENGINE MOUNT** After about 150 hours, I discovered a crack where the spools are welded to the ring tube on my dynafocal mount. I had modified the mount to clear the rear mounted carb on the O-360 A1G6 Lycoming. This undoubtedly put radial stress on the ring and the standard butt welds were just not up to the task. This was fixed by adopting a Mooney procedure called out in one of their AD notes. Sorry I don't have the number but it involved welding a fillet plate between the tube and the spool. (See dwg #3.) By the way, these cracks were caught on a preflight (cowl cheeks off) because I had painted the mount an off-white instead of the normal black. The crack had not progressed completely around the tube but was plainly

visible. I wholeheartedly recommend painting the motor mount a light color. This applies to the flight control weldments, too.

**AILERONS** I had a serendipitous occurrence with my ailerons that might help some other T-18er. From the outset my airplane flew virtually hands off. However, at 170 mph and above, roll control became very stiff. Other Thorps I had flown also exhibited this tendency. I discussed this with Lu Sunderland and he said that this was just a Thorp idiosyncrasy and since the airplane was originally designed for 150 mph cruise, this was to be expected. Well, I learned to live with it until I noticed that the ailerons flexed quite a bit during hard rolls. Since I really enjoy formation flying and other performance oriented maneuvers, I really needed to fix this. I never really liked my ailerons since they were the first parts I made and my quality control was a bit lacking. I made a new set with the following changes to the plans (yes, I accept full responsibility for my actions): upped the skin and stiffener thickness to .020; made the skins from one piece with a bent up trailing edge (see dwg #4); and installed a trim tab outboard on the right aileron. Now it really does fly hands off, with or without a passenger. The most pleasant part of this whole thing was that the airplane can now be flown with just fingertip pressure right up to redline. This is due to a "fatter trailing edge." I have since noticed "fat" edges on competition Pitts' and even the Super King Air has bulbs built into the ailerons. Making a few test strips and bending them on your particular brake will aide in determining where the bends will fall and thus what the dimensions for the skin should be. Bill Williams has even made one piece flap skins in this manner. (Hint: The grain of the metal must go chord-wise. Also, buy more aluminum than you think you will need; mistakes are not only expensive but also time consuming if you have to reorder.)

**WIRING** Watch how you route your wiring, with particular attention to the proximity of the alternator lead and the instrument leads. I had a very short first flight due to a high cylinder head temp reading. It turned out to be caused by

induced voltage between wires I had neatly bundled to go through the firewall. Keep the low voltage probes separate from other wires. Quick disconnects installed from the start will also save you time when disassembling for later inspections and modifications. Crimped-on terminals can be a source of corrosion induced open circuits, though. Do a thorough wiring job the first time or you will end up doing it again. Voice of experience here.

**OTHER TIPS** Temperfoam for the seats is worth the price. Round off (for hip comfort) and reinforce the tunnel in between the seats so it can be used as a step. (See dwg #5.) Reinforce the top of the deck behind the seatback with a transverse stiffener as this is the one place every passenger wants to steady himself when getting in an out of the plane. (See dwg #6.) I highly recommend the Sunderland style cutout of the deck over the baggage area - it allows inflight access and makes it whole lot easier to load and unload. Don't use "Herculon" for upholstery; it won't stand up in the sun. Be extremely careful with zinc chromate or for that matter any of the exotic products used for metal protection. Journals of industrial medicine have documented the effects of long term exposure since the World War Two era. The medical text pictures alone are enough to scare you off. That's all for now. I will try to send more as I remember how it was done. A final word: Stick with the project, it is worth every cut, burn, hour and dollar spent. Bob Highley

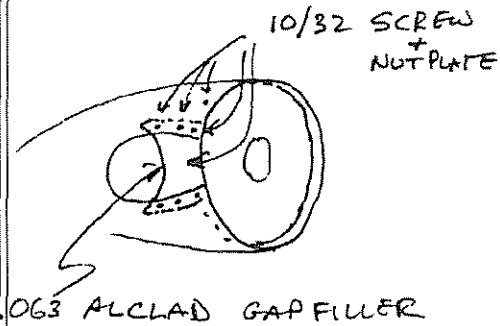
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## EDITOR'S NOTE Tools, Tools

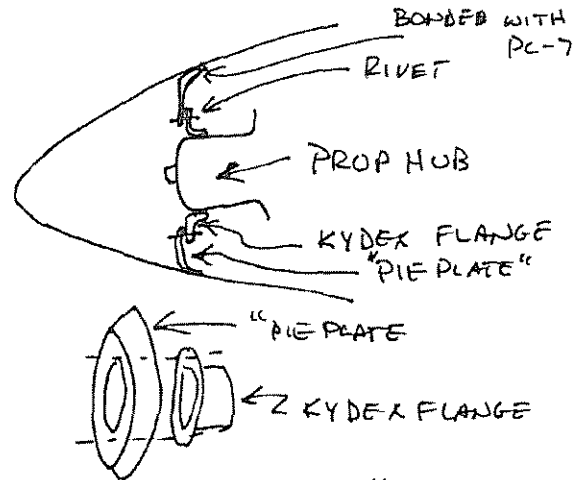
If you didn't drop in and meet Bob Avery of Avery Tools while you were at Oshkosh, you really should give him a call and get his tool catalog. I'm now using a number of his tools in my shop and they are great. Each item is quality built. For example rivet set with all sides and corners polished and rounded. Extra care on everything. What a pleasure to find a business man that is concerned and willing to spend his time solving our tool and building problems. His phone is (817) 267-9407



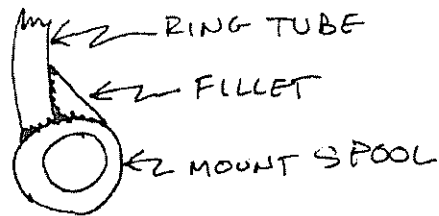
# Bob Highley Drawings



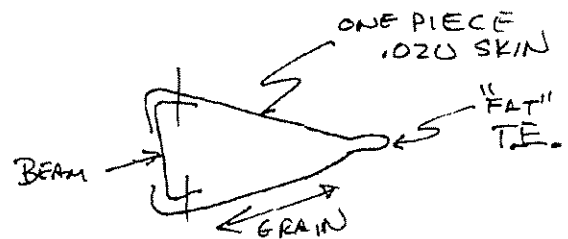
DWG #1



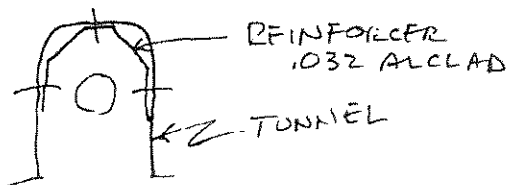
DWG #2



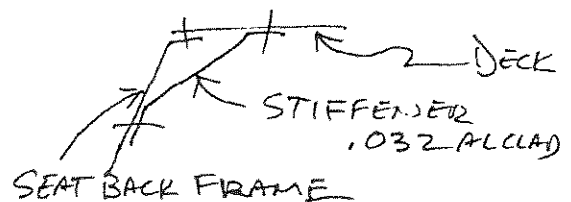
DWG #3



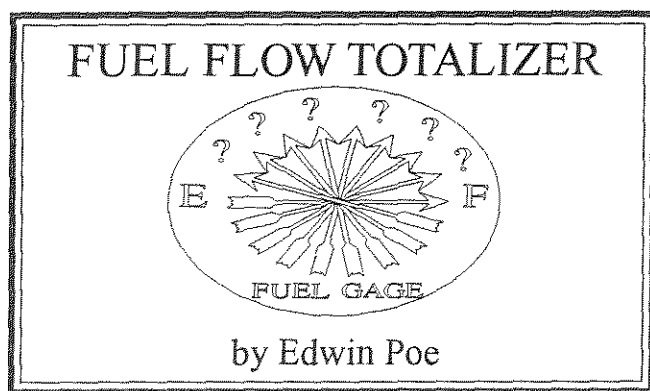
DWG #4



DWG #5



DWG #6



I was very unhappy with the fuel gauge on my T-18. It was the standard Stewart Warner gauge driven by a reostat attached to a float. The gauge doesn't read empty when the tank is empty or full when the tank is full. The scale is only about an inch long and marked at the quarter scale points. Even if the gauge and sender were perfect the peculiar shape of the tank would introduce a major non linearity. I tried several ideas involving an electronic amplifier between the reostat and the gauge which would allow me to calibrate the zero and full points and to adjust the gain in a non linear way to correspond to the tank shape. I didn't have much luck as the package got large and complicated. I still couldn't do anything about the low resolution gauge. The best idea was to use one of the commercially available fuel flow instruments. These give lots of information such a fuel used, fuel left, fuel flow rate, time left, baseball scores and several other things I really didn't need. And they were EXPENSIVE. I don't object to lots of information I just couldn't afford it. So I built my own and kept the cost down by only keeping track of the fuel used. My total cost was about \$200 most of which was for the fuel flow transducer. My totalizer uses the fuel flow transducer manufactured by FLOSCAN Instrument Company Inc. My panel indicator is a 12 volt 3 decade mechanical counter with a front reset. The advantage of a mechanical counter over an electronic counter is its intrinsic memory when power is turned off. The electronics package schematic is shown with component sizes. I am not a circuit engineer and

suspect that there is a better, cheaper, more reliable way to accomplish the objective. However this works and is in use in my T-18 and I like it.

### THEORY OF OPERATION

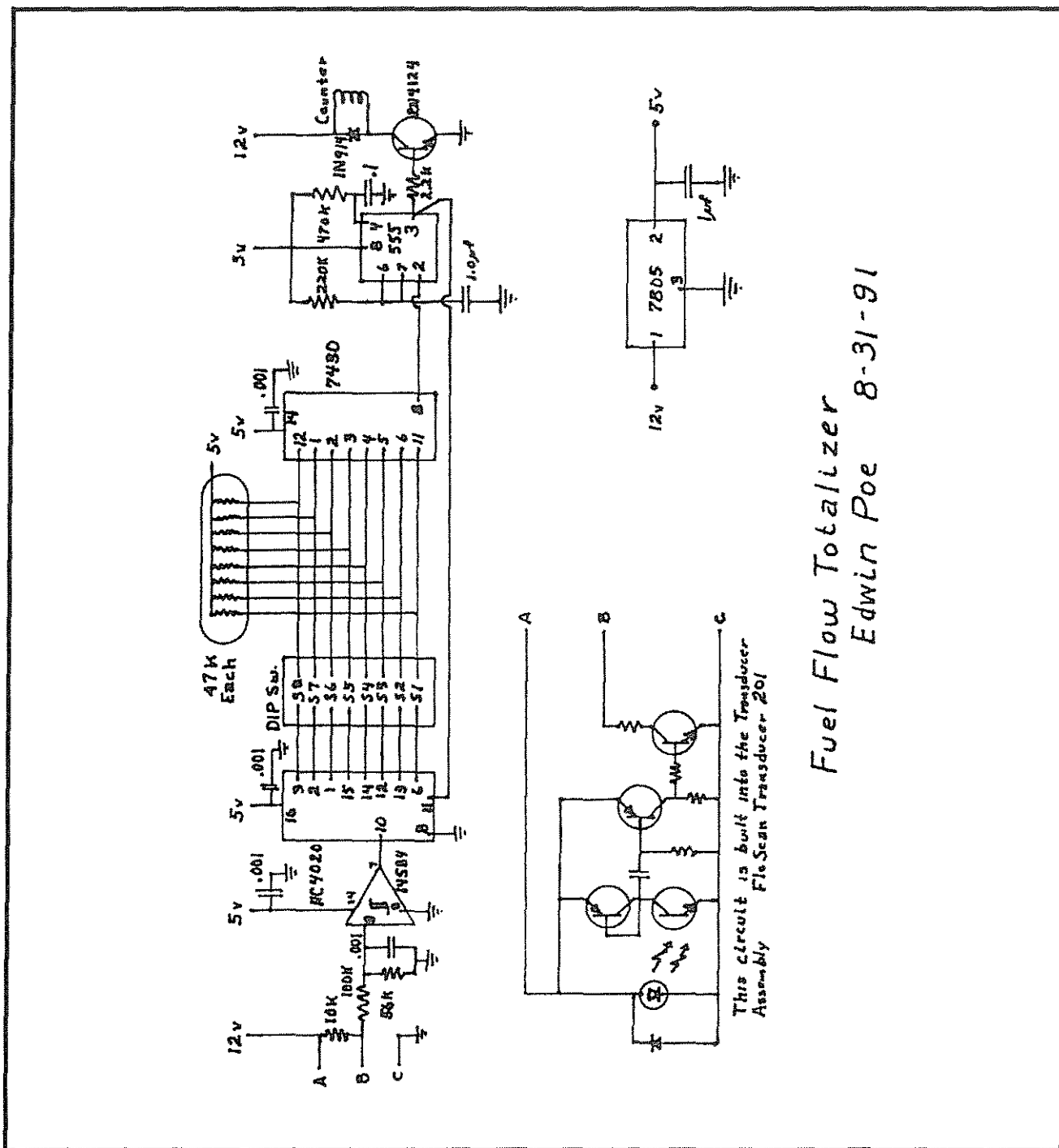
The fuel flow transducer is installed in the fuel line just before it enters the carb. As fuel passes through the transducer a number of pulses are generated proportional to the amount of fuel. This will vary but is in the neighborhood of 100,000 pulses per gallon. Due to the pressure drop across the transducer it would not be suitable for use in a gravity feed system. Since I want a panel indication for each tenth of a gallon all I have to do is count 10,000 pulses and trigger the counter. I don't want a fixed count counter since there is a need to calibrate the instrument to the exact output of the individual counter and installation. There is some signal shaping in the transducer itself giving a square wave output from 1v to 12v. This signal is sent via cable (I used shielded) to the electronics board where it is inverted and level adjusted by a schmidt trigger for input to a 14 stage binary counter. The 8 most significant digits are connected to a DIP switch. The output of the switch is connected to an 8 bit nand gate. I installed a 47K pull up resistor on each input to the nand gate. By setting the dip switch to the desired binary number the counter will keep at least one bit low until the exact count is reached. When the nand gate is satisfied an output is generated. (My counter is presently set to give one pulse out for each 9408 pulses in.) The output from the nand gate starts a 555 connected as a one shot. This serves as a pulse stretcher and provides an output to reset the counter to zero and a pulse to the transistor driver to set the counter. A voltage regulator is installed to generate 5v. The IC's were obtained from Digi-Key but should be available from any electronics dealer. (Radio Shack will not have most of the IC's.) The unit was built on a Radio Shack proto board 276-168 with room to spare. I found a 3 decade counter in a local junk store and have no idea how to get any more. However I did operate the unit with the Radio Shack counter 277-222 which works

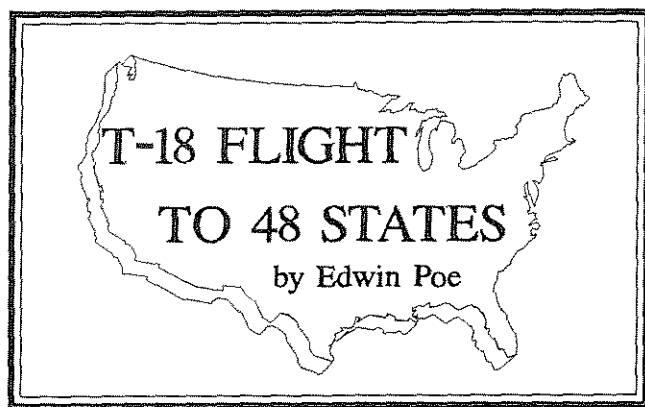
very well. The only thing is it has too many decades. I suppose you could modify the circuit and count each 1/100 gallon and amaze your friends or just paint over the decades not in use.

### Operation

Each time I fill the tank I push the reset to set the counter to zero. The system is wired directly to the 12v bus so it cannot be turned off. As I

fly the counter counts off the fuel I have used. I know I have a 29.6 gallon tank and therefore can always tell how much fuel I have left. When first put into use the accuracy will be off. I reset the dip switch after each filling to correct the error. It takes a few tanks of gas to get the calibration correct but from then on the counter will generally agree with the gas truck counter within a few tenths of a gallon.





Diary of Thorp T-18 flight to 32 states by Bill Mixon and Edwin Poe. June 18, 1990 through June 27, 1990. This trip was part of a series of flights to accomplish a full stop landing in each of the lower 48 states.

*June 18, 1990 Deer Valley, AZ to New Braunfels TX  
Flying time 6:00*

Loaded T-18 to approximately 1540 pounds with about 40 pounds in the baggage compartment and 10 pounds under the seats. This kept the aft CG just ahead of the neutral point when the fuel had been burned down to 8 gallons. Experience on the trip showed a significant reduction in pitch stability when slowing down to land after a long flight. (The pilot and copilot each weighed about 185 pounds.) Although the takeoff weight exceeded the design gross weight of 1500 pounds it was never necessary to land over gross. The few high altitude airports were no problem for the T-18. The first thing noticed as we prepared for the start of the trip was that the recently worked on intercomm would not work. It had been checked on installation by checking only the pilot position assuming that if it worked there then the copilot position would work too. Shortly after departure and transit of the PHX TCA it was apparent that the Alpha 200B Omni was very insensitive and would not be useful. The set had been working very well the last time I checked. (The VOR is seldom used in local flying in Arizona since the mountains combined with 75 mile visibility make visual navigation much easier.) Since the new Loran didn't work very well in the desert southwest this put us into the mode of navigation by highways with a sectional in the lap. Even so the

days flight to New Braunfels Texas with stops at Demming New Mexico and Fort Stockton Texas went very well and we arrived within minutes of the flight plan. Bill's brother met us at the airport and we spent a pleasant evening at his house. The Loran was working the gulf chain by the time we reached New Braunfels.

*June 19, New Braunfels TX to Griffin GA.*

*Flying time 7:27*

Early departure from New Braunfels caused us to fly directly into the sun on a very hazy day. To get above the haze would result in almost total loss of visual contact with the ground so we stayed low. Even so the horizon over the nose was lost in the haze. It was actually easier to fly on partial panel (I don't have an artificial horizon installed) even though we probably had 5 miles visibility. Somewhere along this leg the frequency display on the Apollo 706 communications radio decided to quit. The radio worked OK but you had to remember which frequency you had keyed in. We stopped at Chennault airport (near Lake Charles La) which sports a control tower even though I never saw another plane land or take off while we were there. From Chennault it was a bouncy one hour and forty minutes to Picayune Mississippi. The weather remained hazy, and at low altitudes the turbulence was moderate but continuous. The Loran was boss and we went where it told us and it never let us down. Most of the trip was flown at 1000 to 3000 AGL due to either the short hops or the overcast and haze. The turbulence at these altitudes was enough to cause us to slow the plane below the planned cruise speed. From Picayune MS we flew to Crestview FL. Heavy military training in the area resulted in many MOAs and we couldn't miss them all. We stayed as high as possible to avoid overflying small fields near their pattern altitude. Crestview is a civilian field but it looked like the military owned it with significant helicopter and light twin military traffic. I was happy to get clear of the area and head north to Georgia. The weather all across the gulf coast looked like it might start raining and storming at any minute. The forecast when we left Crestview was for scattered T'storms and rain showers all up and down the coast. The national news that evening reported

the combination of heat and humidity along the coast as "dangerous". When we turned north the visibility started to improve and by the time we reached Griffin GA we had effectively left the humid, low ceilings of the gulf coast. Also we had left the high density military traffic. The overnite at Griffin GA was interesting for its contrast with other airports, particularly in the west. No one answered the unicom, the line boy overflowed the gas tank even though he was cautioned, the airport had an overnite tiedown fee, none of the motels had a free pick up and of course the airport didn't have a courtesy car. The taxi to the hotel was prompt and the hotel nice so things went well.

*June 20, 1990 Griffin GA to Greenville TN Flying time 1:45*

From Griffin GA to Clemson SC we started seeing hills for the first time since west Texas. At Clemson the approach to the airport from the east provides a good view of a large sport stadium which we took to be the Clemson football stadium. From Clemson to Ashville NC the hills got higher and steeper. Just a few miles south of Ashville we found a very tall antenna right on our route which looked like it was high enough to snag airplanes. From Ashville to Greenville TN was an interesting flight up a wide pass in the mountains. As we approached Tennessee the land opened up into much flatter (not to say flat) terrain. The weather to the north and northwest of Greenville didn't look good and a phone call confirmed that a weather front blocked our path with ridges obscured and visibilities of less than one mile. We sat around the airport a while and finally gave up. We took advantage of the delay to change the oil and check the torque on the propeller bolts. I took the intercomm out and carried it back to the motel. The motel driver (turned out to be the owner) agreed to swing by a Radio Shack so I could buy a soldering iron, a roll of solder and two 2.2K resistors. I repaired the intercomm at the motel and it worked for the rest of the trip although it was noisy. A loud sputtering sound was in the audio and it made the continuous use of the intercomm tiresome. At the same time I reversed the antenna connections to the Alpha 200B. This brought the Omni to life again. I guess I had reversed these

connections the last time I installed the panel and never checked. This got all the electronics working again except I didn't have any display of frequency on the 706 comm radio.

*June 21, 1990 Greenville TN to Fredrick MD Flying time 3:06*

The weather continued bad the morning of the 21st. We hung around until about 10:30am until we were sure of our destination and an alternate. The weather at first was low clouds broken to overcast. By the time we reached Pikeville KY the ceiling was at least 5000 AGL and broken. The Pikeville airport had been the cause for much concern due to the entry in the Flight Guide about a drop off 800' from the end of the runway with landslide damage to the runway. We plotted several alternatives in case we got there and decided not to land. It turned out OK since the runway was long enough to avoid the damage area. From Pikeville to Beckley WV was a very pretty trip. There was no level ground to speak of and everything was covered with trees. This terrain continued almost all the way to Shenandoah VA. The small towns were down in the Vee shaped valleys and were frequently only one street wide. From Shenandoah to Fredrick MD we flew up the Shenandoah valleys. I couldn't resist trying to imagine the large Confederate and Union armies moving up and down this terrain.

*June 22, 1990 Fredrick MD to Ithaca NY Flying time 6:16*

This day promised to be the most demanding day of the trip. I started off hoping to get as far as Maine. We actually got all the way to western New York. The weather was good with a high scattered layer later in the day. However the haze was everywhere and visibility varied from 7 to 10 miles. Light to moderate turbulence came up in mid day and increased into the afternoon. When we left Vermont for Ithaca we went to 8500' and the air was very smooth. At that altitude we were just above scattered clouds. We flew from Fredrick to Middletown DE and then circled around the Philadelphia TCA to the coast and up to Farmingdale NJ. This took us practically over Lakehurst and the large dirigible hangers were

very easy to see. However we never did see Philadelphia. When we left Farmingdale we flew out over the Atlantic ocean for a mile and then turned to steer through the narrow gap separating the Philadelphia TCA and the New York TCA. We had to be very careful with navigation here as we wanted to fly completely around the New York TCA to Waterbury CT. This is when the Loran decided to just plain quit! Fortunately the Omni was working by now and we would be able to continue but the Loran would really be missed. I checked the signal strength and found that the master station (I didn't check the slaves) had zero signal strength. I suspected that the station was off the air and sure enough in about 10 minutes the warning lite went off and the Loran started working good as ever. Nothing like this ever happened again and I am now convinced that the trouble was on the ground. In any case we flew west around NYC about 25 miles out and never saw the City. What is more surprising is the amount of open land and woods we saw so close to such a large town. As we swung around to the NE and over CT the population density increased rapidly. Air traffic was not a problem even though there was more of it here than we had seen before. I'm surprised how few airports have active towers. Unicom is used everywhere and the traffic is well behaved. We landed at Waterbury Connecticut and again at Pawtucket Rhode Island where we bought gas. A landing at Fitchburg Massachusetts and on to Sanford Maine which marked the turn around point. Everything from here on was on the way home. Maine, New Hampshire, and Vermont were very lush with trees covering everything which wasn't town or highway. The ski runs on the mountains were obvious. Population density had dropped off quite a bit from early in the day and airports started getting farther apart. We landed in Keene New Hampshire for gas and just stopped by at Bennington Vermont. We flew just north of Albany NY and south of Syracuse on a line to Ithaca. The weather and visibility remained good into Ithaca but it didn't look real great to the west. Within two hours of tie down at Ithaca

we were experiencing a light rain. We had flown up to the front of a weather system headed east while we were headed west. We would spend two and a half days waiting for this weather to get by so we could continue. After tying the plane down we started calling hotels/motels but they were all full. So we tried to rent a car so we could look for a place to stay and all the rental agents reported 'no cars'. Finally we phoned an economy motel and got a room and took the airport limousine to the motel. We made arrangements to be picked up first thing in the morning on the reasonable assumption that the weather would be good.

*June 23, 1990 Ithaca NY*

The weather was not flyable at all. We hung around the airport for a while and even borrowed some tools and checked the plugs and plug wires trying to locate the source of inter-com noise. Finally gave up and started the hotel search routine again. This time we found a hotel with free pickup (but very expensive rooms). So we spent another night.

*June 24, 1990 Ithaca NY*

Another rush trip out to the airport and a call to Flight Service and another day grounded. This time we finally were able to rent a car and took off to see Harris Hill at Elmira NY about 45 miles south. I had known about Harris Hill since I was a small boy but this was my first visit. They were flying gliders in spite of low ceilings and strong winds. We also toured the Glider Museum. With a car we were able to locate another economy motel.

*June 25, 1990 Ithaca NY to Bowling Green OH. Flying time 3:41*

The weather where we wanted to go was reported good but Ithaca was marginal until midmorning. After we could see blue sky overhead and only broken clouds on the horizon we took off. The first thing we found was that the bottom of the broken clouds was only about 1000' AGL. The visibility was at least 10 miles so we struck out on course. The clouds didn't

improve so we stayed below them. The ground did get higher until about 70 miles west of Ithaca we were unable to continue. We turned back to Elmira which was the last good airport we had passed. After some confusion on my part as to which runway we were supposed to land on we put the plane down and started waiting again. There was a FSS on the field. The briefer didn't think the weather was as bad as we had actually found it. However in our discussion with him he pointed out that all of his reports came from airports which were always in the valleys and might not accurately represent what we found in trying to cross the hills to the west. I finally woke up and checked the map and sure enough it was totally unnecessary to fly over the high ground. If we diverted due north for about 40 miles we could end run the hills. It worked. By the time we got back on course in very good weather we had pretty well shot the day. We landed in Port Meadville for gas and continued on to Bowling Green Ohio. The FBO at Bowling Green OH was very helpful and loaned us a courtesy car. An uncertain age green cadillac. It ran and that was enough.

*June 26, 1990 Bowling Green OH to Elk City OK Flying time 7:22*

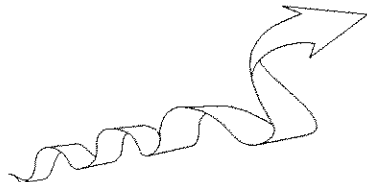
The day started off as the best flying day since we left Phoenix. The air was clear with visibility in excess of 30 miles with no clouds. The run up to Coldwater Michigan gave us a good view of Lake Erie. From there a smooth run down to Kokomo Indiana and we were beginning to believe all the weather was behind us. As the day progressed we picked up some small summer Cu but scattered and well above us. We made great time and got all the way to Effingham IL with no delays. However at Effingham we met a student pilot who had just cancelled his cross country trip due to thunderstorms. I called Flight Service and sure enough our next planned stop in Missouri was at that very moment under a 'violent' thunderstorm. There was a line of T'storms running NE to SW pretty much on our course. It was reported to be moving to the SE at 35 knots. It was not part of

a front. After waiting an hour we took off and flew under the east end of the line of storms. We flew around a few light showers and came out on the back side of the heavy clouds. When we got to Lebanon MO and called Flight Service they told me that Rogers AR was just north of a very heavy storm which was moving SE. They suggested we wait an hour and call back. Since we had clear air and were on the back side of the storm we waited for about 20 minutes and took off. We had no problems into Rogers AR but could see the dark clouds of the storm just to the south. Flight Service cautioned that the route from Rogers AR to Elk City OK was subject to scattered thunderstorms with moderate turbulence. We didn't see a thing and had a nice trip into Elk City OK.

*June 27, 1990 Elk City OK to Phoenix AZ Flying time 6:00*

Elk City to Double Eagle airport (Albuquerque) with a gas stop at Tucumcari NM and we were on our way home. Things went very well. As expected the Loran started acting up just about the same time the omni lost St Johns VOR. I thought we had it made and hadn't even bothered to call Flight Service. About 35 miles east of Payson we started running into heavy smoke and had to make a 180 turn to maintain visual contact with the ground. I called Flight Watch and was told of numerous fires all along the rim and told that VFR flight over the rim was not possible. I turned south thinking to skirt the fire but found the smoke everywhere. As we flew south over very rough terrain with all the valleys filled with smoke the Loran gave up and died. I was too far for the Salt River VOR and we couldn't match the ground with the sectional. Finally I recognized Cherry Creek and turned toward Phoenix. A short time later I saw Four Peaks, the omni picked up SRP, and the Loran decided to give it another try. The ATIS at Deer Valley was reporting 109 degrees and it was only 11:20am! Welcome home!

## TRAILING EDGES



by Floyd Meyer

A bit on trailing edges. Most have said "Clamp them, then squeeze the rivets" and I must agree, for it worked well for those cases when I could use that method. But -- I had borrowed a squeezer from a friend, who now had it in full time use. My rudder and trim tabs were ready to close. So I opted to try an alternative, which worked, and which just might be of value to others -

Assume the mess is done, except for closure of the trailing edge. Then

- \*. Align the edge, using the eyeball. Clamp it between angles, drilled to provide clearance for Clecos and rivet sets.

- \*. Drill, and Cleco, # 40. I am not sure this is necessary but I do it pro-forma.

- \*. Drill out to #30, using dowels in about every 4th hole ( I used taper pins - slope about .002"/inch - which worked great. I do not know where to get them - I borrowed them from a machinist friend.) Cleco every hole not doweled.

- \*. Dissassemble the mess and debur it. Reassemble, dowel, cleco, and clamp it tightly, and now you are ready to rivet.

- \*. Set air pressure at the gun at the absolute minimum which will set the SOFT rivet with about 4 - 5 hits. I used the "Coin Press" method of dimpling - described before in the Newsletter - then drove the rivet. Riveting started at those holes with taper pin dowels. \*. Perhaps the most critical part is hole alignment. Should a rivet not enter the hole with just finger pressure, then REAM the hole - do not attempt to lever (Ice-pick) it into alignment. My tests on scrap clearly showed that the latter always caused a wiggled trail edge, whereas reaming the hole did not. I guess the soft (470-A) rivet

expands without distortion of the edge. The resultant trailing edges were straight, per eyeball assessment. So here is an alternative if you do not have a squeezer, which I would use if I had it. Floyd Myers

## KENTUCKY DAM FALL 1991

The following folks were at the Fall 91 Kentucky Dam Event. Hope I didn't miss anyone!

Roy & Karen Farris, Noble, Ill  
Clif Redden, Georgetown, OH  
Dwight Scaggs, Blanchester, OH  
Don Warner, New Smyrna, FL  
Steve Hawley, Tucson, AZ  
Joe Forbes, Planto Center, IL  
Mac Booth, Daleville, AL  
Bud & Marge Payne, Austin, TX  
Joe T. Miles, Crossville, TX  
Lee Skillman, Mobile, AL  
Paul & Helen Shifflett, Earlham, IA  
Dan & Jane Wolfe, Fairburn, OH  
John & Neora McClure, Marietta, GA  
Stash & Gladys Simpson, Wichita Falls, TX  
Bill Williams, Tampa, FL  
Bob & Susan Highley, Sumter, SC  
Leroy & Mary Holt, Savanna, OK  
Ed & Jeannette Ludtke, Sioux Falls, SD  
Gary & Maxine Green, Granbury, TX  
John (Bob) Olds, Davenport, IA  
Richard Snelson, Clinton, IL  
Dick & Mary Amsden, Mt. Clemens, MN  
Bob & Carolyn Jaeger, Northlake, IL  
Chuck & Michelle Meyer  
Ken & Mary Rhoades, Peoria, IL  
Gary Cotner & Judy Barfield Collinsville, OK

## KENTUCKY





## DID YOU SHAKE YOUR TAIL TODAY ?

by Walt Giffin



After the T-18 forum at Oshkosh 91 concerning severe tail oscillation, I became concerned about looseness in my own stabilator. Shaking the tail on N78WG after the forum seemed to increase the deflection I had previously noted. Maximum deflection measured at the outer tip of the stabilator was approximately 0.25 in. Since this airplane had accumulated over 1300 hours since its completion in 1979 and had never had the tail removed for lubrication or any other purpose, investigation seemed in order.

My good friend Dean Cochran of Broomfield Colorado properly chastised me for delinquent maintenance and then agreed to fabricate any bushings we might need to tighten up the control system. Upon removal of the stabilator we found very little play in the 594 spacers and evidence that the original Lubriplate grease was still providing lubrication. Dean fabricated spacers which were .002 oversize and removed nearly all of the play in the stabilator. No reaming was necessary.

When the rudder was removed and the pressure of the rudder springs released, considerable play in the top rudder bushing (581) was apparent. The hole in which the bushing rides was worn in an elliptical shape with the major axis of wear being perpendicular to the fuselage center line. The bottom bushing seemed tight and both appeared to be adequately lubricated. The mounting holes were straightened and aligned with a guide and expansion reamer provided by Dean. An oversized micarta bushing was fitted to the top attach point. An additional problem was noted in that the AN 23-9 Clevis bolts which attach the rudder cables to the rudder horn were found to be severely

grooved and were replaced.

To complete the reworking of the control system, all bushings from the stick sockets to the tail were removed, inspected and lubricated. All bushings (496, 554, 555) were found to be snug and adequately lubricated in spite of over 12 years use accumulating 1300 hours of flight time and no previous maintenance.

One other unrelated problem was discovered during the extensive tail maintenance. The tailgear fitting 583 had developed three radial cracks from one of the rivet holes which fastens the fitting to the fuselage belly skin. Both the necessity for that particular rivet and the reason for the cracks remain a mystery to me. The cracks were stop drilled and frequent inspections are planned to evaluate the need for a doubler in that area.

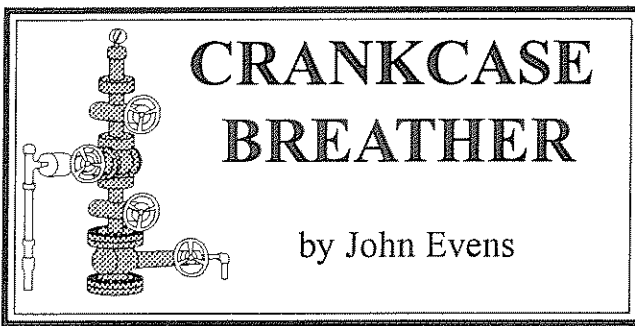
So there you have it. I now have more peace of mind and a very smooth functioning control system. The moral is: the T-18 is a very well designed airplane; it is great to have knowledgeable friends to help make repairs when necessary; and at least once every 1300 hours you should take time to "shake your tail" to see if it has any messages for you.

### FOR SALE ITEMS

Set of prepunched metal templates and wood form blocks for Standard T-18. Also 120 3/32 and 300 1/8 clecos. Gerald K. Czarniak, 4536 W Norwich Ave. Greenfield, WI 53220 Phone 414-541-0318

For Sale: T/S-18 Horizontal Stabilator, S-18 Ailerons, S-18 Plans with Sunderlands's Book, also 180 HP 63 Olds A1 V-8 professionally rebuilt ready for reduction unit. Alan Reich 2161 Gazebo, Idaho Falls ID 83402 Phone (208) 522-3191

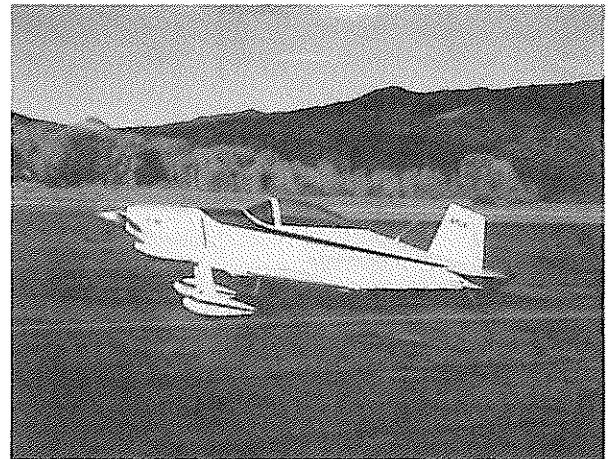
For Sale: A flip over project, some wrinkled skin fwd. Aft fuse good condition, wings will need some skin work. 600 hr 0-290-g goes with it. A lot of extras \$1500 Bob Slagle, (409) 265-8383



October 30, 1991

Thought I'd give you an update on 71JE (s/n 1171). I've put 116 hrs. on it now in the first year. It flies like a dream! Luckily, my wife and kids love to fly with me, and the only problem is who to take. We're based at Jeffco airport in Denver with Dean Cochran (11DC). I've flown to Butte, Montana (past the Tetons, over Yellowstone, etc.), Rapid City, SD (Mt. Rushmore), Nebraska, Kansas, all over Colorado (including Leadville and Aspen), and most recently to Kerrville, Texas for the fly in (where we were very happy and proud to win "Reserve Champion - Plans Built Custom"). It was great to see 6 other T-18's and Dick Cavin there. I recently installed a Garmin GPS100 (global positioning system receiver) and it is really something! Weighs approx. 25oz., and gives 3D navigation at up to 49ft. accuracy anywhere in the world. It has features too numerous to mention, and is only 6.25" x 2" x 3.95" deep. It uses a tiny little antenna which I've mounted on the deck behind the seats. Anyway, some of the guys at Kerrville said I should share the crankcase breather system that Dean Cochran and I are using. It uses a common G.M. emission part - a check valve (part #22048214 or equivalent) which is attached to a small tube which is welded to and protrudes a small distance into one of the exhaust tail pipes. The end of this small tube is cut off at a 450 angle, facing downstream. This produces a small amount of suction on the tube as the exhaust gases flow past. The check valve is there as a safety device in case of backfire - flow can

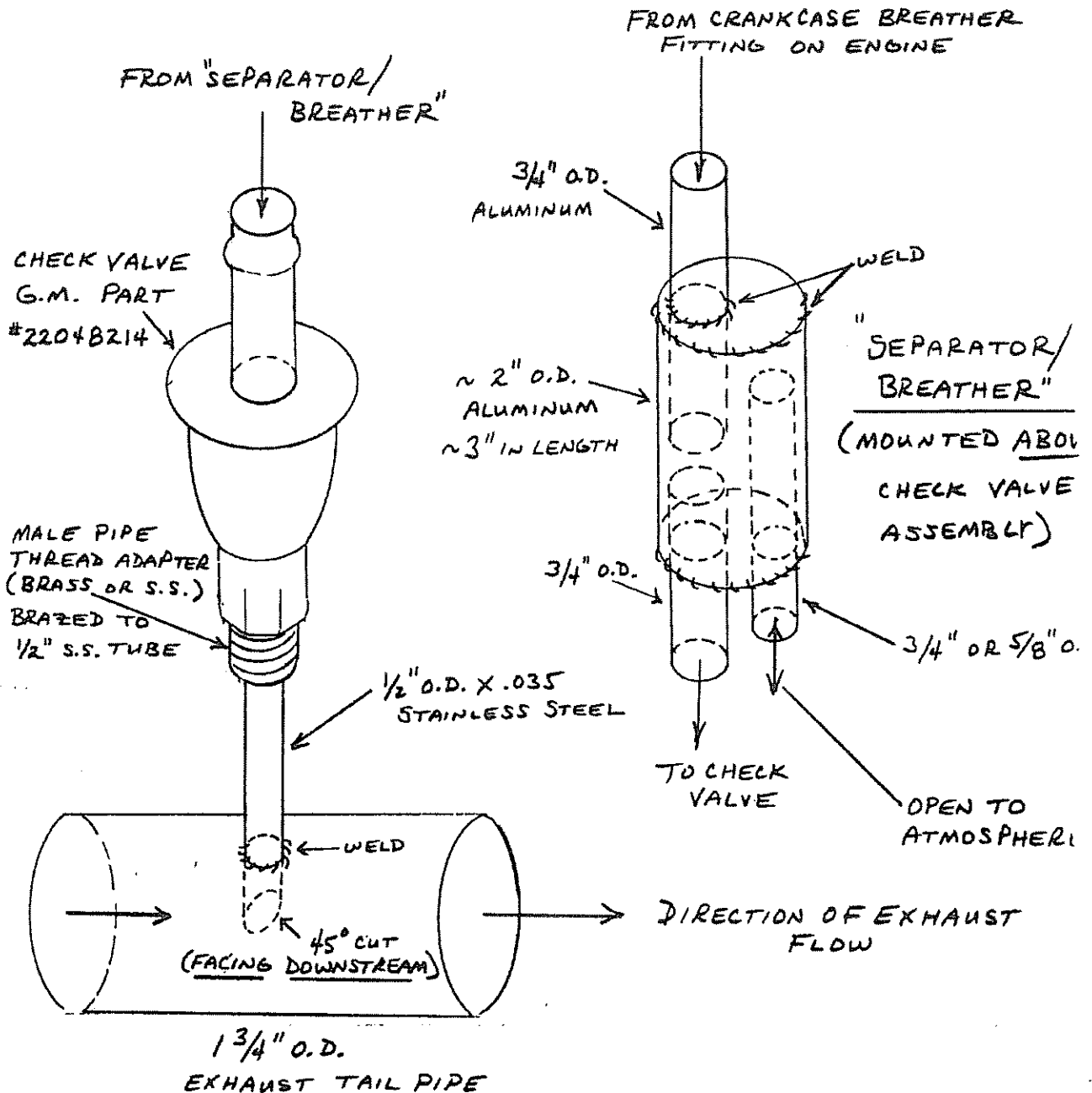
only go in one direction. The crankcase breather line goes from the engine into a small loseeparator/breather", which is just a chamber made of aluminum, which allows positive free breathing to the atmosphere, yet any oil which comes down the-tube drips straight through and into the checkvalve/exhaust pipe, where it is burned instead of getting on your airplane. Please excuse the drawing, as it was done in a big hurry. The tubes on the "separator/breather" going from the crankcase and to the checkvalve can be one piece by simply making a good cut-out in one side (located towards bottom of chamber). This will simplify alignment and fabrication. I have used this system for 116 hrs. (1 year) with no problems. It is not an original idea, but the addition of the "separator/breather" is. When measured, we found that a pretty good amount of suction was produced through the checkvalve, and I didn't like the idea of either pressurizing or depressurizing my crankcase. That's all for now. John Evens 6855 Allison St. Arvada, Colorado 80004 (303) 420-27254 PS - Enclosed is a picture of my plane at Aspen, Colorado this last September.



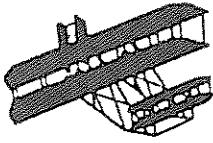
*John Evens T-18 at Aspen, Colorado*

# CRANKCASE BREATHER SYSTEM

BY JOHN EVENS



# NEWS RELEASE



## THE AIRPLANE PLASTICS COMPANY

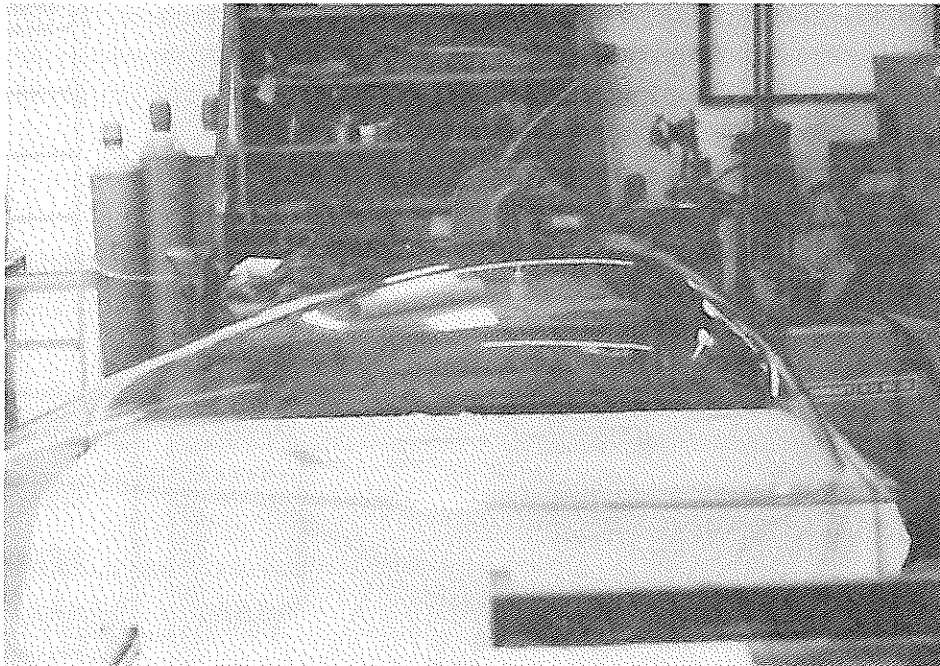
8300 Dayton Road, Fairborn, Ohio 45324  
(513) 864-5607

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From: Airplane Plastics Co. A Division of Fox Lite, Inc.

Subject: A break through in canopy forming technology.

Airplane Plastics Co. of Dayton, Ohio, is now making airplane canopies by a new molding process that produces high quality optics comparable to military fighters. This new proprietary process has been in development since 1975, when the original company, The Airplane Factory, started making free blown canopies for the KR-1. Production molds now exist for the Thorp T-18, Thorp 211 and Questair Venture. Other molds for producing extra high quality canopies for home built aircraft are planned for 1992. Walter S. Hoy President/Chief Engineer



## FOR SALE

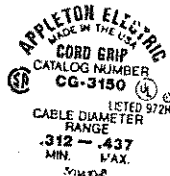
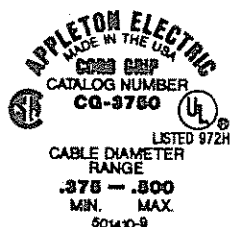
Canopy Covers: T-18 canopy covers specify regular or wide body. Made from "Evolution 3", a fabric designed to "Breathe" but not let moisture or dirt penetrate. Should prevent plexiglas etching due to moisture & heat buildup. Price \$90 each. Contact Ed Ludtke, 2301 Dartmoor, Sioux Falls, SD 57106  
Phone 605-361-2301

Editor's note: I have one of these and they are great! Those of you at Kentucky Dam last Fall got to see one of these covers. Ed is also looking for an engine, see below.

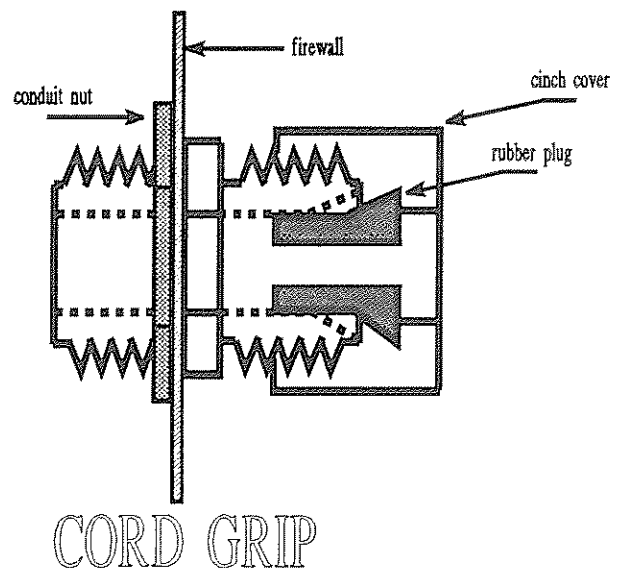
Wanted 0320-0360 Lyc Engine in any condition, must have dynafocal mount. Contact Ed at the above address or phone number.

## Building Tip

This building tip came from Cliff Redden of Georgetown, Ohio and it covers a small electrical device called a Cord Grip that makes about the nicest firewall feedthru for wires or throttle/mixture cables that you can get. They are made of aluminum with a rubber insert sized for electrical cords. They look a little like a pipe bulkhead fitting with a standard electrical conduit size with a conduit nut for connection to the firewall. As the cover is tightened down the rubber is compressed against the cable or wire for a tight fit. I put a small piece of abestos in them on the firewall side for fire protection. For the throttle/mixture control feedthru I turned them around backward which put the rubber and it's cover on the inside of the fuselage, this gave me about another inch for the cables to move with the engine bracket that attaches to the carb.



Cord grip labels, you pick the grip range to suit the application. They also come in right angle models that would be nice for large wire bundles.



## SPRING 1992 T-18 MUTUAL AID SOCIETY MEETING

Oct 30, 1991

Dear Rich,

As I mentioned on the phone a few days ago, I have reserved a block of 26 rooms at Western Hills Lodge for the 8th and 9th of May, 1992. The rooms are \$49 for lakeside and \$54 for poolside. There are also 3 cottages available for \$80 per night. Each cottage can accomodate 2 couples (3 couples if they chose to use the couch/hide-a-bed). Maxine and I plan to reserve one of the cottages and hope the other two cottages will be taken by others in our group. By the way, one only has to take a room for one night instead of two as at Texoma Lodge and Western Hills does have a bar. What I think we should do is to plan a hamburger cook out at our cottage on the Saturday evening instead of trying to organize a banquet. If we can get T-18ers in the adjoining cottages, I think we can pull this off fairly efficiently. The Lodge will cater the cookout if we choose to go that route, or we can do it ourselves. The airport is called Sequoyah Park and is on the northeast corner of the Dallas-Ft Worth sectional. There is no fuel on the field but Tahlequah is about 12 miles east and Muskogee is about 12 miles southwest. We'll also have to arrange for a port-a-potty to be available. There is a phone at the airport and the lodge will provide a shuttle on request. The "Short Winged Pipers" had their national convention at Western Hills a couple years ago and from all reports I've heard they were very pleased with the entire setup. They seem to understand airplane talk. I'd suggest folks make their reservations now. They can cancel their reservations later up until 5 days in advance unless its for an emergency in which case they may accept a last minute cancellation. The number to call is 913-772-2545 and ask to talk to Aletha. Tell them you want to be with the Green T-18 party. You can write to: Western Hills Guest Ranch Box 509 Wagoner, Ok 74477

I hope you have your T-18 finished and flying in time for our Spring get together. I also hope I have mine re-painted by then.

Gary Green  
2530 Bellechase  
Granbury, Tx 76048  
817-579-1995

# Technical Tips

Reprint from The EAA Publication TECHNICAL COUNSELOR

## BEWARE OF COUNTERFEIT BOLTS

By Martin Hollman Aircraft Designs April/May 1991

Every part that goes into the construction of an aircraft is critical. Seemingly insignificant parts often play very essential roles. Examples of these small but vital parts are the bolts that hold much of our aircraft together. Because the hardware involved in aircraft are subjected to extreme stress and demanding conditions, it is absolutely imperative that the bolts be of the highest quality. Many bolts are being substituted for lower grade bolts. These counterfeit bolts are of substandard quality and pose a possible risk. The manufacturers of the bolts are able to mass produce the hardware at a lower cost by using cheaper grades of steel and using nonstandard heat treatment. These lower grade substitutes are becoming increasingly common. Examine any bolts you purchased recently. The following key will help identify counterfeit bolts. Be wary of all Grade 5 and Grade 8 fasteners of foreign origin that do not have any manufacturer's headmarks. Note: Grade 5 bolts have three marks. Grade 8 bolts have six. The headmark (if any) will normally be in the center of the head. A hollow triangle as illustrated below is a suspect counterfeit bolt and should be replaced.

The following headmarks manufactured by the indicated companies are suspect fasteners. Any suspected counterfeits should be replaced with known quality fasteners.

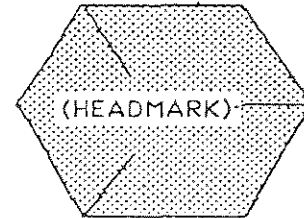
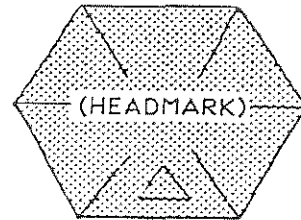
## HEADMARK

|                 |                          |
|-----------------|--------------------------|
| A               | Asohi Mfg. (Japan)       |
| NF              | Nippon Fasteners (Japan) |
| H               | Hinomoto Metal (Japan)   |
| M               | Minamida Sicybo (Japan)  |
| MS              | Minato Kogyp (Japan)     |
| Hollow Triangle | Infasco                  |
| E               | Daici (Japan)            |
| KS              | Kosaka Kogyo (Japan)     |
| RT              | Takai Ltd. (Japan)       |
| FM              | Fastener Co. of Japan    |
| KY              | Kyoei Mfg. (Japan)       |
| I               | Jinn Her (Taiwan)        |
| UNY             | Unytite (Japan)          |

## MANUFACTURER

*Editor's Note: EAA Headquarters has been contacted by U.S. Customs in Florida and the state of Washington regarding the counterfeit situation. This is a SERIOUS problem. The problem is that it became known as a way to make a great deal of money and it is obvious you can see that both Taiwan and Japan hopped on the bandwagon. We have had literally thousands of pounds of these bogus bolts stopped by Customs and the process is an ongoing one. The problem is that a great number of these bolts are in the pipeline and in the hands of suppliers to date. At this time, there is a new congressional mandate that manufacturers must supply their distributors with full technical information on the bolts they manufacture. Apparently, the distributors are not required to do the same for wholesalers or retailers unless specifically requested. Probably the best thing is to specifically ask the supplier for further information on the bolts. It will end up costing everyone more but this is about the only way to be sure. The*

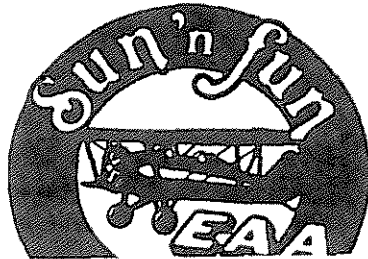
other thing to do is to either have Rockwell or Brinnell hardness tests on a group of bolts you buy. In particular, this would apply to propeller, wing and landing gear attach bolts or any bolts that are operating near the maximum of their strength. The Government agency that is taking the most action on this is U.S. Customs and in particular I want to thank Ed Smith of the Tampa office for bringing this to our attention again. If you would like a copy of their quality act, House Rule 3000, dated November 16, 1990, you can write to EAA, Information Services for it. Many thanks to Congressman Thomas Petri, WI Congressman, for supplying us a copy of this law.



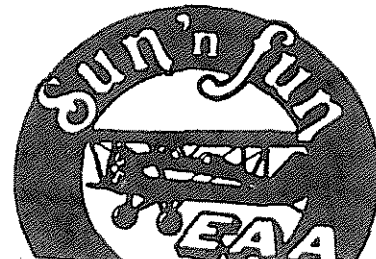
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PLAN TO ATTEND THE SUN'N FUN FLY-IN THIS YEAR!

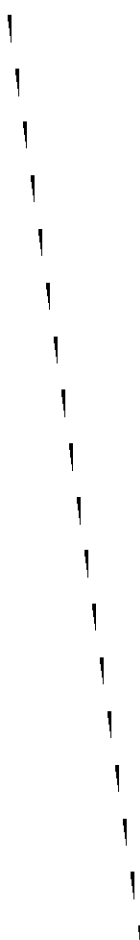
*An Adventure  
In Aviation*



*An Adventure  
In Aviation*





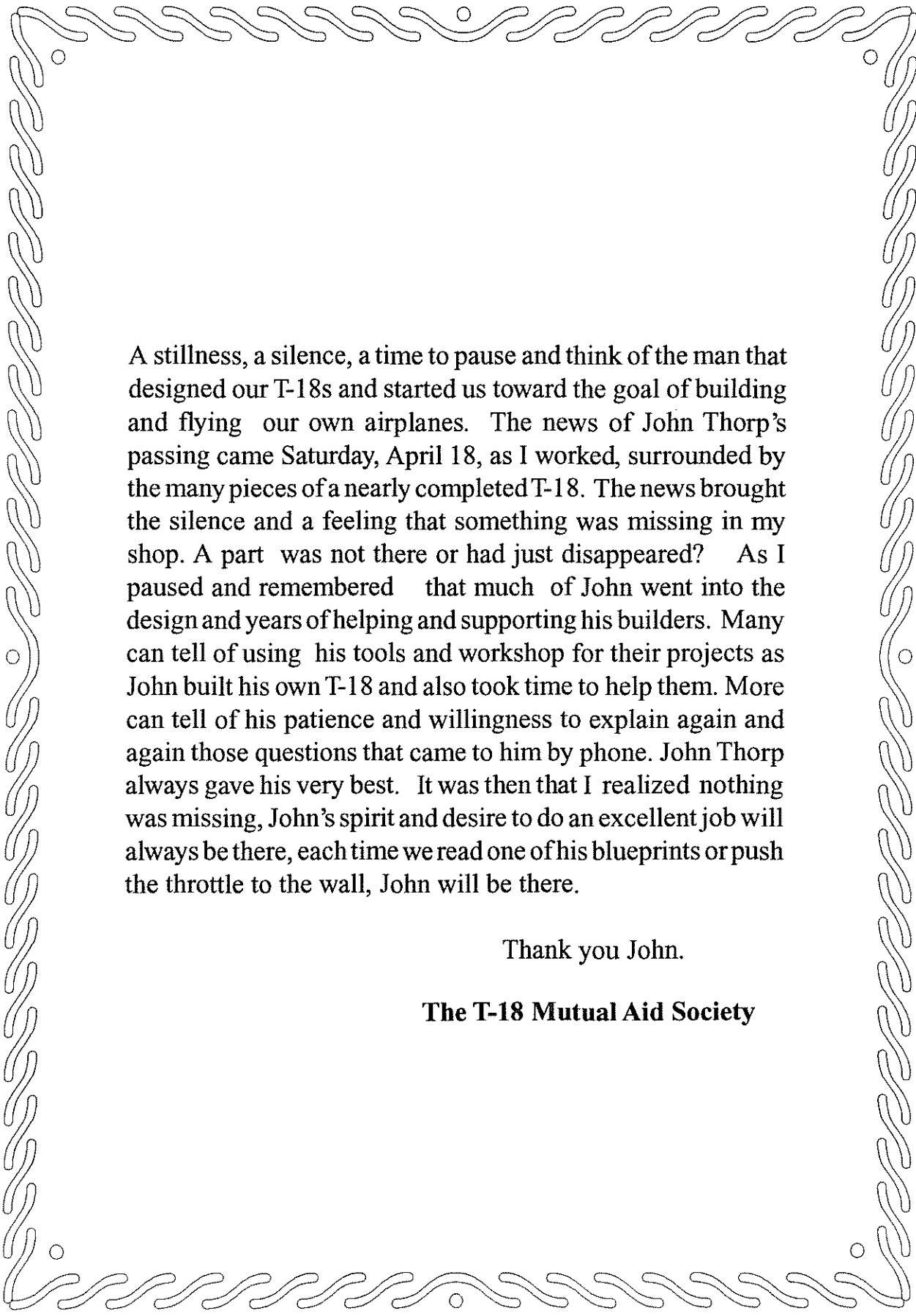


# T-18 NEWSLETTER

ISSUE NUMBER 83



**This special issue of the T-18 Newsletter is dedicated to the memory of John Thorp, who passed away April 18, 1992.**



A stillness, a silence, a time to pause and think of the man that designed our T-18s and started us toward the goal of building and flying our own airplanes. The news of John Thorp's passing came Saturday, April 18, as I worked, surrounded by the many pieces of a nearly completed T-18. The news brought the silence and a feeling that something was missing in my shop. A part was not there or had just disappeared? As I paused and remembered that much of John went into the design and years of helping and supporting his builders. Many can tell of using his tools and workshop for their projects as John built his own T-18 and also took time to help them. More can tell of his patience and willingness to explain again and again those questions that came to him by phone. John Thorp always gave his very best. It was then that I realized nothing was missing, John's spirit and desire to do an excellent job will always be there, each time we read one of his blueprints or push the throttle to the wall, John will be there.

Thank you John.

**The T-18 Mutual Aid Society**

**JOIN IN THE MEMORIAL CELEBRATION**

**THE 80 th ANNIVERSARY OF THE BIRTH**

**of**

**John Willard Thorp**

**JUNE 20, 1992**

**TO BE HELD AT THE OLD LOCKE HOME**

**19960 ELLIOT ROAD**

**LOCKEFORD, CALIFORNIA**

**Bring your memories in word or pictures.**

**A commemorative brochure will be assembled for purchase by all who wish.**

**Or if unable to attend, be with us in spirit and send your memories to :**

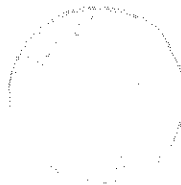
**Thorp Commemorative Trust**

**P.O. Box 805**

**Lockeford, CA 95237**

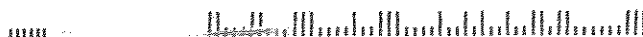
**Transportation will be provided from Lodi airport as in past celebrations.**

Thorp Commemorative Trust  
P.O. Box 805  
Lockeford, CA 95237



PAUL H. CROZIER  
8016 OAKWOOD FOREST DR.  
HOUSTON TX

77040



## JOHN THORP 1912-1992

The aviation world has lost one of its truly great men. John Thorp was an intellectual giant, a veritable walking encyclopedia of gilt edged facts of airplane design factors and engine performance knowledge.

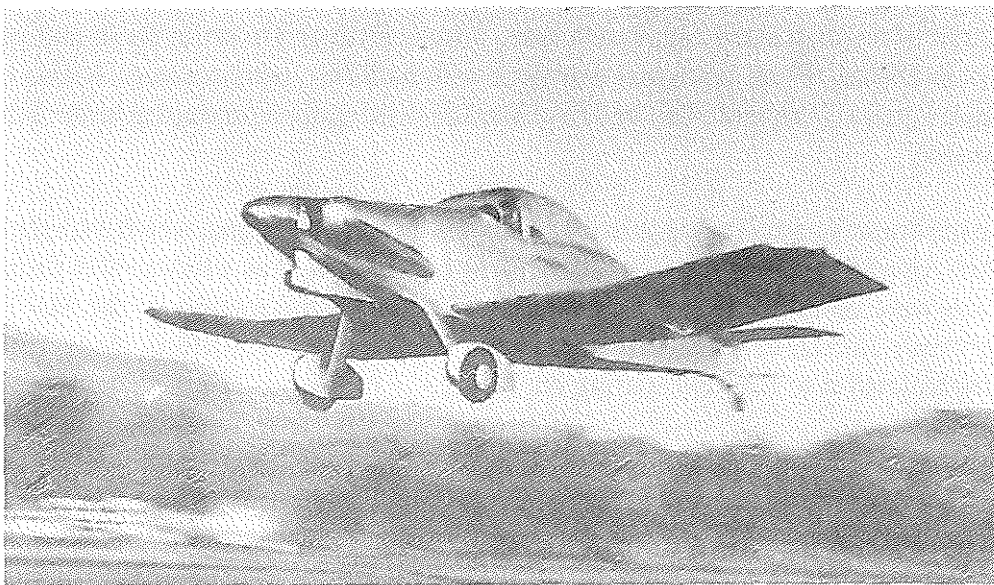
But John Thorp was much, much more than a man bordering on genius in his chosen craft. In every way, he was a gentleman in every sense of the word, a kind and caring person, courteous to all. He was totally honest with everyone, as well as with himself. His very demeanor was always low key, almost to the point of being self-effacing.

He never trumpeted the immense aviation knowledge he was in possession of, but one of his greatest joys was passing on bits of that knowledge to any sincerely interested ones. He had an almost religious zeal in educating his followers in pure unvarnished facts.

When he bestowed one of these gems of knowledge on a person, you could make book on it that it was an absolute fact, based on experience, and was totally reliable, totally devoid of fiction, rumor, or hearsay. He always offered answers to questions in his quiet, unassuming way, but he never tried to force his observations on anyone.

John joined EAA in the very beginning and always exemplified the true EAA spirit, ever pushing the frontiers of knowledge outward, and the generous giving of himself. That quality alone made him a great man in the eyes of those who knew him.

The EAA knew well of his accomplishments as an aircraft designer. In WWII days as a Lockheed design engineer, he was commissioned by Hall Hibbard (the president) to do the complete preliminary design of the famed P2-V naval patrol bomber all by himself, with later production drawings showing



*John Thorp's T-18*

the world's unrefueled non-stop distance record for many years until the Voyager came along.

Some also knew that John Thorp was the world's #1 expert on engine performance and cooling with such companies as Hughes and Lycoming calling on him for his experience.

His knowledge of engines wasn't just theoretical, either. He dearly loved re-manufacturing the O-290D (personally), which became a legend on its own for its outstanding quality.

Not many in EAA knew John was a sheet metal craftsman without peer, also. He introduced EAAers to Matched Hole Tooling, a super accurate method of building an airplane without jigs. The T-18 was and is the outstanding example of this system, that he also previously introduced to industry.

He also introduced EAAers to the ABC system of measurements and the decimal system in the T-18's 222 drawings, which were of professional production quality and a prized classic possession of today.

John's shop, in an older section of Burbank, was a Mecca for the "clan." These were privileged to spend their weekends with him, absorbing a sheet metal education from him as they built their T-18's on his hard tooling. There were the days when John was the happiest, freely giving of his time and expertise, which reflected his basic goodness and generosity, much like a highly respected college professor surrounded by enthralled students.

The Saturday ritual always included the entire gang recessing for lunch at nearby Sir Cedric's, where the atmosphere was heavy with serious airplane talk. John's blackboard there was the ever present paper napkin.

Besides the P2-V design at Lockheed, he designed the tiny Little Dipper and the 2 place Big Dipper. The Little Dipper was a single place low wing on a tricycle gear, powered by a 2 cylinder engine John had "put together" (of about 50 hp). Not only was it so simple and easy to fly but it would also fly in and out of football sized fields with ease. I was privileged to see it fly in and out of Lockheeds parking lot in Dallas, where it amazed everyone with its STOL performance. It also once flew inside the pentagon "patio" I'm told. Too bad Lockheed decided against producing both of these designs (for many reasons).

Space doesn't permit going into great detail on his other designs, which included several models for Fletcher Aircraft destined for New Zealand Ag work, as well as a tiny rocket firing COIN fighter, all of which were certificated. He also type certificated several models of the Sky Skooter, another remarkably easy aircraft to fly. I flew one several hours a day at Rockford, along with Bill Warwick, as we demonstrated it to EAAers starting on T-18s.

Another of his triumphs that I was privileged to fly at another "Rockford" was the tiny twin two place Derringer and it was the very best twin I ever flew, bar none. It was powered by two cont. 100hp O-200s ("beaned" up to 115hp by John). Its minimum one engine control speed was actually less than its stall speed! Not only would it climb very well on 1 engine, the pilot could keep both feet on the floor. Fantastic!

When he sold the design, the new owners heaved it up and put O-320s in it, which ruined it commercially and aerodynamically. Too bad. The same was true with John's preliminary design of the Piper Cherokee. John said their changes in the fuselage shape cost it 25 mph, with a touch of bitterness in his voice.

John freely admitted his #1 weakness was in business dealings, nearly all of which turned out poorly for him, with poor timing and circumstances also a factor.

John was also an accomplished test pilot and, yes, a gutsy one too. I flew with him in his own T-18 several times and would rate him as a competent, precision pilot.

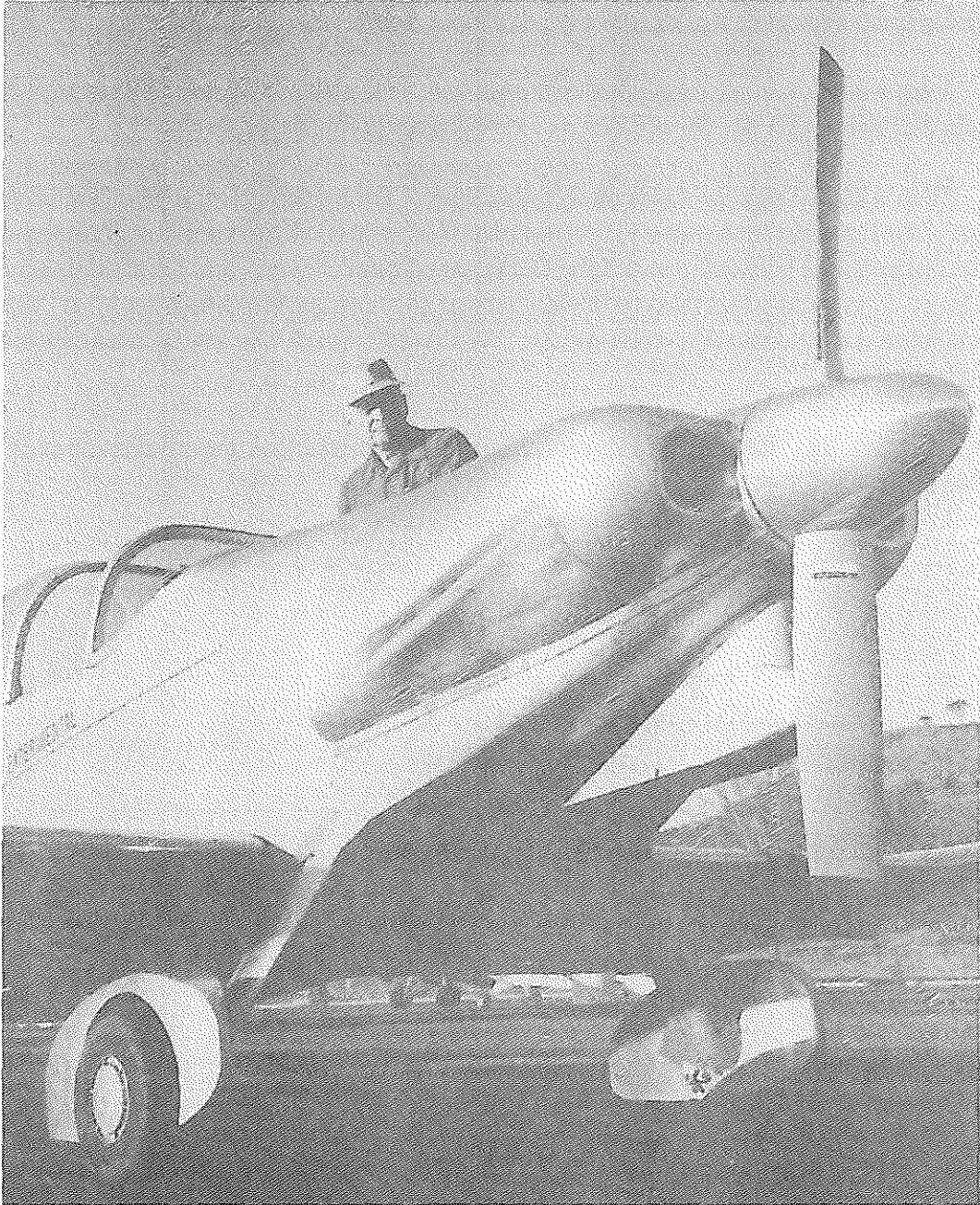
John's T-18 "family" was close to his heart. There were several like Bill Warwick and Dan Dudash in the LA area that became very close friends of John and Kay. Both Lu Sunderland and I enjoyed a warm and personal friendship with John that spanned some 30 years and his passing leaves a deep void in our lives. I personally feel that my life has been greatly enriched for knowing John. Mere words seem so inadequate at a time like this when we say, "We'll really miss John Thorp, a true gentleman, scholar, and a giant of man."

John and Kay, his wife of 45 years, eloped in 1947, and took their honeymoon in one of John's Sky Skooters.

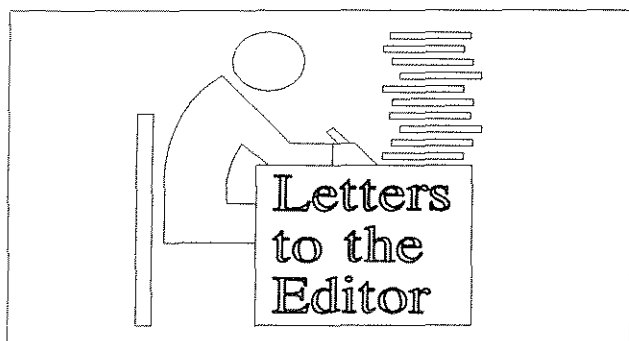
Dick Cavin







JOHN



Dear Rich

Work on my plane is nearly completed. I have a few items to complete before the FAA inspection. Winter and a new home have delayed my building.

I was successful in changing the builders name on the registration. IT took affidavits from the prior owners and 2 1/2 months.

Now concerning the new home. It is located on Chehalem Airpark, a 2,300 ft. grass strip. I have two hangars (space for rent), a pilot's dream come true. (Elevation 190')

I would like to plan an informal fly-in in July or August if anyone out there is interested. If "you" are interested, contact me and I will make the plans.

Chehalem Airpark (175) is located 3 1/2 miles from the Newberg VOR on the 231 degree radial. Camping is available on the field and motels are 5 miles away in Newberg or 15 in Hillsboro.

Electronics International Inc. has a "free" booklet available: Pilots Manual for Diagnosing Engine Problems. I highly recommend it if you have a digital CHT\EGT gauge. It and my Smart Scanner would have prevented a major "Engine Out" situation in my old Cessna 150!

Electronics Int.  
5289 NE Elam Young Pkwy, #G200  
Hillsboro OR 97124  
(503)640-9797

If anyone is passing through Oregon, stop by anytime. I enjoy talking about or flying T-18s.

Del Zander and I will be flying this spring. Along with Greg Halverson's T-18 and a few more around the state, we might make a serious challenge to the "other" local homebuilts. (That RV group)  
Sincerely, Brad Chapman, 17505 NE Terrys Lane,  
Newberg, OR 97132

H 503-538-7316  
W 503-635-4016



Dear Richard

In 1968 I was number 20 to fly a T-18 and have given hundreds of rides during the 1100 hours that I flew it using a 76 EM 68"x81" Sensenich prop vibration tested by Sandy Friezen which is what a certified airplane would have to do. Be sure to have your metal prop vibration tested and use a calibrated torque. Particularly on high compression 4 cylinder engines.

Lyle Trusty is cruising at 200 to 200 mph plus at 75% power using his 76EM 68"x 87" Sensenich fixed pitch metal prop. He has a different cowl and wing plus faring the flaps, ailerons, and tail wheel. He has flown this type of fixed pitch metal prop over 1000 hours which I also did. This says something for metal props.

I know of wood props that have disintegrated on high compression 4 cylinder engines. Maybe on wooden props using a 1/4" thick plate on the front securing the bolt heads and putting elastic stop nuts on the back so you can retorque them frequently would be the way to go.

At 80 years of age I sold my T-18, so drop me off the mailing list.

Sincerely  
Lyle Fleming

Dear Dick

Thank you again for your efforts on the Newsletter and all that it involves.

I have not had any problems with my T-18 since the new elevator. It was definitely induced by excessive control forces on the elevator. The airspeed has been calibrated and is accurate and the airplane will do 200 mps straight and level at 2700 rpm on a Lyc 0360 engine with a fixed pitch aluminum prop., that is at 1000 feet over a fixed course .

I have flown the A\C about 150 hours since I bought it and I am still impressed.

Good Luck and Thanks Again.

Tom Waage  
Phone# 508-945-9010



Hi Richard

I'm adjusting to full retirement like a duck to water, but I'll be back in Nebraska working on the plane--the last of April-May until OSHKOSH.

Best Regards and I really appreciate your effort.

Harlo McKinty



Hi Richard

Here's my dues for the T-18 Newsletter. I just got back from spending the winter in Albuq. New Mexico, great to get away from it all but too long without the bird.

Sure glad to get the newsletter, I hope to attend the May get-together. Keep up the great work--I really enjoy the newsletter.

Bob Olds  
2207 Wilkes Ave.  
Davenport, IA 52804  
319-326-2430

Dear Rich

Well I put off long enough writing to you.

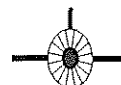
Flew N1943K on Dec. 8. Everything went fine . Flew great, having little problem with lights, radios, and things like that. Have 11 hours on it now. Empty out is 943. Have a 150 hp Lyc., speeds and climbs ECTs are very close to most of the others.

I did have a problem with the airspeed using the piper blade type on the wing seams the straightest side pressurized also giving me a 15 mph slower reading until I disconnected it now using cabin stater.

The float on the fuel sender decided to sink one day, so out came the instrument panel and tank to get at it. 3 cracks in the brass float. Soldered them, now it floats again. Checked it in hot water to see if it bubbled when heated. We'll come to see you when 40 hours are flown off. Kenny Ranta, Omaha NE

*Editors Note: Looking forward to seeing you.*

*See Kennys pictures later in this letter.*



Working on T-18 #2 wide body, new L.E. wing nonfolding type, basic fuse metal work done, main spar done, outer panels done. No engine choice yet--have 600 hours on T-18. No one 36 EH modified 0-290 Cassidy wood prop-160 mph. 1900 ft main climb one person. Have flown to Oshkosh 3 times with 36 EH. Elmer Hymen, 36 Center St, Midland Park, NJ 07432



Dear Richard,

I would like to share some information with other T-18 owners which may be of interest. I understand that it has been written about before but here it is anyway.

I originally completed my T-18 in June 1970 (633 PM). It had 160 h.p. engine with a fixed pitch metal prop. With full flaps I never experienced any pitch

over tendency (bunt maneuver). Eight years later I totally reworked the plane and installed a new Hartzel constant speed prop. This time the plane had a tendency to pitch over with full flaps. It appears that the weight of the CS prop made the difference. I sold 633PM after 16 years of flying.

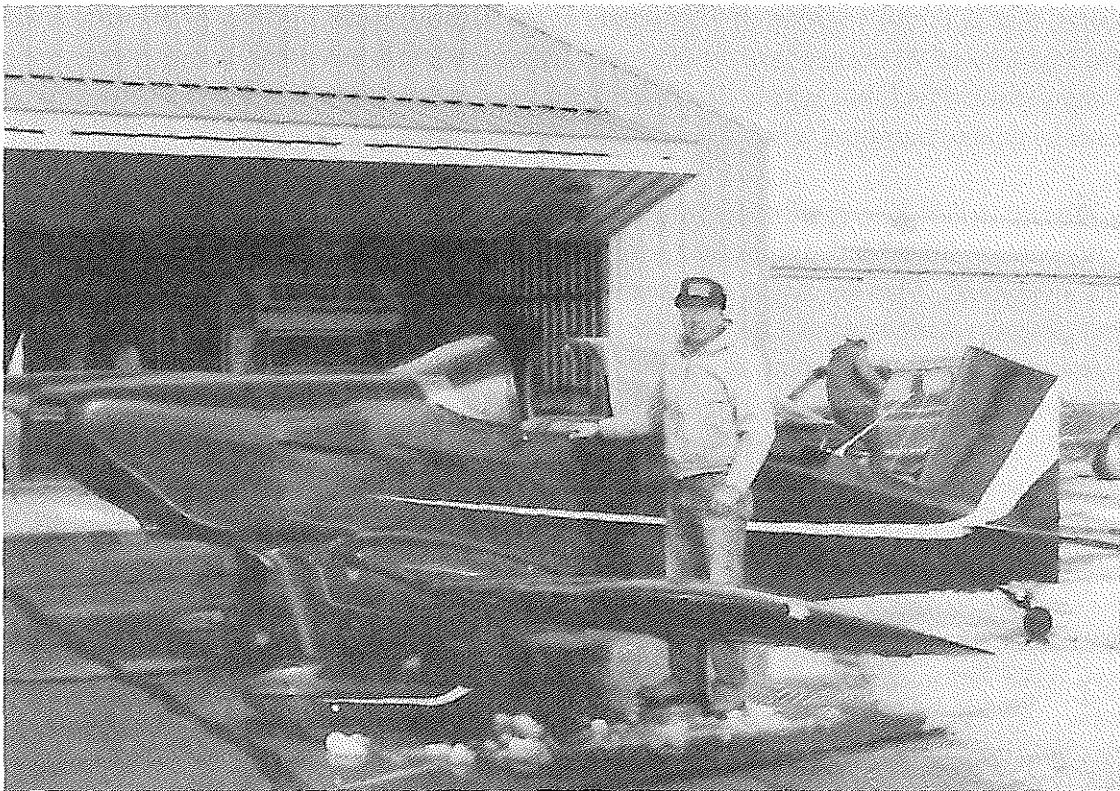
A couple of years ago I purchased John Hardy's T-18 (57JH) and I have been sharing it with Capt. Pat Stanley who instructs in T-38's at Enid, OK. Together we have gone over the airplane and upgraded everything. This plane has a hartzel cs prop also and it has a tendency to pitch over with full flaps. I have electric flaps and we became very concerned that

we may sometimes encounter the problem with not enough time to retract. I know a lot of folks don't like electric flaps but it sure cleans up the cockpit.

After talking with Barret Kemp, he sent me a copy of NL #71 which explains J.S. Thompsons apparent fix for the bunt maneuver.

I am enclosing a sketch of the strips which Pat and I installed. I have flown the plane several hours and it seems to have fixed the problem. With a most forward CG and using various approach speeds, there is no tendency at all to pitch over.

Thanks,  
Parker Miller  
N57JH

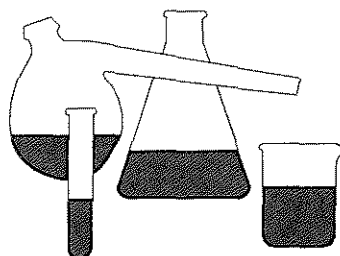


*Kenneth Ranta with his new "flashy red" T-18, N 1943K*

## OCTANE RATINGS

by Craig Marshal

with reprints from EAAC by  
W.J. Keough



Dear Richard,

Further to our telephone conversation of Feb. 2, 1992-Please find enclosed my check for the T-18 Mutual Aid Society membership as well as the fuel information and personal letter I received from the author of same, with permission to reprint in the T-18 Newsletter. OK'd by phone. I hope you will print this information in a SPECIAL SAFETY NEWSLETTER (a.s.a.p.) as I was shocked to read someone using Mogas in a Lycoming engine that requires a minimum 91-96 avgas. A study of this information will reveal that a mogas with a 92 A.K.I. or (antiknock index), as advertised on the gas pump, when tested by the motor method will result in a reading of 86 octane which is well below the requirement of the 91-96 engine. I was also told (off the record) that a well blended mixture of  $1\frac{1}{3}$  100LL +  $2\frac{2}{3}$  mogas with an A.K.I. of 92, or M.O.N. of 86 should yield a fuel with octane numbers high enough to satisfy the requirements of the engines certified to run on 91-96 min. octane avgas, as far as destination is concerned only. One should be careful when mixing mogas and avgas as the octane reading does not move in a linear fashion, that is to say 1 gallon of 100 octane avgas blended with 1 gallon of 80 octane mogas will not yield 2 gallons of 90 octane fuel. At this point I am saying that I am not recommending the use of mogas for any aviation fuel, but supply this information so your readers can make an informed decision with regard to octane numbers when considering alternate fuels.

My request to Bill Keough for this information was because of the Lycoming 0-320-E2G 150 h.p. 7 to 1 compression 80-87 fuel engine had a camshaft that went to war with the lifters and made me and my T-18's very sad. This condition was caused by a reconditioned camshaft being installed, while the old cam followers were retained, because they "looked good" at last overhaul. Lycoming says anytime a new or reconditioned camshaft is installed, new cam followers must also be installed (believe it). This engine started making metal at 100 hours since O.V.H. Since my T-18 engine was over propped anyway, "Warnke almost constant speed 67x77 prop!" I decided to modify to 0-320 "D" series 160 h.p. By the installation of 8.5 to 1 high compression pistons. This engine is equipped with nitrided cy. barrels, as premature wear will take place with plain steel barrels. Consult Lycoming's "Cylinder, Piston, Piston ring, application list #SFN 880-1".

Now for the good news. If you check newsletter no. 78 you will find performance figures for my T-18 C-GCWA before mods. Since then I have done a 2 way average ground speed check over a 5 mile course. Air speed error not more than 1  $1\frac{1}{2}$  kts.

Mod #1 installation of brake caliper fairings. This mod blew my mind. 7 kts increase at 75% power 2000 ft. 5 kts increase at full power and top speed at 2000 ft. No brake overheat problems. So put them on boys and girls. Cheap speed! Mod #2 engine power from 150 h.p. to 160 h.p. Same prop, "Warnke

67x77.''

Top speed 170 kts. tas. at 2000 ft and 2550 rpm cruise 157 kts. tas. at 2000 ft. and 75% power O.A.T. 40 degrees F. Have not yet checked rate of climbs, but I expect 1600-1700 fpm at 1500 lbs. gross.

I have two questions I would like answered if any of your readers have the info. I could not find answers in any of the newsletters.

1) Can the T-18-CW be flown safely with the canopy locked in a full open position, or removed completely. I suspect there might be air flow problems over the tail feathers. I have not tried to do this to date, but wish to do so.

2) Is there any change in the forward or aft. C of G limits, since the Lu Sunderland mods, (wide body, 5" longer airframe) and (convertible wing with new airfoil). If anyone has the answers for these two questions, please contact me ASAP--call collect or write to the above address.

Richard please keep up the Newsletter, you are doing a fantastic job for your fellow flyers, and I am sure they love you for it.

As always, please excuse this poor penmanship--I'm not very clever at this sort of thing.

Happy landings,

Craig Marshall

144 Strathallan Blvd.  
Toronto, Ont. M5N 1S7  
Oct. 21, 1991

Dear Craig

Enclosed you will find a copy of the article on Moaas vs. Avgas and this will supply the missing words for your copy. You will note that the text says that motor octane (MON) for mogas octane correlates very closely with the first number of the avgas test. This is an important consideration when you consider changing the compression ratio of an engine.

I called Bob Falkiner at Imperial Oil this morning to get his opinion of the suitability of using premium auto gas on a Lycoming that requires 91/96 avgas. Bobby by the way is a member of EAAC and has just completed a Quickie. He is a research chemical engineer with Imperial and is the expert on aviation and motor gasoline quality.

Bob confirmed that the current motor octane of premium mogas is in the range of 85 to 87 and this is well below the required avgas octane of 91 as specified by Lycoming for the high compression modification. This substantial difference of 4 or 6

octane numbers between the motor octane and the avgas requirement would indicate that you could be running the risk of severe detonation during takeoff and climb power settings. Bob pointed out that it is probable that the Lycoming test conditions for establishing the octane requirements were undoubtedly much more severe than the conditions that you will encounter. However, the trouble is that you would not know if you are getting detonation at takeoff power until you had done serious damage to the engine.

In the case of using regular mogas as a substitute for 80/87, you are using a mogas with 83 M.O.N to replace an avgas of 80 octane. In your modified engine you would be using a premium mogas of 86 M.O.N. to replace an avgas requirement of 91 octane. So you are certainly stretching the factor of safety in the octane ratings and it would appear from this that it would be prudent for you to operate on 100/130 avgas on the modified engine.

We hope this helps you in your decision.

Sincerely, W. J. Keough

**MOGAS CHALLENGES AVGAS**  
reprint from EAAC with Bill  
Keoughs permission.

*The EAAC is pleased and extremely fortunate to have Bill Keough on board as a fuel expert. His presence with us in Ottawa at our recent Mogas deliberations, was greatly appreciated. He has spent most of his working life in petroleum related pursuits and is well qualified to discuss this matter. He has served on one Royal Commission enquiring into environmental concerns related to lead pollution and is presently serving on another which is enquiring into problems related to nuclear energy. Bill is newly retired from his last position as Vice President, ESSO Petroleum. He also flies a Cessna 172. Ed.*

For more than five decades, pilots understood and believed that aviation

fuel (avgas) was inherently of better quality than automobile gasoline (mogas) and the use of mogas in an airplane engine could do serious damage to both the engine and probably the pilot. For most of that time that understanding was right. So why is it that in the 1980's there is a serious movement to use mogas in aircraft engines? Is it the sizeable price differential between mogas and avgas or are there more fundamental reasons?

Like most things of this kind, the trend to the use of mogas in aircraft is an evolutionary development and not some sudden change in basic truth and principles. Back in the late 30's and through the war years of the 40's mogas was a low octane rather



unstable mixture of hydrocarbons with wide variations in distillation and volatility. Avgas, by contrast, was a product much the same as today's. In 1938 the United States Army Air Corps developed a specification for a grade of avgas that was to have an octane rating of 100 and this became the fuel for the high performance aircraft developed during the war. To use the mogas of that era in such an aircraft engine would have been disastrous.

After the war, the technology used to produce military avgas was applied to the manufacture of mogas. Fluid catalytic cracking and Alkylation were the key process developments. Auto engine designers were quick to utilize the new qualities of mogas. Engine compression ratios and horsepower increased dramatically throughout the 50's and 60's. By 1965 the Research octane of mogas was approaching 100 and mogas was looking more like avgas.

About 1972 a further development improved the quality of mogas, when petroleum companies began to market a grade of "unleaded" mogas. To meet the octane requirements without the use of tetraethyl lead, the refiners developed the naphtha reforming process that produces a very stable high octane hydrocarbon. Unleaded mogas became a premium quality product with stability and octane much the same as 80/87 avgas.

The evolution of the quality of mogas is the main reason that we now hear of this fuel being used in some aircraft engines. Qualities of various mogas samples are compared to 80/87 avgas in Table I and we will discuss some of these differences.

Octane is the quality that prevents premature explosion of the fuel, on the compression stroke of a gasoline powered engine. It is an essential value in the engine's fuel, if the engine is to be able to produce its design power. In Table I the 80/87 avgas was tested as though it were a mogas so that we could compare its octane value with the mogas samples. As you can see, the octanes are all very similar and it is reasonable to conclude that engine knock or power loss from this source should not be a problem when using mogas in an 80/87 engine.

While discussing octane, perhaps we should divert for a moment to clarify how octanes are measured and reported. Motor gasolines are tested for two octanes using different conditions of fuel air ratios and compression ratios. One test gives a Research Octane Number (R.O.N.) and the second produces the Motor Octane (M.O.N.). Then to further complicate the situation the two octanes are combined to give an "Octane Index" which is the arithmetic average of the two test results or  $R+M/2$  octane posted on the gas pump.

Aviation gasoline octane is measured under different operating conditions than motor gasoline. The first test simulates cruise conditions and is referred to as the "Lean" octane. Both octanes are used to identify the grade of fuel so we have 80/87 or 100/130 grades.

If we compare results of mogas and avgas octane tests we usually find the M.O.N. of mogas is very close to the "Lean" octane of avgas but R.O.N. does not correlate with "Rich" octane.

**VOLATILITY**

Volatility is a term used to describe



the propensity of a fuel to vaporize at normal operating temperatures. Motor gasoline must vaporize so that it can mix with combustion air and be distributed evenly to the engine cylinders but at the same time not vaporize so much as to produce excess vapor in the fuel line or carburetor bowl where it can cause the fuel starvation phenomenon known as vapor lock. Vapor lock occurs in a fuel system when gasoline is heated to a temperature that causes excessive evolution of vapor which can interrupt the flow of gasoline to the carburetor or cause foaming in the carburetor bowl. The net result of this excessive conversion from liquid to vapor in the fuel system is a reduction in the amount of fuel reaching the cylinders and a loss of power much like leaning the mixture in an aircraft engine.

Mogas has a much greater variation in volatility than does avgas. In the winter the volatility of mogas is increased so that cars will start more easily on a cold morning. However, if you get one of those crazy chinooks in Alberta when the winter temperature jumps to summer like conditions your winter mogas is a prime candidate to give vapor lock problems. And likewise, if you are using a supply of winter mogas in an aircraft on a hot spring day you may find your mixture running lean when you least expect it. If you are going to use mogas in an aircraft then it is absolutely essential that you take the time to understand something about volatility. Let's see if we can help.

To estimate the volatility of a gasoline we should, ideally, like to know the distillation curve of the fuel and the Reid Vapor Pressure (RVP)-The RVP is a relatively simple test

which tells the pressure exerted by a fixed volume of fuel and air at 100 degrees F. It is a measure of how much light hydrocarbon such as butane or pentane is in a gasoline. The RVP of mogas will be considerably higher in the winter than in the summer, ranging from 15.5 PSI in January to less than 11.5 in July. By contrast, avgas never exceeds 7 PSI at any time of the year and it is common to find avgas in the range of 6 PSI or lower. So mogas is, by design, a more volatile fuel than avgas and we should therefore expect more problems on high temperature days with mogas.

Knowing the RVP of a fuel will give you a hint about the volatility but it does not tell the full story. To get the rest of the story you need to know the distillation characteristics of the fuel, especially the temperatures at which 10% and 50% of the fuel volume is vapourized. Looking at Table I you will see a substantial difference in the distillation temperatures for the Alberta unleaded mogas and the Southern Ontario mogas. In Alberta, 10% of the fuel will be vapour at 31 degrees celsius while in Ontario the temperature would have to be 39.5 degrees. Then look at the 80/87 avgas which would have to reach 67.2 degrees to produce the same ratio of vapour. So the distillation temperatures give another piece of information that is vital to understanding volatility.

Now we have to put the two pieces of information together. RVP and distillation temperature can be combined to produce an indicator called T(V/L)<sub>20</sub> which is calculated and used by fuels researchers to set specifications on mogas blends to avoid vapour lock problems. The term

T(V/L)20 means the temperature at which you will have a 20.1 vapour/liquid mix. In Table 1 this temperature is calculated from the RVP and the 10% and 50% distillation temperatures using a formula specified by ASTM Spec. D-439 for mogas. The lower the (V/L)20 temperature the more chance you will have of running into vapour lock. As expected, the Alberta gasoline has a much lower critical temperature than the other listed products.

At this point you are probably saying this is all very interesting but not of much practical value. That's true but there is something you can do if you are the type who likes to fiddle with gadgets and read specifications. First, the gadget. There is a relatively inexpensive (about \$205 Can.) test kit called Gas-Chek that is reported to do a good job of measuring RVP and as an extra it also includes a test for alcohol content of the fuel. It is very portable and is used by pilots and race car operators in the U.S.

Then if you want to know something about the distillation of the fuel you can get a copy of the new specification that the Canadian General Standards Board (CAN/CGSB B-3,5-M79) has produced which sets out the maximum volatilities (RVP and distillation temps.) for unleaded mogas in various geographic areas of Canada for each month of the year. This will give you some guidance to the type of fuel you are buying from reputable sources.

There are still other things you can do to minimize the risks of using mogas. Don't fly on a really hot day if you think you have some leftover winter gas in the tank. Aviation Safety magazine reported a rule of thumb

formula attributed to Mr. Al Hundere of Alcor, for calculating the safe outside air temperature when operating with mogas of a known RVP. The formula is:

Safe OAT degrees F =  $120 - 6 \times (\text{RVP} - 7)$

This is based on a safe temperature of 120 degrees with regular avgas of 7RVP. So you subtract 7 from the RVP of your fuel, multiply this by 6 and subtract the total from 120. If you have a mogas of 15 PSI RVP this formula says don't fly when the temperature is over 72 degrees F. It's interesting but I can't say how valid it is.

There are also some good operating practices if you operate on mogas, such as - advance the throttle slowly from idle; don't sit for long periods at idle before takeoff; do a full power run up; and when you get in the air stay below 5000 feet because altitude also vapourizes gasoline. And last but very important, use only unleaded fuel. Don't use leaded regular.

Now if you haven't given up on the thought of mogas as an aviation fuel there are some other things to worry about like alcohols and aromatics but that's a story for another day. Fly safely.

#### References:

Harry Zeisloft "Autogas flight test in a Cessna 150 airplane" SAE paper 830706.

Alexander R. Ogston "A short history of aviation gasoline development, 19003-1980" SAE paper 810848.

B.C. Caddock, P.T. Davies, AW Evans and R.F. Barker "The hot fuel handling performance of European and Japanese cars" SAE paper 780653. WJ.Keough 144 Strathalla Blvd., Toronto, Ontario. M5N 1S7

TABLE I  
FUEL COMPARISON  
UNLEADED REGULAR MOGAS  
ONTARIO ALBERTA WISCONSIN

80/87  
AVGAS

| Distillation     | DEGREES |       |      |      |
|------------------|---------|-------|------|------|
| 10%              | 39.5    | 31.0  | 40.6 | 67.2 |
| 30%              | 62.1    | 58.5  | 65.6 | 81.7 |
| 50%              | 94.0    | 102.5 | 97.8 | 93.9 |
| RVP kPa          | 90.8    | 105.5 | 90.3 | 35.6 |
| PSI              | 13.2    | 15.3  | 13.1 | 5.2  |
| T(V/L) 20 Deg. C | 46.4    | 41.3  | 47.4 | 70.1 |
| R+M/2 OCTANE     | 88.6    | 87.7  | 87.2 | 88.0 |

*Editor's Note: My thanks to Craig Marshal and to W. J. Keough for the above material. I will publish Part 2 of Mr Keough's article in the next newsletter. I would like the membership to send their comments for the "Letters to the Editor" section of Newsletter 84.*

## FOR SALE

### GPU PARTS

12 volt direct drive starter (Delco Remy) and starting ring, bendix mag parts, 1 Slick 4016 VW mag, Marvel Schebler carb. parts, new exhaust valves, new std. main bearings, 3 crankcases, regrindable cams and one crankshaft, connecting rods.

For Sale:

Ratray T-18 Cowling-used, but certainly usable--\$150.00

Scott Tailwheel assembly-6 inch solid tire-used - \$100.00

Jeff Ackland, 6812 Cottonwood, Shawnee, Kansas

### T-18 PARTS

Flat back engine mount and the alum. plate (completely machined) folding wing main spar and the steel fittings, ailerons and counter weights, plans, and many misc. parts, axles and brake cylinders.

For Sale:

66"x76" sensenich prop--\$350.00 (never used) suitable for 150-160 hp lycoming power in T-18

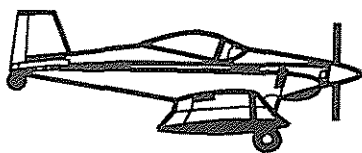
5x5 Goodyear wheels and brakes--Best offer

Eddie Eiland  
1350 Thunderbrook  
De Soto TX 75115  
H (214) 230-8266  
W (214) 330-2370

Bob Yeakey  
9729 Bellewood  
Dallas TX 75238  
H (214) 398-2947  
W (214) 750-7438

# FIRST FLIGHT

by Ken Morgan



THE FIRST FLIGHT (The Second Time Around) N 46806 By Ken Morgan I have been working on a T-18 project all my life; well, not quite, but it seems that long. During the building process, I always got involved with other airplane projects and let the important one go (T-18). I had completed most of the T-18 basic structure (bought a wing from Lyle Fleming in CA.) and was ready to start on the other 50% when I heard about a T-18 in Florida that had been stripped of engine and instrument panel. This aircraft had been built in Kansas and first flown in 1977. Since that time it had gone through several owners, including the present one who had taken it in trade on a Cessna 210. Does the pedigree sound interesting? The new 210 owner wanted all the T-18 radios and instruments (full IFR panel with autopilot) for installation in the 210. The new owner of the T-18 was a dedicated RV builder and wanted the T-18 engine (fuel injected IO 320) and constant speed prop for an RV-6 he was building. I purchased N 46806 sans panel, electrical, radios, or engine. However, I did get a current airworthiness certificate with the aircraft. This brings up a point, for those of you buying completed projects, the only legal way to obtain registration is to get the airworthiness certificate with the aircraft. If not, you are in a catch 22 situation and must either be the builder, or it must be a kit with you completing the other 51%. On June 1, 1990 my new T-18 project was trailered from western Florida back to Texas. J'nene and I created quite a scene touring the Vicksburg Civil

War Battlefield/ Cemetery with the T-18 trailering close behind. I was enthused about the aircraft as I could see flying it in about 3 months. After installing the engine/panel from my original project and adding electric trim and a general weigh reduction effort; Yep, you guessed it, 13 months and 27 days later, July 27, 1991, N 46806 saw daylight under her wheels, \_The First Flight, The Second Time Around. Even though I cheated a bit (purchasing another project), the thrill of the first flight was just as intense and joyful as I had imagined. For those of you working long hours to complete your project, believe me it is worth all the effort. I have had experience in tail draggers, restoring and test flying an early SA-100 Starduster Biplane, in addition to a few hours in a Luscomb 8E, and T-18 time from a few years back (I had flown and soloed Bob Millers T-18). I felt qualified to handle the first flight, particularly after getting several hours of dual with Gary Green. However, I decided to let experience prevail and ask Gary to do the honors. Magneto problems on Gary's plane just before OSH prevented him from making the flight. I'm grateful to Gary for his help and encouragement; however, I'm awfully glad I was able to make that first flight myself. Test flight day was blue sky, temperature about 77 degrees, and wind south at about 10mph. I had completed all aircraft work and made several taxi runs earlier in the week. She handled great on the ground with no tendencies to head for the boonies. The aircraft had weighed in at 871 lbs. with an empty CG at station 62.47 (7.47 aft of the leading edge of wing datum, 14.9% MAC). This empty weight was a real accomplishment as the aircraft had previously had an empty weight of almost 1100 lbs. This was with an IO 320 injected engine, constant speed prop, full panel, including auto pilot, and an apparent complete lack of weight consciousness by prior owners. From the above configuration I had gone to a highly modified 0290G, Pacesetter 68 X 66 wood prop, full panel less vacuum/gyros but with all other goodies including Terra Nav/Com, Transponder/Encoder, ECDI, and Foster 500

Loran. After a thorough pre-flight there was nothing else to do but go. I was fortunate to have good friend and T-18 renovator (N 56VB) Evan Roberts to do chase in his A36 Bonanza. Also flying chase was my RV buddy and good friend Tom Keim in his RV-3. Engine start-up was accomplished in 2 blades with the 0290 idling smoothly, ready to go. Taxi to active, check radios, and coordinate with my chase pilots. Mag check was good with about 60 rpm drop. Pulled a notch of flaps, no pattern traffic, rolled to center line and slowly applied full power. She responded immediately with the tail up in about 400 ft. and airborne in about 800 ft. Climb out at 120 mph indicated, 1000 fpm on VSI. What a wonderful feeling, and then you get the answer to that proverbial question: Was it worth all the time and effort? And, you already know the answer to that one. Except for making several circuits above the airport with one notch of flaps hanging out the flight could not have been more successful. Minor problems were roll trim (heavy left wing), and higher than normal oil temperature. Takeoff rpm was about 2200, with full throttle rpm of 2600 at 3000 ft., Indicating just under 190 mph. I couldn't be happier with the overall performance as there was some concern regarding the ability of the 0290 to pull a Pacesetter 66" pitch prop. I believe the standard 0290 would have a problem: however, my modified 0290, with higher compression (7.5:1) D2 pistons, 0320 intake valves, and MA4SPA carb. does an outstanding job. I am still working on the heavy left wing. The oil temp problem was caused by restriction in the partial flow oil filter connected in series with the cooler. I now have about 50 hours on N 46806 and enjoy it more each time I fly. Performance at cruise is spectacular; however, I could use a few more revs on take off. The Pacesetter folks can reprofile the outer prop tips to give me 150 more revs on take off. This may be the optimum solution for compromise take off/cruise performance. A recent trip from D/FW to St. Louis 3:15 going and 3:30 on return. Round trip of 1100 miles, producing average ground speed of 163 mph, @ 2500 rpm, 8.6 gph fuel burn. Not

bad for an 0290 GPU. I am more than happy with these numbers. etterm an individual cyl. 4 stack exhaust Prop: Pacesetter 68" X 66", Thorp spinner. Airframe: Imron paint, longer gear, all wheel/brake and gear leg fairings. Rattray cowl with adjustable cowl flaps Performance: 2600 rpm @ 2500 ft. 188 mph indicated 2450 rpm @ 3000 ft.(75%) 160 mph indicated Stall Clean: 63 mph ind. Stall Flaps: 60 mph ind. Good stall characteristics, no bunting tendencies. SEE YOU AT THE FLY INS! Ken C. Morgan T-18 N46806 S/N 1064, Vital Statistics: Empty Wt. 871 lbs. Empty CG 62.47in Gross Wt. 1500 lbs. Fuel (main 29, aux rear deck 10) 39 gal Full panel less vacuum/gyros, Terra nav/com, ECDI, xpnder/encoder, with Foster 500 Loran (updated NOCUS/SOCUS midcontinent chain) Engine: 0290G modified to produce 140 hp.

Ken Morgan, 1612 Northridge Dr. Arlington, Texas 76012 817/265-6838  
N46806

January 16,1992

T-18 Mutual Aid Society  
Route 3, Box 295  
Clinton, Il. 61727

Rich

Enclosed is a check for the 1992 News Letter keep up the good work.

My T-18 N8AL turned nine years old in December. I gave it a birthday gift of a NAV-AID Auto-Pilot. I was able to locate the servo in the spar box under the pilot seat. This allows me to hook the control linkage directly to the walking beam. With the auto-pilot engaged I can always override it with the control stick, this is a built in safety feature. The NAV-AID has a track mode and I have coupled it to my II MORROW FLY-BUDDY + loran. Talk about neat, this thing is better than sliced bread.

I regularly fly with a buddy who has a RV-4. His aircraft has a Lycoming 0-320 160 HP. My T-18 has a Lycoming 0-320 150 HP. We both are flying behind Sensenich 66-74 wood props. We have both checked our tachs. At any given RPM the T-18 is faster. Turning 2500 RPM I have about a 5 MPH speed advantage. We fly together about once a week and my T-18 is always faster. He thinks it is because I have less frontal area but we all know that the T-18 is just a better airplane.

Again keep up the good work.

Al Bosonetto N8AL  
32625 Benson Dr.  
Westland, Mi. 48185

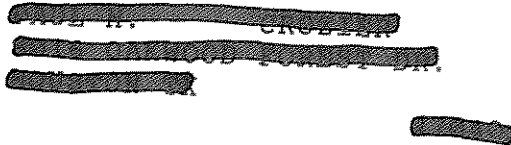
Day (313) 651-1333  
Nt. (313) 261-6852

*Editors Note: Good letter Al. Could you send a sketch of how the servo is connected. Thanks.*

**NOTICE: (STANDARD DISCLAIMER)** As always , in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.

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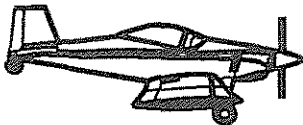


Newsletter #84 is being prepared and will be sent to all of you that have renewed for 92  
Check the label for a red zero for not paid. Let me know if I have a bookkeeping error. Thanks.

### T-18 MUTUAL AID SOCIETY 1992 RENEWAL

Please include a check or money order for \$25 and send to:

Rich Snelson, Route 3, Box 295, Clinton, IL 61727



NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY, STATE, ZIP \_\_\_\_\_  
PHONE # \_\_\_\_\_

# T-18 NEWSLETTER

Issue Number 85



*IT'S OUR TURN!!! RICHARD & ROXANNE SNELSON AND N295RS*

## IN THIS ISSUE:

Young Eagles Flight Program  
Engine Power Estimator  
California Fly-In by Hal Stephens  
Aircraft Painting (Building A Paint Booth) by R Snelson  
Thorp Check Out by R Snelson  
Flight Safety - Fuel Management  
Kentucky Dam by R. Snelson  
John Thorp Memorial Tribute Book

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Watch for this Emblem in the following newsletters. It will mark articles and plans for Oshkosh 93 and the T-18 30th Anniversary arrangements.

FLASH! FLASH! FLASH!

EAA Director Billy Henderson and Tom Poberezny have agreed to work with us to arrange both a 30th anniversary celebration for the T-18, and a remembrance for John Thorp during Oshkosh '93. This is wonderful news and offers us the chance to tell the world about the fine airplane we fly and its designer. Some of the ideas that have been discussed follow.

\* I have asked Mrs. Thorp (Kay) if she would consider coming to Oshkosh 93 for the events. Her answer was yes! So I think we should raise the funds for her ticket and accommodations. Will you help? She said she was there a few weeks ago on a tour and went through the Museum. She told the guide her name and asked about seeing Tom. Unfortunately, the guide didn't do anything about it. That's too bad since I'm sure Tom would have wanted to say hello. She mentioned that he was a little boy the last time they met. Let's bring Kay to Oshkosh for the John Thorp remembrances. Contributions for ticket can be sent to me.

\* On Friday the Nature Center may be available for a noon lunch and the John Thorp remembrance.

\* That evening the banquet would again be held at Butch's Anchor Inn. With some special guest that might include Peter Garrison (wrote The article Thorp and Me in Flying Aug 92) and of course Mrs. Thorp.

\* A T-18 Fly-by using either a select group or anyone that would like to be in it. I have heard that this needs to be better organized than the fly-by for the 25th anniversary since we had airplanes all over the place. I have asked Gary Cotner to help organize this event.

\* A T-18 Forum, It would be nice to tie this in early in the week on either Friday or Saturday.

\* T-18 special parking area in rows 9 & 10. We will need help setting this up and may need someone there to rope off the area early.

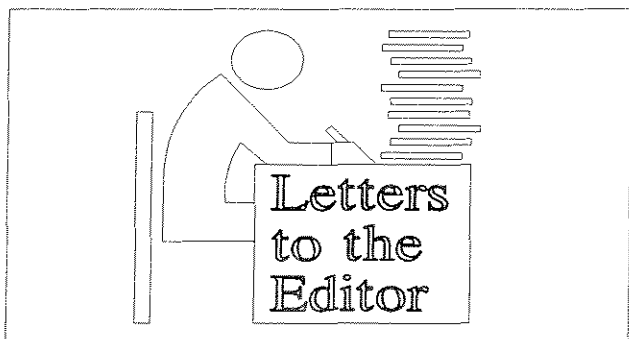
\* Let's have at least 60 or more T-18 at Oshkosh '93. This year we had 20 T-18s registered, which just happened to be the third largest group of homebuilts on the field. Next year with a little effort by all of us we should be able to field 60 or more airplanes.

How about it T-18ers? Can we count on you to be at Oshkosh '93 and help us celebrate this occasion? Let me know now if you will plan on bringing your T-18 to Oshkosh. I will start the count now.

Step forward folks, Tom has asked his staff to help in arranging this celebration, so we need to match his efforts with all the enthusiasm of a T-18 builder who just made his first flight. I need help in arranging and planning this event. Pick up the phone and call now I want your input to help make this a memorable occasion. Phone 217-935-4215

John Thorp's sister has prepared a book honoring his accomplishments and memory. The book is well done with many pictures taken through out John's life and career. See the details for obtaining it on page 19 of this newsletter.

My congratulations to John R. Evens from Arvada, Colorado for winning the award for "Plans built Outstanding Workmanship at Oshkosh 92. John said it was quite a surprise when the box with the trophy arrived after the Fly-In since he had no idea that he had won. As I mentioned in the last newsletter, everyone needs to take some time and look his airplane over. The workmanship is truly outstanding. Everything is done simply, cleanly and shows great attention to detail. Great job John and Vicky.



Dear Richard,

Just a note to let you know how much I appreciate your kind words and the page you did in the last newsletter regarding our "Best T-18, Oshkosh '92" award. I'd like to let you know that we were surprised again about a week after Oshkosh, when a package arrived from the EAA. It was a beautiful trophy for "Plans built - outstanding workmanship". I sure felt about ten feet tall! Dean Cochran, myself and Vicki headed out for Placerville, CA on Saturday morning, Sept.19, but were turned back about a third of the way by solid clouds and thunderstorms in the mountains of Utah. We came back and landed in Grand Junction, CO and then at Paonia, CO to see a friend. Dean stayed on in the area overnight, and we headed home. We did see some beautiful country, but were disappointed in not making the fly-in. We're going to try for Prescott, and possibly Kentucky Dam and/or Kerrville. One other thing - just a comment about the Pacesetter props. Don't know if anyone else has had this experience or not, but it can't hurt to mention it to the guys. The quality and attention to detail that was shown by Bill Cassidy when I bought my original prop from him many years ago, seems to be lacking in the new ones. I bought one on which the bolt holes were not drilled perfectly perpendicular to the face, causing a misaligned front spinner bulkhead and wobbly spinner. There are ways to correct for that, of course, but a guy expects better for \$600.00. Also the leading edge of one tip was badly done. I sent it back and got another with the same poorly drilled holes! If you're thinking of buying

6855

Allison St. p. 2 one, check it out. That's it for now. I sure hope you're getting some good time in your bird, Richard. I know how exciting it is, and

believe me, after almost 2 years and 200 hours, it's still pretty much the same feeling every time. Good luck and thank you again! John Evens Arvada, CO 80004 Phone (303) 420-2724



October 1, 1991

Dear Rich, This letter is ten years in coming, it's been that long since I started the project and longer if one figures the time it took to decide what to build. Back then the hot ticket was the Vari-ease, but I wanted something that I could use off a grass strip and made of friendly aluminum! I guess that was 20 years ago, because I built our home with a basement entrance large enough for a T-18 fuselage to fit through. After the house was completed, I found a Cessna 170B in pieces which was to good a deal to pass up. By this time the folding wings and wide body were partly finished, couldn't made any progress on either project and knee keep it parts! After some soul searching I decided that the best thing to do was rebuild the 170 since it is a whole lot easier to put together parts then it is to make parts then put them together! It turned out well. The Cessna, the home, a side business, nothing, not once for one minute did the thought ever cross my mind not to finish the Thorpe, and a big contributing factor was the newsletter, I'd read the articles, then go into the basement work shop and just look at something. A year or so ago I once again picked up the project, It was hard remembering where I'd put things, but in less than a week it was as if there never had been a break of, well, years! And the newsletters had a good deal to do with it. I tell you this to thank you for taking up the banner. About ten years ago while on a business trip to California I drove out into the valley and visited John Thorpe at his home, at that time he was still able to get around a bit, he took me into his shop and talked at length about T-18 stuff. He mentioned what a treat it was when people buzzed his house with their new T-18's My birds getting there, the wings are complete and hanging from the floor joists, the rest is mostly complete with only the instrument panel and exhaust system left untouched. I said a year ago that I'd have it flying this fall, now I'm saying that I'll

have it done next fall! Can definitely see light at the end of the tunnel tho. I would be proud to have you look her over, I'm located about one hundred miles north of you , four miles from the Lake Lawn Lodge airport, Delavan Wisconsin. It takes me about eight minutes to get there. Sincerely: Bob Pernic 86 Dartmouth Rd Williams Bay, Wisconsin 53191 Phone 414-245-6445 home and 414-245-5555 office



Dear Richard, Progress on N925RS is slow. That isn't news. Had the engine all assembled only to find that the prop flange was out too much. The crankshaft had been passed by a repair station. Sent it to another shop, they wanted too much for the repair. The third shop gave it a red tag. It was an 0-290 plus cracks in the flange and bearing journals. I found a crank at Gibson and I think it is good. I still need a 0-320 crank or else sell a good case and four cylinders. Regards, Bob Slagle 39 Robin Hood Ln. Clute, TX 77531



Dear Richard,

By now I assume that you have heard that Paul died on August 17, following a decline which began in late January and progressed rapidly from the first of March. He died peacefully in his sleep, at home, where he wanted to be.

The cause of death was mesothelioma of the pleura of the left lung. This is a cancer that does not form a tumor or mass as such, but caused a thickening of the pleura wall. Since the diaphragm is involved, surgery is not an option, and the two currently approved chemotherapy treatments have rather horrendous side effects, according to the doctors, and in only 20% of the cases treated is there a 5% reduction in the size of the tumor. The National Cancer Institute in Bethesda, Maryland, has two experimental treatment programs and would have accepted Paul in one of those programs had he so chosen. But by April, we had planned to go east, he was no longer able to travel.

Aside from shortness of breath, and the cough which was the symptom that first caused him

to seek diagnosis last fall, and the evergrowing weakness, he did not suffer pain, for which we were thankful.

At 73, and in otherwise good health, he was too young, with too much living yet to do, for this to have happened to him and to us. I'm sure one of his greatest regrets, as it is for me, was not to be able to finish his T-18, which was 90-95% completed. We never discussed it--I couldn't and still can't without breaking up.

I am determined that somehow, his project WILL be completed, and will go to Oshkosh, with Paul listed as the principal builder. He deserves that much. I don't know how this will be accomplished--whether I can find a buyer who will agree to such a stipulation. Two members of Chapter 135 in Des Moines, have suggested that the chapter might take it on as a project. Whether that is a viable option, I don't know at this time. I wish there were a T-18er in that group, but there is not.

I will miss the semi annual meetings of the T-18ers , and I'll be thinking of you this weekend as you gather at Kentucky Dam Village. You all meant a great deal to Paul, and we always looked forward to our gatherings. Please give my regards to everyone. Sincerely, Helen Shifflet

P.S. Several years ago at Oshkosh, we purchased small T-18 pins--a replica of the plane. I would like to obtain at least eight more. Do you know whether they are still available, and from whom?

P.P.S. Congratulations, Richard, on completing your T-18!!



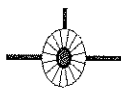
Dear Richard,

A short note to let you know that me, my wife and N711SH (#835) are moving to Lakeland, FL. I will be on the staff of SUN' N FUN and have already gotten permission to include a 30th yr. Thorp Tribute in the festivities - in fact, Tom Poberezny has been notified and is prepared to work with us at Oshkosh also. I'll be in touch with you soon to brainstorm the plan. My new address is Bob Highley 4171 Medulla Rd. Lakeland, FL 33811.

I am presently the proud owner of N8RK, having purchased it from Dr. Richard Wecker about a year ago. This bird is 0320 powered with standard wing, electric flaps, VFR instruments, lights and Loran. It was built by Rudy Kuhoth in 1975. This is the second T-18 I have owned, the first one being Don Thompson's N8DT. I sold 8DT in early 1991 when a neighbor liked my airplane more than his money. I had planned not to purchase another plane until I had an opportunity to fly many more types of homebuilts, having long ago given up on the production models as just not exciting enough. (I also like to go faster for less money than those "truck" drivers!) Well, after 6 months the bug bit me again, and I just couldn't find anything I liked better than a Thorp! So I went out and found another. I really do enjoy this little design. It's exciting to fly and gives me a real sense of pride when I take it out. Also, having been a former "training wheels" pilot, those squeaker three points really give me a sense of accomplishment.

Keep up the good work with the newsletter. I've missed it during my absence. hope to see you at Kentucky Dam next month.

Dennis Mitchell  
833 G. St. #1  
Salida, CO 81201  
719-539-3403



***Editor's Note: Larry D. Eversmeyer is getting ready to fuel inject his 0-320 and is looking for ideas, suggestions, drawings or pictures. Send them to Larry D. Eversmeyer, 10721 Eastlake Circle, Oklahoma City, OK 73162 or call him at (405) 728-1919.***

Dear Richard, I want to become a member of the T-18 Mutual Aid Association. I do not know the membership fee so I'm enclosing check for \$25.00. We met at Ky Dam St. Park in '90, I'm the one that came in in a Navion. I made my first flight in my T-18 on Oct 10, 1991 after taking some duel from Dave Eby. The flight was uneventful except for stabilator trim system being out of rig badly. I now have 65 hrs. on airplane. It has a 150 HP Lycoming on it. The pitch on my propellor is much too course; Sensenich said to cut 1/2 inch off each tip, I did this and picked up about 75 RPM but I still need about 150 RPM more. This preamble is leading to a question: Do you have any information about any member that is using a 3 blade ground adjustable composite prop? If you know of such an installation, would you please send me the member's name and phone number as well as any printed info you have? I would have joined long ago but did not have your address. J. W. Perrine, 2722 Military Road, Jacksonville, AR 72076

*Editor's Note: Sorry but I don't have any information on prop. Let's see what the membership can come up with for you.*



Dear Richard, Enclosed are photos of all the T-18's at Placerville. Hal was planning on sending you the list of everyone who was able to attend.

N166BC is now ready for sign-off by the FAA. The inspection will be scheduled this coming week! I am still not prepared to fly it, without more tail dragger time.

I would like to thank Hal Stevens and everyone for the great time at Placerville. I am planning on holding a Northwest T-18 fly-in at my place. The week-end before Memorial Day is tentatively planned. Locatin Chehalem Airpark, Newberg OR, 14 miles south of Hillsboro. Brad Chapman 17505 Terrys LN. Newberg, OR 97132.



## YOUNG EAGLES FLIGHT PROGRAM

*I hope all of you get the opportunity to participate in the Young Eagles Flight Program. It's great fun to introduce a young person to flight and then to get a letter saying thanks. This young man has a great memory and recalls many of the details of his first flight in a T-18. I think he also has a great way of letting me off the hook for a couple of bounces on my landing. Thanks Marty, your excuse was even better than mine.*

Dear Mr. Snelson,

Thank you very much for letting me ride in your plane. I was excited when we were going out the door to go camping and you called and asked me if I wanted to go flying. It was a little hard getting in the plane. I liked talking to you through the headset and listening to the control tower. It was fun taking off because you started going really fast and all of a sudden you were in the air. When we took off I saw Old Farm Lakes which is the subdivision next to my subdivision. Just after you told me we were at about 2500ft., it started to get bumpy. It felt like we were going down a gravel road very fast and I was a little scared because the wings were shaking. Then we went up to 2600ft. and the ride got smoother. I liked it when you pointed out Clinton Power Station. Then we saw your house and the nursing home where your mother is. After that we turned around and that is when I got to steer. First we turned to the left and you said "Think left" and then we turned to the right and you said "Think right". I was glad you turned the plane a little so I could see better. My favorite part was when we were going to land and we had to go past the runway. Then we did a really sharp turn to the left. I looked out your side because it was down and it was awesome!. The landing was bumpy because of the black stuff on the runway. Thanks again, I had a good time and really like your plane.

Martin Adam

## Power Graph

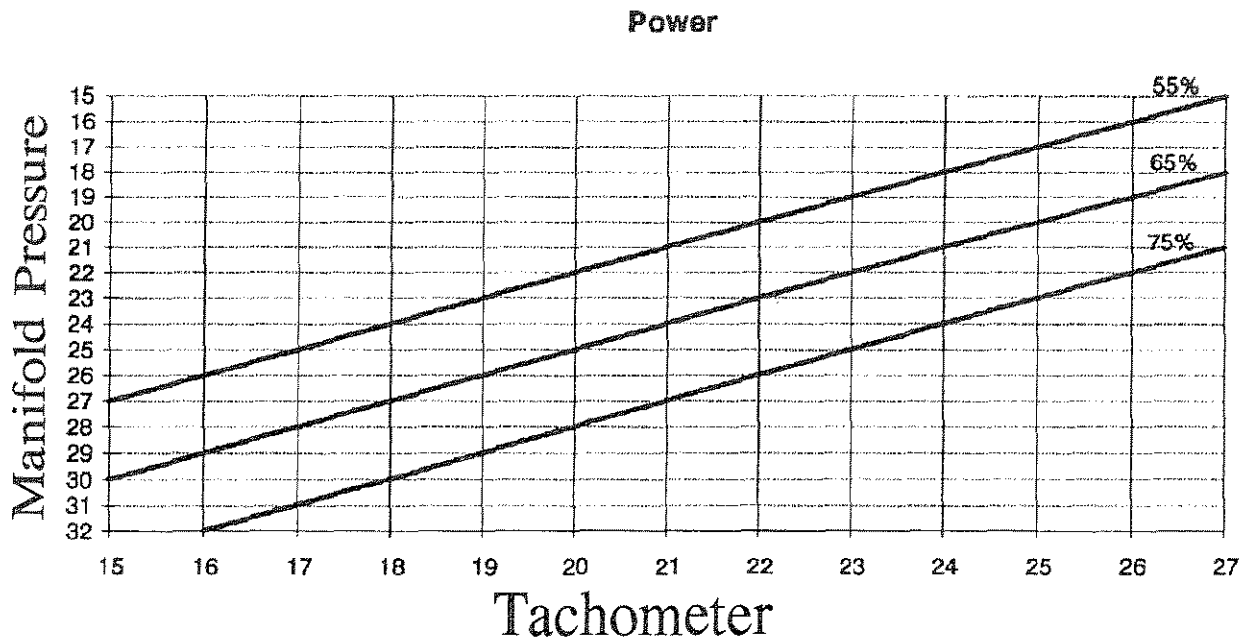
I developed the following graph, that can be used to determine your approximate power setting, from three data points given in one of the RV Newsletters. The data points are:

42 = 55% Power

45 = 65% Power

48 = 75% Power

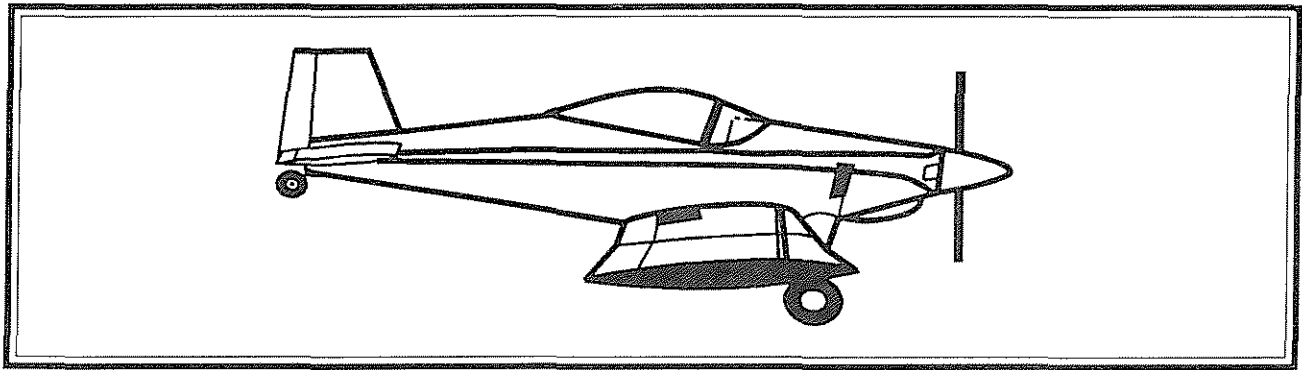
For any power setting you add the manifold reading to the first two digits of the tachometer reading to determine the first number. For example 24 inches of manifold and 2400 rpm gives you 48 which is equal to 75% power. By using the graph you can start with either manifold pressure or the tachometer reading and determine your approximate power setting. You may want to make a copy of the graph and carry it in your airplane for reference.



## ITEMS FOR SALE

FOR SALE: Dynafocal Mount for 0-360 Lycoming Engine, large doughnut type, \$175.00 Call or write Les Conwell 1725 Oakland CT. Lutz, FL 33549 Phone 813-920-2931

FOR SALE: 2-Throttle vernier cables (lengths are 48" and 43") \$25each, Scott Tailwheel \$100, 0-250mph airspeed \$45, panel mount wet compass \$35, complete set of wide body plans \$175



# California Fly-In

by Hal Stephens

Sept. 20, 1992

The California T-18 Flyin is concluded. We deem it a success! Fourteen airplanes on the field including the two under construction. Attendees included Steve Hawley of Tucson, AZ who was the first on the ground Friday afternoon with Len Robinson of San Dimas in the right seat (he's about 2/3 finished with his bird). Next in was Dave Tennant of Lompoc, California.

Upon orienting himself with the ground for a few minutes and meeting the others, Mr. Dave Tenant invited Jim Critchfield, the person for whom this fly-in honored, a ride in his beautiful T-18 Thorp Tiger. Jim Critchfield has been building his machine for over 27 years (started construction in 1963) and has never sat in a T-18 much less had a ride in one. Upon their return the smile on Jim's face was from ear to ear. His comment was "it sure was responsive and quick!" Dave gave him his first T-18 ride ever. Thanks a million Dave! It's worth all of that.

Later in the evening Harry Paine with his son Matt came in just before dark. Some of us went to the Elk's Lodge for their great Friday evening dinner. Harry and Matt set up their tent and prepared for their father and son camp out.

Saturday morning dawned bright and clear with visibility near 60 miles up at this 2500 foot level in the Sierras. When we arrived at the field after the motel pickup we found son, Matt got fed up with dad's snoring and packed off to the hangar with his bedroll to get the rest of a nights sleep.

As the morning rolled on the airplanes rolled in. Gordon MacDonald from Glendale, Ron Carroll and his wife, from Paradise, Lyle and Ann Trusty from Lancaster, Brad Chapman, from Newberg, Oregon, Tommy Thompson from near Las Vegas, Nevada, Wayne Irwin from Groveland along with Kirk Wallace who has recently inherited his father's project, Bob Cianflone and friend from Ventura, Gus Gordon and wife from Granada Hills, and Mel Clark drove in from Huntington Beach. Mel should be test flying within two years if he is to complete his ten year goal. Leo Corbalis and wife Janis drove up from San Jose as did Tom Hunter with friends from the Bay Area. Up from Sacramento in his beautiful blue bird was Harry Arnold who stayed for the day. Last but not least, Jon Hendrickson from Stockton and a friend as well as Gil Garcia and his wife came up to look at the beautiful airplanes

and have steak dinner with the group. Unfortunately, several people who had planned to attend did not arrive, three planes from Colorado and two from the Oakland/San Leandro area were sorely missed.

People were more interested in talking airplanes and critiquing Jim Critchfield's hangared T-18 project than in touring the apple hill orchards however, some of the ladies drove up the hill to taste the fresh apple juice and look at the boutiques.

By dinner time people were very hungry and a bit thirsty for a little processed California grape juice. The charcoal soon blazed in the BBQers and the steaks were sizzling. Lillian Critchfield made a huge pot of her "Santa Maria" baked beans to go along with the salads, french bread and her walnut cake. Needless to say, no one went away hungry. Also invited guests were some of the Chapter 512 EAA members who helped throughout the day.

"The Mountain Democrat", Placerville's newspaper sent a reporter and photographer to document the event for the townspeople. Several of our T-18 owners were interviewed and photographed with their machines. Special 'thanks' to Lyle and Anne Trust who put the reporter in their airplane, had her don the headset and described the thrill of flight through the plane's intercom.

The EAA members and Antique members opened their hangars for the group to see the beautifully restored Stinson, the Airmaster, the Lincoln-Page, the Wizzer motor bike and other wonderful toys of yesteryear.

Talk has it that the T-18 owners in mid-state California are considering another west coast fly-in. Dave Tennant, Harry Payne and others in the Santa Ynez, Lompoc, Pismo Beach/Camarillo area might be coaxed with requests.

Nancy and I would like to say thanks to all who came to and participated in the fly-in and hopefully we'll see you one day soon. We enjoyed ourselves and hope you did also.

PS: It was beautiful to watch the formation flight of the Tigers leaving Placerville for their homes in South California.

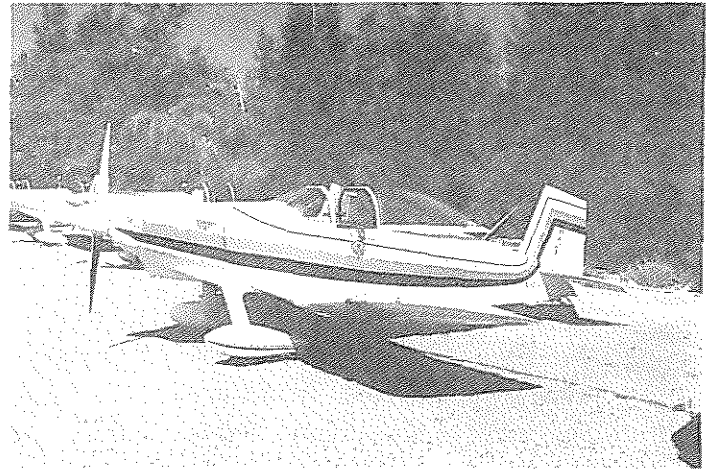


*Jim Critchfield's Thorp T-18 located at the Placerville Airport in California. His wife claims that the hanger is Jim's second home since he's there seven days a week. He has been building his tiger for over 27 years.*





Bob & Patty Cionflone of Ventura, CA



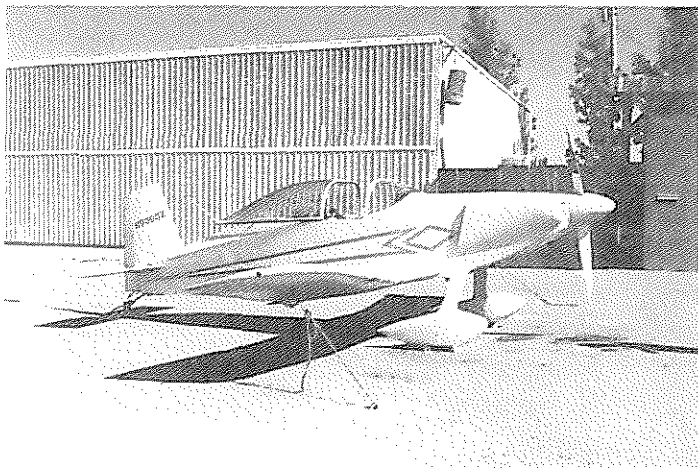
Harry Arnold's fine white with blue trim T-18  
Harrys from Sacramento, CA



Tommy Thompson of Jean, Nevada



Wayne Irwin and his bright yellow orange "Devils"  
paint job. Waynes from Groveland, CA



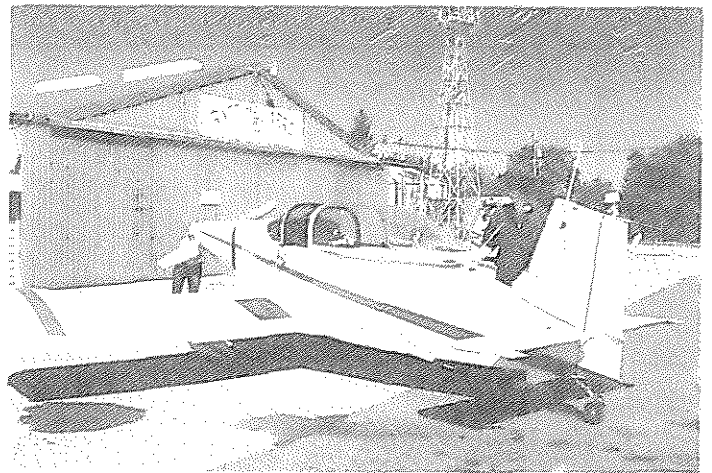
Steve Hawley of Tuscon, Az. This guy really gets  
around with this airplane.



Gus Gordon beautiful star studded T-18, he's from  
Granada Hills CA.



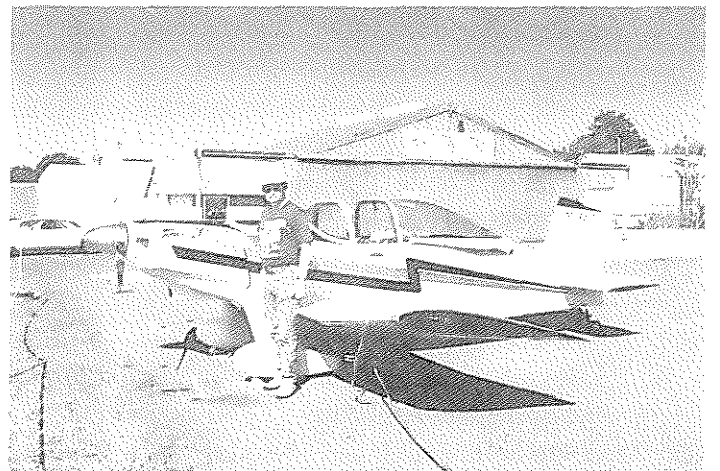
Lyle & Anne Trusty's T-18. They're from Lancaster CA.



Gordon Bordon and his bright orange T-18 from Atascadero, CA.



Gordon MacDonald and his T-18 from Glendale, CA



Dave Tennant and his "Sweet Dreams" from Lompoc, CA.



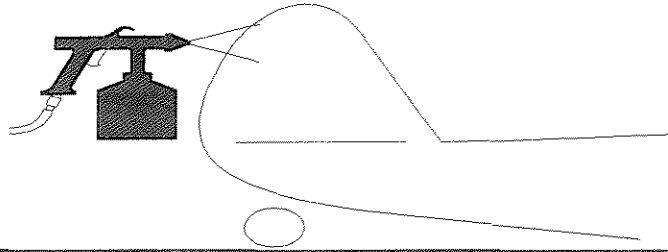
A late arrival, don't have the name of the owner. Records show that the plane was built in 74 by a R. Keller



We weren't sure of the owner or builder on this airplane. Any help fellows?

# AIRCRAFT PAINTING

by  
RICH SNELSON



Every time I read another article on aircraft painting that mentions painting outside on the drive way, I think here's a guy that doesn't live in "Windy" Illinois. We have enough trash in the air to turn a wet paint job into #80 sandpaper. And then there's our "B25" bird population. They know the second a wing panel is outside. The cry goes out "it's practice time". They have Norton Bomb sights built right in their butts. To heap even more havoc on a freshly sprayed panel we have "Kamikaze" insects. They impact the new paint and stick there fluttering in gooey circles, while the painter watches and wanders if he should pick the little bugger out of the mess or just opt for his permanent encapsulation. With all these undesirable decorative effects ahead of me, my goal was to build a dust, bird, and insect free paint booth.

I didn't want the booth to be a permanent fixture so it was designed to be quickly assembled in a garage or on a patio by using a few bolts and turn buckles to hold it together. The plans are included and illustrate my paint booth. The construction method uses 2 x 2 lumber and small plywood gussets that are glued and screwed into place with dry wall screws. The skeleton is covered with heavy clear plastic sheeting available from any hardware store. I had a larger area than most garages, so you may have to size the plans down to suit your site.

I started with a plastic floor but found it impossible to keep clean. There's no way to vacuum it, since the hose just sucks it up. The bare concrete floor works better and allows both vacuuming and scrubbing down before each use. Besides you won't believe the sealing job several coats of urethane will do to a concrete floor. Water will just bead up from then on.

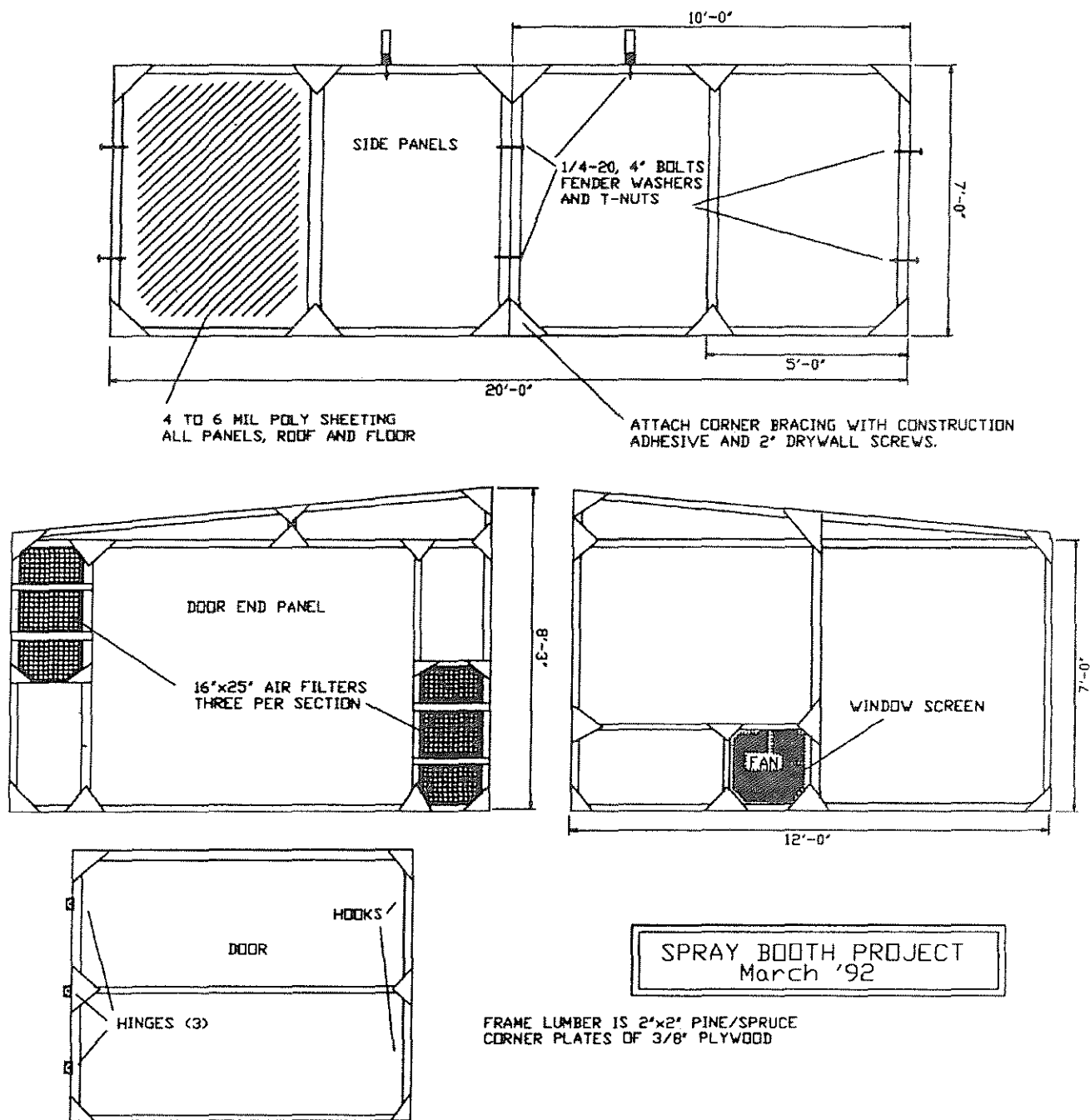
Standard furnace filters are installed on one end using common wood screws to hold them. A large window fan is mounted on the other side for air movement. I used the fan to suck air out of the paint booth. To do it over, I would turn the fan around and blow-in. This would pressurize the paint booth instead of sucking dirt & dust from every opening that's not sealed. To make the system deluxe the air from the fan would come in along a side and not be allowed to blow directly on the newly painted pieces. Another advantage of using the fan in a positive pressure direction would be a safety concern from explosion or combustion of the highly saturated air going across the hot fan motor on its way out.

Do everything you can to keep the booth clean. Don't do any wet or dry sanding in it. This really creates a nasty mess and leaves you with all kinds of dust and dirt that's impossible to get off the walls and floor. Preclean everything that you take inside. Use dry, oil free compressed air to blow parts off, get it to all cracks and crevices. Before each painting run, vacuum the floor and wet it down. Leave the fan off until you're ready to paint. Turn it off as soon as you're done. This will result in less movement of air and dust.

Lighting the work area and parts to be sprayed proved to be very difficult. After trying a number of combinations of lights it was clear that too much light was worse than not enough. The very bright Halogen shop lights proved to be way too bright. Direct bright light causes a glare on the wet paint that makes

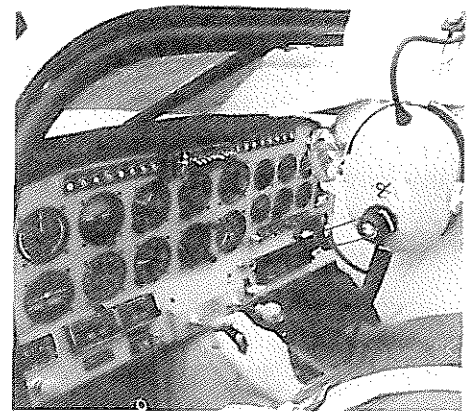
it difficult to tell where you've painted. For those of you that haven't used a spray system, the first coat is easy to put on since you can see exactly where you've been. The second coat is much more difficult since the only way you can tell where you've been is to look for the "wet area" being sprayed. By opening all the garage doors and working in the day time I got the best light. I have two sky-lights in my barn and at midday the light was nearly perfect. Next to that, several 100 watt incandescent bulbs worked out the best for me. Dave Eby the real master at this, sprays with a paint gun in one hand and a light in the other. By correctly positioning the light you can get a reflection from the wet paint area.

I hope this article is helpful and will get you on the way painting or repainting your airplane. I'll have another article on the spray painting process in the next newsletter.



# Thorp Check Out

*by Richard Snelson*



White man's legend has it that Wichita Falls was named by an Indian woman wading in the river there. Finding it waist deep she said "Wichita" the Indian word for that depth. Before my trip to Wichita Fall I felt "up to my waist" in problems and details about flying my new T-18. However during the four days I spent in Wichita Falls the problem and details for that first flight were all worked out. This article is about the advise and tips from two very experienced T-18 pilots, Dave Eby and Bryant Rolland. I hope it proves valuable to future T-18 pilots or their instructors.

Wichita Falls claims fame for the most T-18s for its population size. That number is now four. The first was built by Bryant Rolland and completed in 1978. Bryant can claim fame as being "current in Mid-Airs" after his run in with a Cessna while on approach to Oshkosh in 1990. With his wing bent and a stall speed of 140 mph, he was able to spiral and land. His plane is now rebuilt with a new wing and flies as good as new.

My check-out started with Bryant on Friday afternoon, lucky fellow was filling in for Dave Eby, who was returning the next day. He's flown many hours in his career as a professional flight instructor, flight examiner, and commercial pilot. As our goal Bryant wanted to introduce me to the T-18 and how to handle it in steep turns, slow flight and stalls. His advice centered on pitch control and what to look for over the nose of the in flight T-18. Since I'm tall and sit up near the canopy top, in a climb I could see about 1 inch between the cowl and the horizon. This pitch attitude resulted in an airspeed of 100 mph and a safe climb. Close behind pitch in importance, Bryant placed rudder control. He continually stressed the need to keep the ball centered when maneuvering and backed it up with demonstration of what occurs in uncoordinated flight. He knows of at least one T-18 accident caused by cross controlling while getting too slow on approach. After getting control of the nose in turns to the right and left we moved into stalls and stall recoveries.

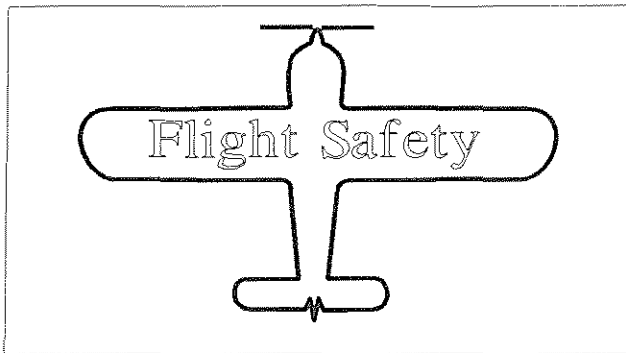
Recognition of approaching stalls was not difficult, each could be felt and heard as the fuselage shuttered at the onset. Recovery was normal, drop the nose slightly and apply full power. Bryant then had me move into a much deeper, more developed stall that broke sharply straight ahead, but Wow! nose down. My reaction, which was wrong, was to quickly pull back on the stick and apply full power. This resulted in "wham" a secondary stall that I was not expecting. Bryant recovered and explained the correct method for stall recovery. First level the wings, no power, especially with the nose straight down, and give the plane a couple of seconds to gain some flying speed before starting back with the stick. A trade off is involved to get enough speed, not too much, and return to level flight without excessive G loading. With the air work done we headed back to the hanger for a discussion of our flight and what I had learned. My thoughts were already on tomorrow and what Dave Eby called a piece of cake, take offs and landings.



For those of you that haven't meet Dave Eby he likes to be referred to as a 62 year old crop duster. During a TV interview the reporter asked, "Isn't it exciting flying around way up there in the sky?" Dave replied "No, but it sure gets exciting when your flying 4 to 5 feet above the ground!" That statment really sums up Dave and his personality. As mentioned in a previous Newsletter, Dave has wooden block inserts in each of his brake pedals. They are very effective in helping to slide your feet from the rudder pedals to the brakes. He was quick to point out that the quicker my feet got sore the better my rudder control would be. So guess what folks! Off with the shoes and do it barefooted. Were talking in basic here so for those old time tail-dragger pilots your excused, go read someting else. For all the rest: For take off line up just to the right of the runway center line, this puts you in position to watch the line with your peripheral vision, while watching some object at the far end of the runway for aircraft nose alignment. It's tricky here because the nose of a T-18 is built pointing five degrees to the right, you sit on the left side of the nose and if you aim the spinner right down the runway your won't be going straight ahead. Pick your aiming point, put in power, and feed in right rudder to hold your alignment. Keep it right there along side the runway center line. If you can't and your headed for the bushes, only adjust your direction enough to get it straight, then in small amounts correct your travel to bring it back to the runway center line. If you don't you will find that you're overcorrecting in both directions. Assuming a no crosswind condition you will know that you've got it down when you can put your left foot on the floor and do it all by just applying gradual right rudder. Dave taught me to begin the takeoff roll with the stick back and to let the tail fly it self off as speed permits. A note here,I didn't remember this later in one of my early solo T-18 take-offs and managed to horse the tail up way too quickly before I had enough speed for the rudder to be effective. This was with a left cross wind, that made it worse and proceeded to cock me to the left and caused the darn thing to act liked it was possessed by the devil as it ran off the runway, barely missing a runway light. Normally by the time the tail flies its self off you are well on the way to a good takeoff since rudder control in a T-18 is very effective.

Dave's instructions for landing started with airspeed control, his recommendations included slowing to no less than 100 mph on base with 90 mph targeted for final. Control coordination is critical through out the approach turns, use the rudder, keep the ball centered. On final Dave brought in full flaps, at that time a small pitch adjustment was needed to maintain airspeed. Right on down starting the flare at 15 to 20 feet. Dave's instructions for landing were to flare as if you were going to just put the mains on then continue to hold if off and convert the landing to a full stall three point touchdown. After three point contact the stick is brought full back to assure solid tailwheel contact for directional control. He showed me how to judge this attitude by sitting in the plane during taxi and noting the nose position. It's very important to keep the nose there, and no higher. With a bounce or nose high attitude, apply a little power, gentle with the stick, keep it comming back, avoid oscillations that could lead to loss of directional control. If that fails, go around, you need the practice anyway. Make the landing just to the right of the center line and don't cross it. Use a point on the distant end of the runway to steer and correct heading errors quickly. At touch down it very important to have the airplane headed exactly parallel to the runway centerline or side. Any cocking at that point is hard to correct and can result in a rough ride and possibly a ground loop. Dave gave me some practice at wheel landings but advised the use of the three point until I had the directional control down pat.

Dave asked me to write this so he would have it to give to any new T-18 pilots he would check out. His advice worked well for me and helped to get me through my test flying and the first 25 hours, some of which caused me more than just a few grey hairs. My advice for those that are just finishing a project and haven't been flying for a while is to get tail dragger instruction and practice under your belt. After that take Dave up on his offer to put you in the left seat of his airplane and check you out. Thanks Dave



## **Fuel Management Problems Involving General Aviation Non-corporate Aircraft:**

By Betty Hicks Reprint from NASA'S Aviation Safety Reporting System Number 151 Dec 91

*Editor's Note: Betty Hicks is an ASRS Research Consultant. She has been Coordinator of the Aviation Program at Foothill College in Los Altos, California since 1972; holds an ATP certificate; and has logged more than 6,000 hours as a pilot and flight instructor in a wide variety of aircraft. This is Part 1 of a two-part research article by Ms. Hicks. Part 2 will be published next month.*

"I charted a course from ABC to XYZ," wrote a pilot on his ASRS form. "The distance is 35 nautical miles. I figured a 15 to 20 minute flight. We took off with close to 1/4 tank in the left wing, and 1/8 in the right tank, which I figured at 10 gallons remaining. It was pitch dark. I climbed at full power to 11,000 feet from the 5,900-foot airport. The climb rapidly brought the tank gauges to empty about five minutes before arriving over XYZ." The pilot saw no rotating beacon at the destination airport, and no runway lights. A mayday call on UNICOM brought a response from another pilot working on his airplane in an XYZ hangar. The airport was closed for construction, was the bad news, but the Samaritan on the surface volunteered to align his truck lights down the one available runway. The engine quit as the pilot turned base leg. The frightened and angry pilot protested to the FAA that his predicament was caused by an inefficient NOTAM distribution system, and that even if he had filed a VFR flight plan, the information about airport closure would not have been available.

Yet research by ASR determined that the *Airport /Facility Directory* (a critical inclusion in the "all available information" pilots are required to seek prior to cross-country flight) clearly stated that the airport was closed indefinitely for construction and specified the proper source of NOTAM information.

**A Persistent Safety Problem.** *Fuel exhaustion (out of fuel) and fuel starvation* (fuel in tanks but unavailable to the engine due to system problems or pilot mismanagement) are leading causes of general aviation, non-corporate accidents and incidents nationally. A recent review of incidents reported to the Aviation Safety Reporting System (ASRS) confirmed that fuel mismanagement incidents are a persistent occurrence in these data, as well. The ASRS study set included 111 fuel exhaustion/starvation reports submitted to the ASRS by general aviation, non-corporate pilots between January 1986 and April 1991. Our objectives were: 1) to classify and quantify the reasons pilots allow tanks to go dry; 2) to suggest, after examination of research findings, preventive procedures and attitudes that might be incorporated into basic flight training and into the various formats of general aviation recurrent training. A survey of reporters' qualifications revealed that, contrary to the research team's preliminary expectations, these were not only neophyte pilots running tanks dry, or failing to throw the switch to another tank. They were certificated as student through airline transport pilots. Over half had logged 500 hours or more total flight time. One out of every seven reports was submitted by a flight instructor. Why did the 111 pilots reporting to ASRS fly through their fuel reserves, so that 107 of them had to make unscheduled landings? What can we learn from them about procedures and judgments that contribute to fuel exhaustion/starvation incidents?

**Primary Causes of Fuel Emergencies.** The reporters in the ASRS study set identified several primary causes for their fuel emergencies: trust in unreliable fuel gauges; careless preflight inspections; inaccurate flight planning; weather fac-

tors; and fuel system malfunctions and mismanagement.

**Trust in Unreliable Gauges.** Twenty-two pilots in the ASRS study set attributed their fuel emergencies to trust in the notoriously unreliable light aircraft fuel gauges. Yet almost half of these pilots also stated they knew the gauges were unreliable before their incidents occurred. "My fuel computations and fuel gauges indicated that I still had one hour of fuel remaining when both engines flamed out," wrote a ferry pilot who left his out-of-gas twin on a farm.

**Careless Preflight Inspection.** Loose or missing fuel caps and quick drains stuck in an open position were overlooked during preflight in 13 cases. At the same time, three-fourths of the study reporters made no mention in their ASRS reports that they had checked fuel supply and the fuel system visually. Typical was this account of inadequate preflight: A pilot on a photo mission assumed the FBO had topped the tanks, but he preflighted nonetheless. "I stuck two fingers in the tank and was convinced that I felt fuel to the top." Forty minutes later he landed, fuel exhausted, on a road running through a cotton field.

**Inaccurate Flight Planning.** Of the 111 reporters, thirty reported both their preflight estimates of aircraft endurance and also the time in flight at which the fuel exhaustion occurred. The average error overestimated endurance by 55 minutes. Yet only one third of these same reporters indicated they had ever calculated actual fuel burn for the aircraft involved in the incident, and half of these performed their calculations after the fuel exhaustion incidents occurred. One of these reporters was breaking in a new engine at a higher RPM than settings previously used. "I now see my error," wrote the pilot, following a safe out-of-gas landing in a field. "My fuel burn calculation should have taken into consideration the higher RPMs." Ten reporters asserted that the aircraft owner's manual had given incorrect figures on expected fuel burn, or misinformation

on usable fuel. "According to the manufacturer's manual there should have been sufficient fuel to make this flight, plus another hour's extra time," wrote the pilot of a twin that landed out of fuel on a busy city street.

**Weather factors.** Sixteen pilots reported that weather especially misplaced faith in winds aloft forecasts was responsible for their fates. "I didn't think such a fast airplane would be so drastically affected by headwinds," confessed one shocked reporter. Thirty of the fuel exhaustion/starvation incidents involved pilots on IFR flight plans. Several of these pilots accepted IFR clearances beyond the range of their aircraft.

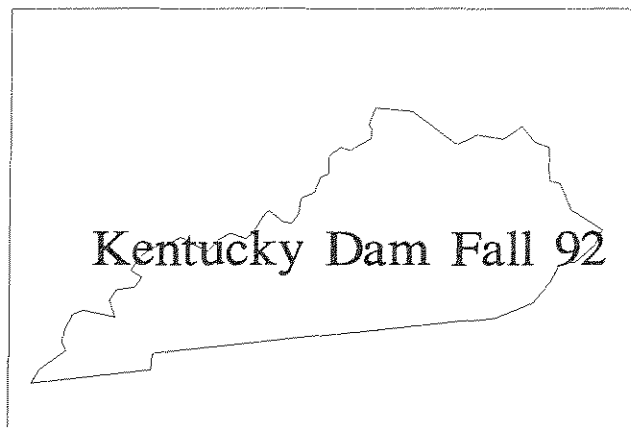
**Fuel System Malfunctions/Mismanagement.** Twelve pilots reported fuel system malfunctions, but most of these problems could have been detected by a thorough preflight inspection. In ten incidents, failure to switch tanks caused fuel starvation.



*Ron & Jane Hayes builders of a beautiful T-18 that was completed and flown for the first time this summer. The Hayes are from Blue Springs, MO. Pictures of the plane in the next newsletter.*



We were level at 3000 feet with the airspeed indicating 170 mph. Our course was due south toward Kentucky Dam. The project had become a flying reality. My thoughts were of my first trip to Kentucky Dam in 1989 with Paul Kirik in his T-18. That trip and the people I met, were to provide the inspiration, and encouragement needed to "keep building". With our Loran providing the heading and RoxAnne following our progress on the sectional we were nearing "our own" arrival at Kentucky Dam. T-18 activity could be heard on 122.8. "Ky Dam 747JP is turning final for 27".

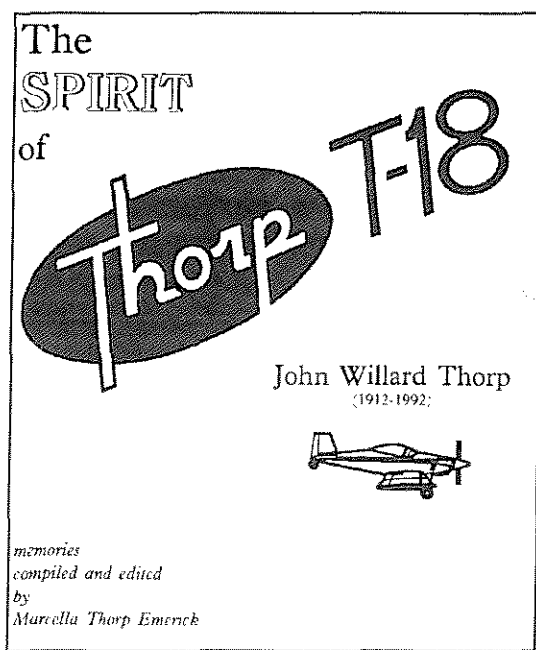


Being a little nervous about my first landing in front of the T-18 elite of the world I called at about 15 out. "Kentucky Dam 295RS is 15 to the north inbound." Well Lee Skillman was waiting and his reply was immediate. "295RS Kentucky Dam, come on down Rich there's about 40 people here, all waiting to watch you land." Well I decided right then that no matter how good or bad this landing turned out I would say RoxAnne did it. With my black & white pride stable on final with full flaps at 90mph and everything under control my confidence returned. The landing was a squeaker.

Later after watching Lee with Jim Paine in N747JP, make a couple landings for each approach I paid him back by telling him how easy it was and that RoxAnne really made our squeaker landing. Little did he know that it was nothing like the one I'd made earlier in Lincoln, Illinois as I landed to pick up RoxAnne near her school. After that one I looked around hoping no one was watching. As I taxied up she came around the hanger. She quipped, "Bet you hoped no one was watching". Oh well! We had arrived at Kentucky Dam on a great weekend of seeing friends and flying was still ahead.

Saturday morning found everyone at the airport. By my count we had fifteen T-18s present. To prove T-18 building is alive and well, we had 15 builders present. Jim Paine is one great trooper. He made sure all the builders and family got a T-18 ride. Thanks Jim! The highlight of the weekend came late Saturday as a six plane formation took to the air. As the group of six was passing over Ky Dam airport Dave Eby and I were turning on final. Dave was flying my plane and firewalled it. The group of six became seven! "The Magnificent Seven" After several passes over the airport they formed up for the landing and peeled off on a five count. All the planes were recovered in order! RoxAnne said she didn't know whether to cheer or salute! Jim French got the whole thing on video and sent me a copy. Thanks Jim! Mine is nearly worn out from watching N295RS in the fly-bys.

We had a full house at the Saturday evening banquet with over sixty people in attendance. We discussed a Spring 93 get-together, possibly in Texas and a return to Kentucky Dam in the Fall. The food was great and the company even better. Without question, the small local T-18 get-togethers provide the very best opportunity for learning about the airplane and what it takes to build one. Hope to see a lot of new faces at the Spring T-18 Get-Together. More will follow!



Richard, ----May I please introduce myself--John W. Thorp's sister .... Our friend Dick Eklund advised me to send you this enclosed blurb and copy of the memorial tribute I have compiled honoring the accomplishments and memories of my brother. Any help you and your colleagues can offer to help in the distribution and sale of these booklets will be greatly appreciated ...

He also tells me of plans for honoring my brother's contributions to EAA with ceremonies at the next conference. I would like to be included if that is possible, as J.W. and I are among the few last members of our generation in a large California pioneer family. If you have comments regarding this and plans, I would appreciate hearing from you. I think his wife, Kay, will be making plans to also attend. She is doing well.

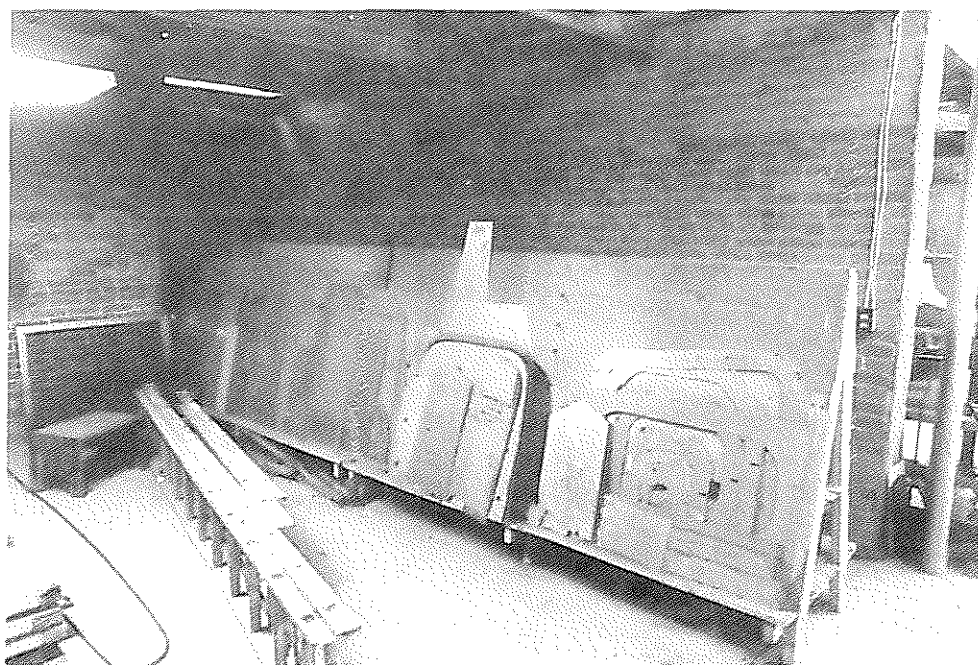
I hope you will forgive me for using some of your NEWSLETTER material in the book. You will doubtless recognize it, and I hope any editing I did meets with your approval. Sincerely, Marcella Thorp Emerick

*Editor's Note: I liked the book and think you did a great job putting it together. It should be a part of every T-18 builders keepsakes. Richard Snelson*

The memorial tribute booklet THE SPIRIT OF JOHN WILLARD THORP is now available for \$5.00 per copy, and includes tax, handling and mailing. It contains 26 pages of text with 35 b/w photos reminiscent of his life, his family, friends and associates. Send request and check or M.O. to:

MARCELLA THORP EMERICK  
7218 Linglestown Rd.  
HARRISBURG, PA 17112  
Ph. (717) 545-5219

*This is a photo of John Thorp's shop. His templates for the T-18 are still stacked neatly on a rack.*



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We're pulling all the stops! Help make  
Oshkosh 93 "The Thorp Year"

John Thorp Memorial Book is now available!

# T-18 NEWSLETTER

Newsletter No. 86



*Russ Ross and his T-18 N45RR on his trip to Alaska*

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**North to Alaska by Russ Ross**

**Flight Safety by Ken Morgan, John Evens**

**T-18 Gatherings for 93**

**1993 Renewal Notice**

**NOTICE: (STANDARD DISCLAIMER)** *As always, in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.*



The planning and scheduling for the 30th Anniversary Thorp T-18 events to be held during Oshkosh 93 is going well. In December, I received a letter from Tom Poberezny acknowledging my request for special consideration, and expressing his desire to help arrange our events. Cooperation has been impressive and it looks like we will get all that we have asked for.

Our events will start at 11:30 AM, Friday July 31, in the EAA Nature Center pavilion, where we will hold a short memorial service and tribute for John Thorp. We will follow the service with announcements and times for other Thorp events for the week. Lunch may follow if it can be arranged.

The next event will occur Friday sometime before the airshow. Mrs. Thorp will be introduced on the flight line speakers platform by Lee Skillman and a Thorp T-18 missing man flight will be brought overhead. Gary Cotner of Collinsville, OK is helping to arrange this formation flight. My request to Verne Jobst, Flight Operations, was to have a small group of T-18s that will have practiced formation flying in advance, take part in this event.

Then Friday evening it's back to Butch's Anchor Inn for our annual T-18 banquet with Mrs. Thorp as our special guest.

We have latched on to a Saturday morning 10:00 - 11:15 slot for the T-18 Forum. I don't have the tent number yet but that will follow. One other event late in the fly-in is planned to allow late comers a chance to get together. We have a small park in Oshkosh, South Park, Shelter #2, reserved for Tuesday Aug 3, starting at 6:00 pm. Take Route 44, turn north on Georgia St. and right into the park. You can get there on the bus that runs to & from the college dormitories.

Special parking was the last item we requested and it will be arranged with Ken Whyte. Ken will work with our early arrivals to arrange the area. I asked for rows 9 & 10 but we may need more space than that if we get the turn out I'm expecting. Ken thinks that area should be ok, but asked for us to be flexible and work with him after we get there. I understand there have been changes to the field in that area. A new taxi way has been built along the flight line and the fence moved to the west to keep about the same parking space. Ken said that we probably wouldn't want to put ropes and stakes up early since it would make it difficult to get airplanes in and out. He asked if we could provide two volunteers to help with our T-18 parking. His staff will know about the parking arrangements and will send T-18s to us to park. If you can help, please volunteers for this. Phil Tucker of Sport Aircraft is paying for 3 or 4 signs that will be used to mark our parking area and let the world know about our 30th anniversary event.

Well that's it. Now it's up to you the T-18 Mutual Aid Members to get your T-18s out, polish them up and bring them to Oshkosh 93. Let's put 60 airplane on the flight line and show the world what a "homebuilt" metal airplane is all about, and that John Thorp's proven design still offers a performance advantage that should be considered when selecting a project. Get your name and plane on my list for Oshkosh 93. Call me now! (217) 935-4215

I want to thank those individuals that jumped the gun and sent their contributions for Mrs. Thorp's travel accommodations. Two fifty dollar contribution have us off to a good start. If you can, please help with this by sending your contribution to bring Kay to this special tribute to John Thorp. If any of you fellows that fly the big iron can help with discounts on tickets let me know.

continued on page 3

## T-18 Events for 1993

**Thorp T-18 Fly-in at McAlester, OK.** May 14-16 See Gary Green's letter on page 17 for more information on this event.

**Thorp T-18 Gathering at Oakland Pontiac Airport,** Michigan on May 22-23 See Al Bosonetto's letter on page 18 for details of this event.

**Thorp T-18 Fly-in at Kentucky Dam** on Oct 8-9 (more details later).

### **Other Sport Aviation Fly-Ins:**

#### **Sun & Fun, April 17-23**

Rumor has it that a small group of T-18s will depart Sun & Fun early for a couple of days in the Bahamas. Care to join us?

#### **T-18s will make a showing at Greeley!**

Greeley Weld County Airport and the Rocky Mountain Sport Aviation Fly-In is June 26-27. This sounds like a fun event, free camping on the field, free transportation to town. Food available on the field. The Greeley Stampede Rodeo and Parade is going on that weekend. They are asking that we consider their facilities as a future sight for our T-18 annual club meetings. (Editors note: I will try to make this one. Any one care to join me and put some T-18s on the flight line?) See their letter on page 16. **Colorado T-18s Unite**

**Flash! Flash!** Late breaking news, John Evens has arranged for a block of rooms in Greeley at the Holiday Inn for June 24-27. The phone number is 303-659-1164 ask for "The Evens Party" or conformation number 62204517. Cost is \$55 per night for up to 4 people. Rooms are limited so call now. John and the Colorado T-18ers will help with transportation.

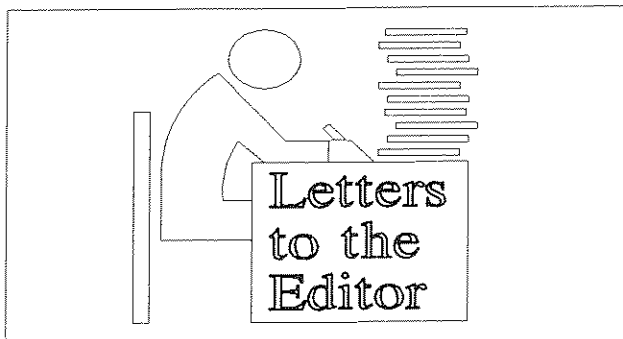


NOTICE! NOTICE! NOTICE! NOTICE!

A special edition T-18 newsletter will be published, to arrive in your mailbox before Oshkosh 93. It will contain your letters and stories about either John Thorp or the T-18. So please start writing now. Tell your story. If you're like most of us, the T-18 has a mighty big place in our hearts and life. John's idea for a simple to build, all metal sport plane has captured us, and given us projects and rewards beyond words. However, I think you will be able to find words that will mean a lot to all of the T-18 Mutual Aid Society members and also to that new kid on the block that may be thinking of a T-18 as his project. Send your letters to me before June 93.

T-18 Newsletter Editor  
Richard Snelson  
RR3 Box 295  
Clinton, IL 61727

Editors Note: Time really goes fast when your having fun in a T-18. I'm approaching 100 hours in N295RS. Can't seem to find time to work on it long enough to get the upholstery finished. I did build a neat top for my dash using solid foam and one layer of fiberglass on top. It's covered with Nalgahyde on the front curved side and carpet on the top. Pictures and a how to article will follow in a future newsletter.



1/17/93

Dear Richard;

It appears to be time for dues again, so here they are.

I'm also enclosing a check for Kay's fund to get her to 1993 Oshkosh. I hope that you get plenty for the fund. Actually knowing the group and their admiration for John and Kay, I'm sure that there will be sufficient donation. If more is needed please let me know.

I know that you are enjoying your T-18 and hope that you will continue to do so.

My trip back from 1992 Oshkosh was rather uneventful although they had forecast a line of thunderstorms running north-south East of Grand Island.

However, they showed that a weak area would be in the vicinity of Broken Bow north of a direct route. Using my 34 years experience as a USWB meteorologist plus a lot of finger crossing, I took that route to west of BBW, LBF then south-south-westward to Akron, Co on home with no weather problems other than strong gusty wind when I made a fuel stop ant Broken Bow.

Actually, my air time was less then a friend in a C206 who took the more direct route but at higher altitude-about 6000 to 9000-through Western Nebraska westward. At times, his groundspeed was 90 knots up there.

While at Oshkosh, I swapped my Foster 500 Loran and \$450.00 for the updated Foster 501. It really helped on the flight home since I was unable to fly my preplanned flight route. Using the Loran can make a lazy navigator out of you. You have to be careful that you don't set back and get caught

with a nonperforming Loran in a tight spot. However, I'm sold on such a unit or now at this late date I would definitely go for a GPS. Yours, Pete Gonzales 1818 Server Dr. Colorado Springs. CO 80910 Phone 719-634-6358



30 Dec 92

Rich:

Re my phone call this date, I do not find a file on disk which I believed I sent you about 2 - 3 months ago. Perhaps it never happened. So here is a replay-

Give for almost free: Angle tooling for clamping of trailing edges -aileron, stabilator, and rudder. \*. A male form for stabilator tips. It shows minor battle damage from removal, but, with a bit of touchup, using sheetrock joint cement, it would be usable. \*. And I only ask that the recipient reimburse me for cost of UPS.

My check for \$130.00 is enclosed. This covers the Scott Tailwheel plus 1993 dues. I am not sure just what dues are-but to me the newsletter is worth \$30. Incidentally, there is no rush for the tailwheel- I really do not need it for a few months.

Well, all major assemblies except for the fuselage are complete. As for the fuselage, the aft belly skin and the side skins are riveted up - the 596 and 601 bulkheads are in. The forward belly skin is clecoed up and the firewall stuck in place with duct tape. I opted not to install the dash frame, a fragile member, until necessary.

As mentioned, I plan to place both flap controls and the throttle on the left. Flap drawings are essentially complete, but throttle control drawings are merely sketches. Final drawings cannot be done until a decision is reached re the engine, which I suspect will be the Subaru 2.2 with a Lou Ross reduction unit.

Keep in touch and I hope you have a great 1993.

Floyd Myers 5170 Sunset Dr Ogden UT 84403  
801- 476- 0153

Dear Rich,

I hope you had a nice Christmas and wish you the best for 1993. We moved into a new house over the holidays, you can't beat that for timing. Please note the new address on letterhead and change in your records.

I guess by now you are really enjoying the T-18. If you are like me, the first 25 or so hours were periods of great excitement but didn't feel as comfortable as I would like in the aircraft. I have over 100 hours now and wear it like a glove. Don't mistake my comment for complacency as I am still aware of its potential danger if not properly handled. However, I do feel confident in my T-18 piloting ability and enjoy it more each time I go out.

Rich, as you know I converted the 0290G engine for my T-18 and have had outstanding performance from it. Last year I was able to trade for an 0320B2B 160Hp with low time and all accessories. I am so pleased with the 0290 that I haven't given much thought to changing to the 160HP. Considering the added value of the aircraft with a certified engine when and if I decide to sell, I have decided to go with the 160HP. It hasn't been an easy decision as I get outstanding performance from the 0290 with auto fuel and add TCP when I use 10OLL. With a modified Pacesetter prop, 68 X 68 I get about 185mph at 2000ft. full throttle 2600rpm, and cruise 160mph indicated at 2450rpm. With those numbers I wonder why I am changing out the engine.

I would appreciate your getting the word out about the engine and possibly listing it for sale in the next newsletter. I am enclosing a copy of the ad I am putting in Sport Aviation (Feb. issue).

I will have my bird down for a few weeks to install adjustable cams on the inner wing rear spars to correct a heavy left wing problem. Will also take care of some other minor items prior to the spring flying season. I visited with Gary Green a few days ago, he said the spring flyin was in May at McAlister Ok. Lets hope the weather will cooperate with us. Ken C. Morgan Arlington, Texas Phone: 817-265-6838

Editors Note: see the rest of Ken's letter in the Safety Section it tells of loosing his tail wheel.



Dear Richard, Congratulations on the flight of N295RS! If you get half the pleasure we have had with N78WG over the past 13.5 years (1450+hours) all of your building time will have been well spent. I think it is a great idea to have a 30th year Thorp Celebration & to include Kay. My contribution toward her ticket is enclosed. Walt Giffin Pueblo West, CO 81007



DEAR RICHARD,

MY T-18 (N18AL, SN 287) IS IN ITS 18th YEAR OF FLYING WITH VERY FEW PROBLEMS WITH THE AIRFRAME OR ENGINE. THE ENGINE (0320-E2D) IS COMING UP ON TBO AND I AM NOW PLANNING TO OVERHAUL IT AND REFURBISH THE AIRFRAME AS NECESSARY. THE FIRST 12 YEARS OF FLYING WAS MOSTLY OUT OF MOJAVE CALIFORNIA, WHERE THE WIND BLOWS HARD AND SELDOM DOWN ANY PARTICULAR RUNWAY. UPON RETIREMENT WE WANTED TO GET OUT OF THE SOUTHERN CALIFORNIA "RAT RACE" AND MOVE TO IDAHO, THE FIRST THING I DID WHEN WE GOT HERE WAS TO BUY A HANGER FOR THE T-18. THERE WERE MANY T-18'S IN SOUTHERN CALIFORNIA, AND I MISS GOING ON TRIPS WITH THEM. I BELIEVE I HAVE THE ONLY T-18 IN THE STATE OF IDAHO.

I MADE A THOROUGH STRUCTURAL INSPECTION OF THE AIRFRAME IN PREPARATION FOR REFURBISHING AND FOUND EVIDENCE OF RIVETS WORKING IN THE WING SKIN ALONG THE INBOARD MAIN SPAR CAPS, ALSO IN THE AREA OF THE WING BREAK FITTINGS, I BELIEVE THIS CONDITION WAS REPORTED ON IN AN EARLY NEWSLETTER. THE SAME CONDITION IS SHOWING UP ON THE INBOARD STABILIZER SPAR, BOTH SIDES. THE ONLY CRACKS I FOUND WERE IN THE VERTICAL FIN TIP RIB BEND RADII AT THE AFT END WHERE IT ATTACHES TO THE VERTI-



CAL FIN SPAR AND WHERE THE TOP RUDDER HINGE FITTING ATTACHES. THIS CONDITION MAY BE UNIQUE TO MY AIRPLANE, BECAUSE I HAVE A STROBE LIGHT AND TAIL LIGHT MOUNTED TO THE VERTICAL FIN FAIRING WHICH MAY AFFECT THE NATURAL FREQUENCY OF THE STRUCTURE IN THE AREA.

I DON'T THINK ANY OF THIS IS CRITICAL AT THIS TIME, I WILL CONTINUE TO FLY IT UNTIL I GET EVERYTHING I NEED ON HAND. THANK YOU; AL CHIVERS 4465 ODEN BAY DR. SANDPOINT ID. 83864 PHONE 208-263-4618



Hi Dick,

Well, I finally got my medical back in October. It sure takes a long time. AOPA sure has been a big help right from the start in 1986 when I had a heart attack.

If you put out a newsletter between now and April 15, could you put my Florida address on it as bulk mail doesn't get forwarded. I want to go to the Western Fly-In and then to Calif. Dick Amsden 1225 N. W. 21st St. Stuart, FL 34994



Dear Richard,

It's nice to see that you've gotten your bird off the ground. Congratulations are in order. You also wrote a fine article on the Thorp Check Out which I'll keep on hand.

When you publish the next newsletter I would appreciate your putting in the following request.

**Help needed in the following areas** -- photos diagrams - plan - written instructions for the following: 1. Electric flap systems, 2. Instrument panel with fold down feature, 3. Moving rudder cables to outer edge of cockpit.

**I also want to buy:** 0320 narrow deck case, 0320 crank, Gyro Inst - Horizon & Compass, Radios, Antennas - all types needed, wood prop 68x68

Best Regards, Paul Mac Michael 4222 Juniper DR, Tacoma, WA 98466 Phone 206-566-1971

Dear Richard,

I pray that you had a wonderful Christmas. Congratulations on the completion of your T-18.

I'm a new builder and have purchased plans #444 formerly registered to Cyril E. Williams. You may want that info to update any list.

Please find the check for Kay enclosed. I don't consider myself much of an organizer but I have a phone, computer & fax. If I can help you to get out the T-18's/S-18's for OSHKOSH 93 I would be willing to help.

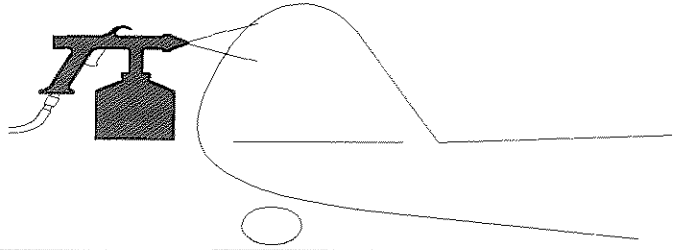
I appreciate your dedication on all our behalfs. David R. Lheureux 23740 Magic Mtn. Pkwy. , Valencia, CA 91355 Phone 805-259-9423

### **For Sale Items:**

LYC 0290G 140HP, THORP TYPE CONVERSION, 100HRS TTSN RUNNING INT-18 \$3850. CALL 817/265-6838. KEN MORGAN.

# AIRCRAFT PAINTING II

by  
RICH SNELSON



It's too bad that painting an airplane comes at the end of the project instead of the beginning. At the end, you want the project to just be over, and the airplane to be in the air traveling the 30 miles or so to that great little airport restaurant for Sunday morning breakfast. Nothing that you do during the last six months of a project can be called fun. However, if you could forget about doing all the fiberglass parts, with their one-million pinholes and all the misery associated with their preparation and painting. The remaining painting might be thought of as near-fun.

As part of the preparations for painting my Thorp T-18, I read everything I could find on the subject. Some of the best of these articles were written by Tony Bingelis for Sport Aviation Magazine. As has been my practice during my projects I called and talked to several other builders with experience and knowledge on how to do the job correctly. With their help I came up with quite a collection of tips that weren't in anything that I had read. This article summarizes the things that I learned from them and during the painting of N295RS. I don't have a perfect paint job! And I don't claim to be any sort of expert on the subject of painting. However, as I gained experience my painting improved, and the early orange peel effects and other problems stopped occurring. Hopefully, knowledge of how someone else did it will help you when you're ready to paint or repaint your homebuilt.

## Material Selection

The materials that I selected for painting my airplane were, Dupont's Variprime and Ditzler's PPG Durethane Polyurethane Enamel System. The

Ditzler paint system was selected for its fuel resistance plus good impact and chip resistance. It's important to check with the paint manufacture or supplier for compatibility of the primer and top coat material before you mix brands as I did. Please don't let me lead you down the road into using Polyurethanes. They are very expensive and very unforgiving of spraying mistakes.

When you've selected a type and brand of paint get the manufactures data sheets. They describe the process and steps required for its application on specific surfaces. For aluminum the steps are cleaning, etching, priming and top coating the parts.

Since I did my painting with the new High Volume Low Pressure (HVLV) turbine paint system, I have included information about its specific use. Since the turbine puts out air at a temperature of 95 degrees, this hotter than normal air temperature has to be considered when selecting the paint reducers. Each manufacture has a range of reducers for use with their paint. You normally pick a reducer based upon the expected room air temperature at the time of painting. As it turned out, the high temperature reducer did the best job with the hot turbine air, regardless of the room temperature, allowing the paint to flow out smoothly without any orange peel effect. I had one-half of the airplane painted before realizing this fact. Experience can be quite a teacher.

## Cleaning

When my metal work was complete I had some parts that were bare aluminum while others had miscellaneous amounts of zinc chromate applied. The zinc chromate had been sprayed over a partly

Even with all the careful preparation, when you spray the final color coats, you may get some nasty surprises, like “dirt” and “dust devils” that were not visible before. If you wonder where the contamination comes from: 1/3 comes from the paint booth environment, 1/3 from the surface and areas to be painted and 1/3 from the painter’s clothing. By working on each of the three areas it hopefully can be minimized. For example: I used a paper throw away painting suit from NAPA Auto Parts Stores that helped a lot in keeping lint out of the paint, also the paint booth was cleaned and scrubbed down before each painting run. Each of the parts went through several cleaning stages, as outlined, before painting. It does involve a lot of preparation but, it’s worth it.

Hopefully, when you check your work later you won’t have too many dust devils or imperfections to deal with. Just in case you do, to remove the small dust devils, I purchased a small block made of 1000 grit sanding material. (Before using the block it needs to sit in water for several hours.) The block has a sharp edge to push through the dust cutting it off level with the paint’s surface. Then the wet block is used to sand just the very small area around the cut. Follow the sanding with a liquid polish and a lot of elbow grease to restore the shine. For bad runs it’s necessary to either strip the piece and start over or let it completely dry and sand the run out. You will find polyurethane is a very tough paint to sand! Work with a sanding block and go by feel to tell when the run is gone. It’s better to take off more of the top coat than you think is necessary than to repaint the part and still be able to see the run.

### **Masking and Painting the trim colors**

Follow the manufacturer’s recommendation for drying time before taping. Then still test for dryness by putting some sample tape in a “it won’t show later location”. Remove it and see if it leaves a footprint or track, if it does the part needs additional drying time.

I found the best masking tape to use is the blue Scotch Brand plastic. It works well around curves

and can be pressed down to eliminate any run under. After it’s in place go over it several times with your finger nail pressing the edge down to be sure it’s sealed. Just before you paint go over it again. Buy a roll of masking paper from an automotive paint supplier. This type of paper has a wax side and will completely prevent paints from bleeding through. I have used newspaper for this, but it’s not a good idea since it will allow bleed through.

I know that some of the really great paint jobs are done by taping each side of a trim color separately. This gives you a smooth flush paint joint as opposed to painting the trim colors on top of the base color which leaves a rough edge. I took the easier route on this one by painting the base color first and spraying the trim color on top. This is much faster and easier to do and if the tape is removed at the right time, the rough edges can be minimized. Wait at least 5 to 8 hours before removing it. Taking it off sooner will result in a rough torn edge. I left some of the tape on for two to three days and it still came off with a clean shear. The best method of getting it off is to pull it back on itself at a sharp angle.

As you may have realized from reading this article, Urethanes are difficult to use and don’t forgive mistakes. You “get what you spray” Unlike automotive paints urethanes can’t be sanded and rubbed out when you make a mistake. However, if correctly applied they provide a very thin, light weight, tough surface that will last for years of flying. I hope this article is helpful and saves you from the many mistakes that the lack of experience can cause. One last tip, make up a check list before you spray. Hang it on the door of the paint booth and read it each time you go in! Be sure it includes “tighten the top of the spray gun”. Take my word for it, after cleaning up two spills on top of a fresh first coat. **“Experience can be quite a teacher”**.

# NORTH

by Russ Ross to ALASKA



I HAVE ALWAYS WANTED TO FLY "UP" TO ALASKA AND OVER THE YEARS I HAVE OWNED A CITABRIA AND A SUPER CUB; AND IRONICALLY BOTH AIRPLANES WENT TO ALASKA. I RE-TIRED FEBRUARY 1ST OF THIS YEAR AND DECIDED THIS WAS THE TIME TO GO. I PROBABLY SPENT ABOUT THREE MONTHS RESEARCHING THE DETAILS OF MAKING THE FLIGHT. YOU MUST HAVE A SPECIAL FLIGHT PERMIT FROM TRANSPORT CANADA TO FLY AN EXPERIMENTAL CATEGORY AIRCRAFT INTO THE COUNTRY. ALSO YOU ARE REQUIRED TO CARRY SURVIVAL EQUIPMENT: SPECIFICATIONS VARY BETWEEN CANADA AND ALASKA. TRANSPORT CANADA HAS A "STRIP CHART" OF THE HIWAY WHICH ELIMINATES A NUMBER OF SECTIONALS. IN ADDITION TO IT I CARRIED THREE SECTIONALS TO GET THRU CANADA; PLUS THE CANADA FLIGHT SUPPLEMENT. INFORMATION ON FLYING THE ALASKA HIWAY IS AVAILABLE FROM TRANSPORT CANADA THE FAA AND AOPA. AS FOR ALASKA TAKE WHATEVER SECTIONALS YOU WILL NEED FOR THE AREAS YOU INTEND TO FLY. IF GOING INTO ANCHORAGE I WOULD RECOMMEND A TERMINAL AREA CHART.

I DECIDED TO MAKE THE TRIP IN JUNE TO ENSURE MOTEL ACCOMMODATIONS BECAUSE WE SIMPLY DID NOT HAVE ROOM IN THE BAGGAGE COMPARTMENT FOR CAMPING EQUIPMENT. WITH THE SURVIVAL GEAR, FLITE CASE, CAMERA EQUIPMENT TIE DOWNS AND THE MINIMUM AMOUNT OF CLOTHES; WE HAD 90 LBS IN THE BAGGAGE COMPARTMENT AND IT WAS PACKED! ALSO I DECIDED TO ENTER CANADA THRU LETHBRIDGE, ALBERTA; WHICH MADE IT POSSIBLE TO FLY THE MISSOURI RIVER AND ITS RESERVOIRS INTO MONTANA. LOTS OF SCENIC BEAUTY.  
THE ITINERARY:

3 JUNE: LEFT NORTH SOO CITY AT 8:00 A.M. FOLLOWED THE MISSOURI RIVER TO PIERRE, S. DAK. NICE SMOOTH FLITE. IHR. 36MIN. FUELED

WITH 100 LL. USED COURTESY CAR TO GO IN TOWN COFFEE AND ROLLS.

CHECKED WITH FLIGHT SERVICE; WEATHER PREDICTED FRONTAL CONDITIONS FOR MONTANA LATER IN DAY. DEPARTED PIERRE AND CONTINUED FOLLOWING RIVER. LANDED MANDAN, N. DAK. 1HR.06MIN. FUELED AIRPLANE GOT RID OF SOME COFFEE AND DEPARTED FOR WILLISTON, N. DAK. ARRIVED WILLISTON 1HR.10MIN. LATER. ABOUT THIRTY MINUTES AFTER WE ARRIVED THE FRONT CAME THRU. THE AIRPLANE WAS HANGARED AND WE SPENT THE NIGHT AT THE SELECT INN, WHICH WAS THE BEST MOTEL FOR THE MONEY ON THE TRIP.

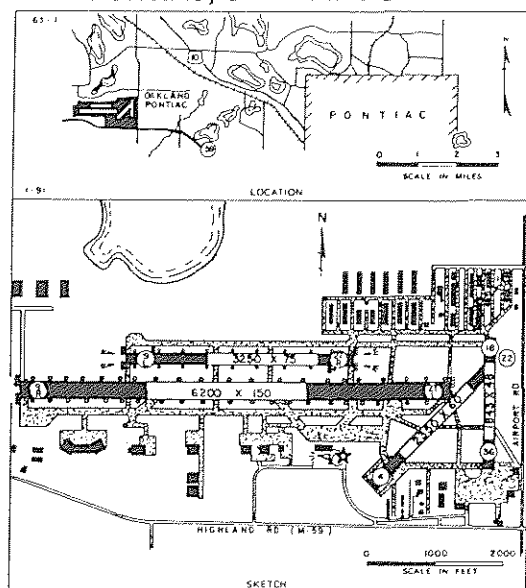
4 JUNE: DEPARTED WILLISTON FOR HAVRE, MONTANA. 2000 ft. CEILINGS AND LOTS OF TURBULENCE. LANDED AT GLASGOW AFTER 52 MINUTES FOR A BREAK. DEPARTED GLASGOW FOR HAVRE AND ARRIVED THERE 59 MINUTES LATER. AFTER A HALF HOUR COFFEE BREAK; FILED FLITE PLAN (ADVISE CUSTOMS) FOR LETHBRIDGE, ALBERTA. DEPARTED HAVRE USING THE VOR FOR NAVIGATION. THE LORAN WAS VERY ERRATIC. AFTER ABOUT TWENTY MINUTES WE LOST THE VOR BECAUSE OF LOW CEILINGS. FLEW COMPASS COURSE OVER SOME VERY DESOLATE COUNTRY. FINALLY PICKED UP THE LETHBRIDGE VOR. AFTER LANDING THE TOWER DIRECTED US TO CUSTOMS PARKING AND TOLD US TO REMAIN IN THE AIRPLANE. WE WAITED FOR SEVERAL MINUTES WHEN I SAW THIS GUY WAVING--US INTO THE BUILDING. I HAD ALL THE DOCUMENTS FOR THE PLANE AND OUR BIRTH CERTIFICATES. WHEN WE ARRIVED IN THE CUSTOMS OFFICE HE ASKED FOR OUR DRIVERS LICENSE! THAT WAS IT. IN ABOUT THREE MINUTES WE WERE ON OUR WAY. THE CANADIANS REALLY TREATED US GREAT. WENT TO FLITE SERVICE TO CHECK WEATHER. LOW CEILINGS, RAIN AND CLOUD. DECIDED TO HANG IT UP FOR THE DAY.

# Join The Gathering

## Welcome T-18 Pilots And Enthusiasts

### May 22nd & 23rd, 1993 Pontiac, Michigan - Oakland Pontiac Airport

#### PONTIAC, OAKLAND PONTIAC



**RWY LENGTH BEYOND DSPLCD THR**  
 04/ — " 09L/ — " 09R/ — " 18/ —  
 22/ — " 27R/ — " 27L/ — " 36/ —  
**APRT: OAKLAND PONTIAC (PTK) JAP**  
**CLASS A**  
**LGT: ROTG BDN, HIRL, MIRL, VASI, REF, MALSR**  
 —ON REQ TWR, AFTER TWR OPNS, HIRL, PRLST T  
 INSTRY CTL, MALSR—STD PCL CTAF  
**MGR: DAVID VANDERVEEN**  
**FONE: 313/666-3900**  
**FBO: ADL 666-3500 (U 129 62) AVANTGARDE 666**  
 3730 CENTURY AVN 666 1200 (U 129 55)  
 CHRYSLER PENTASTAR AVN 666 2630 (U 131 15)  
 HALL AVN 666 1051 (U 666 1965) (U 131 64)  
 9600 (U 131 725) LYCON 666 3980 METHUEN ACIT  
 INST 666 3670 MICH AVN 666 3440 (U 131 0)  
 ROYAL AIR 666 3070 (U 130 0) TRADE WINDS 666  
 4077 WATERFORD AVN 666 3333  
**COORDINATES**  
 N 42 39 9  
 W 083 25 1  
**ELEV**  
 960'  
**RDO FAC: CTAF/TWR 120.5, GND 121.9**  
 121.75, ATIS 125.45, CLND DEL 116.25,  
 DTW APP/DEP (R) 124.9, ILS, U-122.95  
 (ALSO SEE FBO S)  
**VOR/DME DIR/DIST 111.6 (PS) 119' 4.9**  
**RM TO FLD**  
**FUEL: 100, JET A**  
**RPR: MAJOR AXP, AVIONICS, PROP, INST**  
**WX: FSS LAN 600/992 7433 (PTK AREA)**  
**TBS FAX 2021, LAWS**  
**SNW RMVL: YES**  
**TRNSP: RMTL CAR, TAXI**  
**MEALS: AT ARPT, ADJ**  
**RON: IN TOWN 5.0 MI**  
**ATRD: 24 HRS**

**RMK: \*TWR OPN 0600-2400, CUSTOMS, AVBL, USR R FLT, ARPT, MIN 5 HR ADRY NOTIFICATION R/L**  
 313-226-3140, WINTER MOD CALL U-122-95 (2400-0600) (U) SNW FLOW ADVISORY

Join the local T-18 pilots and builders from the Detroit Metro Area for a weekend of fun, celebrating 30 years of the Thorp T-18. Several well known T-18 pilot/builders will be on hand to share their flying and building experiences. Also, hear some very interesting history about T-18 development.

Pontiac Airport is approximately 25 miles North of Detroit and is a controlled field, but fear not!! If you fly in, tell the controller on initial call up that you are part of the T-18 group and you will receive V.I.P. treatment. A special roped off tiedown area will be provided for T-18's only.

There are restaurants on or near the field for our Saturday night dinner and Sunday breakfast.

A Comfort Inn Motel on the field will provide rooms at corporate rates. So, when you call, tell them you are with the T-18 group. Phone (313) 666-8555.

For further information contact:

Al Bosonetto Day; (313) 651-1333  
 Night; (313) 261-6852  
 FAX; (313) 651-2650





### HELP BRING KAY THORP TO OSHKOSH 93

I talked to Mrs Thorp today, Jan 31, and she is very excited about coming to Oshkosh for the 30th Anniversary of the T-18. Please do what you can to help make this possible. Several folks have jumped the gun on this and sent their contributions. Thanks! I'm going to start calling Monday to try and find a room she will have John's sister staying with her, Mrs. Marcella Thorp Emerick. I understand quite a number of you have ordered her book about John. "The Spirit of John Willard Thorp". She is planning to enlarge the book to include some of the fine letters you have written about John, and have it for sale at Oshkosh 93.

### RENEWAL TIME FOR THE T-18 MUTUAL AID SOCIETY

In order to keep track of the dues and not have to send out renewal notices throughout the year, there are all due in Jan. This lets me know at the start of the year how many copies to print. If wish to be dropped from the newsletter let me know. I didn't drop anyone last year for not sending their due until late in the year. This runs up the printing and postage costs unnecessarily. So please help out here and send you dues this month. Also if you have a change of address let me know as soon as you can. Since we use bulk mail the newsletters will not be forwarded by the post office.



# T-18 NEWSLETTER

Newsletter # 87



*Parker Miller of Friendswood, Texas beautiful T-18*

## IN THIS ISSUE:

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McAlester, OK May 14-16 by Richard Snelson

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1st Annual Oceano T-18 Fly-in by Harry Paine

North to Alaska by Russ Ross (part 2)

**NOTICE: (STANDARD DISCLAIMER)** As always, in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.





## Oshkosh 93 Events

Friday July 30, 1993

11:30 At the EAA Nature Center

Join us to welcome Kay Thorp and John's sister Mrs Marcella Thorp Emerick. We will have a short memorial service in John's honor at noon.

12:30 Cookout lunch at the Nature Center  
Bob Highley and other volunteers will cook Bruats. We will plan on at least 100 people so be sure and join us for this.

Afternoon: I don't have a time for the fly-by but we hope to have Kay Thorp at the flight-line stand with Lee Skillman to MC the event.

6:00 Butch's Anchor Inn, for our annual T-18 banquet, with Mrs Thorp and Mrs Emerick as our special guests.

Saturday, Aug 1 at 10:00 am T-18 Forum

Tuesday, Aug 3 at 6:00 pm in the Oshkosh City South Park Shelter #2 Evening Get Together. City bus route gets you there.

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*Editors Note: I'm including the following article for those of you that don't get Sport Aviation..*

The Thorp T-18's introduction happened thirty years ago at the 1963 Rockford EAA Convention. It made a low, quiet approach in the back of a car, rolled up in a box. That rolled up aluminum was used in a "metal workshop" to build and assemble a T-18 fuselage in just three and one half days. This year at Oshkosh "93", in memory of John Thorp (1912 - 1992) and in appreciation for his contribution to the homebuilt movement, T-18 builders, pilots and admirers will gather for a Thorp T-18,

30th anniversary celebration.

### *"The New Antique"*

When John Thorp's article telling about his dream of a simple to build all metal sport plane appeared in the February 1962 Edition of Sport Aviation it was surrounded by articles and pictures of tube and fabric airplanes. Metal airplanes certainly were not new, but the idea of a simple to build design was. John's words were: "No one airplane can excel in everything and the T-18 is no exception. By many standards it is a new antique". He spoke of low cost, light weight and a design that would utilize the readily available 125hp, 0-290G Lycoming "ground power unit" as an engine. The airplane was pictured with an open cockpit and a partial cowl that left the cylinders out in the breeze. His statement that the design could be coaxed up to as much as 200 mph raised some eyebrows but later as canopies, pressure cowlings and fairings were added, it turned out to be a fact.

Starting in May of that same year John's series of 14 articles on building the T-18 were published in Sport Aviation. They described a simple design and building process that allowed the fuselage to be laid out, fabricated and assembled without any jigs or fixtures, by using matched hole tooling. This method of tooling and assembly was used very successfully on another Thorp designed airplane, the Fletcher FU-24. Over 100 of these were assembled in New Zealand using nothing more than saw horses and clecos as the assembly tools. With matched hole tooling one side skin is laid out and drilled and then used as a pattern to make the second one. Holes are located in the second skin by using a transfer punch to mark and punch them for drilling. The airframe bulkheads are built using a half template that is flopped about a center line, during layout, this will assure perfect symmetry. After fabrication the fuselage is simply clecoed together, for riveting, without a jig.

John's original plan was to sell T-18 parts with the holes marked and ready to drill for assembly. This didn't happen and all the early T-18's were "scratch

built'' from the ground up. A lot of them from John's own templates that he furnished without charge to anyone that came by his shop in Lockeford, California. Scratch building the T-18 came easy, primarily because of the professional set of aircraft drawings that John provided. The drawings were done in the decimal system and used standard aircraft dimensioning methods of stations, butt and water lines as references. The drawings were complete and very accurate. Years later only a handful of small errors have been found in over 200 separate drawings.

The sale of T-18 plans was brisk. Many T-18's were under construction and John's phone was ringing off the hook with builders asking questions. John was a very patient person and spent hours answering the same questions again and again. And occasionally he had to handle a know-it-all wanting to change the design with some wild innovation. John always gave the same answer 'stick to the plans'. John didn't know it, but a lot of help was on the way. Dick Cavin and Lou Sunderland, both T-18 builders had started 'The T-18 Mutual Aid Society' and would spend the next quarter century putting out a builders' newsletter and both personally serving as focal points for the T-18 building efforts. Most builders camped at their mailboxes, awaiting the next newsletter. In it came encouragement, education on metal working, and details of how someone else had solved a tough building problem. John Thorp often used it as a forum to answer builder questions. Without the aid of computer data bases and mailing lists the Cavins and Sunderlands spent hours addressing newsletters by hand to more than 1500 members. The hours of work on the newsletter had to take away from their building time but it sure shortened it for everyone else. Never-the-less, both Dick and Lou finished and flew their own T-18s.

Bill Warwick of Lancaster, California was building the first T-18, and looking over John Thorp's shoulder as the plans were being completed. The first flight came on May 12, 1964. Bill had installed a 180 hp Lycoming with a constant speed prop, and his T-18 was quite a tiger in the performance area.

In fact, he couldn't open the plane up at sea level since it would quickly exceed the initial structural red-line of 180 mph. This speed was later raised to 210 mph after John Thorp flew an extensive flutter test program that resulted in two small changes to the horizontal tail assembly. As word spread of Warwick's T-18's Tiger performance the 'Thorp Tiger' nickname stuck and light bills went up all over the country as builders started really burning the midnight oil to finish their own T-18s. John was afraid that pilots would think that the 'Tiger' came from being hard to handle, so he never liked the nickname for his T-18 design.

Each issue of the T-18 Newsletter brought the announcement of more first flights. By 1975 more than 140 T-18s had flown and Lou Sunderland had come up with the idea for a folding wing T-18 design. With builder interest high Lou and John Thorp worked together on a wing design that could be moved by one person from flight position to a trailing position in just a few minutes. The first offering of the design was as a supplement to the standard T-18 plans set, but later Lou redesigned the T-18 fuselage to allow 2 more inches of cockpit width. This wide body fuselage was also 5 inches longer than the conventional fuselage. It was designated the S-18. The plans were redrawn and offered as the widebody, folding wing T-18.

The aviation community soon realized the tremendous capability and potential of the T-18 as a cross-country airplane and two builder/pilots put it in the record books to prove it. The first to set records was an Australian builder, Clive Canning who flew his T-18 around the continent of Australia. Then on June 12, 1976 departed Melbourne, bound for Great Britain a round trip that took him over 28,800 nm. A look at a world map shows that his route took him over some wild country. Clive and his T-18, VH-CMC can claim a first for 'Combat in a T-18 in the Gulf'. One leg of his journey took him over Syria where jets were scrambled to intercept him. Clive was attempting radio communication to no avail. The jets pulled away and the reason became apparent, their wing leader was attempting to shoot the T-18 out of the sky. Clive's

own words in his great adventure book Charlie Mike Charlie describes it best: "Dear God! It cannot be happening. The noise and shock waves as the cannon shells passed around the little bird were almost beyond description". Clive's escape from the four Syrian Mig's is truly a tribute to the maneuverability of the Thorp T-18.

Anyone wanting to read about Clive's great adventure can obtain the book from Sport Aircraft Inc. Clive was awarded The Royal Federation of Aero Clubs Oswald Watt Medal and Roderick Turner Trophy. His famous T-18 VH-CMC now has a permanent home in an Australian museum.

The second T-18 builder and pilot to set world records was Don P. Taylor of Helmet, California. When Don first approached John Thorp in 1966 with his plan to build and then fly a T-18 around the world, John wasn't sure that he wanted to sell him the plans. John felt that Don might hurt himself. However, after several discussions Don obtained the plans and built N455DT, completing and flying it in 1971. Don's first attempt to fly around the world came in 1973. Like Amelia Earhart's first attempt to fly around the world, it too ended on an island in the Pacific Ocean. Don made it to Japan, just 4000 miles short of his goal, where he had to quit because of bad weather. Disappointed, he disassembled his T-18 and shipped it home in a box. His second and successful attempt came in 1976. Starting August 1, from Oshkosh he flew his T-18 "Victoria 76" 26,200 miles in 61 days to circle the world. The story of his phenomenal journey can be found in the 1977 Spring issues of Sport Aviation. Don still wasn't ready to resort to Sunday afternoon flying, so for an encore he flew non-stop from the West Coast to the Bahamas in 1980 and later in 1980 back to Hawaii and then on to Australia, New Zealand and returned to the U.S. Then finally, in one great crescendo, he flew the T-18 north around both the true and magnetic north poles. Don and his T-18 set more than 25 records, many of which still stand today. His famous T-18 N455DT is part of a beautiful display in the EAA Museum in Oshkosh commemorating Don Taylor's great flight around the world. Don Taylor explains

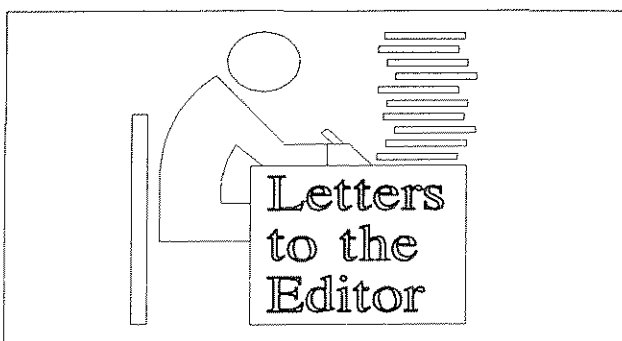
best why he did it "For all EAAers! (All of us)". Don says that much of the credit should go to John Thorp for "such a sturdy, magnificent aircraft."

Today after 30 years, the T-18 is alive and well. Thorp T-18 builders and their airplanes have been awarded the prestigious Wright Bros Award for twelve of the thirteen years that it has been awarded. More than 600 have been built and flown. Building and flying a T-18 starts a lifetime love affair. Proof is readily available, since there are T-18 builder-pilots in their 80's who continue to fly their great machines. T-18 builders who sell their airplane often end up building another one, when nothing else comes close in performance.

This year, T-18's will gather at Oshkosh and at regional fly-ins to celebrate the 30th anniversary. Each of the regional events offers those that are interested in the T-18 an opportunity to examine and ride in this fine aircraft. Look for fly-in dates in Sport Aviation and join us for a weekend of nothing but pure flying pleasure the T-18 way. Anyone wanting to build a T-18/S-18 should contact Sport Aircraft, 44211 Yucca, Unit A, Lancaster, CA phone (805) 949-2312 for drawings and parts. Other T-18 parts are available from Ken Brock Manufacturing, 11852 Western Ave. Stanton, CA phone (714) 898-4366. To learn about the building skills and methods used in the construction of a T-18, contact me to join the T-18 Mutual Aid Society and to obtain the 85 back issues of the newsletters. Look for us on the flight line at Oshkosh 93, and learn more of the Thorp T-18 story.

This year instead of rolling in quietly to Oshkosh 93, T-18s will add their familiar "Tiger's Roar" to the festivities during this, the 30th anniversary of the T-18, and the 40th anniversary of the EAA.

T-18 Mutual Aid Society  
Newsletter Editor  
Richard Snelson  
RR 3, Box 295  
Clinton, IL 61727  
Phone (217) 935-4215



Dear Richard:

It was a pleasure talking with you on Friday, January 29. To give you a little background on my project, I started it in 1978 (Plans #1258) at the age of 23. In the past 15 years I have completed the empennage, wings, and almost all the sheet metal work on the fuselage. I have a standard wing and fuselage with a 160 HP engine. Some of the changes I have made include a removable floor below the gas tank, opened up deck for baggage access, electric trim, and various other improvements extracted from the newsletters. The newsletters have been a big help and I would like to thank you for devoting the time to continue them. David Neustel 1045 Sunfish Dr. Manteca, CA 95336 Phone # (209) 823-0625



March 20, 1993

Great job on the news letter. Certainly hope the 30th anniversary celebration is well attended and John Thorp gets the kind of tribute he deserves for the T-18. I'd love to attend but it looks like that won't be possible as I'm leaving in mid April for F-16 transition (Will be in Tampa and may make Sun N Fun) and will be tied up with that until about the middle of the Oshkosh show. Had hoped to be finished sooner and may be able to get back early but that's not looking good as of now.

Talked to Jim Paine a few weeks ago and he said you folks were able to meet for dinner and had an enjoyable visit. Sounds like

you're making good use of the new T-18 and finally reaping the reward for all your hard work. The plane certainly looks nice and I'm sure you'll have many years pleasure in return for all your efforts.

Thanks again for all your hard work on the newsletter. I really enjoy them and look forward to each one. Dan Wolfe, Fairborn, OH



Dear Richard,

I sold my T-18 N808P to Lyle Brooks in southern California. I have been so busy restoring a C-195 that I just wasn't flying enough to stay current.

Lyle has had several T-18s over the years and will fly the plane frequently as it deserves. I will not be renewing my membership in the T-18 Mutual Aid Society.

Congratulations on the completion of your plane. I'm sure you will be as pleased with it as I was with mine. Sincerely, Edwin Poe



Dear Rich,

Enclosed are my 1993 dues and a little extra for the Kay Thorp Fund. I hope to bring my T-18 to OSH this year for the celebration.

I recently had a problem with my airplane which might be of interest to builders who have not yet installed their fuel tanks. While flying the airplane, I started smelling fuel vapor in the cockpit. The strength of the odor varied with the speed of the airplane. It was minimal at high constant speed, but became very strong as the airplane was slowed down. This made me suspect the vent line, so guess what? Out with the instrument panel and fuel tank. The builder opted to use clear vinyl tubing for the vent, and it had split at a point where he decided to cross

over into the channel (or 2 angles) that run down the center of the firewall. The tube had flattened at this point, and eventually split when it became rotten (after 14 years). I replaced this tube with 3/8 ID Automotive fuel hose, and ran the line down the firewall to the right of this channel (in line with the vent fitting on the tank) to a point below the tank, and then angled over to the center to connect with the vent fitting on the cockpit floor.

This sounds like a pretty trivial problem, but it sure caused me a lot of work. However, it did afford me the opportunity to inspect the back side of the fuel tank, which I had never done.

Another problem I have is excessive clearance in the right hand side folding wing pins. These have been loose ever since I have owned the airplane, but have now worn to a collective .008 clearance. I have ordered a special piloted reamer to oversize the holes to .567, and am having new pins made to fit.

Aside from these problems, my T-18 has provided virtually trouble free operation for 600 hours, and I am looking forward to many more hours of fun, flying.

Keep up the good, work, Rich. I really enjoy the newsletter and find it to be very informative and educational.

Sincerely, Doug Frantz 1019 S. Meadow Lane Mustang, Ok 73064

Dear Richard, T-18, N166BC flew on Jan 10, 1993. Dave Simpkins started this one in Feb of 1964! It flew just beautifully.

I performed high speed taxi testing on Jan 1, 1993. No major problems were encountered on the first flight. The chase plane was able to get video of Greg Halversons N922GH and N166BC in formation. The first landing was my "perfect" landing.

Words just cannot describe the fantastic feeling of a first flight. N166BC is powered by a Lyc 0-0-290G. Due to my prop being improperly

pitched 2,300 RPM is the maximum at full throttle. Even so I was indicating 120 mph, which matched two other aircraft. After 3.5 hours I pulled the prop off for repitching. The prop will be back this week so I can continue the flight test program.

I recommend purchasing "Flight Testing Home-built Aircraft" by Vaughan Askue for your flight test program. Available from Historic Aviation A well planned test flight program is the only "safety first" course of action. I will be getting out a full report as I develop the flight data.

The work on the details is just beginning. Gear leg fairings, wheel pants and paint just to name a few. The empty weight was 898 lbs. The empty CG was near the front limit, so no aft CG problems (I hope, flight test will tell). Brad Chapman 17505 NE Terrys Ln. Newberg OR. 97132 Phone (503) 538-7316

## **For Sale/or Wanted Items**

Wanted T-18 (S-18CW) aircraft may be finished & flying or somewhat finished. Must be well constructed. The paint, upholstery, instruments or radios do not matter. Can be with or without an engine. This will be a youth project! We will provide a tax receipt for the donation plus some cash. We will also provide a total release of liability. Call Hal Stephens (408) 723-0244 eve.

**For Sale:** March 13th, about midnight a tornado passed across the Ocala, Florida airport, destroying many aircrafts and several hangers. My T-18 was one of the badly damaged. I have disassembled the airplane and the parts that are not damaged I would like to sell.

I would appreciate it very much if you would list these parts in your newsletter.

The part numbers are from Sport Aircraft, Inc.

### **PARTS AND COMPONENTS LIST:**

495 push and pull assembly elevator  
515 main landing gear  
514 fuel tank- fiber glass

551 walking beam-- aileron and elevator control  
T-18 canopy frame

502-3 Horizontal tail assembly

532 center wing

Rudder pedal assembly and master brake cylinders  
Approximate cost of these items \$2500.00 Will  
sell them all for \$800.00 or separately. Sincerely,  
Richard Madison 4222 NE. 18 Terrace Ocala,  
Florida 34479 (904) 732-9535

**FOR SALE:** With all plans, logs, and newsletters  
included. 1987 Thorp T-18-s #1191, Reg. C-  
GCWS, wide body, folding wings, New Sunderland  
air foil, flush riveted, 2" longer main gear, wheel  
pants with brake fairings, all airframe components  
deburred, etched, and zinc chromated, Before final  
assembly by air force airframe engineer. No  
damage history. TT airframe 291 hours. Full  
panel, vacuum Dir and Hor gyros, electric T and B,  
true airspeed kts., 3,000' V.S.I., "G" meter, tack,  
sensitive alt., manifold pressure, 8 engine instru-  
ments, plus fuel gauge and outside air temp, vernier  
throttle, dual controls, cockpit insulated for cold  
and noise, 1 panel mounted Terra TX720 Com, 1  
Tunnel mounted on Velcro, 10 channel scanning  
S.T.S 7600 Nav. Com. wired to system with radio  
select switch on panel and push to talk switches in  
top of joysticks, voice activated intercom, Apollo  
G.P.S. with North America data card, and world  
wide data base, tracer one E.L.T., antennas mounted  
out of slipstream in composite wing tips, and under  
canopy. Stereo and tape deck.

**PROPELLER:** Warnke almost constant speed  
fixed pitch wood, 67x77, with leading edge protec-  
tion and composite wrap on outer tips. Rain seems  
to be no problem. T.T. 291 hours.

**ENGINE:** 1973 Lycoming O-320-E2G, modified  
to D series, 160 h.p., at last major overhaul by  
certified Aero-engine shop. 97 hours since over-  
haul. 2,072 hours since new. Accessories include  
S.W. oil cooler, custom crossover exhaust system  
with flex joints, cabin heat muff, alternate air, 65  
amp. alternator, vacuum pump, accessory cover  
has pad for constant speed hydraulic pump.  
New tires and brakes installed January 1992.  
hangered at Sechelt B.C. Canada, 49 27 39 N. and

123 43 02 W. Asking 39,000 U.S. Ten minute  
video available on request. Contact Craig Marshall  
at Sea Breeze Ent. P.O. Box 2472, Sechelt BC.  
VON 3AO. (604) 885-3554

**For Sale:** S-18 CW - Fuselage on gear, full set  
of plans & newsletters. Wings, Flaps, Ailerons,  
Tail all completed. Package includes windshield,  
canope, rails/track, fuel tank and all additional  
parts & pieces to virtually complete the machine.  
\$ 9000. Optional IO-320 engine with 200 since  
new, pacesetter 68x68 prop, spinner, logs  
\$6,500. both airframe & engine \$15,500. Bud  
Todd Byron, California (510) 634-1223

*Note from Hal Stephens: This is a very well built  
airframe. Not only is it a fold wing but also the  
wider longer version of the T-18. Other projects  
can be purchased by one who can't afford the  
time to build from scratch but in my opinion the  
work done by the original builder is worth  
warranting a serious look at this project.*

### **T-18 Project for SALE**

T-18 Standard body Folding wing on  
gear. Airframe 90 % complete. Fuselage and  
wings flush riveted. All control surfaces done,  
gas tank, removable floor. Seats and instrument  
panel. Windshield and canopy fitted. dynafocal  
mount for IO-320B1A engine. No fiberglass  
parts except for lower cowling. No interior.

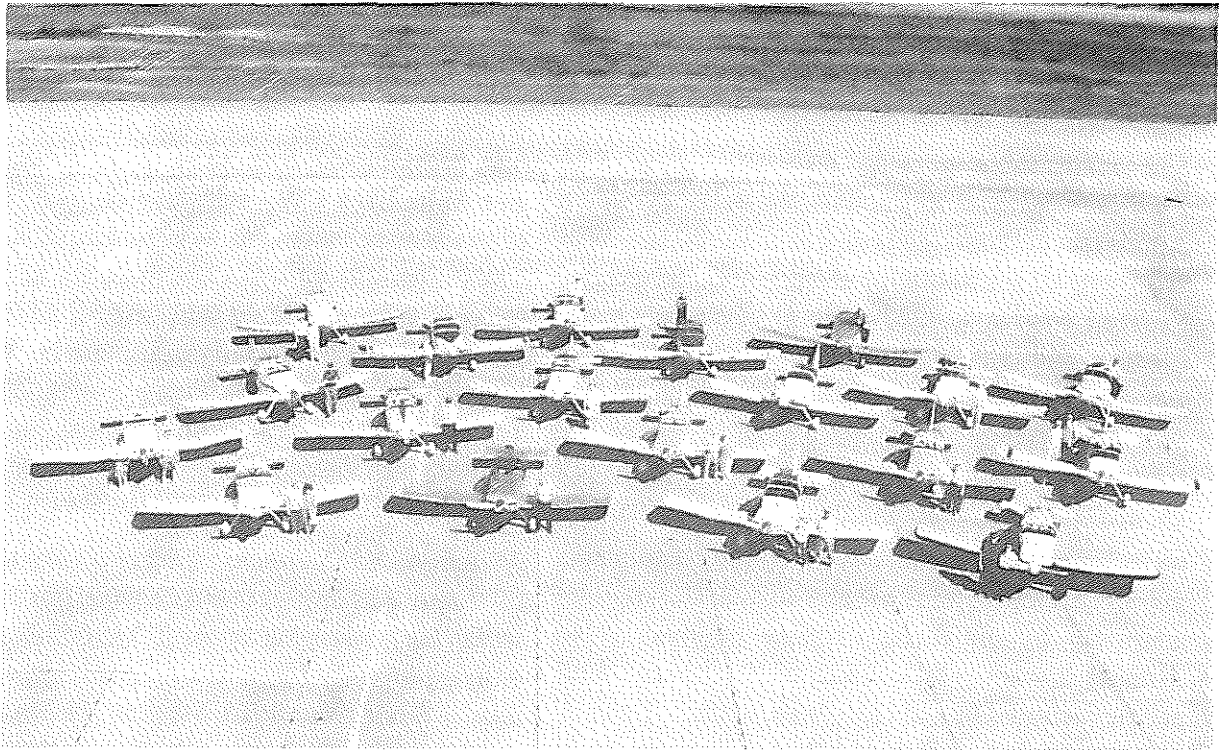
Price negotiable.

Ed. Bjornrud, (206) 868-2025  
Box 246, Redmond, WA 98073-0246

*Editors Note: ED called and said he might  
consider an Oshkosh delivery if he has someone  
very interested at that time.*

### **FOR SALE: PAUL SHIFFLET'S T-18**

Editor's Note: I traveled to Earlham, IA in May  
to see Helen Shifflet and Paul's fine project. The  
T-18 is a widebody, folding wing. All the  
structure is complete except the outer wing  
panels, ailerons and outer flaps. It has a Lyc 160  
hp fuel injected engine that is run out and will  
require an overhaul. It is equipped with a constant  
speed prop. For more information call Helen at  
(515) 758-2621



## McAlester, OK May 14-16

by Richard Snelson

The comments that I'm receiving about the McAlester Get Together are ranging from "great event", "best ever" to "lets go there again". It's no wonder everyone had a good time, the weather for the first two days was near perfect! Runway 19 was blessed with only a 5 to 7 knot slight crosswind and as a result a lot of T-18 flying took place. Steve Hawley of Tucson, Arizona and Gary Holt of Tulsa gave a lot of young folks their flying introduction by taking half of the kids in town for an airplane ride.

Gary Cotner of Collinsville, Oklahoma was quick to round up a flight group to practice formation flight for the Oshkosh T-18 Fly-By. Gary was joined in the air by Gary Green, Ed Ludtke, Max Booth and Dave Eby. Their flying included the missing man formation and will provide a good representation for John Thorp and the T-18 Mutual Aid Society at the Friday afternoon Oshkosh Fly-By.

My count of airplanes at McAlester were 22 T-18s, one Vari-Easy and one RV. Or should it be two RVs the second one had four wheels, and was way over

gross weight with gadgets. It was on the parking lot. It belongs to our friends Lee and Dixie Lutz, who drove all the way from Rolla, Missouri to watch T-18 and be with us for the weekend. Lee had a T-18 ride with Gary Green, his smile was ear to ear when they got back so he must have enjoyed it. Dixie said she would wait until next time to fly with Gary. Next time, Next time etc... The other RV, the one with wings had slipped in quietly, sporting a T18-6 sign for protection, it belong to Chuck and Barbara Clevas of Enid. We let them stay since Chuck promised to cook for us Saturday night.

We had two new T-18s on the field. Jim Perrine of Jacksonville, Ark had his yellow bird, N110JP there. It had first flown in 92. Congratulations Jim! Sure beats coming to fly-ins in the Navion doesn't it. An all white T-18, N25002 joined us from Neb, it belongs to Len Baker. Nice restoration job Len.

Texas was well represented at the event by T-18s and their crews, Parker Miller, Pat Stanley, Ken Morgan, Dave and Pat Eby, Bryant and Bonnie Rowland, Gary and Maxine Green, Bob and Helen

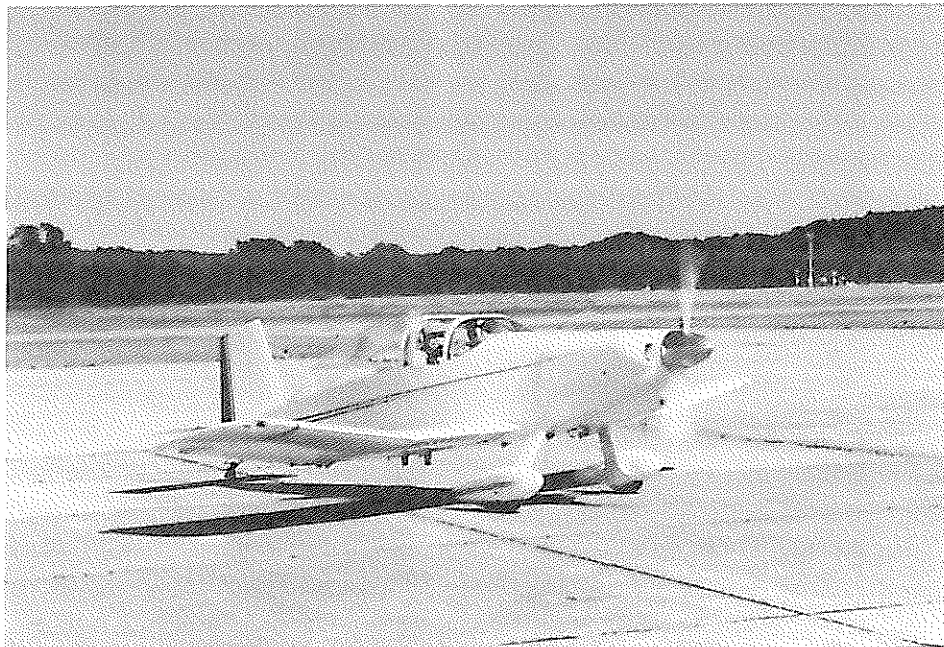




*Gary Green conducting a post flight briefing for the Oshkosh Flight Team*

Slagle, and Bud and Margaret Payne. A regular at T-18 events, Max Booth was there, said he flew through some of the heaviest rain he had ever been in to get there. Dick Amsted and his wife made it from Michigan, it was only part of the trip for them since they were on there way to California in their T-18. Ed and Jeannette Ludtke were there in their Wright Bros Award winning T-18. A group of

three T-18 flew in from Colorado. It included Dean Cochran , John and Vicki Evens and Walt and Beverly Giffin. Oklahoma T-18s included, Gary Holts, Gary Cotner, and Doug Frantz. Coty and Wilma Johnston from Snyder, OK. drove in, they are building and are well along on their T-18 project. Leroy and Mary Holt who live in McAlester, OK really did a great job putting together the



Gary Green's T-18 with his new yellow and green paint scheme





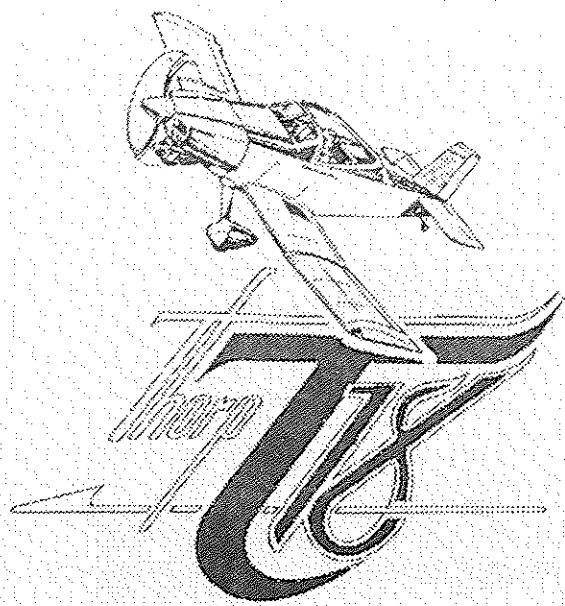
Look at that smile on Lee Lutz's face! rumor has it that Gary had him upside down and Lee didn't know it because he had his eyes closed.

arrangements for our Fly-in. A local merchant and grocer, Richard Young really went out of his way to help make the event a success. He set us up with scads of food, we had snacks and drinks all day Saturday plus a great evening cook out and the total cost per person was under \$5 dollars. Leroy Holt

sold his T-18 to his son Gary a while back and it's really sad to see Leroy walking around with his head down at our events. Cheer Up Leroy! Start Another one and you'll feel better when it's done. Thanks to all of you for the great Oklahoma hospitality and friendship. We'll be back!



The RV crowd will try anything to join our fly-in and get a ride in a great airplane.  
T-18-6 ?? I kind of doubt that!



## T-18 Gathering Pontiac Airport

by Al Bosonetto

MAY 22 & 23 1993

SATURDAY MORNING DAWNED WITH CLEAR BLUE SKIES, BUT LOOKING AT THE WEATHER MAP SHOWED MARGINAL WEATHER IN SEVERAL OF THE STATES SURROUNDING MICHIGAN. THE SUNDAY FORECAST WAS FOR RAIN AND HIGH WINDS. WE HAD SEVERAL CANCELLATIONS DUE TO THE POSSIBILITY OF GETTING STUCK UNTIL MONDAY.

WITH MY T-18 PARKED ON THE RAMP, DICK PENNMAN FROM ROMEO MI. WAS THE FIRST TO FLY IN. JIM AND JUDY PAINE WERE NEXT TO ARRIVE, COMING FROM DAYTON OH., FOLLOWED BY BERNARD THALMAN FROM WILMETTE IL. NICK SERAPHINOFF FLEW IN FROM DETROIT CITY AIRPORT. DR. MARK LAMOS' T-18 WAS TAXIED TO THE RAMP BY BOB DIAL. BILL OLIVER FROM PONTIAC WAS NEXT TO ARRIVE. RICHARD SNELSON FLEW IN FROM CLINTON IL., AND GARY COPELAND ARRIVED FROM ADRIAN MI. FRED GINDL HAD TROUBLE WITH THE FUEL INJECTOR ON HIS T-18, SO HE FLEW IN FROM MILTON, ONTARIO CANADA IN HIS NAVION. BILL BERTRAN ARRIVED IN HIS SKY HAWK WITH HIS T-18 IN FLORIDA.

BOB DIAL HAD A HANGER SALE WITH

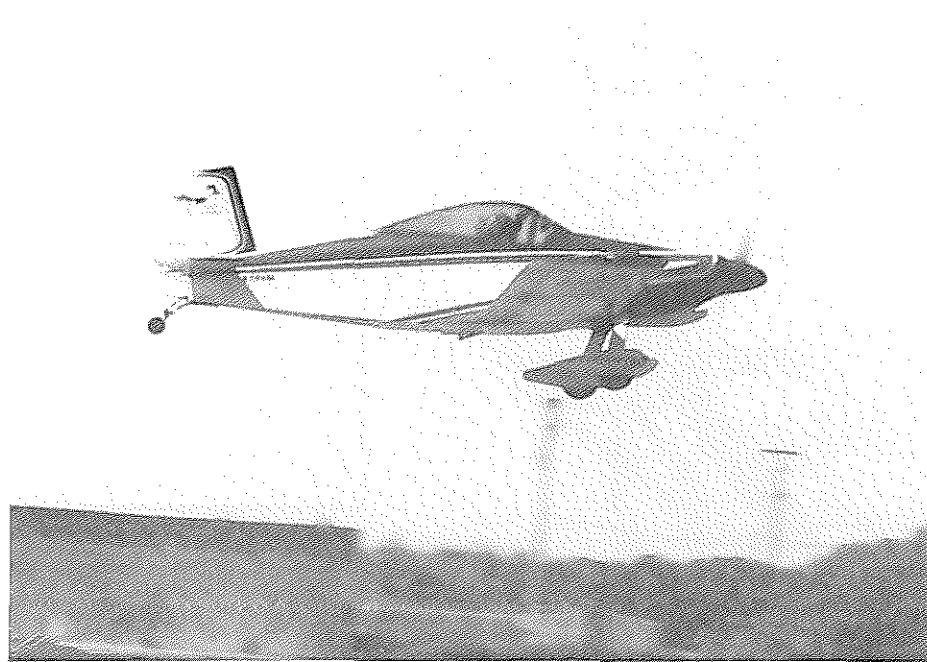
MANY T-18 PARTS, INCLUDING WING RIBS, AILERONS, FUSELAGE SKINS, INSTRUMENTS, RADIOS AND BOXES OF FITTINGS. THESE PARTS WERE SOLD AT A FRACTION OF THE ORIGINAL PRICE. TYPICALLY ONE OR TWO DOLLARS FOR A WHOLE SET OF RIBS.

THE T-18 GATHERING WAS SPONSORED BY EAA CHAPTER 113 AND SEVERAL OF THE MEMBERS ARRIVED WITH THEIR AIRCRAFT. THESE INCLUDED A RV-4, MUSTANG II, STAR-LITE, VOLMER SPORTSMAN, PITTS SIC, GLASAIR II, SKY BOLT, STINSON VOYAGER AND A CHINESE YAK.

BECAUSE OF THE DETERIORATING WEATHER, SEVERAL OF THE GROUP DECIDED TO DEPART FOR HOME SATURDAY AFTERNOON.

AS PREDICTED THE WEATHER ON SUNDAY WAS A TOTAL WASH OUT, WITH RAIN, LOW CEILINGS AND VISIBILITY LESS THAN 3 MILES. SEVERAL OF THE GROUP HAD BRUNCH AT THE AIRPORT RESTAURANT, AND AROUND 3 PM DECIDED TO CALL IT A DAY.

NEXT YEAR WE WILL MOVE TO AN UNCONTROLLED AIRPORT TO ALLOW FOR MORE FLYING.



*Rick Manley N79RM -alais Road Runner*

## 1st Annual Oceano T-18 Fly-in

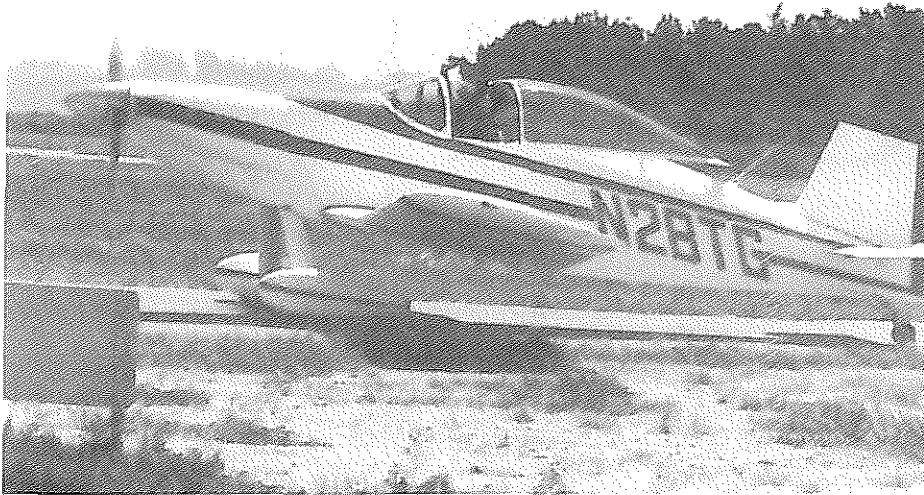
by Harry Paine

For those of you back east who are unfamiliar with Oceano, California you missed a treat. Oceano airport is located within walking distance of one of the west coasts finest beaches. There is also sand dunes for dune buggy enthusiasts, fishing, swimming, surfing, horseback riding, golfing, camping and of course flying. The beach itself is about 25 miles long, 10 of which is very isolated, which makes beach patrol at 50ft and 180mph very fun. Oceano Airport is a very nice little strip complete with a pilots association pilot lounge and free over night camping in a grassy area right next to the tiedown area. Friday evening was the first day of the fly-in. The weather was nice and clear, but the wind was howling and some of the planes did not come in due to severe turbulence (Sigmets) over mountain passes which most of California is made of. A lot of folks drove in so we still had 13 for dinner at the world famous F.McLintocks restaurant. It was a long wait but worth it. They have a very unique way of pouring water there, where the waiter is blind folded, and then stands on a chair, a glass is

placed on the patrons head and the waiter pours the water from about six feet!

Saturday morning was beautiful no wind and a clear blue sky. a few of us went on beach patrol making sure the sea gulls could still dodge a flying T-18 bullet. About 10:00 a.m. the wind came up again and our good landings turned into mini touch & go's. Our Supply Master Hal Stephens finally arrived fully loaded down with two huge coolers of sparkling wine otherwise know as champagne. We don't know if it was the wind or Hal's overloaded T-18 and a half, but he made landing history at Oceano airport. The wind got so high, the majority of the pilots decided against a spot landing contest. Instead many rides were given in T-18's. I gave 8 and I think that all who attended the fly-in had rides. Three of the people I gave rides to are builders, fairly well along in their projects. When I took Lenard Gaines up for a ride and turned the stick over to him I could hardly take it back he was having so much fun.

After all the aircraft were down and se-



*Tony Ginns Brand new N28TG completed  
Dec 26 1992!! What a Christmas present*

cured along with the pilots Saturday evening, the cork flying contest was started. About 5:15 PDT Mr. Hal Stephens took over the cork flying contest. Cork flying was a new form of flying to myself and the inexperience showed, because my solo flite was easily out distanced by the next competitor. After all was over Ilene was the winner with a flight of about 50 feet!! Then we had drink all this champagne. We all know it has a slow fuse but some of us forgot. Everyone said the tri tip BBQ was excellent but I think they could have been fed dog biscuits and received the same compliments because everyone was feeling so good. Dave Tennant won the best Hanger lie with a story

that describes a very interesting flight in an ultralite aircraft when one of the wing panels pops loose. Hal Stephens won the Hard Landing contest with a minor earthquake reading of 3.3 on the richter scale according to seismologists at Cal-Tech.

Sunday morning was beautiful and some of us took advantage of the early morning calm. Visibility must have been about 100 miles and the air was smooth as silk.

After some formation fly bys everyone started heading for home. Asking when was the next Oceano T-18 fly - in going to happen. If any of you come by Oceano give me a call and we could go flying or whatever.

The next T-18 Fly-In for the West Coast is Sept 19&20th at Placerville airport. RSVP Hal Stephens 408-723-0244.

Harry Paine T-18 8613A Ph# 805-481-2524



*Chief Agitator & Chef Harry Paine*

WE PICKED UP THE HAVRE VOR AND LANDED ABOUT 15 MINUTES PAST OUR ETA. THE CUSTOMS OFFICIAL WAS LATE FOR AN APPOINTMENT SO WE PASSED IN A FEW MINUTES. GASSED UP. HAD A SNACK AND DEPARTED FOR WILLISTON N.D. AS WE APPROACHED WILLISTON WE HIT SOME TREMENDOUS CLEAR AIR TURBULANCE. I INSTANTLY CHOPPED THE THROTTLE. THIS WAS PROBABLY THE WORST TURBULANCE I HAVE ENCOUNTERED. SEEMED THAT IN A MINUTE IT WAS ALL OVER. WE LANDED AT WILLISTON IN LIGHT RAIN AND HANGARED THE AIRPLANE. STAYED AT THE SELECT INN AGAIN.

21 JUNE: LEFT WILLISTON FOR MANDAN UNDER LOW CEILINGS. ARRIVED MANDAN 1 HR. 8 MIN. USED COURTESY VEHICLE TO GO INTO TOWN FOR LUNCH. DEPARTED MANDAN FOR PIERRE. S. DAK. ARRIVED 58 MIN. LATER. FUELED

AND DEPARTED FOR SIOUX CITY. NICE FLIGHT DOWN THE MISSOURI RIVER. HOME IN 1 HR. & 55 MIN. WITH A HEAD WIND.

FOR THOSE WHO LIKE STATISTICS:  
TOTAL FLIGHT TIME  
41 HRS. 34 MIN. MILES FLOWN 7000 AVERAGE SPEED 168.67 MPH. FUEL BURN 372 GAL. GAL. PER HR. 8.96

P.S. THIS WAS A GREAT TRIP AND I WOULD RECOMMEND IT TO ANYONE. WE WERE LIMITED TO THREE WEEKS BECAUSE OF MY WIFE'S LIMITED VACATION TIME. THE AIRPLANE PERFORMED SUPERBLY. WHAT ELSE COULD YOU EXPECT FROM A T-18? I WOULD LOVE TO DO IT AGAIN AND SEE MORE OF ALASKA. ANYONE CONTEMPLATING THIS TRIP AND NEEDING FIRST HAND INFORMATION CAN GIVE ME A CALL.

RUSS ROSS



*Dave Tennant giving Hal Stephens a complete checkout in his T-18 "Sweet Dreams" Dave lives in Lompoc, California.*



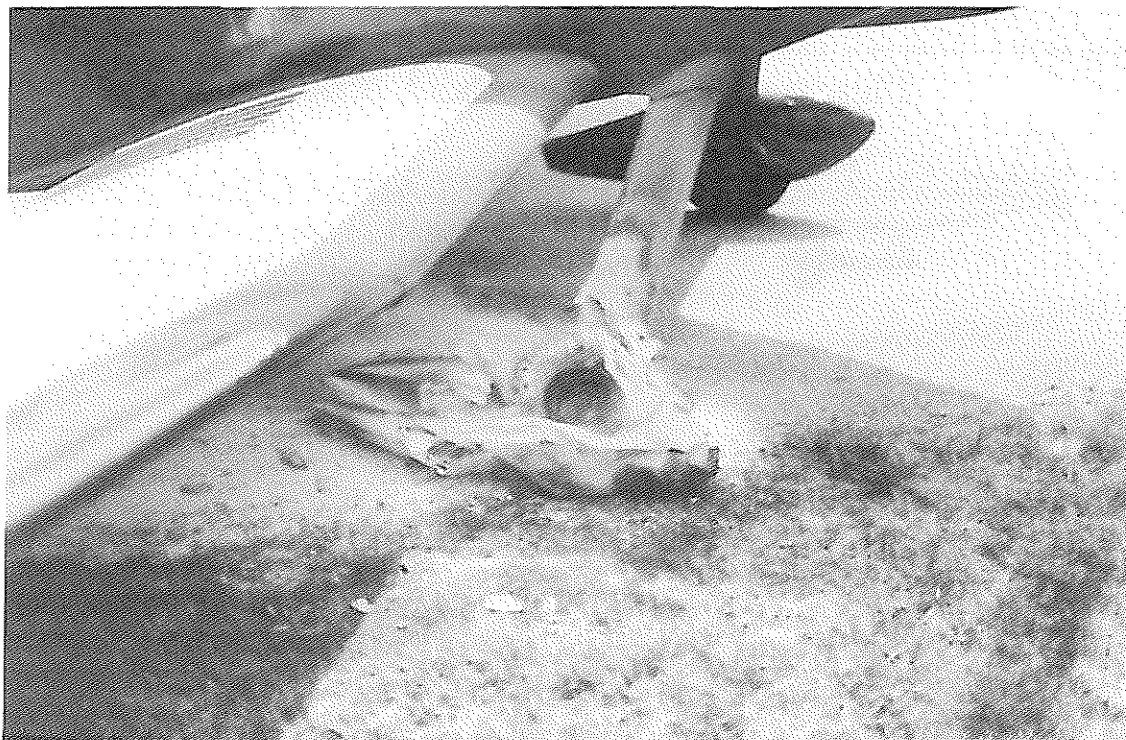


## Wheel Fire Caused by Dragging Brake!!

The moral of this sad tale comes first: Never, Never taxi an airplane with a dragging brake. Period. .... Stop! get out and get it fixed where it sits. Believe me it's no fun to watch 3000 hours of work and \$30,000 burning with no way to stop it.

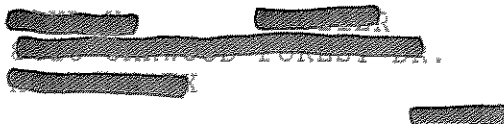
This sorry mess occurred as I was on the way to Sun n Fun. I made a stop at Mussel Shoals AL. for fuel and as we were leaving, after run-up, I noticed the right brake was dragging. I wasn't sure at first since the wind was around 24 knots, but turned back from the runway and started down the taxi way to the FBOs. After about 150 feet it got worse. I started a turn off the taxi way and the tire blew. We stopped and Jim Brownell, my passenger, got out to check the problem. The wheel was on fire big time!!! We tried the small Halon fire extinguisher on the wheel, but with the wind it had little effect. I stayed in the cockpit long enough to call Flight Service on the field and report the problem, also called the FBO for help. After what seemed an eternity, the "On Field Fire Department" finally got to my T-18. You can see part of the result in the picture below. The bottom of the wing was warped and the paint burned off. No melting or damage to the spar. All the wheel parts and brakes were ruined. I was glad the gear is 4130 steel since the small fire wouldn't hurt it.

What caused it to start to burn??? I don't know for sure. That same brake had stuck the same way two times before. Each time I had cleaned the pins that the caliper floats on and it worked ok afterward. In fact they had just been cleaned before the flight. We had also packed the wheel bearing with new grease. This happened on April 16. After a couple hundred hours of work to reskin the wing and fit new wheel pants, I was back in the air and made it to McAlester for the Fly-in. Let me know if you have any idea how the fire may have gotten its start. Richard Snelson



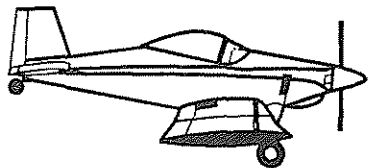
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If you haven't sent you 93 dues please help me out with this and get your dues in now.

Please send in your 1993 renewal this month



**T-18 MUTUAL AID SOCIETY 1993 RENEWAL**

Please include a check or money order for \$25 and send to  
Richard Snelson Route 3 Box 295, Clinton, IL 61727

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY, STATE, ZIPCODE \_\_\_\_\_  
PHONE NUMBER \_\_\_\_\_

I'VE INCLUDED \$\_\_\_\_\_ TO HELP BRING KAY THORP TO "OSHKOSH 93" FOR  
THE 30TH ANNIVERSARY EVENTS.

# T-18 NEWSLETTER

Newsletter #88



## IN THIS ISSUE:

30 Anniversary Events at Oshkosh by R. Snelson

Letter to the Editor

True Airspeed from GPS by David Fox

Torque Values for Props & Extensions

by Barrett M. Kemp

Technical Tips from EAA Technical Counsel News

Oct 8-10 Fly-In at Placerville

T-18 Fall Meeting at Kentucky Dam Oct 8-9

**NOTICE: (STANDARD DISCLAIMER)** As always , in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.





## THE OSHKOSH 1993 30TH ANNIVERSARY

By Friday morning of Oshkosh 93 we knew that the Thorp T-18's 30th anniversary would be a success. Our first goal of bringing Mrs. John Thorp (Kay) had been realized the day before, when she arrived in Dick Eklund's Sky Scooter (Thorp 211) after their 13 hour flight from California. Kay told us that by coincidence it was the same Scooter that she and John had eloped in 46 years earlier.

Our second goal of getting 30 or more T-18s to Oshkosh for the 30th anniversary had also been realized. We had packed more than two flight line rows and by carefully parking airplanes tail-to-tail we managed to surround the Sky Scooter with forty beautiful T-18s. Before the fly-in ended the count of T-18s reached more than 50. This is an impressive number of airplanes, and only resulted from your efforts to make the 30th anniversary a success and to show EAA'ers that the T-18 is an affordable, available homebuilt. Many individuals returned to Oshkosh with their T-18s after previously vowing "never again". Others worked hours on their airplanes, even borrowing an engine to make this one special trip. And then we have Gayle Lecount from Danville, Illinois who has made the last 21 fly-ins in his T-18! Congratulations Gayle, that has to be "the record".

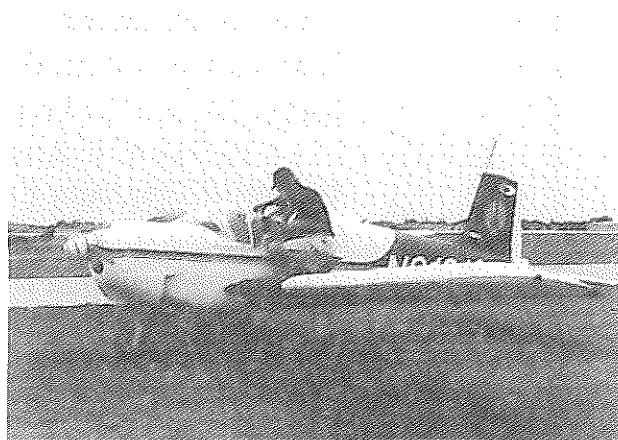
Friday's events for the 30th anniversary started in the EAA Nature Center with a remembrance for John Thorp. I think Lee Skillman's memorial talk about John, his life and work, did well to express how we all remember him. I've included Lee's talk

in this newsletter for all of you that didn't make it to Oshkosh.

A leisurely cookout in the Nature center's pavilion followed the service. Our cooks Bob Highley, Bill Williams and Ben Scola prepared their special beer favored "Braut" recipe that was enjoyed by all. (Note: Everyone liked the cookout idea so much that we will try to get the pavilion again next year.)

After lunch it was picture taking time and an opportunity to meet our special guests for the event. Joining Kay Thorp was John's sister Marcella Thorp Emerick and her daughter Gretchen. Marcella had brought copies of her book about John to the fly-in and spent time in the "authors' corner" selling and autographing them. (A very nice remembrance of John. Call Marcella at 717-545-5291 to obtain one)

Two other special T-18ers joined us from Ajo, Arizona, the remarkable Don Taylor and his wife Lois. Anyone visiting the EAA Museum has seen N455DT "Victoria" the T-18 that Don built and flew around the world. It's my opinion that Don's accomplishments exceeds those of the much later and more publicized Voyager flight. I don't mean to take anything away from the Voyager's construction and flight crew. It's just that Don did it alone. I had the opportunity to have dinner with Don and Lois on Saturday night and have this to say about him, "he is a great story teller (all true) and adventurer extraordinaire". Here's what Don had



*The Sky Scooter "Thorp 211" S.N. 3*



*T-18ers relax in the sun after lunch*

to say about John Thorp, and the 30th anniversary "Had to come - Lois and I decided! No decision! We had to be here!! John put the "Fly" into my life. I simply owe this man so much! Long may his records stand". I promise more about Don in future newsletters. Don & Victoria's story still needs to be told.

After lunch it was back to the flight line for a chance to look over the many fine T-18s on display. We had planned to have a special T-18 fly-by Friday afternoon but things didn't come together as we had hoped. Special EAA insurance requirements and the paper work necessary for the formation flight discouraged this event. However four of our T-18s did fly in the homebuilt review on Saturday. We thank Russ Ross, Max Booth, Tom Kerns and Ron Hayes for representing us in this event.

Friday evening we filled the dinning room at Butch's Anchor Inn, with more that 140 T-18ers and their guests. The menu had been expanded to allow some additional choices and the food was very good. Lee Skillman served as master of ceremonies and introduced all the T-18 family members to Kay and her guests. Kay noted later "I was truly honored & overwhelmed with love & attention". (Note to Dear Kay, Let me assure you it was our pleasure to have you with us for the events. You are a beautiful, warm lady and a great sport for putting up with over a 100 T-18 pilots")

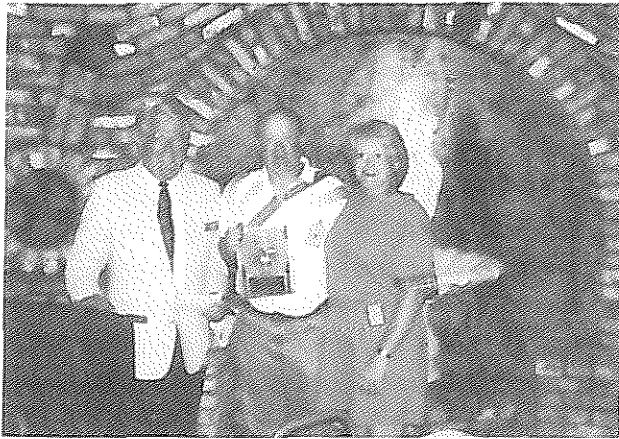
Awards were given to T-18 pilots bringing a T-18 to the fly-in for the first time. And then the award

for the best T-18 at Oshkosh 93 was presented to Ron and Jane Hayes of Blue Springs, Missouri. Ron has this to say about the T-18 "No better way to get around-speed-class-builder support- The Thorp tends to draw a special type of people" and from Jane, "Flying in the Thorp is out-of-this world! The T-18 people are wonderful". Our congratulations to the proud parents of such a fine well detailed creation. It was a wonderful banquet and would have been even better if Butch's air conditioner had been working. Several folks had to leave early because it was so hot.

The T-18 Forum on Saturday morning was well attended with the tent more than three quarters full. The general discussion was about T-18 safety and covered some of the aspects of aerobatic flight in the aircraft. The loss of two T-18s earlier this year that were both possibly doing aerobatics was brought up, hoping that someone in the forum might have more information about the accidents. None was forth coming. The early Thorp modifications to the T-18's tail were brought up in discussion and resulted in one new T-18 owner learning that he may have a problem. An inspection, after the forum, of the tail of his aircraft found loose rivets on both sides of the spar tube. Indications were that the aircraft may not have the doubler tube installed. Paul Kirik who helped with the forum brought up the fact that he has found several aircraft that he has performed annuals on with the rear spar material not carried out on the center bolting fittings. This leaves the structure about 30% short of material



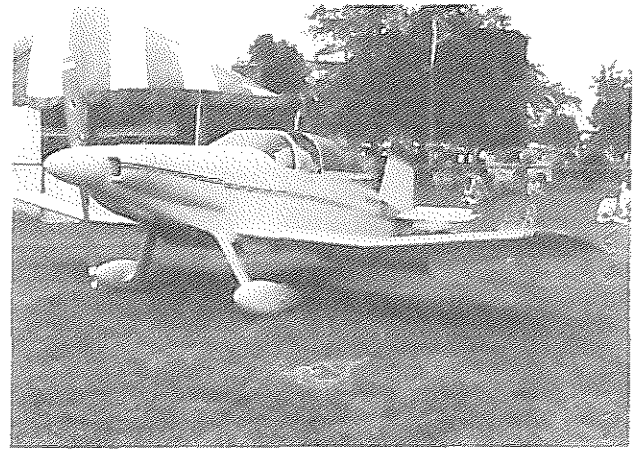
*Kay Thorp and Tom Poberezny*



*Lee presents Best T18 Award to Ron and Jane Hayes*

and strength at the outer to inner wing rear spar junction. It's his opinion that this should be corrected.

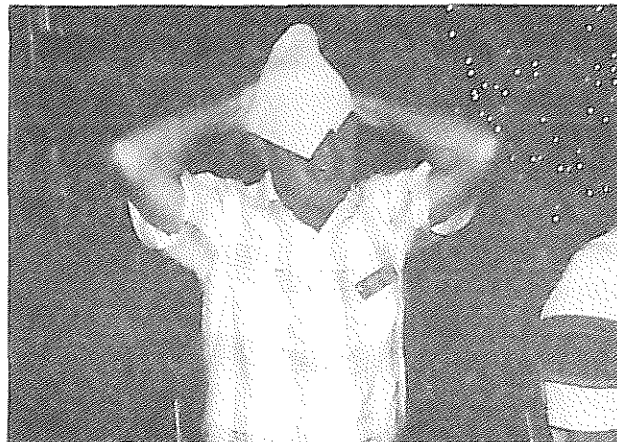
The rest of Saturday and Sunday were spent enjoying the airshows and looking over the great assembly of fine T-18s. I got to talk to many of you, but as always not for long enough. I passed around a small travel journal at the fly-in and collected your thoughts on the 30th anniversary of the T-18 at Oshkosh. I've read it several times since getting home and enjoy your comments and thoughts. I returned home Monday with the GPS showing a ground speed of 165 knots all the way. The trip



*1993 Best T-18 at Oshkosh Award Winner*

home was over and so was another Oshkosh. It all went too fast! I close this article with a note written in the travel journal from T-18 pilot Bob Ryan that says it all. "

*Hi Dick: 67RJ Thorp T-18 WC. This maybe a very sad day for me as I just sold my T-18. Each of us must part with true loves at some point in life. I hope this one isn't premature. I have been flying this airplane since completion in Nov 88. About 350 hours of great enjoyment and frustration. I know I'll miss it and flying in the years to come. One thing for sure, this has to be about the greatest little airplane in the world. Not 67RJ but the Thorp T-18. Sincerely, Bob Ryan"*



*Name Withheld !!!! Initial are D.E.*

*Most visitors to Oshkosh never see or notice the small white chappel nestled on a lake just off Pioneer Airstrip in the EAA Nature Center. Today is an exception, the chappel is full. Friends, family and admirers of John Thorp have gathered to remember the man and his contributions to aviation and mankind.*

### **REMEMBERING JOHN THORP**

I'm not at all sure that I am the most qualified or even qualified at all to be the one standing up here honoring such an aeronautical genius. It's quite humbling with his wife & sister here with me. But when Dick Snelson asked me to do this part of the program, I wasn't fast enough to say "I think someone else should do that".

After reflecting for some time, I decided the best thing to do was plagiarize what others have written, Dick Snelson, Dick Cavin, John Shade & Peter Garrison.

JOHN THORP ..... John Thorp was very familiar to some people and quite unknown to others; which occupied the teeming borderland between fame and obscurity. He was one of the legions who were famous in a specialty. Many who knew John clearly regarded him as a great man and a historic figure. He was an aeronautical engineer whose career spanned the most active and productive period of the development of the modern small aircraft. He left his mark on that period; there is a Thorp style, just as recognizable to an aircraft buff as the Ted Smith style and the Stelio Frati style.

John Thorp's official career dates back to the Boeing School of Aeronautics where he studied in the early 30's, the same time as Ted Smith, although they didn't know each other! He went from school to the Lockheed Aircraft Corp. during WW II as a design engineer. Hal Hibbard, the president of Lockheed assigned John the task of doing the complete preliminary design of the famed Navy P2-V

patrol bomber all by himself; and he later did the production drawings. This aircraft held the worlds unrefueled non-stop distance record until a couple of pilots by the name of Dick & Jeanna flew the Voyager around the world. As an employee, John invented the flying tail which since then has made great inroads in light plane designs and low and behold we find it on the backside of all of our airplanes.

While still at Lockheed John designed the Little Dipper, a single place aircraft and the Big Dipper, a two place plane. Stories of WW II have it that the Little Dipper landed inside of the Pentagon "patio", on a demonstration flight for the military. The Little Dipper project got nowhere and the Big Dipper got shelved when Lockheed decided to stay out of the general aviation market. Shortly thereafter, John shelved Lockheed.

He designed and certificated a two seater aircraft called the Sky Scooter. The same airplane that John took his new bride in on their honeymoon in 1947. The same airplane, 46 years later, that his wife, Kay was brought from California to Oshkosh in the early part of this week.

The Sky Scooters, of which there were eight, were built on none other than "matched-hole" tooling. What T-18er isn't familiar with that term.

The Sky Scooter lent its shape to the first Piper Cherokee, on which John did the preliminary design study and later built the prototype landing gear. He had an idea that he could put two small 100 horse power engines on the Sky Scooter and could then. Fly he and Kay on a much desired trip to Europe. George Wing of the HI-Shear Rivet Company saw the mock-up, got carried away with the idea of a two seat twin and turned it into the Wing Derringer. After they had acquired the design rights, the new owners beefed up the air frame and put LYC 0-320's on it which ruined it aerody-

namically as well as commercially.

In the 50's Mr. Thorp worked for the Fletcher Aircraft Corp. where he designed, among other airplanes, the FU-24, a remarkably homely utility airplane which was manufactured in New Zealand for many years.

In the early sixties, John developed the Ti-gear & Turbine engine conversion for the Beechcraft D-18, better known as the Twin Beech. That work was then and I would assume still performed by the Volpar Corp.

It was during this same period of time that the idea of the T-18 came into being. John had challenged EAA'ers with the thought that an all metal airplane could be built just as cheap and just as fast as a rag, wood & tube airplane. He was challenged and he took up the drafting pencil and T square once again and the eighteenth aircraft design of John Thorp became a reality.

The introduction to the EAA came at Rockford in 1963. It didn't do a high speed pass; it didn't do a low speed run; it arrived rolled up in the trunk of a car. In the next 3 1/2 days it became a fuselage built between two folding chairs. This year, 30 years later, at Oshkosh, we have more than 45 on the flight line, one in the EAA Museum and I believe more than 500 are flying.

John spent the last part of his working career almost entirely devoted to the T-18. John & Kay moved back to the Thorp homestead in Lockeford, Ca. in 1974 from the L.A. area. He was able to do some T-18 activities for awhile but soon the deadly Parkinson's disease began to take its toll. John passed away April 18, 1992 at the age of 80.

JOHN THORP, a true gentleman, an aviation Scholar and a Giant of a man. We will miss him but any time any one of us sees a T-18 in the sky, bends a leading edge between two 2 x

4's or reaches for another blue print, John will be there. WE WILL REMEMBER HIM.

### **Prayer for Memorial Services**

Almighty God, we give you thanks for your good gifts to us, and most especially today for the opportunity to be here, remembering our friend John Thorp. We thank you for our common love of craftsmanship and building, especially as given expression in the T-18 and for our common love of flying, that makes us kindred with John, with one another, and with all who love the skies. We thank you also that we are joined today by John's wife, Mrs. Kay Thorp and by his sister Mrs. Marcella Thorp Emerick, and ask thy continued blessing and comfort to them.

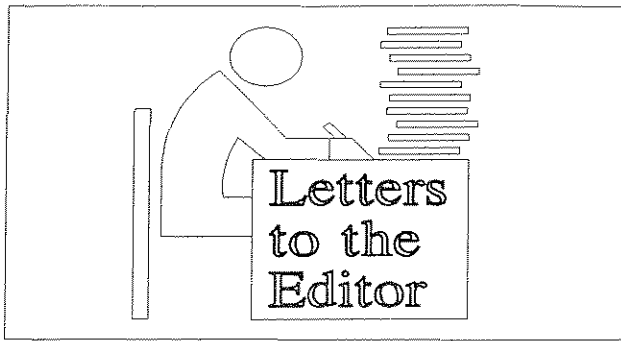
We give you thanks this day for the particular life you created and gave to us in the person of John. We thank you for his vision, dedication, and devotion to the common bond that brings us to together. We give thanks for his love of flying, and for his intensity of personality, which together generated the aeronautical genius of which we have been heir. And we do feel very much like heirs, children of a man who always had time for his builders, time to listen and to care about those who shared his passion.

Lord, look over John when he pulls up in front of the Mister C's in the sky, and welcomes to his table our other friends John Shinn, Lou Sunderland, John Walton, Paul Shefflit, John Kenton and Tom Waage.

We remember on this day these and all our other friends who have loved building and flying T-18s, and who have joined John in your presence.

Help us Lord God, to remember all for which we have to be thankful... for your skies, for the joy of being close to you there, and for friends past,

*Our thanks to Lee Skillman from T-18'ers everywhere.*



30June 1993

Dear Richard,

Here is my small contribution to one person's association with the T-18. Almost 40 years ago, I was a NavCad dropout at Pensacola, something that is still fresh in my memory, but that is another story. I didn't have anything to do with aviation for almost 15 years after that until I had the opportunity to do a little aerial photography and again the bug bit. I got my private ticket the hard way (I had to pay for it myself and while on an assignment photographing in Southern Utah, I picked up a Popular Mechanics to read one night. Jim Bede, that great crowd pleaser, had me convinced I could build an airplane, at home, with a drill, hammer, pair of pliers, etc., and I took the bait on the BD-4. About that time the BD-5 came along, and the BD-4 support seemed to be lacking, especially for a novice builder, who didn't even have a drill, or pliers. I was still hooked, so I looked for a new project. A friend, who was also a BD-4 fan, suggested I look at a Thorp. What's a Thorp? Just about that time, Lu's article in Air Progress Annual came out on the T-18. That was pretty impressive, and really got my attention. A little more investigation, and I purchased plans #888 in 1972, and immediately went into mind-lock. 1973-my first trip to Oshkosh. What can I say! That was when I was able to pitch my tent almost on the flight line. I got my first T-18 ride from Gene Eckle at a solid 200 mph with even a little stick time (very little), but that was all it took. I was convinced I had made the right choice. 1976-my wife said if I went to Osh again, I had to get my 4 year old

son out of the house, so away we went. Wonderful trip! I can still see John Shinn stuffing my boy and a small Teddy Bear in the back seat of his beautiful T-18, and we had another great flight. By then, my project became a love of labor, and I'm still at it 20 years later, but coming down the homestretch. What does John Thorp and the T-18 mean to me? It was my second chance to be associated with the world of flying for which I am most grateful. I am sorry I never had the chance to meet John, however I do remember the letters and questions I had for him and how he never failed to answer promptly with such consideration and encouragement. With all the wonderful sights and sounds of Oshkosh over the years, I have never entertained the thought of any other project but the T-18. My 4 year old boy who went with me in John Shinn's T-18 is now 21 and a Mormon missionary in Spain, soon to come home, but I'll be at Osh 93 with my No. 2 son, who helped me finish the outer wings last summer. At the risk of being too sentimental, I would just like to say, thank you John, and EAA for that second chance.

Respectfully,  
Roger Clayton Salt Lake City, Utah



THORP TN851 LT 6/26/93

Dear Richard:

I just skimmed through the T-18 Newsletter #87 and will respond with a twenty five dollar check, and a couple of suggestions as to what could make your brakes drag. (Sorry to hear about that).

When I first built my T-18, in 1974, I put a set of 1/4" Stainless Steel brake lines from the lower fuselage longeron to the brake caliper housings. (It looked like a pretty neat installation 1) However, when I started flying I found out that my Cleveland brakes would not self adjust, and I had to pump them up to get a solid pedal each time I used them. I deduced the rigid steel line was holding the caliper, preventing self adjustment. in my



case the rigid lines were holding the calipers in a direction to keep them from assuming a new position which would accomodate brake pad wear. If the lines held the calipers in the other direction they might cause brake drag. I subsequently replaced the rigid steel lines, fittings, flex hoses at the master cylinders, etc., with a single piece af 3/16" Nylo-Flow tubing, with appropriate fittings, and my problems went away. (There is an insert that goes inside the end of the tube and a Ferrule/B nut that attaches the Nylo-Flow to a union with pipe threads on one end). A lot of the Western T-18's use this set-up and it has a good record. I got my lines and frttings from a go-cart shop, which uses them on their disc brake set-up. Recently I was able to buy some of the fittings from a hardware store, for a swamp cooler.

The other thing that comes to mind is brake piston "O" Ring swelling from incompatible hydraulic fluid. I buy my replacement Cleveland Brake "O" Rings from San Val Aircraft in Van Nuys and use only 5606 (red) hydraulic fluid. (There are many kinds of O Rings and two kinds of hydraulic fluid, with only one satisfactory combination.)

Sorry to say that Anne and I are going to miss Oshkosh this year because we had made other plans. (We intend to be up north in the Straights of Juan De Fuca). I previously sent you a donation to help provide expenses for Kay and Marcella, and hope that everything goes well. We'll be thinking of you all. Sincerely, Lyle and Anne Trusty 1665 West Newgrove Street Lancaster, CA 93534 (805) 949-1131



Dear Richard,  
Enclosed are the photos of your T-18 we took at McAlester. As you can see, they didn't turn out very well. It must be the camera or type of film used because the cameraman was the same guy who went up with me to take pictures of the Cessna 195 and the 195 photos came out great. I saw them at the Denton,Tx antique

fly-in last week-end and virtually every one of the photos of the 195 were great with crisp, bright colors in the background. We'll just have to try again at our next gathering. I don't know what type film Jon was using to photograph the 195 and don't know what is recommended for air to air shots.

I dodged a bullet the other day with my T-18. I'd been noticing a little bit of oil leakage from somewhere around the accessory case for some time but had never been able to figure out just where it was coming from. I had about decided that I just had not done as good a job assembling this new engine as the old one and had some oil seeping from one or more of the gaskets.

However on the way home from Missouri a couple weeks age, I stopped up at Denton, TX for fuel and discovered a broad streak of oil down the right side of the airplane. Upon pulling the cowl cheek I could see that the oil was coming from the fitting where the oil pressure sender is on the upper right corner of the assessorry case. Upon attempting to remove the Stewart-Warner electric sender unit from the AN-914-ID 90 degree ALUMINUM elbow fitting, the elbow fitting snapped right off in my hand. It had been cracked about 1/2 the way through the threaded male portion that screws into the accessory case. I suspect it was within minutes of completely failing and dumping all my oil in flight. As it turned out, I'd only lost about a quart.

The moral of this story is DO NOT USE AN ALUMINUM FITTING TO ATTACH AN ELECTRIC OIL PRESSURE SENDING UNIT TO THE ACCESSORY CASE. The weight of the sending unit may cause a fatigue crack to develop in the fitting. Either use a brass or steel elbow or remote mount the, sending unit to isolate it from the vibration of the engine. The fitting that failed had been on my old engine for 12 years and on the new engine for a year and had accumulated about a

thousand hours in that configuration prior to failure. I had seen warnings about this installation on Rutan pushers but had not heeded the advice. Turns out it was good advice. Gary Green



Dear Richard, Enjoyed the article on John & the T-18, good job and I wish I could make it to the 30th anniversary but I'm committed to Silverwood thru the summer. Say Hi to all the members for me at the banquet.

By the way.. the name "TIGER" was John's very own idea and he liked it very much regardless what anybody thinks. He preferred "EL TIGRE" but I prevailed and we used English instead to simplify things. Lu Sunderland is the one who did not like it because he felt that it denoted an airplane that was hard to fly. Would you set the record straight on that for me. I see no reason to perpetuate a total myth. See you sometime. Bill Warwick.



5100 Harriet Avenue South Minneapolis, MN 55419 April 20, 1993 (H: 612-824-3288) (W: 612-625-5072)

Dear Richard,  
First of all, thanks personally for all of your great efforts and successes with the newsletter. As a new owner of a T-18 the complete file of newsletters that I got with N444DD (built by Don Derby, bought from Tommy Thompson, both of near Las Vegas, Nevada) is invaluable.

Usually I come to Oshkosh after the first mad weekend to avoid the crowd, but this year I would like to bring N444DD and enjoy the T-18 activities. But I don't have any place to stay for the weekend! Do you or any of the gang have any ideas on where I might find bed space? I usually stay at the dorm, but they have been all booked up for the weekend since early last fall. Let me know if you hear of anything; I'm very flexible!

I am enclosing for your consideration for the newsletter an article that I wrote on an easy way to determine airspeed accurately and quickly from loran or gps data. I hope that can appear sometime in Sport Aviation, but that could take quite a while. If it would help you, I can supply it on a 3.5 in. disk in Word 4.0 for the Macintosh. Thanks again for the splendid work! Sincerely, David Fox



September 2, 1993

Dear Richard and Roxanne,  
I am slowly catching up after the wonderful Oshkosh trip. Thank you so much for all the hard work and consideration that went into the John Thorp memorial activities. We had to do some scud running south to Lone Rock to get away from the wall of water which hit you on Saturday afternoon. The weather then improved all the way home. Our only problem was finding ourselves without a room or transportation at Worthington Minnesota after they had "rolled up the sidewalks" at the airport Saturday night. All the motels were full except one questionable one who promised to save the last room until we arrived. The next call to the only cab company produced no answer. A call to the emergency fuel number got only an answering machine. While I was checking the closed terminal building for some help a family drove up with their two youngest (girl 6, boy 8) to watch the ag sprayer take off. They kindly offered to drive us into town to the motel. Yes you probably guessed, the motel had thought we were not coming and had rented the last room. The family kindly took us home to use their older daughters room (she was away at a friends) and even fed us a late supper. He is a lawyer and they live on one of the many small residential lakes in Fulda about 16 miles from Worthington. I had to tell him Burt Rutan's solution to the lawyer problem, much to Kay's concern he would put us out by the side of the road. He seemed to



be such a genuine humanitarian and wasn't upset by Rutan's suggestions. I later wrote in my thankyou letter that he was the first lawyer I knew who had started his public service by rescuing us. We had a beautiful sunrise over the lake to wake us Sunday morning and he dropped us at the Perkins restaurant while he did some shopping and then took us to the airport. It turned out to be a very interesting experience and I made sure we had reservations at Rock Springs, Wyoming for the next night. We made it home Monday afternoon with no further problems. Almost everyone along our way was most helpful and interested in the Skooter. It was great to get back to cross country flying and my only regret was the short time at Oshkosh. I would have liked to talked to more of the T-18 builders and looked at the impressive work more closely. Maybe next year. .... Thanks again, Richard Eklund.



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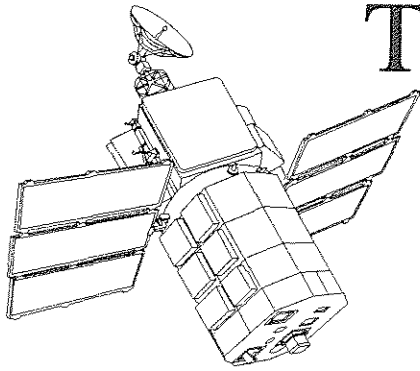
### A Note from Kay Thorp

What a great time and flight! I haven't quite landed yet. I do thank you so much and all the wonderful T-18 Guys & Dolls for having me and giving me such a good time. I know John would have been pleased with the whole thing.

This was the first time I have seen so many beautiful T-18's - mostly my contacts have been pictures & letters.

It was fun to hear some of the little stories that go along with each plane project. I'd like to do it all over again.

Dick is a good pilot and I enjoyed flying in the Sky Skooter again. We had a good trip home tho we were almost like "homeless" one nite but some good people took pity on us & took us home with them. Dick didn't need much coaxing to call ahead for reservations the next night - in Rock Springs WY. no less. Thanks again, Sincerely Kay



# TRUE AIRSPEED FROM GPS

by  
DAVID FOX

## TRUE AIRSPEED FROM YOUR LORAN OR GPS

Here is a quick and easy way to determine accurately the true airspeed of your plane provided you have a loran or a gps that will give your ground speed and show the direction you are tracking. It works at any altitude and with any wind. The only requirements are that the wind doesn't change appreciably and that you hold speed constant during the couple of minutes it takes to record the measurements. The procedure requires recording your ground speed while tracking (not heading) in a chosen direction, then while tracking perpendicular to that course, and finally while tracking on the reciprocal to the first track. The results you get will be very accurate as long as you hold the tracks and speed well and record the speeds correctly. Any units of speed (kts, m.p.h., etc.) used consistently are fine.

Step 1: Track in any direction (keep the track direction steady on the loran or gps) until you get a steady ground speed reading. Record it as V 1.

Step 2. Turn either way 90 degrees and track perpendicular to the previous track until you again show a steady ground speed. Record it as V2.

Step 3. Turn 90 degrees again in the same sense as the first turn and track in the direction opposite that of the track of Step 1. until you have a steady ground speed. Record it as V3.  
Compute your airspeed V by

$$V=1/2 \sqrt{V1^2 + V2^2 + V3^2 + V1^2 \times V3^2 / V2^2}$$

The components of the wind velocity in the directions of your first and second tracks are

$$W1 = (V1 - V3)/2$$

and

$$W2 = (V2 - V1 \times V3 / V2) / 2.$$

Example 1: You start by tracking east to get V1 = 160 kts, then turn and track north to find V2 =

163 kts, then turn west to find  $V_3 = 125$  kts. The computations give  $V = 144$  kts,  $W_1 = 18$  kts, and  $W_2 = 20$  kts.

It doesn't make any difference which directions you track or in which order you find the speeds as long as two are reciprocal (to obtain  $V$ , and  $V_3$ ) and the third is perpendicular to them. You could have started by going west to obtain  $V_1 = 125$  kts, then north to find  $V_2 = 163$  kts, then east to find  $V_3 = 160$  kts; the results are the same. They would also be the same if you started east to find  $V_1 = 160$  kts, then south to find  $V_2 = 123$  kts, then west to find  $V_3 = 125$  kts.

The "seat of the pants" method of estimating speed by averaging the ground speed found in one direction with that found on its reciprocal is good if the wind is roughly parallel to the courses flown, but it can be significantly in error when the wind has a non-negligible component perpendicular.

The following example shows this.

Example 2: Start by tracking north to find  $V_1 = 138$  kts, then turn east to find  $V_2 = 181$  kts, then turn south to find  $V_3 = 142$  kts. The computation gives  $V = 145$  kts. The north-south average is only 140 kts. Here  $W_1 = -2$  kts and  $W_2 = 54$  kts.

The last example uses non-cardinal directions. The only thing to remember is that  $W_1$  and  $W_2$  are the wind components in the first and second directions.

Example 3: Track 040 degrees to find  $V_1 = 119$  kts, then turn right to track 130 degrees and find  $V_2 = 137$  kts, then turn right to 220 degrees and find  $V_3 = 126$  kts. The computation gives  $V = 123$  kts,  $W_1 = -4$  kts and  $W_2 = 14$  kts.

David Fox EAA 331904

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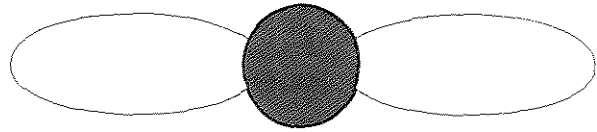
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# TORQUE VALUES FOR PROPS & EXTENSIONS

by Barrett M. Kemp



August 11, 1993

In the June 1993 RVATOR newsletter was a subject that would probably be of interest to T-18 people as well as RVer's. The subject was torque values for prop extensions, the crankshaft end.

Ken of Van's Aircraft, Inc. used the torque values obtained from the Standard Aircraft Handbook for his article in the newsletter, page 12. I think the torque value from that handbook is probably low for the intended purposes. The crush torque for a wood propeller is slightly higher than the Standard Handbook value quoted for the prop extension.

Prior to Oshkosh, I sent a letter to Ken at Van's Aircraft along with some information on torque values from my file. During Oshkosh Ken left a message on my recorder. Upon returning home, I called Ken and talked to him at some length. He had called Sensenich to confirm the data, then said he was a little scared at what he had done. Someone at his end told him no one would be hurt by using the lower torque. Still, he is worried and said he will put a correction in the next newsletter.

I have enclosed the same information that I sent to Ken. I used the Sensenich Table No. 3 for my prop extension torque for the crankshaft flange side. If I were to use a metal prop, I would probably use the Lycoming higher torque. I think people need to look at the available information and decide for themselves. I am sure the prop makers have torque information available for any type of prop and extension.

On another subject, Ken told me of a T-18 near him with a couple of interesting features. Retractable landing gear and 810 pounds weight. Van's Aircraft scales were used for weighing. Builder's name is Dunell Zander, Tigard, Oregon. Ken said the weight was accurate! Do you know of this airplane? I suggested it was made of balsa and tissue.

As we left Oshkosh, I told Les Krumel that this was probably the last time for me and Oshkosh. My ill feeling of what EAA really represents has finally reached a peak. We need an organization that represents the interests of amateur built airplanes and leaves airshows, warbirds, and hawking twin engine business jets to someone else. The charter should limit the tenure of officers and directors too. Is anyone else out there with this feeling and would like to talk about an alternative to EAA? Well, enough for now. Shirley and I intend to be at Kentucky Lakes in October. Thank you. Sincerely, BARRETT M. and SHIRLEY M. KEMP 434 WAKEROBIN RUSSELLVILLE, AR 72801 (501) 968-7318

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## WOOD PROPELLERS: INSTALLATION, OPERATION, & MAINTENANCE INTEGRAL FLANGE CRANKSHAFTS

Your Sensenich wood propeller was manufactured from aircraft quality selected lumber. The laminations are bonded with high-strength water-proof resorcinol glue, and were assembled under closely controlled factory conditions. Propeller balance was strictly maintained during manufacture and verified before shipment from the factory. Assembly of Type Certificated propeller/engine/aircraft must be accomplished by personnel holding the appropriate FAA license.

Installation of the propeller will require a front face plate of adequate stiffness (approximately the same size as the propeller hub), a flange adapter (in some cases), and a set of attaching bolts of the proper length.

It can be shown that an engine must deliver its driving torque to a wood propeller through static friction. That is, the force which resists movement of the propeller hub on the engine flange is due to compression of the wood surface against the flange. Therefore it is important to compress the wood to its maximum during propeller installation, but also important to avoid crushing the wood. Although the drive bushings incorporated in most flanges provide a back-up system, a load will be imposed on them only if there is movement of the propeller on the flange. The bushings can carry engine driving-torque loads for only a short period of time.

Forest Products Laboratory<sup>(1)</sup> data for Yellow Birch wood shows that the optimum compression pre-load of a wood propeller hub is approximately 0.006 inch per inch of hub thickness (i.e.: a propeller hub which is 1 inch thick before installation should be compressed 0.006 inch to a thickness of 0.994 inch by drawing up the propeller attaching bolts). Knowing the hub thickness and the number of threads in each inch of attaching bolt thread, it is possible to calculate the proper additional rotation of each attaching bolt after the front face plate, propeller, and flange (or adapter) are snug. For example, a propeller hub which is 4.50 inches thick should be compressed 0.006 × 4.50 equals 0.027 inch. If 1/2 inch dia. bolts are used (1/2-20UNF threads), they should be turned  $0.027 \times 20 = 0.54$ , or just over 1/2 revolution after the front face plate, propeller, and flange are snugged. See Table No. 1 for examples of common installations.

Generally recommended wrench torque to achieve proper hub compression against standard flanges are in Table No. 2. These torque recommendations do not consider variations of thread condition, and

assume that the threads of the bolts and in the drive bushings are clean and dry.

### INSTALLATION PROCEDURE

After study of the preceding discussion of wood propeller installation requirements and of your propeller assembly, the following installation procedure should be followed:

- (1) Be certain that the magneto switch is "off" and that both magnetos are grounded.
- (2) Install the flange adapter, if required. Adapter retention bolt wrench torque recommendations can be found in Table No. 3. Lock and safety-wire the bolts. NOTE: Some adapters require safety-wire through the bolt-heads, others incorporate safety-wired set-screws.
- (3) Locate the propeller on the engine flange, or adapter, in most convenient position for hand-cranking.
- (4) Remove a spark plug from each cylinder. Check the aircraft's wheels to prevent movement.
- (5) Install the propeller attaching bolts "finger-tight", so that the face plate, propeller, and flange are snug (but the wood has not been compressed). Check track of the blade tips by rotating the tips past some fixed object on the floor. The tips must track within 1/16 inch of each other when the installation is completed. Track should be corrected at this time by snugging up the bolts nearest the blade which is forward. This will result in a common starting point for all of the attaching bolts.
- (6) Tighten the attaching bolts in small increments, moving diagonally across the bolt circle. It is good practice to check track frequently while tightening the bolts. Take care to tighten bolts on opposite sides of the blade center line evenly so that blade-to-blade conformity of angles is maintained.
- (7) Since a small part of the wood compression is plastic(permanent), it is good practice to loosen the bolts, and to allow the wood to relax for an hour. Retighten following the same procedure.
- (8) Install safety wire. It is good practice to wire the attaching bolts in pairs (not a continuous wire), twisting the wire between bolt heads.

(1) FOREST PRODUCTS LABORATORY  
U.S. DEPT. OF AGRICULTURE  
MADISON, WISCONSIN

**TABLE NO. 1**  
**OPTIMUM WOOD PROPELLER INSTALLATION**  
**HUB COMPRESSION METHOD**

| Hub Thickness (in.) | Desired Hub Compression | Bolts             | Torque (Bolt Rev.) |
|---------------------|-------------------------|-------------------|--------------------|
| 3 $\frac{3}{8}$     | 0.020                   | $\frac{3}{8}$ -24 | 0.49               |
|                     |                         | $\frac{1}{2}$ -20 | 0.41               |
| 4                   | 0.024                   | $\frac{3}{8}$ -24 | 0.58               |
|                     |                         | $\frac{1}{2}$ -20 | 0.48               |
| 4 $\frac{3}{4}$     | 0.029                   | $\frac{3}{8}$ -24 | 0.68               |
|                     |                         | $\frac{1}{2}$ -20 | 0.57               |
| 5 $\frac{3}{8}$     | 0.032                   | $\frac{3}{8}$ -24 | 0.77               |
|                     |                         | $\frac{1}{2}$ -20 | 0.65               |

**CAUTION:** Final bolt-torque should be within the range shown below, TABLE NO. 2

**TABLE NO. 2**  
**WOOD PROPELLER INSTALLATION**  
**TORQUE WRENCH METHOD**

| Size of Steel Aircraft Bolts Specification | Dia.(inches) | Recommended Wrench Torque(in.-lb.) |
|--|--------------|------------------------------------|
| AN6  | 3/8          | 200 ± 25                           |
| AN7  | 7/16         | 250 ± 25                           |
| AN8  | 1/2          | 300 ± 25                           |

Ref. AN 01-1A-13(1946)

**CAUTION:** Over-tightening propeller attaching bolts will cause the wood of the hub to crush, breaking its moisture seal and slightly reducing drive-torque capacity of the installation.

**TABLE NO. 3**  
**ADAPTER RETENTION BOLTS**  
**RECOMMENDED WRENCH TORQUE**

| Size of Steel Aircraft Bolts Specification | Dia.(inches) | Recommended Wrench Torque(in.-lb.) |
|--|--------------|------------------------------------|
| AN6  | 3/8          | 280 to 300                         |
| AN7  | 7/16         | 480 to 540                         |
| AN8  | 1/2          | 720 to 780                         |

**OPERATING TIPS:**

The following practices will add to the service-life of your wood propeller.

- (1) Do not use the propeller as a tow-bar to move your aircraft.
- (2) Avoid running-up in areas containing loose stones and gravel.
- (3) Place the propeller in a horizontal position when parked.
- (4) Inspect frequently for bruises, scars, or other damage to wood and blade leading-edge protection. It is good practice to conduct pre-flight and post-flight inspections.
- (5) Protect your propeller from moisture by waxing with an automotive type paste wax. Keep the drain-holes in metal tipping open.
- (6) Assume that your propeller is unairworthy after any kind of impact until it has been inspected by qualified personnel.
- (7) Inspect and check propeller attaching bolts for tightness at least every 100 hours or annually. More frequent inspection may be necessary when climatic changes are extreme.
- (8) All wood and metal tipping repairs must be made at the factory or by an approved propeller repair station. If your propeller was manufactured with recessed synthetic leading edge protection, a kit is available from the factory for repair of minor damage to the plastic material.
- (9) Check propeller balance whenever there is evidence of roughness in operation.

If your propeller begins to show any of the following damage, it should be retired from service:

- (a) Cracks in hub bore,
- (b) A deep cut across the wood grain,
- (c) A long, wide, or deep crack parallel to the grain,
- (d) A separated lamination,
- (e) Oversize or elongated hub bore or bolt holes,
- (f) An appreciable warp (discovered by inspection or through rough operation),
- (g) An appreciable portion of wood missing,
- or (h) Obvious damage or wear beyond economical repair.

Refer to FAA publication AC43.13-1a for further information.

## **TIRE PRESSURE -A SIMPLE MATTER?**

“From the Central States Association Newsletter”

### **WHERE'D THE AIR GO?**

We all know that proper tire inflation is important. Probably, we even recall that underinflation can cause tires to creep or slip on the wheels when brakes are applied thus shearing off valve stems. Sidewalls can be crushed by the wheel rim flanges under the force of landing impact. The resulting damage can be a bruise, break or rupture of the cord body. Such damage requires tire replacement.

Severe underinflation can cause ply separation because of the extreme heat generated during sidewall flexing. The same condition can cause inner tube chafing and a resultant blowout. What a nice thought for a dark night landing on a narrow runway!

None of this can happen to you of course because you check your tires with a good gauge after installing a new tire. Right? Did you know that air is usually trapped between the tire and the tube at the time of mounting? During the next few days after mounting a new tire this trapped air leaks out the valve stem hole in the wheel. This event leaves the tire severely under-inflated, even though it showed the correct pressure after mounting. The correct procedure is to check tire pressure for several days after mounting a tire to assure the pressure is still correct.

OK, so all you smart ones knew that and figure I owe you a beer. Here is where I get the beer back. I'll bet you didn't know that tires grow. No, not on rubber trees. Tires are made of nylon cord which stretches for the first 12 to 24 hour period. This “growth” will result in a tire pressure drop. Those of you with tubeless tires aren't out of the woods either. It seems that molecules of compressed gas can actually diffuse through the rubber of a tubeless tire. Allowances for that phenomenon must be made when maintaining tire pressure. The maximum allowable diffusion is 5% for any 24 hour

period.

Tire manufacturers recommend checking tire pressure at least once a week, or daily if flown that often. Can't you just imagine removing your wheel pants to check tire pressure before each flight? There MUST be an easier way. I've been successful in checking tire pressure by noting the vertical clearance between the wheel pant and the concrete floor in my hangar. Normal fuel load variation seems to make little difference in wheel pant clearance when an EZ is parked in the nose down position.

## **“THE QUIET COCKPIT”**

by Lee Stevens,  
EAA Technical Counselor, Yakima, WA

I hope this information will be of some use for the The name of the material is ARMA FLEX. I buy it at the builders who want to quiet their airplane's cockpit. following thermal supply company: Industrial Rubber. This material can be obtained in sheets 3 ft. x 4 ft. x 1/2 Portland, OR. I hope this is of some help to you as I in. or 3/4 in. thick. The local FAA office allows it to be have spent a considerable amount of time seeking glued to the firewall and cabin side on PA-18's. It is material to use in aircraft for sound reduction purposes, black in color and is very good at absorbing sound. and was happy to have found it.

# FOR SALE

THORP T-18 FOR SALE by builder/owner N2819L

AIRFRAME: 485 hours total time since certificated in 1984. Top speed is 186 mph TAS. Cruise at 75% power is 170 mph. Cruise at 2450 rpm is 160 mph. Empty weight is 975#, Gross weight is 1600#. Power loading is 10:1. Baggage to 50#. Wing loading 18 lbs./sq./ft. Always hangered, no corrosion. Never damaged. Tinted sliding canopy, shoulder straps, adjustable air vent, cockpit heater. Flap and aileron gap seals. 3M sound and vibration dampening foam/aluminum used throughout. A fitted gortex fabric canopy cover is used away from the hanger. Distinctive orange/yellow polyurethane paint scheme. Custom fabric interior of non-flamable materials.

ENGINE: Lycoming O-320A2B, 150 hp. 465 hours SCMOH by Piedmont Aviation engine shop. Stainless steel cross-over exhaust stacks, oil cooler and filter, air/oil separator, EGT, CHT, voltmeter, ammeter, oil pressure and temperature. Autogas authorized. Burns 8gph from a single, 29 gallon aluminum tank, gravity feed. Vernier controls.

PROP: Wood/fiberglass computer-designed and crafted by Craig Catto who builds custom props for the Formula I racers. It's a cruise prop with a 70"dia./73" pitch.

AVIONICS: King KX 155 navcom and King KI 209 CDI with glideslope, King KT 78 transponder and a Transcal 120 encoder, RST 504 audio panel with a voice-actuated intercom, marker receiver, 99 waypoint LORAN, handheld Terra TPX 720 transceiver, ELT and two Clark HIO-40 headsets. Mic switch on the stick.

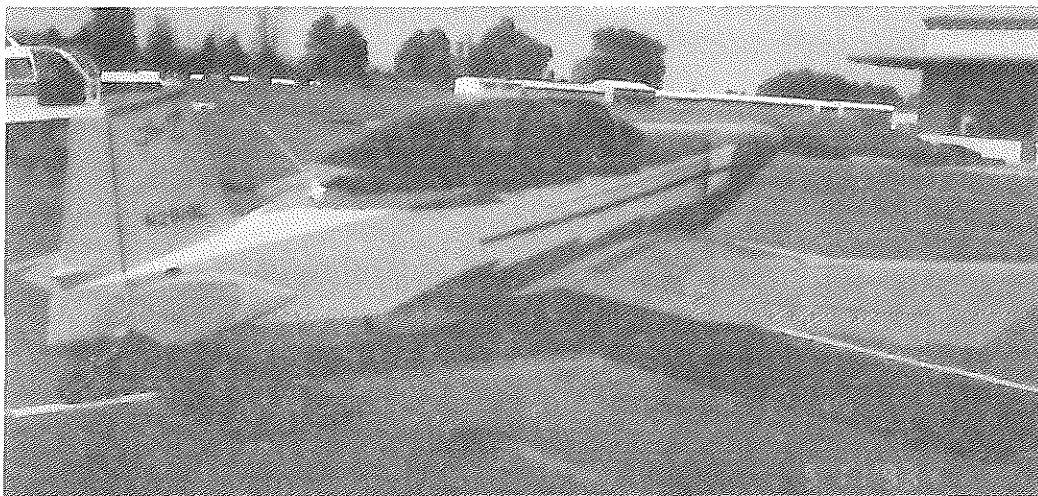
INSTRUMENTS: Certificated for IFR. Vacuum directional gyro and attitude indicator. Electric turn coordinator. Nav lights, strobes, and a landing light. Instruments are bezel lighted and reostat controlled. Alternate static air valve. Shock absorber mounted panel.

This T-18 was built with great care to be airworthy for many decades. It incorporates many nice features. It was built in Merced, CA, from 1979-84 in 5,000 hours.

Any T-18 is NOT certificated for aerobatics. It's a fine cross-country airplane and 2819L has been flown from California to Oshkosh three times.

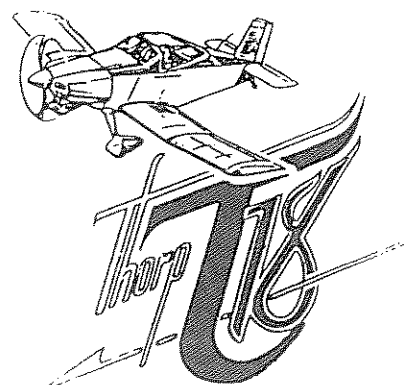
A prudent buyer should be competent and confident flying a high performance taildragger. The T-18 is based at the Pine Mountain Lake airport near 38N, 120W on the SFRan sectional chart. Groveland is a small town nearby.

Contact Wayne Irwin, 12741 Cresthaven Drive, Groveland, CA 95321. (209) 962-4253.





**LET'S FLY**



**THORP T-18**  
**2nd Annual Placerville**  
**Fly-In**

**DATE:** October 8-10, 1993

**WHERE:** Placerville (Hangtown)  
California

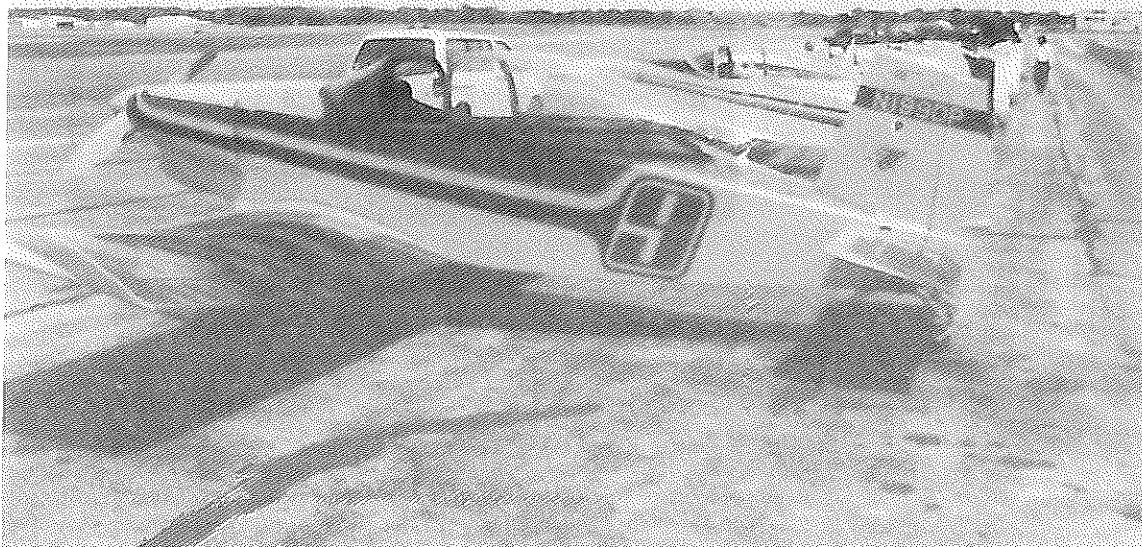
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**EVENTS:** Yes! - Cork Flying, Bring champagne

**PRIZES:** Yes!

**FUN:** Yes!



*Richard Penman's brilliant yellow and red T-18*

## T-18 FALL MEETING KENTUCKY DAM VILLAGE STATE RESORT PARK

The Fall 1993 T-18 weekend at Kentucky Dam Village State-at-e Resort Park will be held on October 8-9. The private dining room has been reserved for Sat. Oct. 9, at 12:00 noon. (Note this is a change, we could not get the dining room for the evening). We will again use the buffet.

MAKE YOUR RESERVATIONS WITH THE PARK DIRECTLY. YOU MUST SPECIFY YOU WANT THE PAINE PARTY IN ORDER TO RECEIVE THE QUOTED RATES. THE LODGE MAY BE FULL OTHER THAN THE ROOMS THEY ARE HOLDING FOR, OUR PARTY AS WE HAD TROUBLE GETTING RESERVATIONS THIS YEAR. RESERVATIONS MUST BE MADE BEFORE SEPTEMBER 8, 1993. RATES ARE: \$45.47 (single) \$54.75 (double)

KENTUCKY DAM STATE PARK P.O. BOX 69 GILBERTSVILLE, KY. 42044  
1-800-325-0146

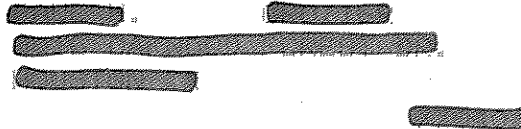
Camping is also available on a first come, first serve basis as well as cottages. Contact the resort for information.

Kentucky Dam State Park Airport is 30 miles east of the Cunningham VOR (Paducah) on the 90 degree radial, 8 miles south of V178. The runway is paved, and 4000 feet long. The airport is approximately a mile from the resort, however transportation is available for those who do not wish to walk.

BRING YOUR OWN TIE DOWNS.

T-18 NEWSLETTER  
ROUTE 3, BOX 295  
CLINTON, IL 61727  
1-217-935-4215  
NO. 88 Sept 93

Bulk Rate  
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T-18 FALL MEETING KENTUCKY DAM  
VILLAGE STATE RESORT PARK  
OCT 8-9

2ND ANNUAL PLACERVILLE FLY-IN  
OCT 8-10

# T-18 NEWSLETTER



*Jim Stuart's gorgeous two-tone, brown trimmed Thorp T-18. Jim lives in Santa Ana, CA*

## IN THIS ISSUE:

**Oshkosh 1993 to Me** by Frank Snedeker

**First Flight** by Jim Stuart

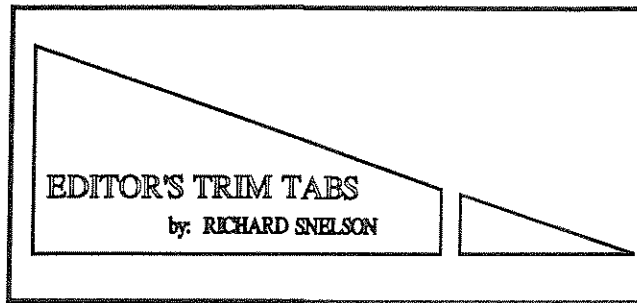
**Placerville 2nd Annual** by Hal Stephens

**Mountain Flying** by Hal Stephens

**The John Thorp Legacy**

**"This Nut Flew Around The World, Contest"**

*NOTICE: (STANDARD DISCLAIMER) As always , in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.*



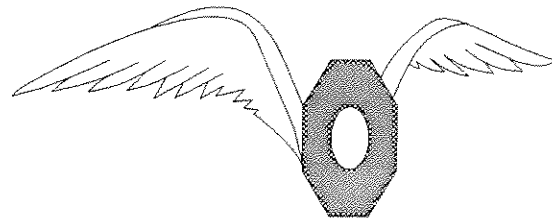
### Reflections:

Some of you may be busy building and haven't taken time to look up to see what's going on. Others may be flying their Thorps and just don't spend enough time on the ground to notice. One who has noticed, is the lady that answers our phone, my wife RoxAnne. She takes the calls from members, new prospective members to the T-18 Mutual Aid Society and others that want to buy a T-18 in the worst sort of way, but just can't find one. What this means is that the demand and therefore the value of our aircraft has gone up. Sure, the timing is also right for this to happen for a number of other reasons. Fewer and fewer airplanes in the general aviation fleet, more demand and so forth. But because of the Thorp T-18 article in Sport Aviation, the 30th anniversary at Oshkosh and the T-18 Mutual Aid Society our aircraft is right up front again. Pilots everywhere want to get a ride in a T-18. I now have a waiting list and it's growing. Former T-18 owners call that have since had Glassairs and RV's and want their T-18 back. It's great to hear all the "I want stories" and have a fine T-18 sitting ready in the hanger for "my" beckon call. If you're a new builder or an old one that just needs to finish his project, get a move on! Time's a wasting and we need you in the fleet for the next trip to Oshkosh and wherever the local T-18 events may be next year. Happy Building!

During dinner at Oshkosh Don Taylor offered The T-18 Mutual Aid Society Members some actual nuts & bolts that he had kept from his T-18 "Victoria" that flew around the world. Many of you might like to have one to make it a part of your airplane for good luck, or to put it on a small plaque for a conversation piece. I'm

thinking of a small dash mount plaque that says "This nut flew around the world". No Don, that's not referring to you! To make the distribution of the souvenir parts fair let's have a simple contest that will benefit all the members. Just write an article on something about the Thorp T-18. If you don't think there is still more that should be said about building this machine just ask Roy Farris of Olney, Illinois. He just went through skinning his wings and had a rough time getting started. Roy reads everything in print about building the T-18. He said that parts don't always fit and new ideas on assembly are needed. For details of the contest see "The Nut That Flew Around The World" page in this newsletter. There are only 24 pieces so take out your pen and start writing. Again our great thanks to Don Taylor for all that he has done for the homebuilt movement and especially the Thorp T-18.

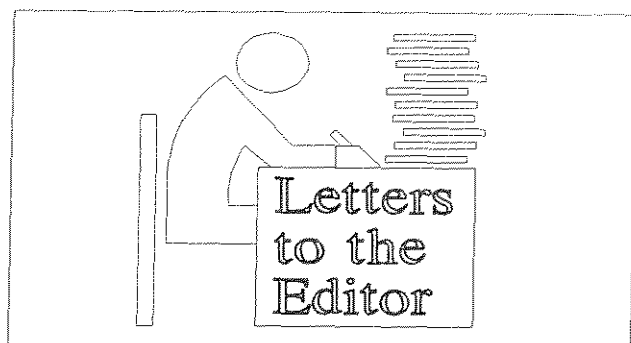
### "The Nut That Flew Around The World Contest"



See page 19 for the contest details.

### **Dues Dues Dues**

It's time for 1994 Mutual Aid Society Dues. As mentioned last year the dues are set up to all be due at the first of the year. However, a lot of folks paid late in the year. In fact there are still several still behind for 1993. This will be the last newsletter they will get. I've got to stop sometime. Our printing costs continue to go up. It never fails most will send late checks and letters saying "Boy I'm glad you didn't drop me" and then one lone fellow will write that he didn't want the newsletters anyway. Oh well! I'll bet he read every darn one of them. Don't you? If he got one safety idea or suggestion it was worth sending them to him. **Check the mailing label for your status, no pay for 93 and paid for 94s are marked. Thanks!**



Dear Richard,

It was nice to meet you at Oshkosh and I'm glad to be part of the Mutual Aid Society now. My first time out there was great, I never saw so many homebuilts, not to mention T-18's.

A lifelong ambition of mine has been to fly, and the ultimate-- to build an airplane. Now it's becoming a reality. When I first learned about T-18's I was thoroughly impressed, having gotten to know John Popejoy (another builder), where I worked. Until then I thought homebuilt airplanes were only in magazines, and was just short of envious. At once, I decided an all metal craft would be my choice also. Other things I looked for were two seats and most of all, folding wings. There are other planes that meet these requirements but few to build from plans one part at a time. Kit planes are available, but I wanted to really BUILD a plane rather than assemble somebody else's.

That was almost 10 years ago, and now I want to thank Bob Kemp who's been a great help getting me off to a good start. One day talking about my aspirations with Bob (whom I just met) I learned he was a generous man as he freely offered me a legitimate set of plans. Later, he even gave me parts to go with them. These were all new parts, enough to build a whole fuselage: frames, skins, extrusions, and miscellaneous others. Bob's a real supporter for the homebuilders; he even took me to Oshkosh and continues to be a good teacher. I'm sure you realize the great help it is to have someone provide moral support, sharing the same interest, and I'm blessed to have such encouragement.

My prospective goal is to be in the air in 5 years. It shouldn't be too long before Bob has his own plane flying.

Your efforts are well appreciated too. The newsletters are a good source of information. One of the most important aspects I considered about the T-18 was it's time-proven design. It seems to be well understood by now and with folks like you and other contributors, there's a lot written about it. I have my EAA membership and Tony Bingelis' books too, but nothing beats these newsletters for specifics on the T-18. At this point in my experience it's doubtful I can offer much, but will write again when I get my feet really wet. Thanks. Sincerely, Les Krumel  
P.O. Box 1115 Cedar Crest, NM 87008



December 11, 1993

Dear Richard,

My T-18 N89ER (formerly N56VB) sn 1106, which I have spent four years rebuilding, flew once again today.

The airplane had flown 232 hours between 1978 (new) and 1980 but the previous owner became disenchanted with it and allowed it to sit outside in the weather for about eight years prior to my purchase in 1989. It had not been run or even tied down. The wheels had sunk about 6" into the soft ground and that was likely the only thing that kept it from blowing away. The engine, airframe, and systems rebuild was challenging. I believe I could have built an airplane from scratch easier.

N89ER is a standard T-18. It has a 0320B3B 160 HP engine, a wooden 66X80 inch Sensenich propeller, 2" extended landing gear, and full IFR electronics and instruments. Empty weight (with oil) is 1022 lbs.

It was with great pride that I watched Gary Green of Pecan Plantation, Texas do the test flight. Ken Morgan from Arlington, Texas

flew chase in his beautiful T-18.

Gary graciously provided about one half hour of instruction in his T-18 but I did not feel that I was ready to fly the airplane considering the pressures of the day and the number of hours I had spent in the previous week getting it ready.

Gary said the airplane had normal flight characteristics and no problems were noted other than standard "aw-shucks I'll fix that" type items.

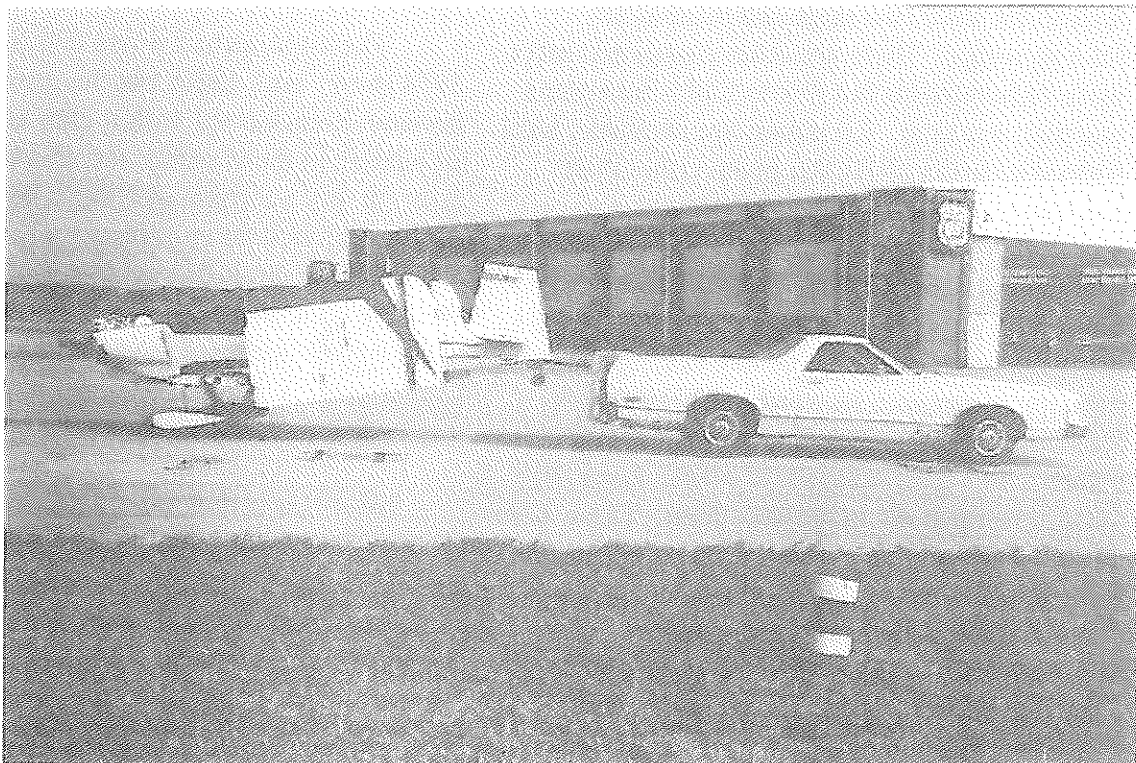
T-18 owners providing technical and moral support for this event were Gary Green, Ken Morgan, Tom Landham and Jim Putney. It was quite a thrill to see five T-18s on my apron in Temple, Texas.

Sincerely, Evan A. Roberts Rt. 5, Box 158-C  
Temple, Tx. 76501 (817) 778-2252

DEAR RICH; PLEASE FIND A CHECK FOR \$25.00 TO COVER MY ENROLLMENT IN THE T-18 NEWSLETTER. I DO HAVE ALL OF LEW SUNDERLAND'S LETTERS AND WORKED CLOSELY WITH LEW ON THE FOLDING WING. IN FACT, I GAVE LEW THE IDEA AT OSHKOSH IN 1979 I BELIEVE. HE DID THE DRAWINGS AND JOHN THORP DID THE STRESS WORK UP ON IT.

I SUPPOSE THE DRAWINGS ARE COMPLETE FOR THE WIDE BODY AND FOLDING WING NOW, BUT WE WERE IN A HURRY TO GET IT FLYING AND ALL I HAD WAS A LIST SHEET, TO TRANSFER TO THE ORIGINAL DRAWINGS. I STARTED FLYING MY BIRD IN 1981, AFTER 7 1/2 YEARS AND 6000 HRS. OF WORK IT IS A BEAUTIFUL BIRD. I CRUISE AT 180 MPH @75%POWER. I DO TOW IT AS YOU CAN SEE LIVE 4 MILES FROM THE AIRPORT.

(cont on next page)



*Bill Brackett's beautiful white with blue trim T-18CW under tow*



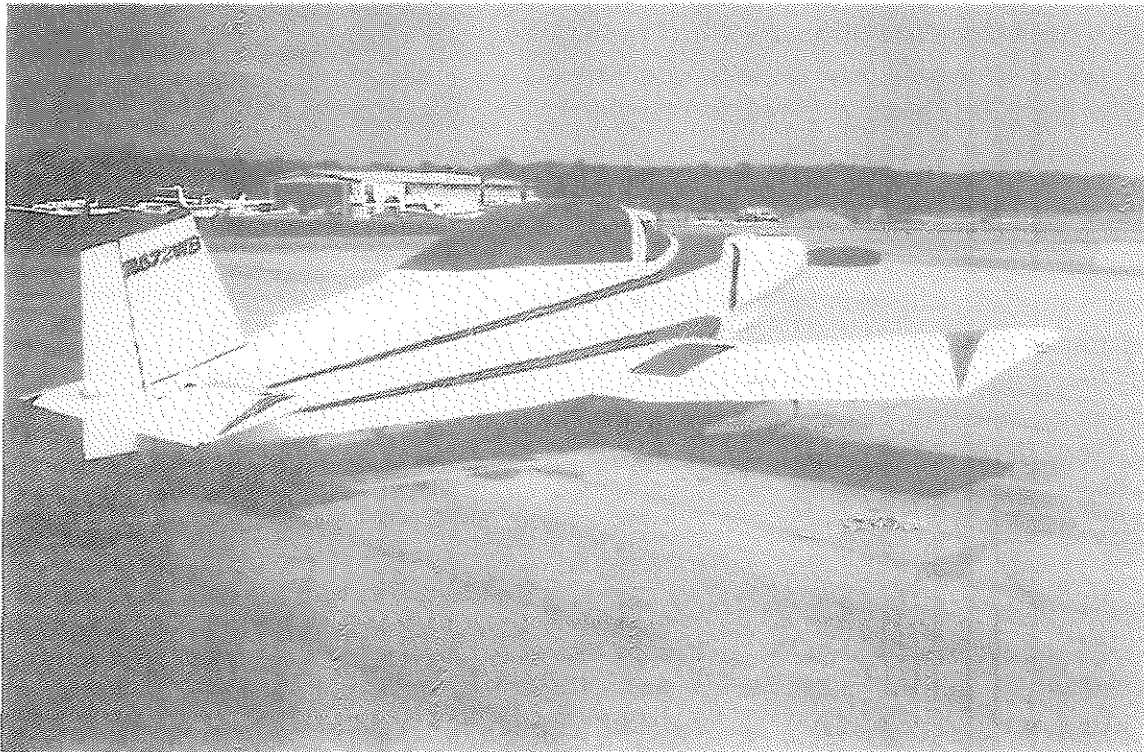
IF I CAN BE OF ANY HELP TO ANYONE, PLEASE LET ME KNOW. ALSO PLEASE ADVISE ANYONE USING THE STRETCHED FUSELAGE TO KNOW THAT IT WAS DONE FOR THE HEAVIER MOTORS & COULD BE A PROBLEM CG. WISE IF THEY USE A LIGHTER MOTOR. BILL BRACKETT 152 NORTH ROAD BUTLER PA.16001 (Editor's Note: Bill regrets it but his T-18 is for sale.)

### For Sale

EXPERIMENTAL THORP T-18CW(CONVERTABLE WING) 2 PLACE SDE BY SDE (40')WIDE BODY 72#

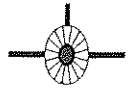
BAG.CMPT. FOLDING WING VERSION HIGHWAY TOWABLE (8FT.WIDE) USING A 1978 FORD RANCHRO PICK UP BUILT BY MACHINIST WITH 40 YRS.EXP.& INST.PILOT. I0360 AIA 200 HP./ CONST SPEED PROP. INDIRECT LIGHTED PANEL. PLUSH INT.BLUE & RED FINE WEAVE EXT.BLUE ON WHITE 3 FUEL TANKS W 54.6 GLS.TOTAL. 2 DAVID CLARK HIO-40 HEAD SETS 1981 E.A.A.AWARD WINNER (FOLDING WING)FLIES LIKE A "P51" "NARCO" EQUIPMENT I MK12DVOR/ILS 1 MK12DVOR. A.D.F. 841 DME.890 TRANSPONDER AT150 AUDIO PANEL CP-136M CHT/EGT ALL4 CYL. I.F.R.CERTIFIED BILL BRACKETT PHONE DAYS (412) 287-5804 EVENINGS 287-8212

*Editors Note: Since Bill sent this article he had a power failure on take off that resulted in some damage to the landing gear. Anyone interested in owning a T-18 needing some repairs should give him a call.*



*Another photo of Bill's fine flying machine. It's nice to hear from the east coast Bill!*





Sept. 13, 1993

Dear Richard,  
I'm way past due on my report about the Rocky Mountain Regional Fly-In @ Greeley Colorado in June. I believe there were 11 T-18s in attendance.

These are the ones I can remember - Jim Borg & son (from Minnesota), Dean Cochran (Broomfield, Co. ), Jerry Feuerman (Denver, Co. ) Walt & Bev Giffin (Pueblo, Co.), Pete Gonzalez (Colorado Springs, Co.), Jim & Judy Paine (Dayton, OH), Ed & Jennette Ludtke (Sioux Falls, SD), Bob & Juanita Ryan (Seely Lake, MT), and two others - one from Canyon City, CO & one from Sheridan, WY (I apologize for not remembering their names). Next time I'll write everyone's name & N- number down.

Myself, with John Burton from EAA Headquarters as passenger, and the Ludtke's made a flight on Sunday morning over the mountains and Estes Park, Colorado for some sightseeing. I received a nice letter from John in appreciation - his first time flying in the mountains, and he remarked how wonderful to be flying @ 10,000 msl & look up at mountains surrounding. It was so good to see you @ Oshkosh & such a great showing of T-18's !

We're going to try to make the Placerville, CA T-18 FlyIn in October, so won't see everyone in Kentucky the same weekend. Wish we could be 2 places at once! Take care! Best regards, John Evens N71JE.



9/20/93 Lincoln, NE

Dear Richard, I've been working like a dawg ever since Oshkosh getting the bird ready for paint, and things are beginning to take shape. I

was dissatisfied with the fit of my previous fairings so I made some new ones: and that coupled with many other little things that needed attention, and the summer has gone, but it looks like it's really going to be completed with an annual all brought up to date within the next month, so the light is there. I'll send you a picture for a future newsletter when you print a lot of pictures. Also if you think that there is any interest, I could explain the way that I did the fairings; although it was just the basic routines of fiberglassing; let me know.

Many thanks for all your efforts, we of the MAS really appreciate it! Best regards, Harlo McKinty.

*(Editor's note: Good to hear from you Harlo. Please do write it up and send along with the picture of your plane.)*



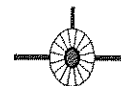
## Wanted      Wanted:

DYNAFOCAL MOUNT  
COWLING  
CANOPY  
STABILATOR TIPS

Call or write John Winton Box 84, Port Mansfield TX 78598 Phone number 210-944-2641



Dear Richard, I am interested in a project 50% completed or flying. Prefer wide body & folding wing. But will consider any T-18. Jeff Klossner Call (719) 539-3737



Dear Editor, Kentucky Dam is a great location for our semi-annual T-18 gathering. The scenery is magnificent and a walk along the dam is a thrill. This year we had a good attendance with people flying or driving from all directions. We missed Rich and Roxanne Snelson. In spite of a cloudy, cold, windy day, Saturday

was spent flying and discussing building. We brought our Cessna 140A and Elaine Skillman and Terry Martin got a lesson in tail dragger flying in it from Dave.

A group went to Patty's "Pork House" Friday then to the Brass Lantern on Saturday, where we sat with Rush Limbaugh and the dwarfs.

We had a luncheon meeting Saturday with Jim Paine leading the recoup of the year's activities. We decided to meet again at McAlester, OK in May of 1994. We ended our meeting by singing "Happy Birthday" to Judy Paine.

A visit to the quilt museum in Paducah was a treat with Judy Paine, her daughter Heather and Mother-in-law Mary Paine from Montana. Mary learned to quilt when she was six years old and had made 30 quilts by the time she was married. Best of show for the American Quilter's Society Show and Contest was titled "Air Show" by Jonathan Shannon from Belvedere, CA. He featured old biplanes and on the reverse side had a parachute. That quilt was front and center for us Air Show participants.

T-18er Russ Ross's wife Terri is a quiltmaker, works with Girls Incorporated, ages 6-18, children from broken homes. They enjoy quilting, and presented one of their quilts to Barbara Bush in 1991.

We were sorry to hear of Russ' daughter's death in August. We extend our sympathy.

We saw the following T-18s at Kentucky Dam: N785EL Ed Ludtke, N711SH Bob Highley, N805GS Gene Sloan, N110JP Jim Perrine, N18CR Cliff Redden, N118GG Gary Green, and N747JP Jim Paine.

The annual EAA Southwest Regional Convention at Kerrville was October 15 and 16. T-18s and owners we saw there were Ken Morgan and Tom Landham of Dallas, Bud Payne of Austin, Stash Simpson of Wichita Falls, and Dave Gerlach from Friendswood. Larry Whetzel flew all the way from Ramons, CA in his brand new T-18.

November 1 we enjoyed a visit with Dick Cavin and his bride, Pat. They have our congratulations and best wishes. Regards to all, Pat and "Name Withheld" Eby.

## FOLDING WING INSPECTION

*Editor's Note: The following is part of the Wing and Maintenance Manual for the T-18C. Written by Lou Sunderland. Some years ago. I'll print the preflight inspection information in the next newsletter.*

SUNDERLAND AIRCRAFT 5 Griffin Dr. ,  
Apalachin, N. Y. 13732

### WING INSPECTION AND MAINTENANCE MANUAL FOR T-18C

#### 100 HOUR INSPECTION

(1) Inspect all wing panels for loose rivets, fatigue cracks and general structural integrity. When areas around flush skin attachment rivets are filled with a plastic filler, some circular cracks normally occur in the filler around the rivet heads. The rivets should not come loose, however.

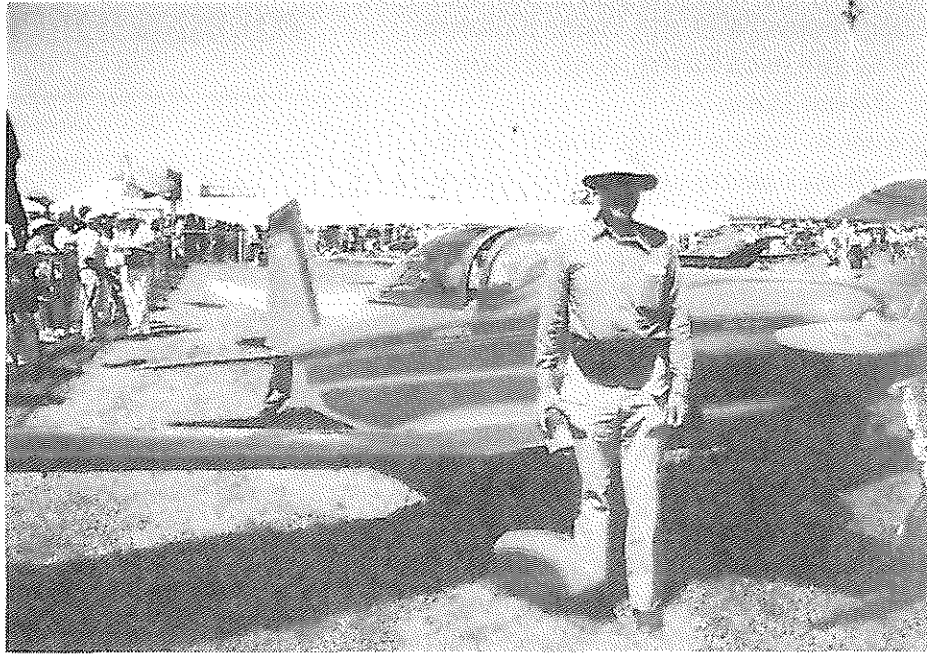
(2) Check aileron control linkage for excessive free play between stick and surface. Adjust the adjustment screw in the 211 aileron bell crank as necessary.

(3) With outer panels installed, check for free play at main spar pins. If the free play in a main spar joint exceeds .100" as measured at the wing tip, new 231 pins should be made.

#### LUBRICATION

All bearing joints (bushings and hinge pins) should be lubricated with Moly-Kote or an equivalent dry lubricant every 500 hours or every 5 years, whichever occurs first. If operation is in severe conditions of dust or moisture, lubrication should be performed more frequently.

*The free play inspection should be made on all T-18Cs.*



# OSHKOSH 1993 - TO ME

## By Frank Snedeker and Thorp T-18 ... N54FS

What airplane builder would not want to fly his own to Oshkosh? What T-18 builder, particularly on the occasion of the 30th anniversary of John Thorps' design of the T-18 would not want to be there? Many that wanted to, could not, for various reasons, make the historic event. I had wanted to in each of the two previous years, make the trip, but could not. It was imperative that the anniversary year just had to be the year.

I piloted N54FS (Frank/Sabrina) with Tim Martin as copilot to Oshkosh '93. We flew formation on the wing of Cecil Hendricks in his T-18, N583C, and his copilot, Bob Heath who is building his T-18 in New Zealand. Our trip started at Auburn airport, near Seattle. The first leg was to Kellogg, ID for refueling. Weather ahead

reported #5 thunderstorms. We turned back into Washington, headed south and then east again through southern Wyoming and Nebraska, north to Sioux City, then Worthington, Austin and on to Oshkosh. But Oshkosh, and the return trip, is the purpose of this story.

Here is my personal story, at Oshkosh, and my solo flight home via Minneapolis MN, Rapid City ID, Greeley CO, Albuquerque NM, Phoenix AZ, Mojave CA, Lancaster CA, Lodi CA, Eugene, OR (with an unscheduled pit stop at Dunsmuir Mott, CA), and the last leg from Eugene to Auburn Municipal, WA. for a total of a tad less than 6,000 miles and 48 flight hours.

All of the stops were to visit family, refuel or to repair the electrical system. The stop at

Dunsmuir-Mott was a necessity of the first order. It is a fact ... the capability of N54FS, is far greater than my capacity. She is insensitive to my needs. She just does not understand. So at Dunsmuir Mott, after 3+ hours in the air I turned her GPS 55 to OFF ... and manually made a diving right turn around a hill, a close in base over I-5, across the threshold to a fast landing, a rapid deplanement, refueled and, was again airborne. N54FS has the capacity to go 5 hours plus reserve at long range cruise at about 150 MPH and burn about 7 1/2 Gal/Hr. The engine is a 180 HP. Lyc 0-360-AIA, The propeller is 1/16" laminated wood by Hendrickson with dimensions 68 X 80.

pulled the power back to 2150 and 18". It takes longer but who's in a hurry anyway. At Rapid City, SD I delayed departing in order to give my nephew a ride. It is a pleasure to see a passenger "pleased as punch".

It was 1930 by the time I landed at Greely, CO. A heavy black rain was over the Greely area as I approached 20 miles out. It was clear to the north and I had plenty of fuel to select an alternate. The rain cleared as I landed. The only life on the field was an abandoned dog. After calling 13 hotels in the area and no vacancy I pitched a tent. Fortunately, and many thanks to EAA Chapters #301, 515, #648, 43, 72, 660,720, and the Colorado 99's, the



*Left to right, Frank Snedeker, Cecil Hendricks and Tim Martin*

In the vicinity of Fresno, CA in smooth air I trimmed her out and held a steady 8,500 ft. ,OAT of 51 Degs, RPM 2450, M.P. 24" and a TAS of 173 MPH. I claim no more than that...., she weighs more than some ... Her 9 gals in each wing gives her range and that is a real comfort. After this and one other check I

Colorado Pilots' Association, and about 15 local businesses that poured a concrete slab about 25' X 40' with a high roof I was comfortable. There are picnic tables, a sink, and barbecue. A truly wonderful project and very much appreciated. I set up my tent under that shelter. The following morning I had a com-

fortable breakfast in the airport restaurant and taught the cook how to scramble an omelet using one TBLS of water per egg. Greely is a great place to visit.

Next stop was Albuquerque, NM. Uneventful. Temperatures warming. Changing scenery. But, I was cool in her cabin what with air coming from the rear of the canopy as well as from automotive dash vents bringing air up from under each wing root through NACA scoops. I landed at the 'Double Eagle' airport just west of the city after a 3 1/2 hour leg of 442 miles. I was hungry and the restaurant was closed. The lady opened it up just for me and in the kitchen we put together a meal. I refueled and was on my way to Phoenix. Thank you very much to Double Eagle. Five minutes en-route voltage charged above 14, then 15 and at 16 I killed the field, turned everything off except the GPS which is powered separately from the bus. There were thunderstorms to the north and one dead ahead, approaching Phoenix which I went around and got back on course with the GPS and started the descent to land at Falcon Field. O.A.T increased with each 1,000' on the way down. I closed off the panel air, turned the radios on to ATIS and then tower and landed. It was 110 Degs. and not like Seattle

At Phoenix my brother and I removed the cowling, in the heat, and the FBO installed a new voltage reg and alternator. My next leg was to California City. Five mins. out of Phoenix the field fuse burned out and I shut everything down again. I circled Cal. City but did not land. Instead I landed at Mojave and talked to several people there and was advised to go to Fox Fld, Lancaster, CA ... and there a new 60 amp voltage reg was installed and, this is important, the battery was charged overnight. No more problems except that out of Eugene I had pressed a wrong button on the GPS and could not get the CDI to come on screen. Using a Sectional chart and two GPS screens alternatively I could get Desired track, Course to

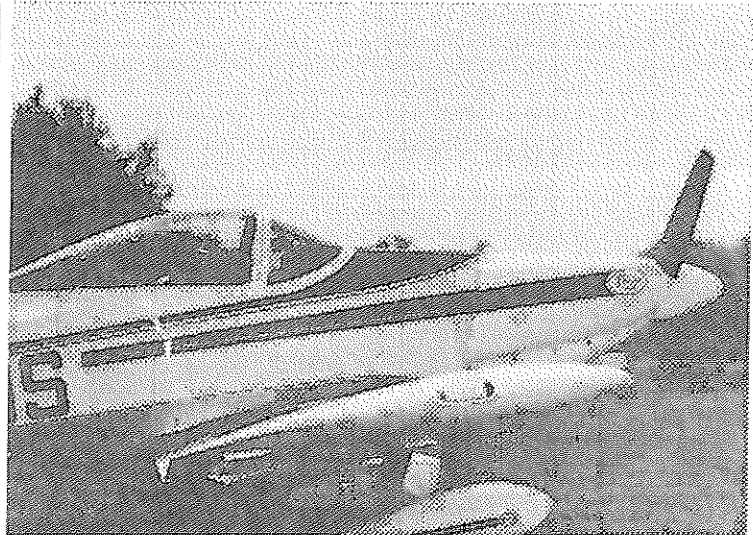
steer, distance and time to destination. Who could ask for more except the ease of the CDI.

As for Oshkosh, it was a very enjoyable event. They did not close the field but in fact had beautiful weather. The T-18 dinner and the Memorial service for John Thorp were most important highlights. A tent lunch was served near the Chapel giving an opportunity to visit quietly with and meet other T-18 builders. I thank GOD for the entire trip and for my T-18, "NANA I KE KUMU".

# FIRST FLIGHT

## for Jim Stuart

Finally completed N428JS after 6 1/2 years of effort. First flight was on June 29th and as advertized it flies great. Since I had zero tail dragger time, first flight was made by Dix Mackey of Orville, Calif. Bill Dasse of El Toro, Calif. is checking me out.



*Our cover photo of Jim Stuart's standard body T-18*

8JS is a standard body, standard wing Thorp with a 150 HP LYC 0-320 E2D engine swinging a Sensenich 70/73 prop. Empty weight is 986 lbs. I don't have any performance data yet. Keep up the good work in publishing the newsletter. I certainly obtained a lot of good information from it. Enclosed you will find some sketches I made during construction of 8JS. These are not all my ideas so I can't take all of the credit. Publish them if you want. If any builders have questions about the sketches they can call me. When I obtain some performance data I will send it along. Jim Stuart 1521 E. Avalon Santa Ana, Calif. 92701 (714) 543-2331 (*Editor's note: more of Jim's drawings in the next newsletter*)

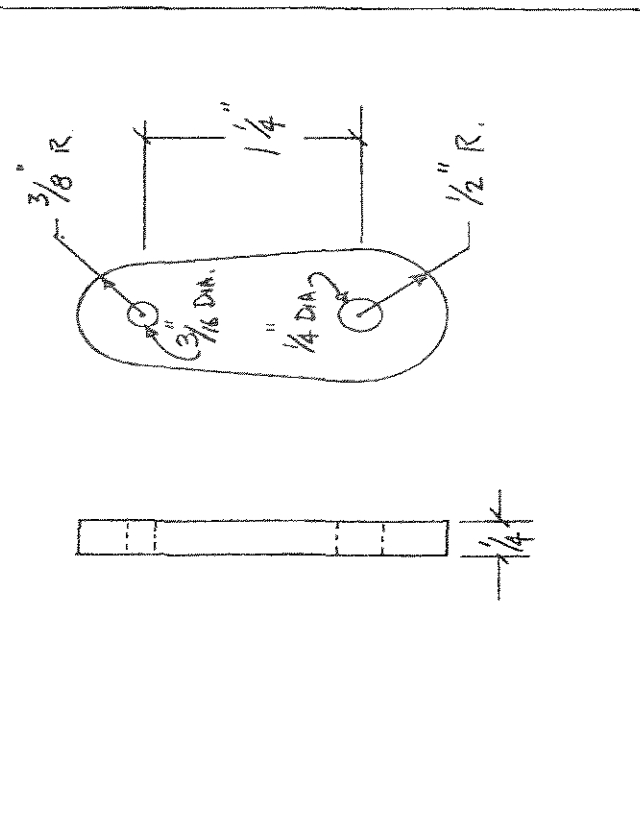
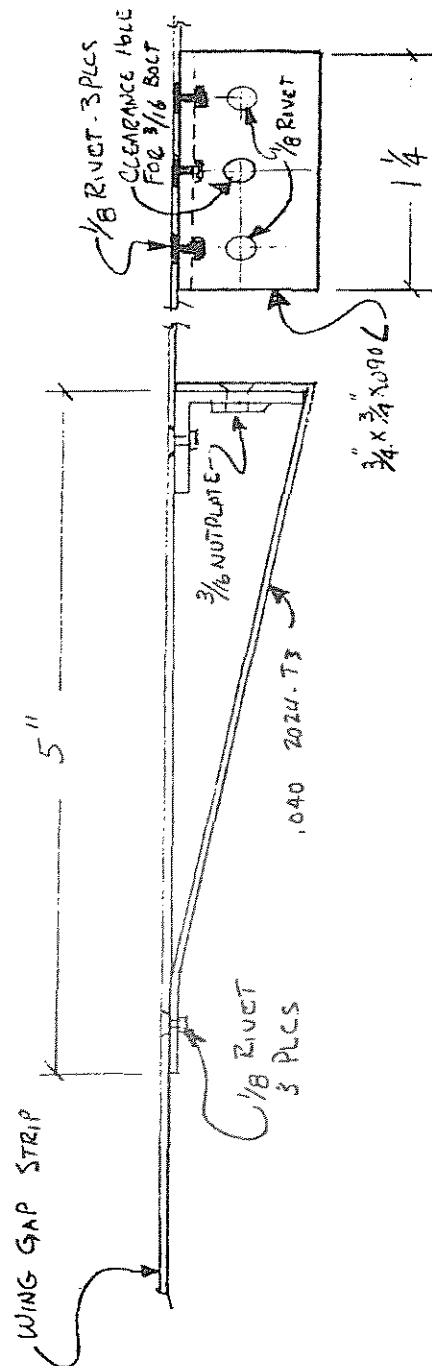
### C.G. CALCULATION FOR THORP T-18 N428JS

|                      | WEIGHT |   | STATION |   | MOMENT  | % MAC |
|----------------------|--------|---|---------|---|---------|-------|
| MAIN WHEELS          | 957    | X | 54.75   | = | 52,396  |       |
| TAIL WHEEL           | 45     | X | 214     | = | 9,630   |       |
|                      | 1,002  |   | 61.9    | = | 62,026  |       |
| OIL                  | -16    | X | 28      | = | -448    |       |
| EMPTY C.G.           | 986    |   | 62.5    | = | 61,578  | 15%   |
| EMPTY C.G.           | 986    | X | 62.5    | = | 61,578  |       |
| 1 PASSENGER          | 170    | X | 85.5    | = | 14,535  |       |
| OIL (8 Qts.)         | 16     | X | 28      | = | 448     |       |
| FUEL (29 Gal.)       | 174    | X | 50      | = | 8,700   |       |
| MOST FWD C.G.        | 1,346  |   | 63.3    | = | 85,261  | 16.6% |
| 2ND PASSENGER        | 170    | X | 85.5    | = | 14,535  |       |
| BAGGAGE              | 44     | X | 109     | = | 4,796   |       |
| GROSS WT. C.G.       | 1,560  |   | 67      | = | 104,592 | 24%   |
| FUEL (1 Gal. remain) | -168   | X | 50      | = | -8,400  |       |
| MOST AFT C.G.        | 1,392  |   | 69.1    | = | 96,192  | 28.2% |

EMPTY WT. = 986 LBS.  
 ALLOWABLE GROSS WEIGHT = 1560 LBS.  
 USEFUL LOAD = 574 LBS.  
 WING MAC IS 50 IN.  
 MOST FORWARD C.G. LIMIT IS 15% MAC = STATION 62.5  
 MOST AFT C.G. LIMIT IS 32% MAC = STATION 71

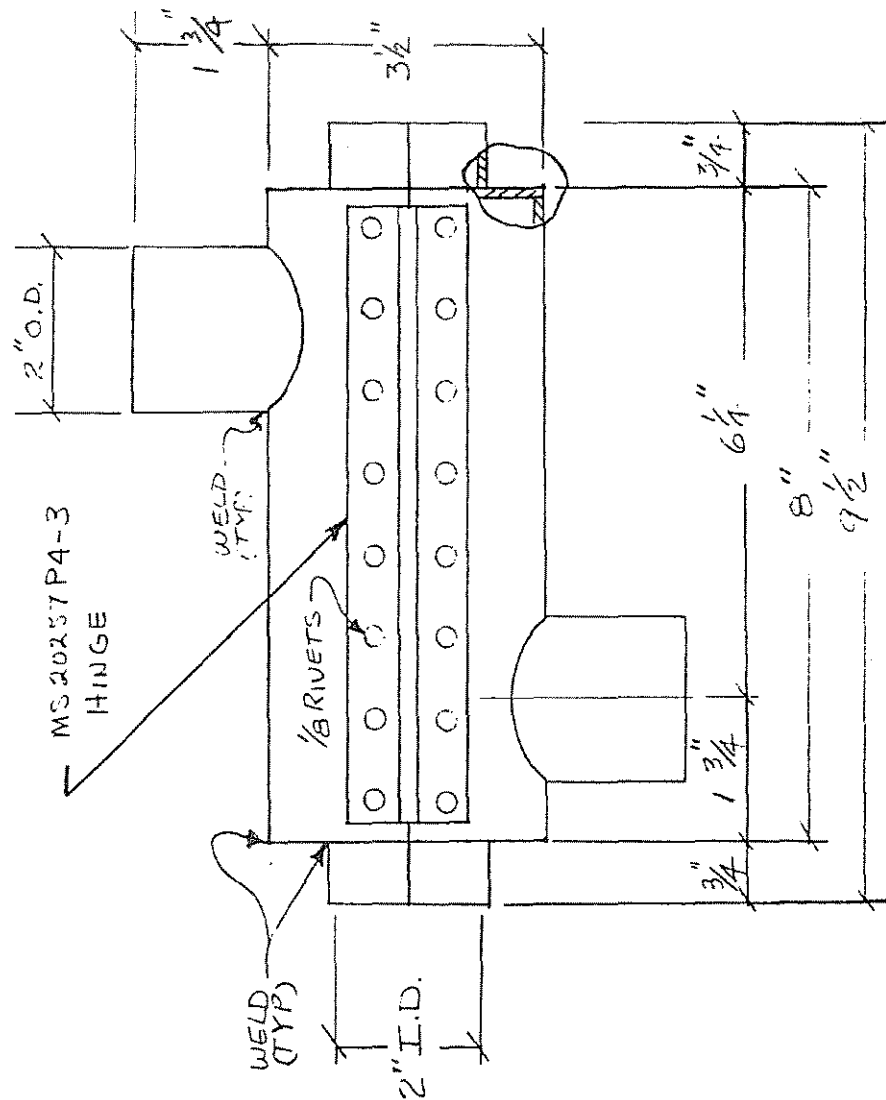
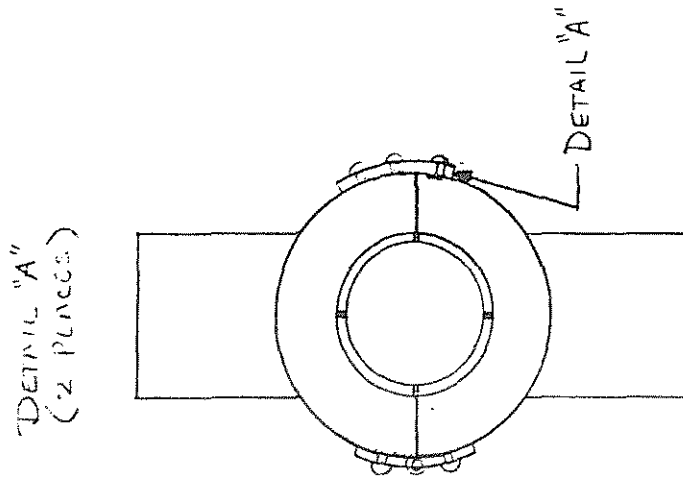
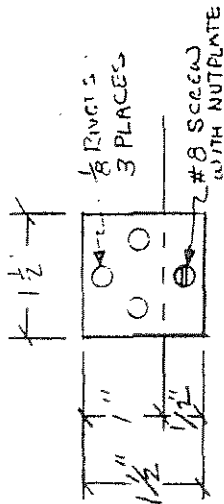
% MAC =  $\frac{\text{STATION} - 55}{50}$

NOTE: AT GROSS WT., BAGGAGE IS LIMITED TO 44 LBS.



| WING GAP BRACKETS |      |
|-------------------|------|
| QUAN :            | 2 EA |
| MAT'L :           | ALUM |

Submitted by Jim Stuart  
1521 E. Avalon  
Santa Ana, Calif.  
(714) 543-2331

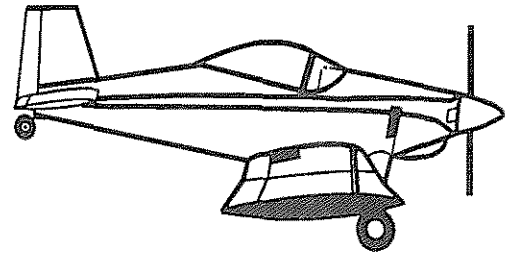
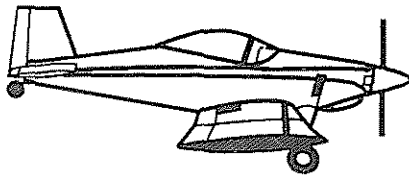
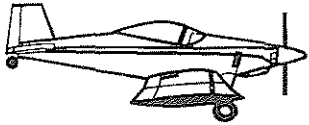


T-18 HEAT MUFF  
3-26-91

MAT'L = .049 S052 AL.  
QUAN = 1 EA  
SCALE: 1/4" = 1/2"

Submitted by Jim Stuart  
1521 E. Avalon  
Santa Ana, Calif.  
(714) 543-2331





## Placerville 2nd Annual

by Hal Stephens

What a great Flyin! Lots of old friends and now several new ones. One doesn't realize the quantity of Thorp designed airplanes that are flying today or that are in the "final" stages of completion until you put on a Thorp Flyin.

Familiar names like Vaughn Parker, Dick Eklund, Dave Tennant, Gus Gordon, Ann and Lyle Trusty, Tony Ginn, Jim Critchfield. Gar Root, and Harry Arnold ring like chapel bells. Newer folks such as Rive Trubok, Ben Harrison, Terry Adams, Alex Sim, Paul Reufauf, and Tom Garnett were among the participants.

Thorp 211, "Sky Scooter's", were flown in by Bob Riddle of Grass Valley and Dick Eklund of Lockford (John Thorp's homestead) to complement the T-18's.

In all 14 Thorp airplanes were on the field plus guests in a Whitman Tailwind and an Aircoupe participated. Both were Thorp "wanta bes".

Tom and Georgia Garnett airlined it from the south land of California to pick up ideas for their nearly completed Tiger as did Ben Harrison from the Seattle area who just bought the major interest of a Thorp project T-18.

Harvey Mickelsen of Sunnyvale, who is about to test fly his super T-18 (as soon as the computer designed wings are completed), was given a ride by Tony Ginn which he thoroughly enjoyed he told me recently. *(Editors Note: see the photos of Harvey and his great T-18 project just after this story)*

Mr. Dave Tennant, a prince of a guy, lived up to his reputation of giving yet another builder his first Thorp T-18 ride! Erwin Darby, who drove for 5 hours from Grants Pass, Oregon has for all his life flown for hire and retired at age 65. Then he started building a Tiger. After 7 years of dreams and

rivets, Dave made his day!! A take off, a crisp climb, and a series of maneuvers showed Erwin just how impressive the Eighteen is. Not before, in all those seven years, had anyone offered a ride or the opportunity to fly the Thorp to Erwin until Dave did. I spoke with Erwin this week, a month after the Flyin, and he reiterated how impressed he was with Dave and how "wonderfully smooth" the Thorp flew when he compared it to those military and civilian machines he was paid to fly.

Dave now has at least two "first flights" to his record, having given Jim Critchfield his first flight in a T-18 at the first annual Thorp Flyin at Placerville. Jim had been "building" for 28 years at the time.

Georgia Garnett was also given not only her first T-18 flight but the first flight in other than an airliner. What a thrill that must have been. Her smile was from ear to ear. Tony Ginn, her pilot, gave five other "rides" to builders and to the visitors. The Flyin was just great for them and we've been encouraged to sponsor the "third annual" next fall as a result.

Jim Stuart from Santa Anna, who only had 4 hours on his new Tiger, flew up with Ralph Millisan of LaHabra to be at the flyin. David Newstel who resides (and builds) in Manteca flew in with the Eklund 211. Terry and Barbara Adams drove up from Stockton as their Thorp is still incubating.

What did the people do at the Flyin -- talked planes, Of course. Several of the gals went downtown to see Placerville and were gone for several hours. They all had credit cards waving in their hands when they left the airport.

As for meals -- huge Togo sandwiches were served for lunch and a full steak dinner was complemented by Lil Critchfield's Santa Maria beans and

fresh baked apple pie from the Apple Hill Ranch which is just up the hill from Placerville.

Who won the cork flying contest? None other than the Aircoupe driver, Laura from Landcaster!!

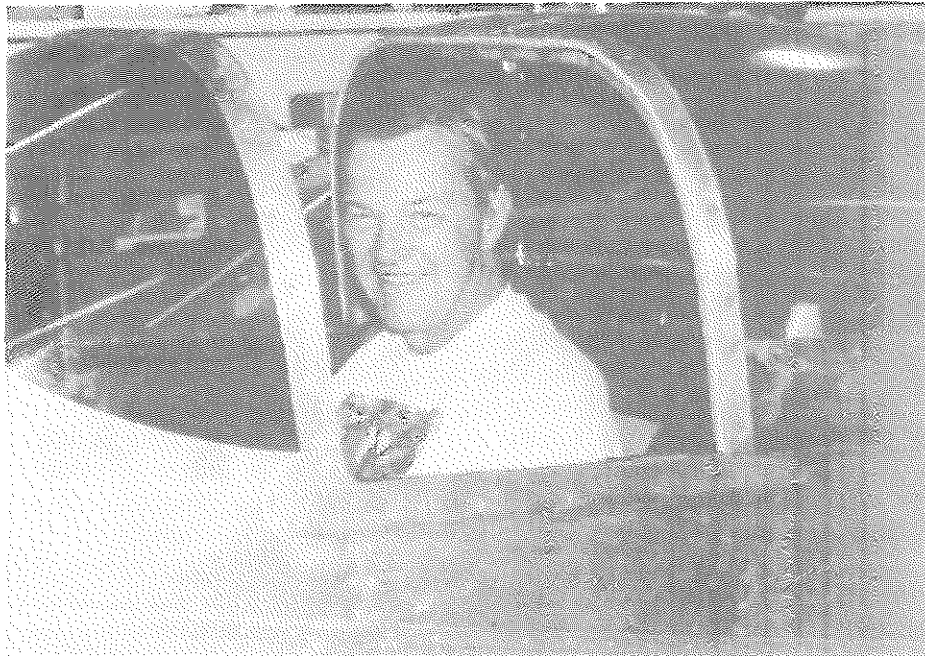
Again, for my wife Nancy and myself it was very nice seeing the friends we've made around the Thorp designed aircraft and wish all those who couldn't be there (like Harry Paine of Pismo country who caught the Asian flu) will be at the 3rd annual in 1994 - approximately late September.

"Long live the John Thorp legacy"

PS. I understand the T-18 project from Bryon, CA,

I described for the most recent newsletter, was quickly purchased by a gentleman from Alabama, who called me to ask more about it. Thanks to your newsletter another T-18 will soon fly!!

PSS. I've just returned from a trip to Oregon and visited with both Erwin Darby and Brad Chapman. Erwin is building folding wings and needs the engine majored then he's about ready. He cracked his canopy and can use some ideas on how to repair it. Brad was building last year and is now flying. He Just flew off the 40 hours. It does fly nicely on the 0-290 GPU. What a lucky guy, he has a private grass strip just outside his back door! Now comes the paint scheme next spring.



*Harvey Mickelsen of Sunnyvale California. We paid him a visit last summer and found a great project that's not far from flying. It should be very fast. Harvey knows his business.*

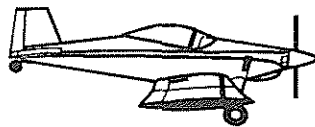
**Simplicate**

**What you don't put in  
can't go wrong**

**Add more lightness**

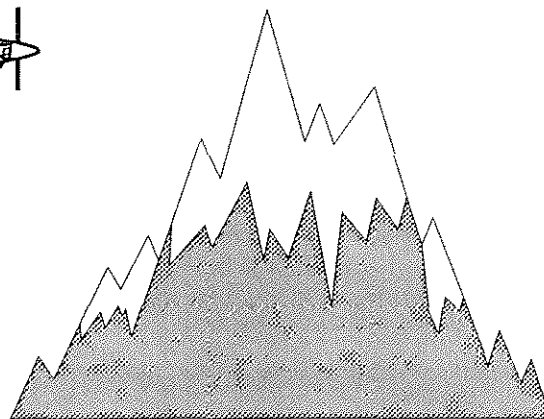
**Craftmanship is not a  
skill, it's an attitude.**

**Harvey has these fine statements posted on his wall in the shop**



## Mountain Flying

by Hal Stephens



### MOUNTAIN FLYING (or flying in mountainous terrain)

Flying in "them there hills" is as simple as 1,2,3!

One is the wind, the two is weather, and three is density altitude.

Wind: air movement is like water in a stream. It kind of babbles along over the rocks, swirls around the larger ones and drops into the holes between them making a splash as it does so. Across the flat bottom portions of the stream the water just flows smoothly following the slope of the ground. Watching a tiny twig flowing in a stream is like being in a light aircraft in the mountains when there is a wind. Of course, its much nicer to fly through the mountains in your T-18 when there is no wind (or very light winds). Imagine a stream in late August when the spring runoff is over. What a placid little brook it becomes. What a wonderful place to fly! Now think about the spring runoff and how the brook becomes raging white water. You've seen it on TV. Heavy winds in mountains are the "white water" of air flow. Unless you're familiar with the feeling of being tossed about and have the skills to fly in it, it's best to wait it out. A better hour will come. Water runs down hill controlled by steepness of the slope and quantity necessary to move. Wind runs down hill from a high pressure area of the atmosphere to the low pressure area.... from a high to a low. The volume of air that flows depends on how high the "high" is as compared to how low the "low" is. The greater the difference between

the high and the low the greater the volume of air must move through the area. My rule of thumb is ... If the wind aloft at 6000 feet and 9000 feet is above 15 to 20 knots, I think seriously if I need to be where I think I want to be at that time. Winds usually subside in the evening and are usually lower in the early part of the day so maybe a different time would be better. Remember, when you have time to spare, go by air!

Weather is next: Weather means clouds. Clouds sometimes mean low visibility and even rain. The rule in the mountains is don't fly in the clouds and the rain.... unless of course you're a competent cloud flying mountain checked out pilot. Weather changes quite rapidly in the mountains. It's controlled a lot by moisture content and convection. Of course there are the frontal systems that are the same to cope with everywhere whether it's in the plains or the mountainous areas and you deal with them in the same manner. Fly between the frontal areas and not through them as they can get both wet and bumpy. In the mountains after a series of rain showers has passed there is a lot of moisture and it tends to rise in the afternoon when the sun heats the ground and in the mountains its sometimes hard to crossover the ridges into the next valley if the one you were flying in has been filled up with a cloud or two. The rule of thumb here is to know where you are and to turn around if need be. Don't push it! If you have time to spare, go by air! Again, morning and evenings are generally cooler. Convective air is diminished greatly. It's a great time to fly!

**Density Altitude:** This one is a sleeper. Rule of thumb is .... Don't fly into high altitudes when it's hot and you're heavy! It's even harder to get out. At the higher altitudes the air is thinner (lbs./sq.in. and all that science stuff). When it gets hot it acts even thinner than thin and can't hold you up there as easily as it does at sea level, or thereabouts. You'll notice that when flying at the higher altitudes the controls seem a bit looser and the plane can wallow a bit more. Given the opportunity, a landing at an airport above 3000 feet will seem the ground is moving along a lot faster on final approach but your airspeed is pegged on the normal approach airspeed. It's true, you will be moving over the ground at a faster pace..... the air is thinner and the "ground speed" will be higher, thus your approach will be hotter. Your landing distance will be longer and stopping will take awhile. Don't choke up..... keep the airspeed up. A stall is not wanted now!

When it comes time to leave the high altitude airport think about the temperature. If it's hot, stay cool. Kick back and wait for the temp. to drop back into the 60's or low 70's. Also think about the load you're going to ask that little engine to lift up into that thin air. Most airplanes don't fly out of ground effect at gross loads, ie, full tanks, full baggage, and full people on hot days. That 150 horsepower engine that you zoom around with at sea level is now putting out as little as half the horses, and gasping for air at that! Check weight and balance again, recompute the take off distance and double check the rate of climb you'll get at the altitude and the temperature you're leaving from. It's basic private pilot stuff but seldom used, except on the exam, unless you're in the mountains. Then it's IMPORTANT! Typically, you can expect to use two to two and a half times the normal runway length to get off and have only 250 to 400 feet per minute climb rate when the normal is about 800 to 1000 feet per minute. You'll wonder what happened to the rubber band up front! Just be patient..... don't pull back on the stick and stall it..... keep the airspeed up and give her time to climb!

One last thing about flying about in the mountains. The old tycoons that built the railroads weren't dumb. They laid their tracks in the easiest terrain they could find--smooth gentle turns and gradual grades. The engineers that came along later with the roads followed the tracks but got a bit more risque. The term IFR means different things to different pilots but in the mountains it means, I follow railroads, rivers and roadways. If you plan your trips through the mountains considering the

above factors, chances are you'll thoroughly enjoy every minute of your trip and be hankering to come back. The people are friendly and the food is great and of course, the sightseeing is unbelievable!

**Hal Stephens biography:** I now have over 4000 hours flying in the past 25+ years. Have flown 45 different kinds of aeromachines; have over 1200 hours teaching flying-mainly in "taildraggers" and have spent a lot of time up in the mountains. I am rated Commerical, Single & Multiengine, Instrument Land, Certified Flight Instructor & Instrument Flight Instructor. I currently own a Cessna 185 and a 125 HP Cuby (SuperCub Clone)



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**ANNOUNCING, ONCE AGAIN, THE AVAILABILITY OF  
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- COPY OF "The Spirit of Thorp T-18" MEMORIES BOOK.

**Price: \$300 including UPS standard delivery in U.S.A.**

**Information Package: \$15**

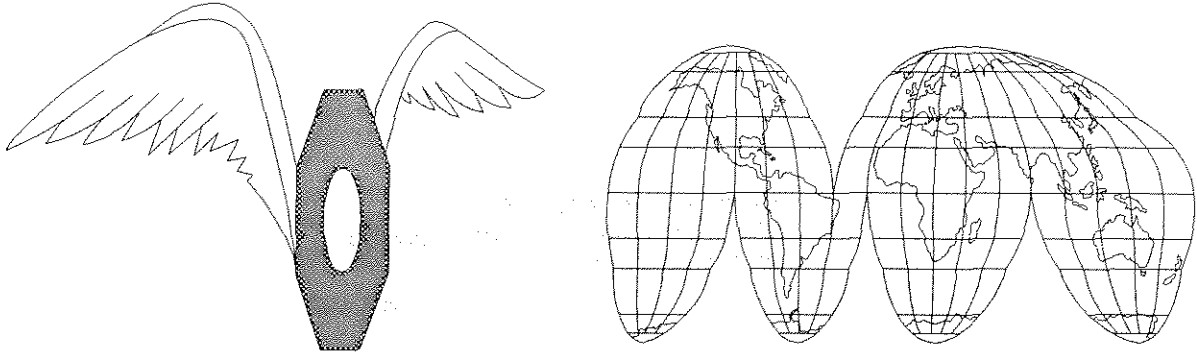
**Current Plans Owners - 4"H x 9"W T-18 Logo -\$15 each**

## The John Thorp Legacy

*Editor's Note: I hope this list of John Thorp's designs is correct, it came from an old article by Don Downie in Private Pilot.*

|      |         |  |
|------|---------|--|
| T-1  | 1931    | Design study only for a two-place lightplane.  |
| T-2  | 1932    | Design study only.   |
| T-3  | 1933    | Four-place, all metal, retractable; originally designed with a seven-cylinder, 1 10-hp Warner; originally equipped with a six-cylinder Lycoming.   |
| T-4  | 1934    | Design study only.   |
| T-5  | 1935    | Built by the Boeing School of Aeronautics, Oakland, California, where Thorp studied and remained as a teacher. Finished in 1938.   |
| T-6  | 1936    | Design study only.   |
| T-7  | 1939    | Serious design study for an all wood airplane.   |
| T-8  | 1940    | Design study only.   |
| T-9  | 1941    | Design study only.   |
| T-10 | 1942    | Lockheed Little Dipper design for the flying infantryman.  |
| T-11 | 1945    | Sky Skooter. Eight were built by Thorp in a factory adjoining what is now the Van Nuys Airport (then Metropolitan Airport). Altogether, 11 were built. The main difference between the original T-11 and the T-211 production model today is the use of the 100-hp Continental rather than the original, 65-hp Lycoming. |
| T-12 | 1945-50 | Design study only.   |
| T-13 | 1950    | FL-23 built by Fletcher Aviation, then in Pasadena, California, as a high-winged observation aircraft to win a competition against Cessna's L-19. One FL-23 was built, with a 225-hp Continental engine.   |
| T-14 | 1951    | Fletcher Aviation designation was the FD-25 (Fletcher Defender), a single-seat, armed lightplane with a 225-hp Continental.  |
| T-15 | 1952    | Fletcher agricultural aircraft FU-24, known affectionately as "Smelly Nelly," it still is used extensively for "top dressing" in New Zealand. Aircraft was designed with matched hole tooling and initially was shipped to New Zealand in predrilled, flat sheets.   |
| T-16 | 1956-58 | Piper Cherokee prototype, the PA-28, originally designed with 180 hp. First airplane built had only 150 hp. Entire Cherokee production dates back to this prototype design.  |
| T-17 | 1958    | Wing Derringer. Began as a simple, twin-engine Sky Skooter.  |
| T-18 | 1960    | We know this part of the story!  |
| T-19 | 1962    | Design study for Frank Nixon for a four-place, twin-jet aircraft.  |

## This NUT Flew Around The World Contest

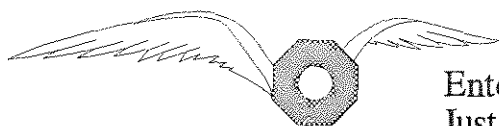
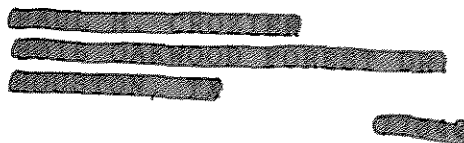


This is your chance to win a piece of history. Don "around the world" Taylor has given us 24 pieces of his famous airplane "Victoria". Hardware that he had left from the bird after he gave it too the EAA Musuem in Oshkosh. It won't be hard to win. Just send an article or note about building some assembly or flying the T-18. The first 24 people will receive a part of Don's T-18 Make a plaque to show the part off or attach it to your T-18 for good luck. Enter now. Send your articles and pictures to me at the following address:

Richard Snelson  
Route 3 Box 295  
Clinton, IL 61727

T-18 NEWSLETTER  
ROUTE 3, BOX 295  
CLINTON, IL 61727  
1-217-935-4215  
Issue #89 Dec 93

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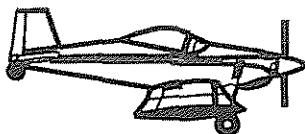


Enter the "Nut that flew around the World" Contest Now.  
Just send a short article on building or flying the T-18 and  
win a piece of history. Courtesy of Don Taylor.

### T-18 MUTUAL AID SOCIETY 1994 RENEWAL

Please include a check or money order for \$25 and send to:

Rich Snelson, Route 3, Box 295, Clinton, IL 61727



Check the mailing label for your status, no pay for 93 and paid  
for 94s are marked. Thanks!

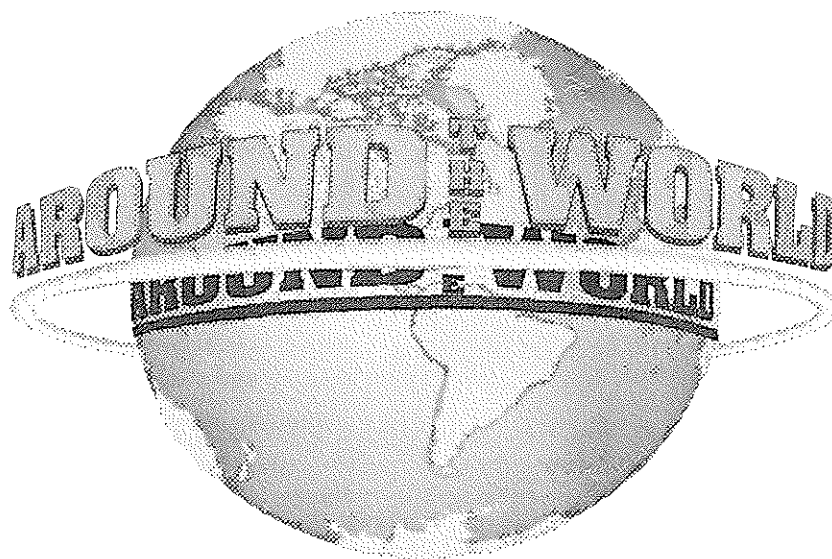
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ADDRESS \_\_\_\_\_

CITY, STATE, ZIP \_\_\_\_\_

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# T-18 NEWSLETTER



## The Flying Nut Contest Special

### IN THIS ISSUE:

**FatCat** by Harvey Mikelsen

**Engine Swap** by Ken C. Morgan

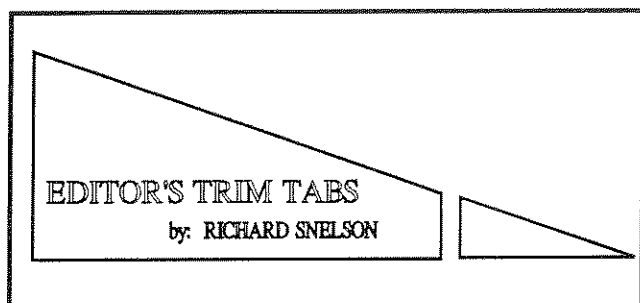
**Project Report** by Roy Farris

**The Conditional Inspection** by Dave Eby and Paul Kirik

**Tips on Lycomings** from The RV Newsletter

*NOTICE: (STANDARD DISCLAIMER) As always , in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.*





## Calendar of Thorp T-18 Events for 1994

A return to McAlester, Oklahoma on May 6, 7 & 8 (see Gary & Maxine Green's letter in the issue for the details.)

Join my EAA Chapter's Mystery Flying Game on May 21, 1994 to play "Where in Illinois is Homer Sanders". Starting time is 9:00 am at the Decatur, Illinois Airport.

Oshkosh Events are: First Friday night of Fly-In, Butch's Anchor Inn for our banquet Forum - No date yet Nature Center Picnic ??? Don't know yet.

3rd Annual Placerville, California Thorp Fly-In on Sept 23-25, 1994

Kentucky Dam on Oct 7-9, 1994

### *Editors comments on Conditional Inspections:*

It really doesn't matter if you have a repairman's certificate or hire a licensed aircraft mechanic to do the Conditional Inspection for you. In either case it's your safety that's at stake. Therefore "you" must insure that the inspection is complete and thorough. If the aircraft mechanic doesn't have a history of the homebuilt's problem areas he could easily miss some important item. If you expect that he will read up on your homebuilt before he inspects it you're probably wrong! Where can he find the data and information about your aircraft? It may be in the old newsletters if they are available in your file. However that would take days of reading for him, so I doubt if anyone could afford that. If he's inspecting a C-152 it's easy, just look up that type of aircraft and see what AD's apply. Not so with a homebuilt. We have very few

similarities in our engines and equipment types. I'm sure he would know and suggest a venturi change for a MA3 or MA4 carburetor. This is a common problem that all MAs have. Would he go the extra mile to research the rest of the equipment? I doubt it. This brings us back to You! and your safety. What can you do in preparation for the inspection to ensure it is complete?

As a first step, collect information about your homebuilt. Read all the old newsletters again, or for the first time if you're a new owner. Make notes on important things to check for. Make a list and prepare the aircraft for the inspection by going over the plane your self. Do all the necessary or desired maintenance before you take it for the inspection. Don't forget to fill out the aircraft and engine logs as each item or maintenance is completed. And then share any information on the aircraft's history with the mechanic/inspector.

Several Mutual Aid members that own T-18s and have a lot of experience with maintenance and inspections and have agreed to help up prepare for the inspections. In this newsletter you can read the first of two articles that can be used as general guidelines for a T-18 inspection. Don't consider the article a complete check list, only some of the things to check. Each aircraft is different and will require a special check list or inspection list to cover all the combinations of accessories and equipment. It's your responsibility to complete the list that you the "repairman" or the inspector will use as a reference to inspect your aircraft.

I feel fortunate in having built my T-18, which qualifies me for a Repairman's Certificate for performing the yearly conditional inspections on my specific aircraft. With the Certificate I certainly don't intend to spend a lot of dollars to hire the inspections done. However, if I can get another T-18 builder to assist in going over my airplane during the inspection, I would want the added assurance and safety factor it would bring. Be sure and see the article by Dave Eby and Paul Kirik on this subject in this issue.



February 9, 1994

Dear Richard:

To keep you somewhat informed, I currently have a standard T-18 fuselage which I purchased. It was in very bad shape and therefore for the last year I have been in the process of demolishing rather than building an airplane. I'm going the wrong way! Recently, I began constructing new parts, and I must tell you that I am increasing in both my speed and efficiency regarding ruining perfectly good sheet metal. No acceptable parts yet, just a lot of activity. I have many prefabricated components, including ribs, etc. I am looking for a windshield, canopy and a canopy frame as well as an engine cowl- ing. My current plan is to use a 180 HORSE, but that is a long way off! If you can provide any assistance in locating parts or if you here of someone desiring to sell T-18 or S-18 stuff, please use my name. Thanks much!

With regards, Van D. Gray, 116 Flintrock Road,  
Hewitt, Texas 76643 Phone: (817) 666-2128



January, 24, 1994

Dear Mr. Snelson, Please find enclosed my 1994 newsletter dues. It's hard to believe that so much time has passed since Oshkosh, I guess we have about 25 more weeks till '94, I very much enjoyed meeting you and your family, and snapping photos of your beautiful aircraft. The

trip reminded me of some of my more younger years and the kindness the T-18 group has always extended. I recently obtained Wendell Green's project and set up a rather cozy shop here at my place of employment. I have been extremely busy lately and have been unable to complete anything other than a couple of ailerons, but it's a start! In addition, I am making a trip up to Seattle to transport Wayne Heigel's project down here (standard wing, standard fuselage, about 80% of the metal work complete) as I have acquired it as well. I hope all is well with your family, including the T-18. I look forward to seeing you at Oshkosh. Take care. Lee W. Walton (T-18 Builder!) DWH Memorial Airport, 20803 Stuebner-Airline #29, Spring, Texas 77379 (713) 370-5235.



KEN C. MORGAN 2011 OAKWOOD LANE  
ARLINGTON, TEXAS 76012 817/265-6838

23 February, 1994

Dear Rich,

I am sending you an article on my T-18 engine change from 029OG to 032OB2B. I am also including some performance comparison data between the two engines.

I was pleased to hear of renewed interest in the T-18. Those of us flying the Tiger, know how great an aircraft it is. This is probably difficult to get across to new and/or prospective builders, particularly with the RVs setting out there with attractive kit pricing. I was recently in Wichita, KS. for two weeks of aircraft composites lecture/lab and met an EAAer with a 150hp Glassair I converted to tri-gear configuration. He was unhappy with the Glassair because of high wing loading and heavy empty weight (over 1100 lbs). These conditions had a significant adverse affect on the performance of the aircraft. His admiration for the Thorp compared to the Glassair was almost embarrassing, but confirms all of our testimonials regarding the

Thorp design and outstanding performance.

Rich, we appreciate your efforts as newsletter editor, hope to see you at the McAlester fly-in.  
Cordially yours, Ken C. Morgan



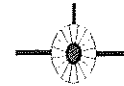
BILL WILLIAMS 2625 PIPKIN RD. LAKE-  
LAND, FL 33811 (813) 644-9649

MARCH 16, 1994

ANOTHER S-18 THORP FLIES, AND DOES IT FLY GREAT! SATURDAY N30WW FLEW FOR THE FIRST TIME AFTER SOME FIVE YEARS OF CONSTRUCTION TIME. IT LITERALLY FLEW HANDS OFF THE FIRST TIME. BOB HIGHLEY GAVE CHASE IN HIS T-18 AND FLEW OFF MY RIGHT WING. HE ASKED "HOW DOES IT FLY"? I RESPONDED I GUESS OKAY" AS I HELD MY HANDS OVER MY HEAD. N30WW IS A WIDE BODY, FOLDING WING WITH AN 0360-AIG AND HARTZELL CONSTANT SPEED PROP FOR POWER. ALL INDICATION THAT CRUISE WILL BE AROUND 180 MPH. MORE LATER AS I HAVE TO GET BACK FLYING TO LOG MY 25 HOURS, SO I CAN MAKE MCALESTER IN MAY. REGARDS, BILL WILLIAMS



RICH, Hope all's well with you & RoxAnne. Like to see you 'all at Sun'n Fun if possible. I've formally requested the nature center at Oshkosh for noon of Friday for our picnic. No word back yet. I'll keep on it. Should have another T-18 flying soon. N30WW - Bill Willian's is in the weight and balance, final inspection phase. Cheers, Bob Highley



Mr. Snelson,  
I spoke to your wife today about subscribing to your newsletter. Enclosed please find my check for \$25.00.

I am interested in buying a T-18 and would prefer one with a 150 HP engine. I do get "Trade-A-Plane", and have found that there are not many T-18's in the Northeast.

We are planning to go to Sun & Fun and hope to look at some there. Any help you can give me would be appreciated. Thank You. Sincerely,  
Jerry Romeo 32 Komar Drive, Ballston Lake, NY 12019.



Dear Dick, I went to the fly-in at Ky. Dam in my single place T-18 and had a great time. Had to get back to work in Nash. Tenn. on Sat and didn't get to meet you. I did get to see several great looking T-18s. I asked one member just exactly why they were so excited about the T-18's? He said, "didn't you know, it's the best plane in the world?" Since that time I have bought yet another T-18. This one a 2-place, 180hp, IFR--T-18. That leaves me with 2 18's, with a need for only one. I have enclosed a picture and info on my old T-18. Hopefully someone else would like to take advantage of my situation & buy the single place from me. Enclosed is a check for \$ 25.00 for the newsletter & also a picture of the T-18 for sale. Hopefully you know of someone that would be intrested in a great & fun airplane. I have truely loved flying this plane for about 70 hours now. I would like now to get my IFR ticket. In doing so I had to buy a different plane. If you could help me out in any way I would greatly appreciate your help. Thanks so much Dana Moore  
4515 Nolensville Rd. Nashville Tenn. 37211

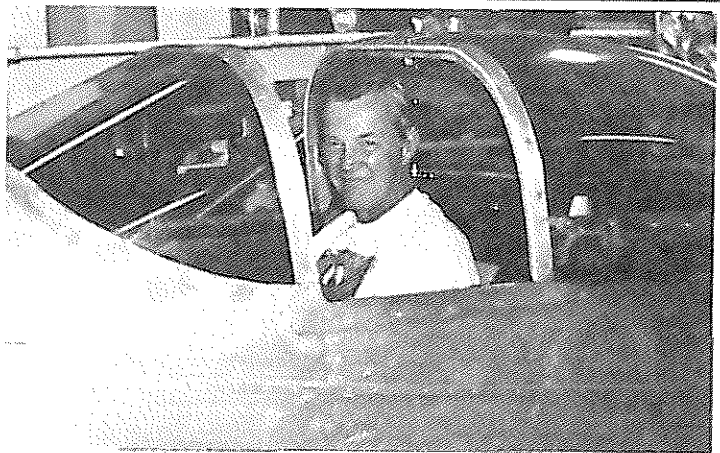
# *Fat Cat*

by

Harvey Mikelsen



CONTEST WINNER



2/18/94

Since Hal Stephens let the cat out of the bag, so to speak, about my project in his Placerville Fly-in article, I might as well come clean. It is a wide body so I have named it Fat Cat and will have a Garfield, the cat flapping his arms in an attempt to fly on the vertical fin, with Jim Davis's permission. The school bus yellow top may have tiger stripes and it might have a white belly. The wings will have the standard plan-form and structure (except for the flap beam which is .032), however the aerodynamics will be all new.

I don't recommend changes to John's fine design, however I am a frustrated aerodynamicist. I have a Master's in Aeronautical Engineering from Purdue U. with a major in aerodynamics. I just retired (Read that laid off?) from Lockheed Missiles and Space Co. after 33 years of every kind of engineering besides aerodynamics.

Enclosed is a drawing of John's 64,412 with his flap. The airfoil is a good WW II technology airfoil and the flap is contemporary for the 1950s and 60s. Computer capability developed since then has allowed advances in airfoil design.

The airfoil I have chosen was designed by Harry Riblett in 1989 after he failed to interest NASA Langley in developing a new series of general

aviation airfoils. It was chosen for it's very small pitching moment which should reduce induced drag from our smallish horizontal tail in cruise.

The flap airfoil I chose is the old Clark Y (Used on the J-3 Cub, Spirit of St. Louis, etc.), slightly modified. This choice as well as the cove/gap design was based on the comments of Arthur Phelps in his forum at Oshkosh '92. Mr. Phelps is a NASA Langley aerodynamicist and has modified his own BD-5 wing airfoil. I sent a set of blueprints to Mr. Phelps and he was kind enough to comment on them. Enclosed is his letter.

I made 1/4 scale wing sections with flaps and tested them in my wind tunnel. (I probably have the only private wind tunnel in Sunnyvale, all the rest of them are owned by NASA Ames or Lockheed.) The tests on the T-18 wing section showed separation starting at very small flap deflections at the trailing edge of the flap and progressing forward to incorporate the entire flap upper surface at 40 degrees deflection. The new wing/flap exhibited no separation at all. It also had a 30% increase in maximum lift coefficient at full flap deflection.

From the above testing you might think "Wow, he's in fat city!", but don't. First, separation is a boundary layer phenomena which is a function

of Reynolds Number. My tests were at lower than full size Reynolds Number which would tend to reduce separation tendencies. Second, the ability to use maximum lift will most likely be limited by the tail forces available. Full scale testing, i.e. flight testing will be required before this mod. can be considered a success. Stand by for the results, soon, I hope!

Other changes to my T-18 are: A single cooling air intake below the spinner and a cowl flap between the gear legs to reduce cooling drag. Separate oil cooler and heater NACA inlets. In other words a new cowl design. Twisted gear legs for drag reduction. A 6 inch prop extension between the zero timed IO 360 and the Prince 68/78 prop for improved prop efficiency. Graphite/epoxy canopy skirt and Thorp latch for better canopy seal. Light Speed Engineering electronic ignition in place of one of the mags. Frantz oil filter. Safety cables a la Bill Warwick in News Letter #51. Wet wings. More radios than I probably need including DME and GPS. Sound proofing of the cabin area. A jump seat in the baggage area for my dog, Princess. Wow! I never sat down and listed all the changes before. For a guy who doesn't recommend changing John's design, I've gotten pretty wild. I hope it all works out.

Harvey Mickelsen Plans #1332 1007 Persimmon ave. Sunnyvale, CA 94087 (408) 737-0559

### **The letter from A.E. Phelps**

A. E. Phelps III 883 Barrie Circle Newport News, VA 23602-3401 Tel: 804 874-5870 Fax: 804 873-3711 Jan 24, 1994

Dear Mr. Mickelson:

Firstly, please accept my apologies for being so long in replying to your letter of Dec 22, 1993. I have lots of reasons, but probably no real excuses. In any event, I was very interested to read your letter and to have an opportunity to see what you have done with the T-18 wing design

and flap arrangement. From the results you show on Figure 2. it looks like you have done a very good job with the flap redesign. You may be interested in knowing that the Grumman Gulfstream I commuter turboprop uses a modified ClarkY in a Fowler flap arrangement not too different from your own design. They did not, however, use vortex generators as you show on one of your drawings. Were the V.G.'s on the wind tunnel model? If so, you may want to rerun the tests to get the true effect of the flap nose and cove geometries you have chosen. Can you, based on the results of your tunnel tests, comment on the effectiveness of Mr. Riblett's modifications to the basic airfoil nose shape in delaying flow separation on the airfoil? So far as I am aware, no systematic investigation on the relative characteristics of the old NACA 6-series cambered sections versus Mr. Riblett's newly cambered versions of the same thickness forms has been conducted, and I am curious to see if his predictions are confirmed by tests. Certainly his analyses using the Eppler II code have shown great promise, but that is an inviscid code and it may not be handling the separation model properly. In any case.. I am happy to see your careful systematic approach being taken before rushing off into a modification effort. Good job.

I have few comments and observations for your consideration: - The 14% Clark-Y section looks very good from your wind tunnel data. Reconfiguring the 15% Clark-Y in the way you have shown should probably be O.K., but you may have premature separation on the aft upper surface. The pressure recovery will be driven by the radius of curvature aft of the maximum thickness point of the flap airfoil, and your recontouring has reduced that radius somewhat. It may not be a problem, but I would suggest staying with a shape you know works based on test data.

Your chosen pivot point looks very good with respect to flap gap, overlap, and Fowler action, but it will of course have higher loads than the

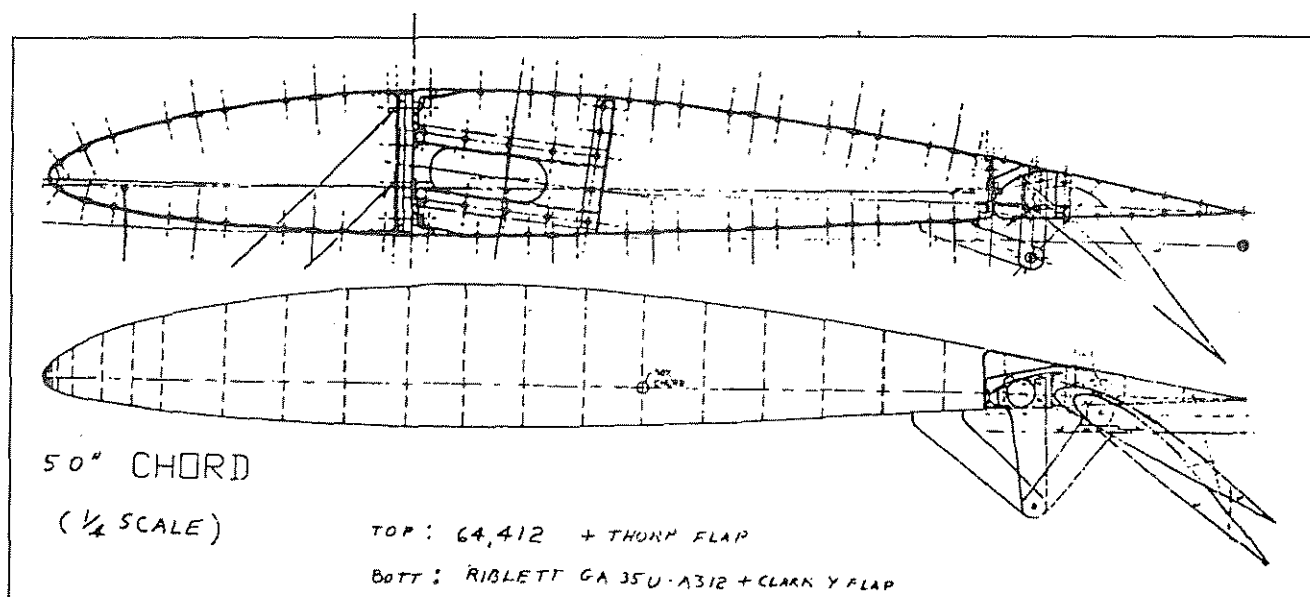
original design. You should check to see that the moment produced by the flap load acting at the end of the longer flap bracket is adequately provided for where the bracket attaches to the wing rib.

Note the interference of the flap torque tube with the fuselage lower longeron when the new flap is deflected to 40 degrees. It looks like you may have to cut away about half of the longeron flange to allow clearance for the torque tube, so you will want to pay close attention to providing adequate reinforcement across this critical member.

The newer flap is considerably thinner than the original flap designed by John, so you will want to check the structural design of the new flap to make allowance for the reduced section modulus in bending between the flap supports. I would advise strongly against adding a third flap bracket, as that can lead to alignment problems under the deflections that take place when the flap is loaded.

Finally, the improved aerodynamic performance of your flap will result in a more powerful nose-down moment when the flap is deflected. In addition, the fact that you have well attached flow over the flap for the full range of deflections now means that the downwash at the tail will be higher (and probably more powerful as well). So check carefully to see that you won't run out of pitch trim control power from the tail. If it looks like you will, you will probably need to alter the tail somewhat. It may only need a slot at the leading edge to provide a little more effective angle of attack, or it may need to be enlarged.

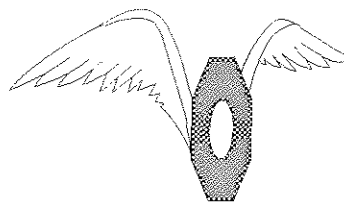
Congratulations on a nice bit of work - it is apparent to me that you are taking a properly conservative approach to modifying what is, by almost everyone's admission, an already excellent aircraft into an even better one. If there is anything else I can do to help, or if you would like to discuss any of these comments in more detail, please don't hesitate to call. Again, please accept my apologies for the late reply. Best regards, Art Phelps Eph. 3:20.21



Harvey Mickelsen drawings of the wing profiles

# ENGINE SWAP

by Ken C. Morgan



CONTEST WINNER

## T-18 ENGINE INSTALLATION 0320B2B VS 029OG

I have written several articles for the newsletter on the conversion of the 029OG to improve its performance and obtain 135-140hp. This modified 029OG engine has been a terrific performer in my T-18 with cruise speeds in the same range as most 0320 powered Thorps. An outstanding Pacesetter 68" X 69" cruise prop has also contributed to the above average performance. You're probably wondering why I would go to the trouble of changing engines to obtain 20 to 25 more horsepower. The main reason was the fact that I had a low time 0320B2B 160hp on the bench, needing only an overhaul. I was also confident that I could find a builder that would be interested in the modified 0290, with only 100 hrs total time. 0320 performance improvements would include better take off/climb with two aboard, and increased T-18 resale value with a certified engine installed. Horsepower increases are not always the answer as there is a point with the T-18, and other similar aircraft, where added HP and weight will have a negative effect, with little if any added performance and a marked deterioration in handling qualities. The 0320B2B was low time but had not run in about 15 years. I didn't know its condition but was hopeful the jugs would be clear of rust and corrosion after such a long hibernation. Fortunately, the original chrome had protected the cylinders with only a rejuvenation and satin finish process (last step in cermichrome) to make them like new. A standard major was accomplished on the 0320,

including case inspection; inspect and polish crank (standard); cam/tappet recondition; new bearings, rings, pistons (new pistons and rings are less expensive than rings for the old pistons); and carb overhaul/update with needle/seat and float components. Major rotating components were weighed and balanced prior to final assy. I completed the overhaul in May of 93 and after several months, located a buyer for the 029OG. At that point, I had mixed feelings regarding the swap as the 029OG had done such a good job and was just getting broken in with about 100hrs TT. I might mention this engine change was from one conical mount (flat back) to another conical mount. The change from conical to dynafocal, or narrow to wide deck is more complicated and would require a change in engine mount, controls, carb intake, baffling etc.

The actual engine swap was relatively simple; however, with the 029OG out, I did clean up the firewall and brake line system, and plumbed vacuum lines for installation of a dry vac pump to run a DG and Horizon.

### 0320 Impressions

First Run: The 0320 engine was nosier and seemed to run rougher than the 0290, particularly at idle. Probable cause, new engine, more power, and higher compression. I used John T's overhauled engine "run in" procedure; "Run as little as possible on the ground, check for leaks, and get it in the air for proper cooling". First flight with the new engine was performed at 80% to 90% power at 4 to 5K feet for 1 1/2 hours. Except for high green oil temp all indicators were normal. Oil temp has dropped to mid

green, after 35 hours on the new engine.

#### Performance

As I have used the same Pacesetter prop (68" X 69"), the cruise performance is about the same (165mph indicated, at 2400rpm). Takeoff and climb is substantially improved with the 0320. Static is 2300 rpm, with take off roll shorter by several hundred feet. At 120mph indicated, rate of climb is 1400ft/min (0290, 1000ft/min) single pilot. Top speed on the deck at 2800rpm is 196mph indicated (0290 2600rpm 188mph).

**Weight/Balance:** The 0320 added about 25lbs; however, that included the addition of a dry vac system. The empty CG moved forward slightly to compensate for the added weight. There were no inflight tendencies to bunt (horizontal tail stall) with full flaps above 100mph. Stall is about the same for both engines, 63 clean, and 61 with flaps.

#### Recommendations

I had fun running with the big boys, at cruise, with the 0290G. The T-18 can be a good performer with the 0290G modified engine, and a properly matched prop. I always felt this was the engine John intended the T-18 to have, and it satisfied the T-18 purist in me. However, if your looking for a performance boost, particularly during takeoff and climb, the 0320 would definitely be the way to go. The expense of purchasing an 0320 engine just to get this added performance would depend on your spending limits, and performance requirements. In my case, I had traded for the 0320, and did not have the expense of procuring a new or used engine from scratch. I was also able to sell my 0290G for a good price, helping to offset the overhaul expense on the 0320. If you are starting out needing an engine I would recommend going with the 0320, but again, it depends on what might be available out there. A low cost (if thats possible) 0290G, that can be modified for 140HP output would certainly be an acceptable alternative. My references to the 0290 are for the G modified to achieve 140HP or the 0290D2, 135HP.

If you have plans to change your engine, or

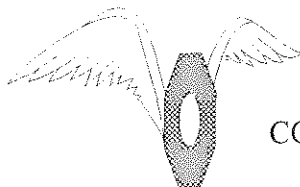
need a power plant for your T-18 give me a call. I would be happy to visit with you, and discuss your engine requirements. Happy T-18 Flying!

Ken C. Morgan, Thorp N46806

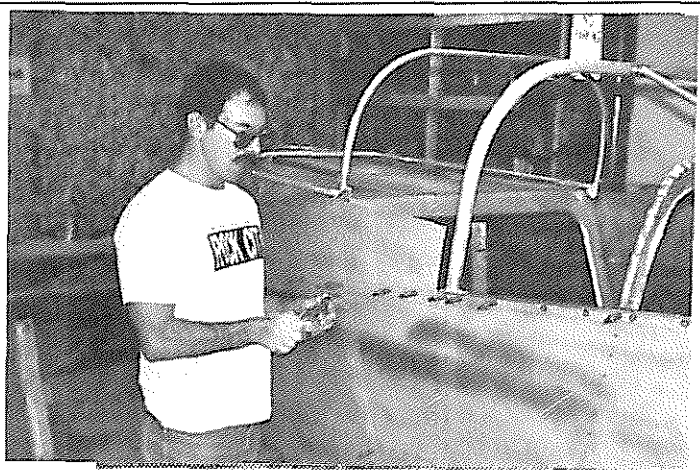


# Project Report

by Roy Farris



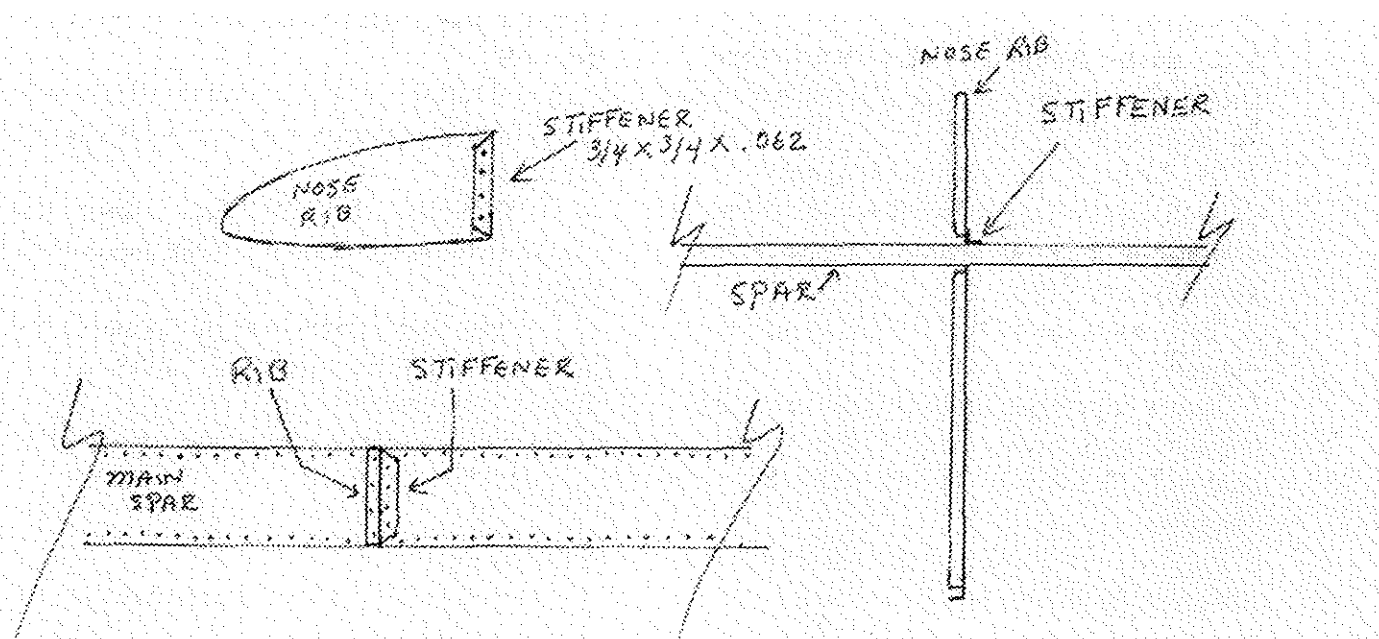
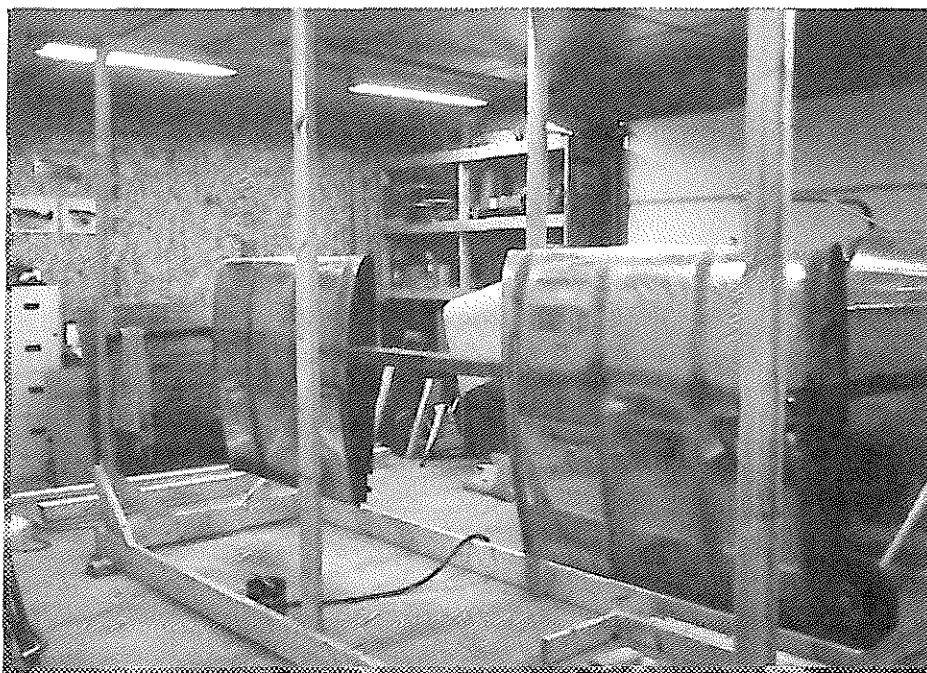
CONTEST WINNER



DEAR RICH, HERE IS MY NEWSLETTER CONTRIBUTION FOR THE NUTS & BOLTS CONTEST. I SURE WOULD LIKE SOMETHING FROM DON TAYLOR'S AIRPLANE TO PUT INTO MINE FOR GOOD LUCK. I HAD THE OPPORTUNITY TO MEET DON LAST YEAR AT OSHKOSH, AND HAD THE MOST WONDERFUL TIME TALKING WITH HIM ONE NIGHT AT DINNER. HE IS A FASCINATING GENTLEMAN TO LISTEN TO. I HAVE ENCLOSED A COUPLE OF PICTURES OF MY PROJECT. I HAVE BEEN AT IT FOR TWO YEARS COME JANUARY OF '94'. SO FAR I AM SATISFIED WITH MY PROGRESS, AND I THINK ANOTHER SIX MONTHS WILL SEE ALL THE MAJOR METALWORK COMPLETED. I DO HAVE ONE ITEM THAT MAY BE OF INTEREST TO OTHER BUILDERS. THROUGH OUT MY LAST FOUR YEARS, I HAVE BEEN LEARNING ALL I CAN ABOUT THE T-18, SO I COULD INCORPORATE THE MOST UP TO DATE FEATURES POSSIBLE INTO MY PROJECT I LEARNED EARLY ABOUT THE SMALL DEFORMATION IN THE UPPER WING SKINS JUST AHEAD OF THE MAIN SPAR, THAT MOST ALL T-18'S SEEM TO HAVE. I LISTENED TO THE OTHER BUILDERS AND PILOTS ABOUT ITS PROBABLE CAUSES AND WHAT COULD BE DONE TO ELIMINATE IT. THE PROBLEM SEEMS TO BE CAUSED WHEN THE NOSE RIBS COMPRESS IN THE

UPPER CORNER WHERE THE RIBS ATTACH TO THE MAIN SPAR. WHEN THE RIBS COMPRESS THIS CAUSES THE UPPER SKIN TO FORM A SMALL HUMP RIGHT IN FRONT OF THE MAIN SPAR. THIS "HUMP" IS PRESENT ON ALMOST ALL T-18'S THAT I HAVE SEEN. FROM WHAT I CAN GATHER, THE DEFORMATION IS CAUSED BY NORMAL WING LOADS, AND ONCE PRESENT NEVER SEEMS TO GET ANY WORSE. THE SOLUTION I BELIEVE IS RELATIVELY SIMPLE, HOWEVER, I DO NOT TAKE CREDIT FOR THE IDEA. I HAVEN'T HEARD OF ANYONE ELSE DOING IT, SO MAYBE I AM THE FIRST. THE FIX, IS TO ADD A  $3/4 \times 3/4 \times .062$  ANGLE STIFFENER, BETWEEN EACH NOSE RIB AND THE MAIN SPAR. IT IS AN EASY PROCESS AND SHOULD ADD ENOUGH RIGIDITY TO THE RIBS TO PREVENT THEM FROM COMPRESSING. THE STIFFENERS RESEMBLE THE VERTICAL STIFFENERS THAT MOST OF US ADD TO THE CENTER WING MAIN SPAR. I'M NOT SURE, BUT I BELIEVE THAT THESE RIB STIFFENERS COULD DOUBLE AS THE VERTICAL SPAR STIFFENERS, THUS KILLING TWO BIRDS WITH ONE STONE. I ADDED THESE STIFFENERS TO EVERY NOSE RIB IN THE WING. FOR REASONS THAT I WON'T GET INTO, I NEEDED TO SPACE MY NOSE RIBS FORWARD BY .062" SO I WAS ABLE TO ATTACH MY STIFFENERS BETWEEN

THE RIB FLANGE AND THE SPAR. I ATTACHED THE STIFFENER TO THE RIB SIDE BY FOUR -4 RIVETS AND THEN TO THE SPAR USING THE RIBS OWN MOUNTING. ON THE OTHER HAND, THE STIFFENER COULD BE ATTACHED TO THE SPAR OPPOSITE THE RIB FLANGE, AGAIN ATTACHED TO THE RIB BY FOUR -4 RIVETS AND THEN SEPARATELY TO THE SPAR BY FOUR, -4 RIVETS. I HOPE MY EXPLANATION IS UNDERSTANDABLE, AND ALTHO MY DRAFTING SKILLS ARE NONEXISTENT I HAVE INCLUDED A COUPLE OF DRAWINGS OF THE RIB STIFFENER AND IT'S APPLICATION. LET ME KNOW WHAT YOU THINK. KEEP'M FLYING ROY FARRIS NOBLE, IL



## THE REGULATORY ASPECTS OF EXPERIMENTAL AMATEUR BUILT AIRCRAFT INSPECTIONS from Dave EBY

### The Requirement:

FAR Part 91.409 requires annual inspections; except EXPERIMENTALS, this is why experimentals get "CONDITIONAL INSPECTIONS", not annuals. The requirement for a conditional inspection in the preceeding 12 months is on the limitation sheet to the aircraft.

### Who may do it?

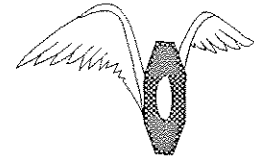
Advisory Circular 65-23A allows a certified repairman, A&P, or rated repair station (AI) to conduct conditional inspections. AC 65-23A tells a homebuilder how to get a repairman certificate for his/her aircraft.

### What must be done?

FAR Part 43, Appendix D lists the scope and detail of the inspection.

### How is the inspection recorded?

FAR Part 91.417 specifies the records (Log Book) that an owner must keep. the entry to be made after the conditional inspection is in AC 65-23-A, "I certify that this aircraft has been inspected on \_\_\_\_\_ in accordance with the scope and detail of FAR Part 43 Appendix D and found to be in a condition for safe operation" The entry will include the aircraft total time in service, the name signature and certificate type and number of the person performing the inspection.



## A STARTING PIONT CHECKLIST FOR THE CONDITIONAL INSPECTION

by Paul Kirik

### Powerplant

1. Loose wooden props - check bolt torque frequently i.e. each change of season or every 50 hours of flying time.
2. Cracked spinner bulkhead & cones
3. Bushings moving forward out of the prop extensions flange into wooden props causing looseness and broken prop bolts.
4. No fire shields on fuel lines in engine compartment.
5. Brittle & cracked rubber fluid lines in the engine compartment. These hoses should be changed at least every 5 years due to heat deterioration.
6. Engine compartment wiring & fluid hoses not properly secured to engine mount etc.
7. Engine controls hard mounted from the firewall instead of from standoffs on the engine.
8. Carbs should have metal floats & one piece

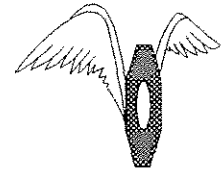
ventures.

### Fuel System

1. Cracked fuel tank at fuel outlet boss weld.
2. No flexible fuel line between main tank & firewall.
3. Fuel shutoff valve mounted on fuel tank not within reach of pilot when wearing a shoulder harness.
4. Fuel tank vent line not of fuel resistant materials. **(this recently caused a T-18 forced landing)**
5. Leaking seal on maintank fuel quantity transmitter mount. This is the main source of fuel fumes in the cockpit.
6. Fuel filler cap not marked for type & quantity of fuel.

### Landing Gear

1. Cracked welds on "A" frame gussets
2. Rubber "donut" spacers between landing gear & firewall - worn & extruding out of position.



3. Loose axle mounting bolts - these should be checked for torque annually. They are mounted in tension & tend to stretch when we get current in one pass.
4. Worn or broken lower engine mount bolts on aircraft operating out of rough fields. "MS" high strength bolts should be used in place of "AN" bolts. (slight reaming will be required)
5. Nyloflow low temp brake lines run through engine compartment - should be aluminum or stainless.

### Control Surfaces & Systems

1. Excessive wear of rudder mounting bushings.
  2. Excessive movement in stabilator mounting bushings. (Note: in both cases it is necessary to manufacture oversize bushing & slightly ream the mounts to obtain a good fit)
  3. Rudder & flap bushings rotating on bolts instead of control surface hinges. It is necessary to tighten the bushing bolts.
  4. Interference between flap & aileron with the flaps fully extended.
  5. Stabilator & stabilator tabs not properly rigged.
  6. Ailerons not having proper travel in either direction - requiring rerigging.
  7. Balance weights installed inside of stabilator leading edge not secured to leading edge skin per the drawings.
  8. Interference between flap cables, rudder cables & trim in the forward & aft tunnels in cockpit.
  9. Cracked welds in rudder pedal assembly at bottom welds.
  10. Cracks in welds of control yoke, walking beam, vertical mount tube. (This has resulted in one fatal accident after complete failure)
  11. Excessive play in pitch trim jack screw mount.
  12. Check control stick for cracks (we know of one that broke just as the plane lifted off)
- Airframe

1. Loose rivets on inboard wing mainspar caps. Rivets should be replaced with oversize

cherrylock rivets as necessary and additional rivets installed per newsletter article.

2. Corrosion on inside of fuselage belly skins at low points - primarily just ahead of 601 bulkhead & aft of rudder pedals. Drain holes should be installed at low points.

3. Cracks in vertical stabilator top rib in area of top rudder hinge attachment.

## TIPS ON LYCOMINGS

from Textron

A Reprint from the RV Newsletter

*At the recent Aviation Exposition in Portland, representatives from Textron Lycoming gave us some tips on operation.*

Lead fouling can be a problem, particularly when running on 100LL. A few simple procedures can help: 1) When leaning in cruise, apply carb heat for several seconds. Immediately after removing carb heat, beginning leaning. Slowly lean to peak EGT or until the engine begins to run rough, then richen 25 to 50 degrees F. 2) On shut-down, run the engine at 1200-1500 rpm for 15-20 seconds, then pull the mixture. Pull the throttle to idle after the engine begins to die. If you do have to remove the spark plugs to clean them, you can immerse the electrodes in Hoppes #9 gun solvent to help soften and remove the lead. When reinstalling the plugs, clean the inside of the plug tops and the "cigarettes" with MEK or acetone. Lycoming says it is important to do this every time. It removes the skin oils, grease residue, and other impurities that can form an electric "bridge" across what should be an insulated area, leading to premature failure. Use a small amount of anti-seize compound on the spark plug threads -- our new mechanic, Phil Duyck - a man who knows small airplane engines very well -- says emphasize the small amount. He also recommends setting the plugs in 0-320s and 0-360s with a torque wrench to about 30 ft-lbs. (Incidentally, the Lycoming rep told me that the long electrode REM37BY Champion

spark plugs that came with my 0-320-E3D engine may be used, -- see Lyc-Service Letter L192B-- even though they were not on the list of approved plugs I consulted. The different electrode pattern on these plugs was evidently developed to combat lead fouling. Since the -E3D is a low compression, 80 octane engine, and in many parts of the country 80 is not available, I will probably have to run 100LL on trips, which has four times the lead content of 80187. I'm going to try them ..... ks) We also discusses leaning procedures for taxi, climb, and cruise. Lycoming's recommendation was that the engine should idle between 550-650 rpm. (The low inertia of a wood prop usually prevents a smooth idle at less than 700-750 rpm, so d you are running lumber, this is acceptable). If the mixture is pulled to idle/cutoff while the engine is idling, the rpm should increase 20-30 just before the engine stops. If it surges higher, the idle mixture is too rich and should be readjusted. Once the engine is properly adjusted, mixture may be left rich for taxi. On climb, the mixture should be left full rich until power is down to 75%. This power might be achieved a couple of different ways. Because RVs climb so well, you may choose to reduce power soon after a takeoff and climb at something like 75% -- if so you can lean to 50 degrees rich of peak, adjusting every once in a while as you go up. If you leave full power in, you should delay leaning until manifold pressure (rpm if you have a fixed pitch prop) drops off to 75% power. As long as the airplane is climbing, the engine should be left slightly richer than it is for cruise, to help with cooling. These and a few more tips are more fully discussed in Lycoming Service Letter L192B of Jan. 19, 1988 and Service Instruction 1094C dated Jan. 31, 1969. A chart of approved spark plugs is shown in Service Instruction 1042T of April 23, 1993.

## CRANKSHAFT OIL SEAL LOSSES FROM CENTRAL STATE'S ASSOCIATION

In recent months there seems to have been an increase in the number of crankshaft oil seal losses. This, as Australian Magna Liset discovered, causes loss of all lubricating oil resulting in a seized engine. Fortunately Magna had just completed the long over water flight from Australia to New Zealand before the seal popped out. Some old narrow deck Lycoming engines have a sheet metal retaining washer screwed to the crankshaft end of the case. This covers the oil seal thus holding the seal in place, even if it tries to slip out. It seems that later model tractor application of these engines don't require any retainer. Pusher applications may not follow the same rule, however. (Lycoming disagrees with the statement and says neither pusher nor tractor applications need the retainers, see below) The next time you are at your airplane see if your engine has the retainer. I have an 0-235-C and there is no retainer plate or screw holes on it. The oil seal retainer installation is covered by Lycoming Service Instruction No. 1073A. It seems Lycoming made a crankshaft oil seal retaining plate safety kit, part number 74034. This kit included 2 oil seal retaining plates PN 74026, 4 #1 0-24 capscrews PN 74330, and 4 plain #1 0 washers PN STD-425. All Lycoming engines, that I can recall, have cast bosses in place on the crankcase. These bosses are sometimes drilled and tapped for screws to hold the oil seal retainer ring. Perhaps it would be wise to install such a seal retaining method on all our engines. If your engine is down for overhaul it would be a simple matter to drill and tap the bosses

for a small screw (perhaps #1 0-24?) to hold the retaining washer. Such a washer could be easily made from flat thin aluminum stock (perhaps .032 2024T3?). If your engine is not apart you might consider cleaning the end of the crankcase VERY CAREFULLY and RTVing two halves of a split washer to the end of the case to retain the seal. Caution: be sure to use a fuel and oil proof type of RTV. Those of you who are running the B & C style of alternator drive pulley may be already covered. My pulley is so close to the crankcase that I don't see how the relatively wide seal could sneak by it. Of course no engine discussion is complete without a little CYA. To that end I called Gary Earon of Lycoming at (717) 327-7096. He said that the above idea would require field approval and the usual official paper chase. I indicated these were in experimental aircraft and he said it didn't make any difference because they were certified engines. He wouldn't offer any suggestion or feeling about the above retainer plate so I thought I'd find out what causes oil seals to "pop out". Gary said, "There are only two reasons for oil seal loss: excessive crankcase pressure and improper oil seal installation." I asked how one might check for excessive crankcase pressure and he indicated pressure should be measured using an air speed indicator as a pressure gauge. The "air speed" should fall between 45 and 60 mph at full throttle. (For those of you using a water manometer that means no more than 1.7") The "air speed" indicator would be connected with the pitot port going to the oil filler tube. He suggested making a plug that fits the filler tube and temporarily replaces the dip stick. This plug would have a tube installed that allows attachment to the pitot side of the "air speed" indicator. The static port would be connected to the normal static ambient air pressure. The correct method of oil seal installation is listed on Lycoming Service Instruction #1 324A which Gary said would be available from any mechanic. I contacted 3 different A & P's to find they did not have

such a thing. Lycoming's official answer was to contact Avial for a copy. I called the closest one, which is in Columbus, Ohio at (614) 258-3477, and requested a copy of the bulletin. They indicated they would send me one at no charge.

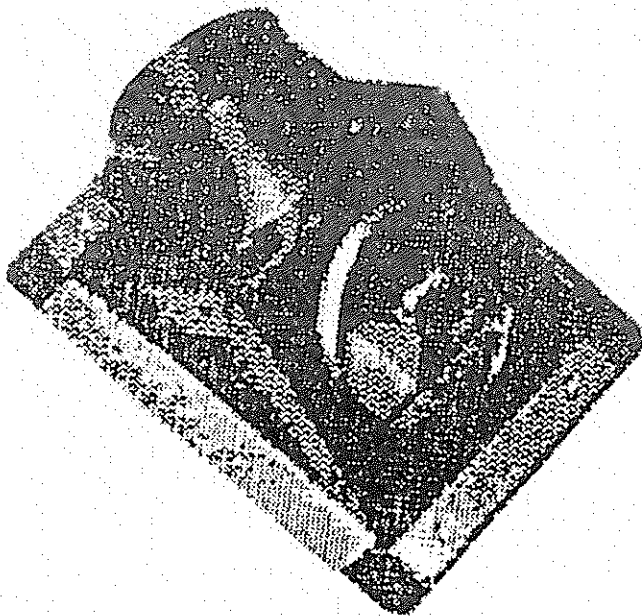
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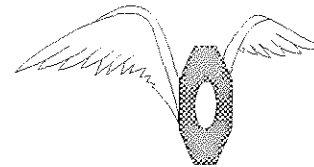
(303) 420-2724





*Ron and Jane Hayes' beautiful "Best at Oshkosh 93" Thorp T-18*

Richard, Sorry this took so long, I am not a good photographer or a writer! The hours are climbing and 102RH has been performing well! I am in the process of putting in a Garmin AVD 100, but really hate to quit flying long enough to mount it. The GPS operates hand held as well as panel mount so why bother mounting it during good flying weather? At 2300 and 23" I still am getting about 185 MPH. I have not calibrated the airspeed but the GPS seems to agree with my indicated. We are enjoying the Thorp and am looking forward to the Greely Fly In. Thanks Ron and Hayes.



### **Editor's Report: On "Let's bring Kay Thorp to Oshkosh 93"**

First let me thank everyone for their help in making Oshkosh 93 and Kays trip to the fly-in such a great success. Here's a run down on what the money went for.

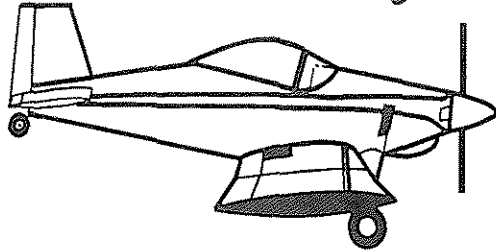
|   |               |
|---|---------------|
| Kay's travel & room while at Oshkosh                                | \$800         |
| The picnic at the nature center                                     | \$300         |
| A check was sent to the EAA for a<br>Memorial Wall plaque for John. | \$200         |
| <b>Total:</b>   | <b>\$1300</b> |

Thanks again to all the T-18 Mutual Aid Members that contributed to this great T-18 Event.

Your Editor, Richard Snelson



# McAlester Fly-In

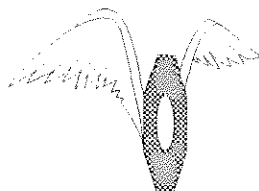


*Gary and Maxine Green at Oshkosh*

Feb 22, 1994

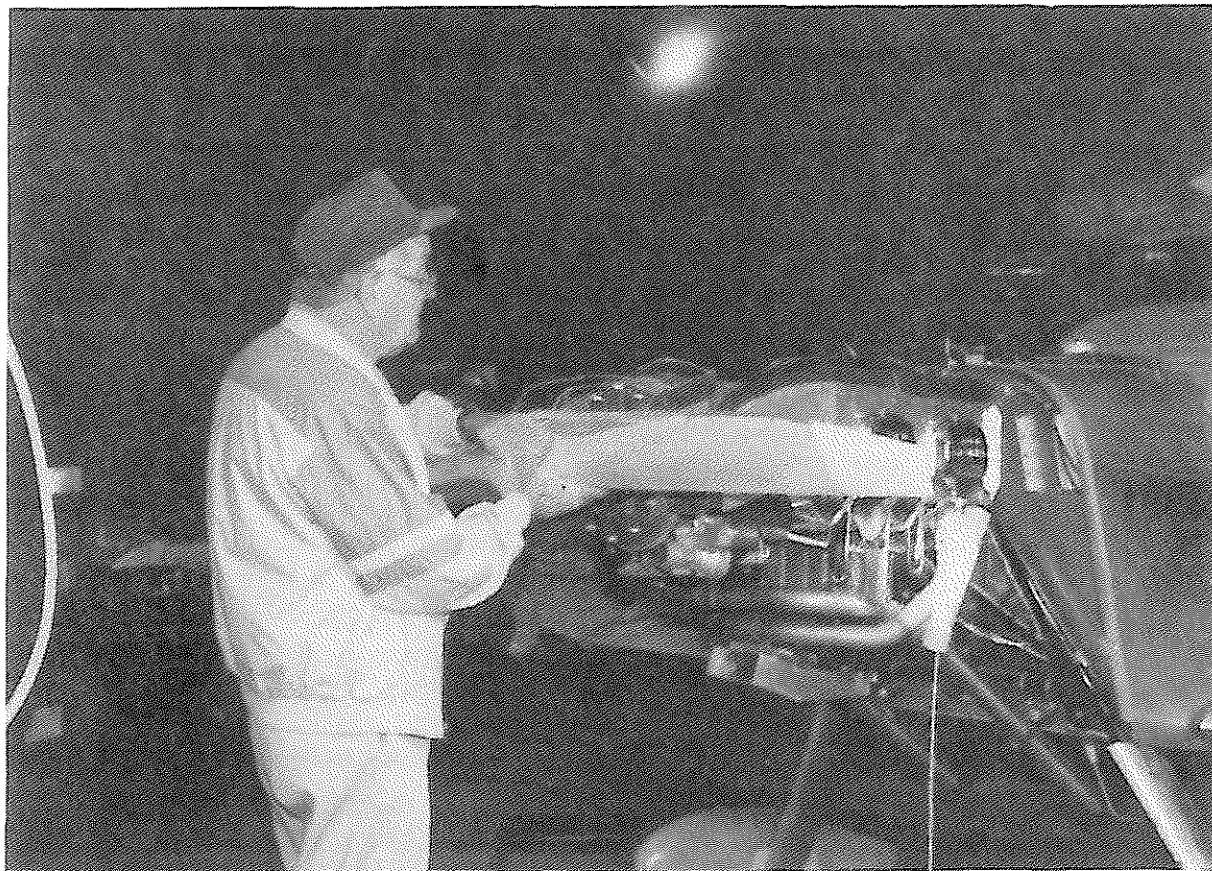
Dear Rich and Roxanne,

Enclosed is my \$25 check for the newsletter. You sure put out a high quality publication. I'm taking over newsletter editor duties for our EAA chapter and I wish I knew how to put out the graphics and style that you do. But, I'm definitely computer impaired. The Spring Fly-In at McAlester is a go. I talked to Dee Cobb at the Holiday Inn in McAlester today. They'll make us the same deal as last year at the same price. That is \$46 + tax for a double room. Folks have to call and make their own reservations. They ought to do it now since they can cancel up to the day of arrival at 6 PM in accordance with standard Holiday Inn policy. The phone # to call is 918-423-7766. They should mention that they want to be with the Holt- Green Party. I also talked to Phil Brenner at the McAlester Airport. They must have enjoyed us last May because they seem anxious to have us back. Phil said we can again use the vacant FSS facility. They have even spruced it up a bit. He also assured me they would make every effort to shelter as many planes as possible in the big hangar and hail sheds in the event of threatening weather. I appreciate that attitude. Phil will also give us a discount on gas at least as good as last year, which was \$1.75/gal. I'm going to have Leroy put the arm on him and see if we can't get him down to around \$1.50/gal. I understand the supermarket owner who treated us so well last year is looking forward to our return and will again fix us up for our cookout if he can get a ride or two in a T-18. I reckon we can handle that! We plan on having a practice cookout/social hour on Friday nite (May 6th) so we will be in top form for the main event on Saturday nite (May 7th). Anyone who didn't have fun at that last year was just plumb anti-social. If it's too late to get this info in the T-18 NEWSLETTER, I'll send out a letter on it if you can provide me with the mailing labels or a mailing list. Leroy and Mary are in the Baja now, so I haven't talked to them recently but I'm pretty sure everything is on schedule for one of our best T-18 Fly-Ins yet, if the weather patterns cooperates.



Gary & Maxine Green  
2530 Bellchase,  
Granbury, TX 76048  
(817) 579-1995

# T-18 NEWSLETTER



*Coyt Johnston of Snyder, OK nearing completion of his Thorp*

## **IN THIS ISSUE:**

**Oshkosh Events for 1994**

**Letters to the Editor**

**Monsoon** by R. Snelson

**Penman Award and building tips** from Dick Penman

**Project Report** by Eddie Eiland

**Flight Safety** "Fuel Starvation"

**The McAlester Interceptors** by R. Snelson

**Starting a T-18 Project** by Joseph L. Kroupa

**Project Report** by Coyt Johnston

**For Sale** projects and planes

**NOTICE: (STANDARD DISCLAIMER)** *As always, in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.*

# Editor's Column

## Events for Oshkosh 94

### **Nature Center for Noon Friday July 29**

Plan on joining us for a cookout lunch starting at 11:30, sign up on the flight-line ahead of time so we can get enough food purchased. We will split the costs.

### **Friday evening at Butch's Anchor Inn for the Banquet**

### **Forum time & date to be in EAA program**

### **Other Events for 94**

Aerospace America, Oklahoma City, OK on July 15-17 contact Larry Eversmeyer at (405) 728-1919 for details (Experimental Aircraft are invited)

Kentucky Dam Fly-In Oct 7-8-9

### **T-18 Mutual Aid Society Membership and your dues.**

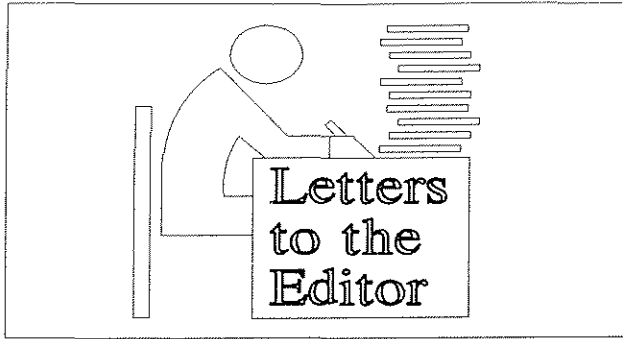
It's time for the **remaining few** that haven't paid, to pay attention to the address tag for the status of their dues. Some owe for 93. And some paid in 94 for 93. If your tag say 93-94 you owe for both years. etc.

Here's the policy for those of you that don't know it. The dues period starts at the first of the year!! If you don't realize that it's because you may have been paying late each year. Please check the tag and send your back dues now. I've been trying to get everyone called that's behind but that is running the phone bill up to the tune of 2 bucks or so a call. So please help out on this. Rich.

It is with sad commentary that I bring you the news that Bill Warwick lost his life Tuesday May 24 while test flying a new Thorp T-18 in Phoenix, Arizona. Bill was 63 years old at the time of death. I'm sure most of you know that Bill was a T-18 pioneer. He built and flew the first Thorp before John had the plans completed.

Information from Ed Poe who was at the airport when the accident happened: First flight of the new airplane (Owned by Bob Praker) occurred in the morning. Only problem was an out of trim condition requiring Bill to hold the nose down. Before the second flight, the rear servo arms were rebent to correct the out of trim condition. Details about the flight are not clear except the airplane spun shortly after takeoff. Ed reports that a special NTSB Investigator sent to check the wreckage has moved it to a warehouse for closer examination. Bill and his wife Millie had been living in Aguila, Arizona for the past few years Her address for anyone that cares to write is: P.O. Box 397, Aguila, AZ 85320

Another T-18 Owner, Charles Kenny of Montuck, NY was killed in a T-18 crash in Florida earlier this year. The NTSB Investigator stated that the outer wing panel failed from a very high negative G load. There was no sign of control surface flutter or failure.



March 16, 1994

Dear Richard,

Enclosed is my ante for the T-18 Newsletter. Please note the new address. Keep up the good work.

I now have my T-18 Operating Limitations amended to include night and IFR. This was very important to me and was not difficult to achieve.

I have 30 hours on my T-18 and a mixture problem that I can't seem to fix. I have to lean about 1" (of mixture control movement) on the ground in order to get smooth power for take off. This also yields the smoothest cruise operation at 2-3000'. Leaning at 7,000 and up gets pretty far out on the mixture control.

1. The mixture is adjusted for 25 to 50 RPM of rise at idle cutoff shutdown.

2. I have a fresh engine overhaul by a reputable shop.

3. I have sent the MA 4SPA Carb. off and had it overhauled to all the new specs. and bench flowed and jetted for the 0320B engine.

4. I have flown it with and without the carb air box and with and without the air filter. Can't tell the difference.

5. My next option will be to install another Carb. I suppose.

The airplane runs good and is very smooth. You just cannot run the mixture control in the full rich position even at sea level.

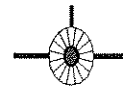
If you or others have any ideas, please call or write. Sincerely, Evan A. Roberts N89ER Rt. 5, Box 158C Temple, TX 76501 (817) 778-2252

3 April 1994

Dear Richard,

Building my center section continues and I hope to begin assembly this summer. In checking my copies of the Newsletter I noticed I am missing #88. The mail is always slow here and the Newsletter is of extreme importance to me. The technical details are priceless and by reading the Newsletter I can resolve questions when working with the blueprints.

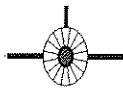
Please keep up the good work. Incidentally, after speaking with you about the Pitot and Static location, I found a heated Pitot and Static head that mounts on the end of a boom. This option appears to be a good one since my friend used the same setup on his during construction in the 70's. This appears to be consistent with Mr. Thorp's views that this item should be mounted in front of the wing leading edge in order to reduce errors. James A. Blaker (Andy) 8947 Vicksburg La. Manassas, VA 22110



Dear Rich, I will soon have some more T-18 caps for sale, as I have been getting requests. I believe these will be improved over the old ones. They are a very high quality golf style cap with a leather adjusting strap, made in Colorado also. The graphics/embroidery are improved. I'll have tan & red ones in oxford cloth, and white & navy in supplex nylon. They are very nice. The price will be \$12.00 each. If anyone orders by mail, please add \$3.00 for shipping. Also, I'm tooled up to make & sell cabin heat boxes. They'll be carried by Aircraft Spruce, but I sell them direct also. It's the lightest, most compact design on the market (less than 5 ounces). It has a stainless steel door & hinge assembly. Designed to mount on firewall & use 2" aeroduct. I've sold dozens to "RV" builders. The price is \$50.00 each plus \$3.95 for shipping & handling.

Sorry for making this letter a big commercial. I also recently received a new Aymar/Demuth prop after waiting 7 months. Preliminary data indicates an increase in cruise speed of over 10 knots. This is based only on GPS ground speed read outs, averaged over several runs in opposite

directions. My old prop was a rather poor example of a Pacesetter 200, 68x69. The new prop is designated 68x75. Preliminary data is as follows: Aircraft -N71JE, standard body, standard wing with new airfoil. Empty weight - 897#, engine - 0-320-D2A, 160 HP. Outside air temp - 65 degrees F. 30.02"HG, RPM @ end of takeoff run ~ 2350 RPM (old prop was 2400) Cruise true airspeed @ 2550 RPM & 7500' MSL -160 Knots, 184 MPH. Full throttle speed @ 7500' MSL over 207 MPH, 180 Knots. I'll get better data on climb performance, etc. at a later date. Best Regards, John Evens 6855 Allison St. Arvada, CO 80004



Dear Richard,

Just received notice of the McAlester fly-in and also the reminder for dues. Frances just called the bank. The check was paid April 5 Th.. Kind of slow. It was mailed March 5 Th..

I do hope everyone pays their dues promptly. The newsletter is too valuable to lose. We sure enjoy reading them. A note on every newsletter as follows may help. "T-18 Mutual Aid Society Renewals are due the first of every year. Send check or money order for \$25.00."

I have flown very little the past couple years. I have Dan Dudah's T-18 N22DV. It's a gem. Hope to fly more from now on. Also have a Star-Lite that I built. I want to sell it this spring. Can't keep both of them. You might run an add in the next newsletter. Star-Lite N40SL. Fully flight tested. Cruise 120. Climb 1200 FPM, Stall 42. Time on airframe and engine 50 hrs. It's a tail dragger. Call or write for picture and info.

I hope Frances and I can get to Ill. some day. We would love to stop in to see you and your T-18. Best regards, Hank Steinginga 45528 Newtree, Lancaster, CA 93534 Phone (805) 942-3046

*Editors Note: RoxAnne and I would look forward to a visit from you. Thanks for the kind words about the newsletter. I owe an apology to*

*the members that had already sent in their 94 dues. On very short notice I sent out the McAlester Notice to let folks know that it was coming up shortly. This was because #90 was stuck in the post office somewhere. On the back I put a second notice about the dues. Nearly everyone that had paid got in touch with me by sending a copy of their check or a note. Several good folks paid twice. Some paid no attention to it. I'm still holding the bag for some folks for 93 and more for 94. I've started calling them and that works, but it sure runs up my cost and takes time I could be writing articles. I can't afford to send out four and five first class postage notices to them like the magazines do. Yet if I drop them and they want the letters later it's a real big postage and printing cost to fill them in. If you can tell I really don't know what to do.*



18 April 1994

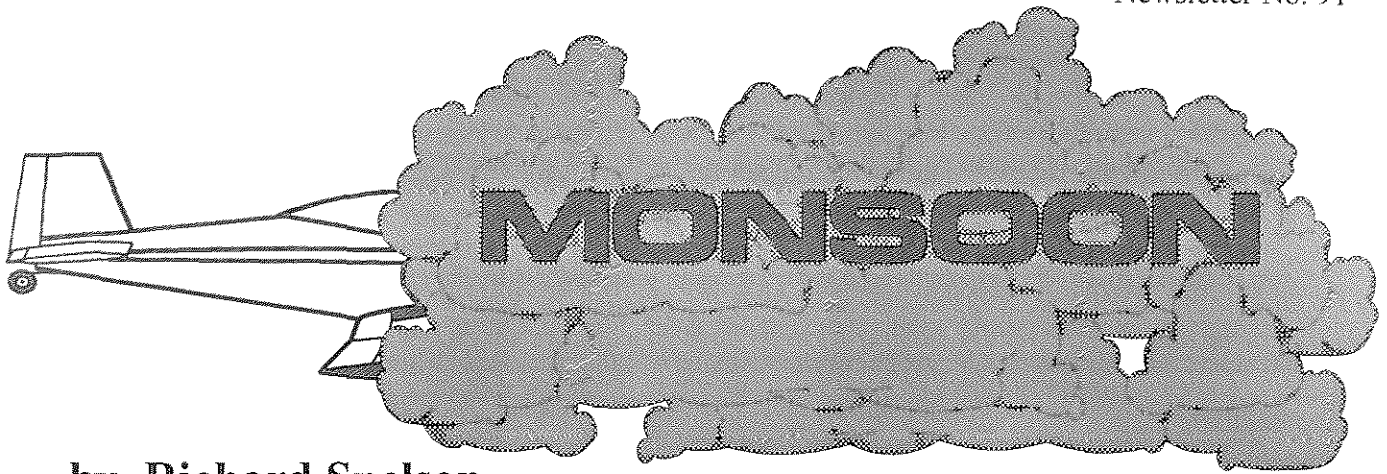
Dear Rich,

Progress on my airplane was proceeding quite well through Christmas but then we found out that my wife had a recurrence of cancer. She had a very difficult operation and is going through radiation now. She is really suffering and I have been very busy with housework, etc. of course, we've got to beat this thing before I can really get on with the project.

I sure did enjoy all of the Thorp events at Oshkosh last Summer. I learned more about John Thorp than I thought that I could and I especially appreciated the time talking to Thorp people about the various aspects of building the Thorp. Thorp people are the best!

If all goes well and my wife gets over this hurdle, I'll see you at OshKosh this summer.

Thanks for the excellent job that you are doing with the newsletter. If I can do anything to help, after we get through this cancer thing, please give me a holler. Sincerely, Don Ruffner



by **Richard Snelson**

Waiting below, the Burma jungle's canopy reaches upward, welcoming the monsoon rain and beckoning to the light aircraft lunging blindly above. The pilot, looking up from the instrument panel for only an instant, prays for any kind of break in the clouds. He sees only a solid sheet of water raging across the windshield. The driving rain has found every crack in the aircraft's canopy and windshield. Now the water streams across the instrument panel, over the gyros and onto the primary navigation radio, causing it to flash its no-op flag from the wet tropical bath. The pounding of the storm is relentless and continues to stress the pilot with 3 to 4 Gs of force.

After more than an hour of the pounding, the tired pilot tries all his old tricks to gain control of himself and to hold the aircraft on course. "Stay alert! Stay alert! "Now look Don," he said to himself, "you're an old 'pro,' a professional! You put this creature together -- you, me -- this Thorp T-18. It's a work of love. It won't come apart. Keep control, pick the wing up, quick! You've started a turn. The old joke always helped before--cheer up things could be worse -- sure enough things get worse. Think, what must I do to survive, to live. Think."

Years before his round the world flight attempt and before the Thorp T-18 was started in his garage, Donald Taylor, the pilot, approached the T-18's designer to get a set of plans. That

first meeting with John Thorp was a disappointment. John felt the plan to fly such a small plane "around the world" was filled with chances for failure, so he refused to sell Taylor the plans. This made Don even more determined to build a Thorp T-18 and fly it around the world, setting numerous world records on the way. So Taylor continued to press Thorp until finally with his blessing and help, Don got the plans and set out to build an airplane that would make history.

After five years in the making, (no kit here) it was finished. Taylor christened it "Victoria" after the only ship of Magellan's fleet to circumnavigate the globe. Don, in moments of panic, would remember John Thorp-- with his always present khaki shirt and pants-- thinking that Don would surely kill himself. That thought really doesn't do much to help Don's confidence now.

Don is a survivor, aware that to continue, the instruments and radios have to be protected. Reaching behind the seat he grabs for his travel bag and starts stuffing its contents on top of and around the sides of Victoria's dripping instrument panel. Underwear, pants, socks and a spare shirt all go to soak up the water. The cockpit quickly looked like a Chinese Laundry. The idea was working. The gyro instruments and backup radios continue to offer a navigational highway for the pilot to follow through the storm toward his destination.



With only a second to spare from the constant instrument scan-- wings level-- altitude-- heading-- airspeed-- Taylor's thoughts turn to his position. "Where am I?" He thinks out loud as he reached for his flight computer. "The time? Let's see, one hour plus forty minutes out of Rangoon. Set 140 knots as my speed and that means 232 miles traveled. Again scan-- wings-- compass-- altitude. Stay on course. Don't loose altitude. Correct now!" Mental math has always been easy for Taylor, even back when he was flying a P-40 over the hump in Burma, but now it seemed hard. "Impossible to concentrate and get the number to come out right." He tries again, "Navigation card shows 620 miles to Pinang, take 232 from that leaves? Think, do the math! Why am I here? Rangoon, Burma, to Penang, ten thousand miles from my home in California, Why? Wanted to be a world record flyer! To leave my mark! The search for the best aircraft, the five years in building and now this solo attempt to fly the smallest plane ever around the world."

A low wing, heavy on the right quickly brings the exhausted pilot back to the reality of flying the tiny craft. "Hold the heading" he tells himself again and again. Quickly he realizes that he needs to switch wing tanks to balance the craft, so over to the right tank. The single pilot IFR work load, along with the beating from the thrashing, tossing aircraft is taking its toll on Don Taylor. The water is still coming in. "Soak it up" he says aloud as he squeezes out the clothing, "Its got to be stopped."

Suddenly he remembers the calculation started only seconds before but now seeming like an eternity ago. "That leaves 388, say 400 miles to go, with seven hours of fuel left. Seven times 140 knots. OK! No problem with fuel." As Don returns to his instrument scan it brings a sinking feeling. The airspeed has gone crazy, the needle is whipping back and forth across the dial and slowly sinking toward the aircraft's stalling speed. Ice? A check of the outside air showed 8 degrees C. How to react? A look at engine rpm

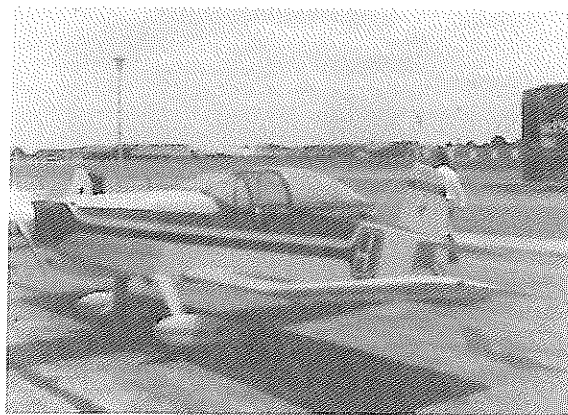
and the altimeter brings reassurance that the craft is still at cruise speed and something is wrong with the instrument. "Water in the pitot tube must be the problem" he thinks, reaching for the drain under the panel" As the water runs from tube onto his hand, the airspeed indicator slowly climbs back toward cruise, 30- 40 -60 -90- 140 bingo! "Another crisis is over and I'm still in the air." He wondered, "What's next?"

There's no waiting for this one. Aircraft engines run best on gasoline not water and the Lycoming up front is rapidly getting enough water to douse it and end Don's misery. But first a warning! Rough engine! RPM jumping! Surging power! All this means another crisis for the tired pilot. This time there is a surprisingly fast reaction by the pilot who has a lot of adrenaline flowing. His frustration with the storm has turned to anger. Quickly he pulls carburetor heat shutting off the inlet air and the deluge of water entering the airbox. With only a small drop in rpm, the engine returns to its normal smooth drone and continues to pull it pilot and Victoria on toward their place in history.

With the engine running smoothly Don again turns his attention to finding his position. Turning on the ADF he finds the target station. The needle centers straight ahead. He wonders "Can I be so lucky?" He checks the frequency and call letters of the station and pushes the test button on the ADF. The needle drops from center and again swings back as the button is released. This confirms his track. The station is dead ahead. Now Don is wondering if he will be out of the storm before reaching Penang! Just as quickly as the thought came, the rain ends, the clouds separate and Victoria emerges over a scattered overcast of tiny "safe" clouds. After contacting air-traffic control Taylor relaxes and gives thanks for getting through the worse storm of his flying career. He knows that soon he will land and another leg of his "around the world flight" will be over. He says out loud, "One leg at a time Victoria" "Tomorrow Singapore!"

# DICK PENMAN WINS

## Outstanding Workmanship Award!



*Editor's Note: Our congratulations to Dick Penman for winning the "Outstanding Workmanship Award for a plans built aircraft for Oshkosh 1993. His beautiful yellow and red "#9" sure rates a 10 in my book. It stands out in any crowd of homebuilts. For this issue of the newsletter Dick has included more of his finely drawn T-18 building details. Also our thanks to him for his help in obtaining T-18 tee-shirts for Oshkosh 93. RoxAnne and I proudly wear ours for flying events.*

March 9, 1994

Dear Richard:

Just a note to say hello to you and your family and to share a bit of news with you. As you know the T-18 tee-shirts and logo that I designed and produced for our 30th Anniversary celebration were very popular among our group at Oshkosh. I have since had a number of requests for other items as well as tee-shirts. So I am going ahead with the investment of digitizing the logo and will try to provide printed tee-shirts, embroidered polo shirts, hats and assorted color decals for aircraft. If you can work this information into the newsletter, it would be appreciated. All pricing will be based on zero profit. I will donate my services as last year.

I have included an article that appeared in a Detroit suburban newspaper about my T-18 and my experience at Oshkosh. I was very fortunate, my Thorp T-18, N199DP, won an EAA "Outstanding Workmanship" award for Plans Built Aircraft. Needless to say, this really topped off my flying summer!!

Based on my observation, we need to somehow give more recognition to those individuals who have contributed their time and effort to promoting the T-18 movement, as you have done. Our Annual T-18 dinner would be a great opportunity to recognize those who have organized fly-ins and/or associated events or otherwise contributed in some way to advancing the T-18 movement. We need to turn new people on to the T-18 as a Home Built project. It was the enthusiasm of the builders/pilots that got me started twenty years ago. This past year has been extraordinary for the Thorp T-18, let's keep up the momentum and do even better next year.

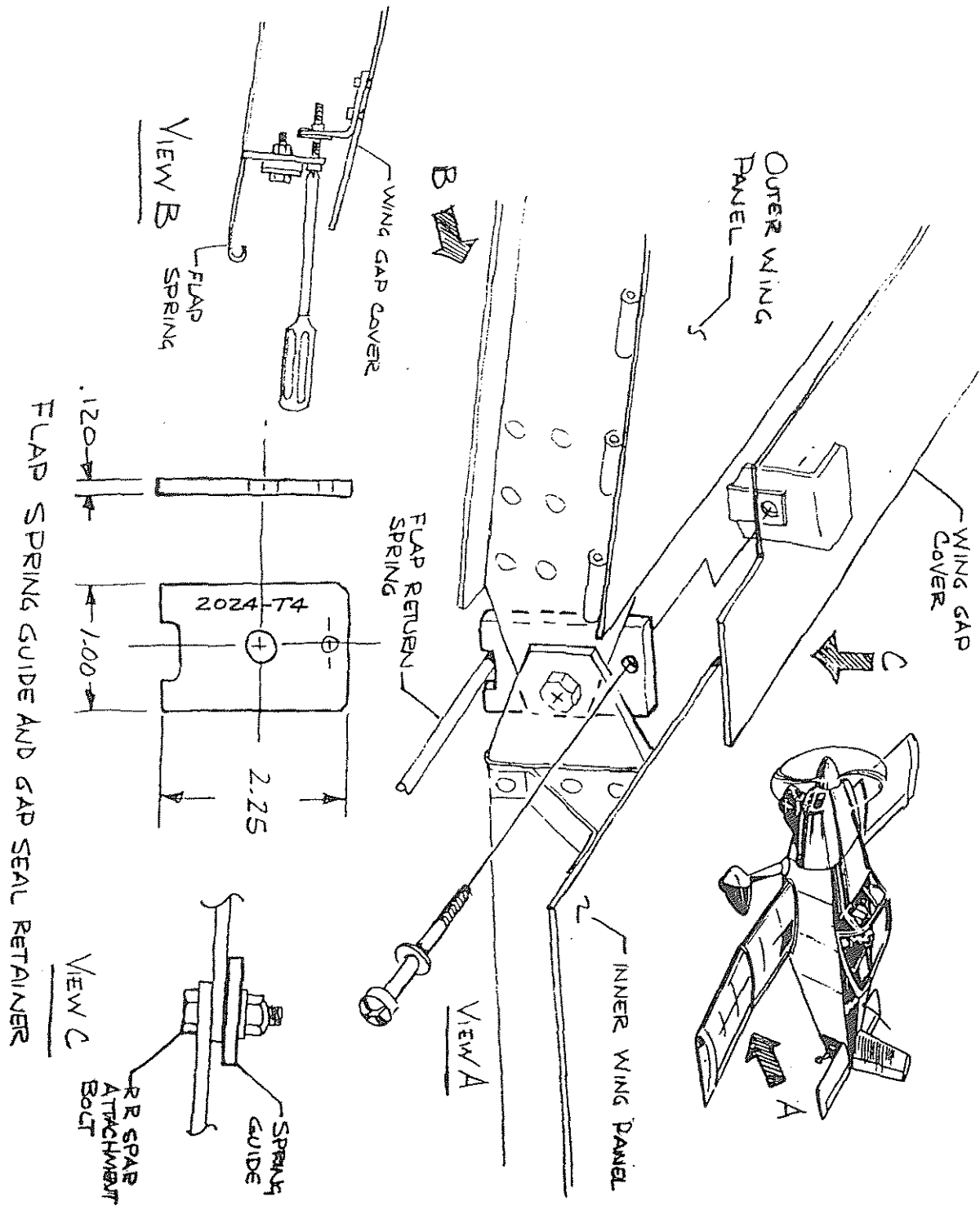
Also, a question came up about using a Flap Spring Guide to insulate the spring wire from the rear spar attachment fitting, a potential wear point on that fitting when the flaps are retracted. I have included a sketch of the guide that I used. It serves a dual purpose, to both guide the flap spring and retain the wing gap cover. Another question was raised about the static port location, so I am including a sketch on this as well. This location was worked out by Bob Dial in the early 70's and it works extremely well. However, a port must be installed on both sides of the fuselage to function properly.

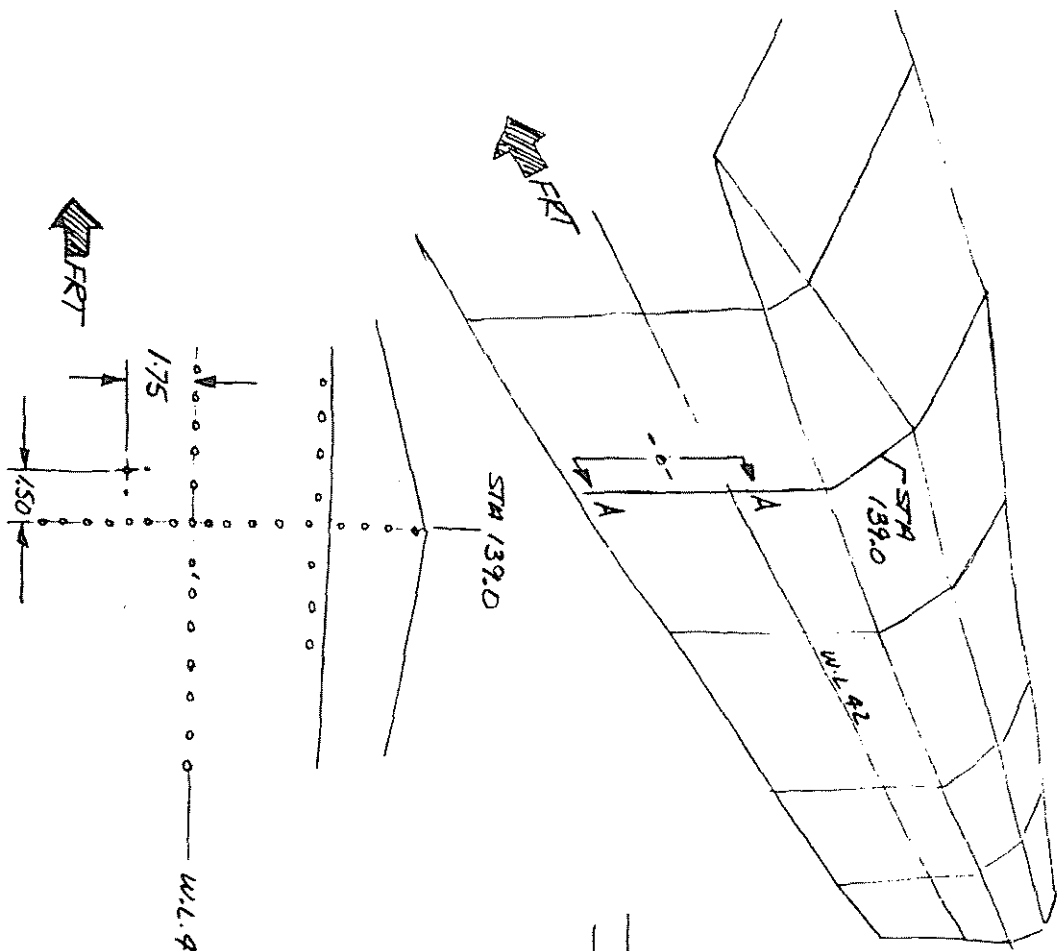
Good flying,

Dick Penman, EAA 60368  
5918 Bordman Road  
Dryden, MI 48428

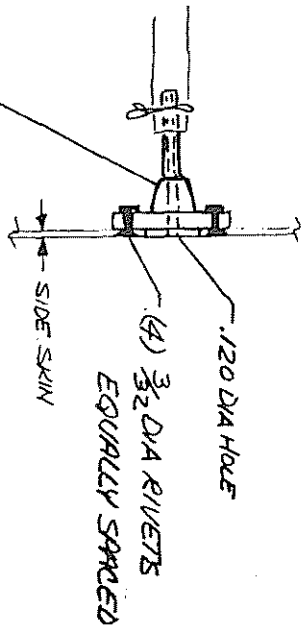
*Dick's drawings follow on pages 8 and 9. Thanks to Dick Penman for some good tips!*







STATIC PORT LOCATION



MACHINE OR FABRICATE  
STATIC PORT FITTING FROM  
6061-T6 OR 2024-T4

SECTION A-A

Eddie Eiland

## Project Report

My project is almost all primed and I hope to have the paint all done within another couple of months. Weather, the kids and running low on motivation have slowed progress on the finishing. I still have many things to do and complete besides the weight and balance and FAA paperwork. It has taken 4 months but I finally got my N number.

Here is a list of several minor things I've done to my project that might interest some.

### 1) ----- The Engine Cowling -----

I laid up my 4 piece cowling in molds loaned to me by Dick Cavin. I used as few layers of cloth as I felt would hold up in use. I used safety-poxy attempting to keep the weight as low as possible yet the strength up. The parts turned out lighter and thinner than most other cowlings I've seen but a problem showed up that I had not counted on. Because of how thin parts were after I assembled the 4 parts I was not pleased in having the cowling pucker between each fastener and that there were so many fasteners. After many hours of looking at it I decided to glue and rivet the 4 pieces together and then split the cowling all the way down each side and use 2 piano hinges to assemble the cowling, just like my Sonerai, I have not flown and there are some other problems introduced by doing it this way but it looks smoother that it would have otherwise, weighs 16 pounds unpainted, is quite strong and can be removed quickly.

### 2) ----- The Engine Baffeling -----

Partly because of the way I built the cowling and partly just because I think it could be sealed better I built my engine baffeling with a top. Basically it is a box with 2 front openings that

line up very accurately with the cowling. Because of this only about 20 linear inches is required to seal each side of the box to the cowling. The conventional method requires sealing about 118 inches to the top and front of the cowling. Also there should be much less load on the cowling and its attachment since there is no large pressure difference across the total area of the engine.

### 3) ---- Regreasing the Aileron Bellcrank ----

Once the aileron bellcrank is assembled into the wing it can't be regreased. Most of my controls are mounted in sealed ball bearings and I hated to build in a plain bearing that I could not even lubricate. With this thought I drilled and tapped a 1/4 -28 hole into the middle of the bellcrank and screwed in a grease zerk. To lubricate this crank takes only a small part of a stoke with the average grease gun and is accessible when the outer wing panel is removed. It might not need a shoot of grease even every other annual but at least I can easily regrease mine if I want to. I think with a bit of care a person could drill and tap the bellcrank even on the airplane.

Sincerely, Eddie Eiland.

I've been putting off sending this thinking I would get off high center on my painting but it hasn't happened.



### FOR SALE      FOR SALE      FOR SALE

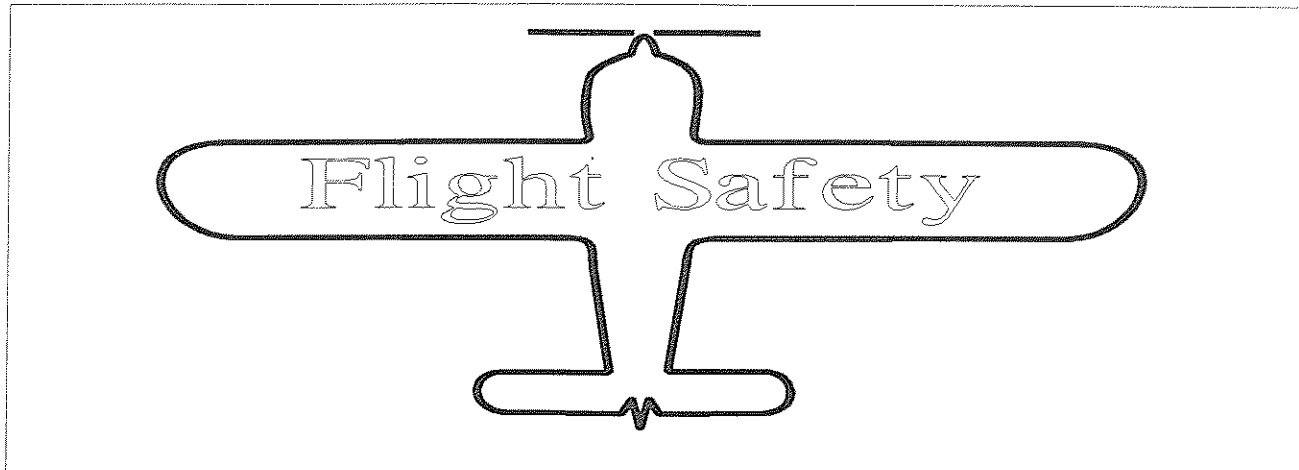
Sensenich Wood Prop (Brand new) 66x78 complete with the fitted spinner assembly. Call 817-766-2523

**For Sale:**      T-18 Parts  
                      New Gear  
                      Flat 0-320 engine mount (used)  
                      Center section needs one skin

Call make offer also some other parts & projects

**I want to buy Piper PA-20 Gear.**

Corky Downer P.O. Box 1258 Mt. Vernon, Tx 75457 Phone 903-588-2773



## **FUEL STARVATION EMERGENCY LANDINGS!**

- 1. Before the next flight remove the gas tank cap and using a flashlight look to see that a filter standup screen is installed in the tank outlet.**

Thanks to Rick and LouAnn Jones for this tip: On their trip back to Texas from the McAlester Fly-In the engine quit. Rick managed to get the aircraft down on a service road with no injuries but some damage to the landing gear and bottom of the wings. Rick reported that just a few minutes earlier they were flying low, due to low ceilings, over a large lake and if it would have happened their they could not have made it to shore. The analysis of the problem later showed that some RTV had been pumped into the aircraft's gas tank during a refueling transfer from Rick's auto. The RTV had been used to repair a breather line on the car earlier. LouAnn commented that she was not impressed with the T-18's glide ratio with the engine out and the prop windmilling. (See Steve Hawley's letter on this subject, following)

- 2. Check the gas tank breather line to be sure it has not collapsed from age.**

This can be done by taking the tank gas cap off and blowing into the breather tube. Another T-18 just made it to an airport with a blocked breather. The engine was about to quit from fuel starvation.

### **Steve Hawley's letter:**

I was sorry to hear of the forced landing of the Jones's but am happy that no one was hurt We don't like to think about it but it could happen to any of us at any time! As 'you know, I also had a forced landing several years ago. The experience has convinced me that every person who flies a T-18 should find an airport with a long runway, and practice engine-out emergency. I can assure you that the T-18, (or any other airplane) is a different animal when the engine is just windmilling, compared to pulling the throttle back to a slow idle, As an illustration, just think how much sweat you would generate hand turning the prop at about 600 RPM. This is what is happening when there is no power available and the prop is windmilling. All of that energy goes some where and you can bet it is not in extending the glide.

I also had bad weather coming home last Sunday. From McAlester I went northwest and hit I

-40 about 60 miles east of Oak City. The ceiling kept getting lower and lower until I was only about 200 feet directly above the west bound lanes. It cleared about 10 miles east of Oak City so I flew around the Class B airspace to the north. About 25 miles southwest of Santa Rosa NM and about 10 miles north of the White Sands Missile Test Range, I was following a little two lane NM state road heading for Socoro at about 200 feet above the ground on a SW heading when 4 F-14 Tomcats and 1 A-6 Intruder went over and around me only 75 or so feet above me. You can bet I was startled, They were heading due west. One of the F-14 pilots waved at me! I didn't wave back, I was busy! Regards,

Steve Hawley

## Non-Instrumented Rated Pilot flies into Clouds at night

I recently heard a testimonial to the merits of stall strips on the T-18 wing. A non-instrument rated pilot in a stall strip equipped T-18 flew into clouds at low altitude at night. He reduced power, initiated a turn, and pulled up a bit knowing that the ground was near. The pilot told me that after a few moments, he realized that he, was flying with the stick FULL AFT and the turn coordinator ball FULL to one side. He then centered the ball with rudder, eased the stick forward, and re-applied full power. The T-18 descended out of the bottom of the clouds at that time, roughly, 800 feet AGL over dark farm country. Any T-18 without stall strips would have departed in a spin with very little chance of recovery from low altitude at night.

The stall strips really do tame the T-18 stall to where it is relatively benign. Wind shear, wake turbulence, pilot tasking from an emergency situation, or disorientation in clouds could put any of us in a stalled situation at low altitude. The four T-18's I have flown with stall strips all experienced dramatic improvement in stall characteristics. All four aircraft behaved differently when stalled without stall strips, and there were differences between the aircraft with strips on, but all four saw dramatic improvement.

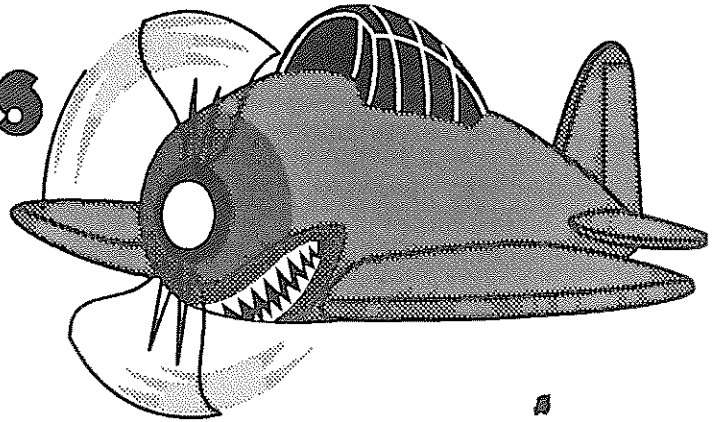
I recently had an opportunity to experiment with stall strips on a folding wing wide body with the LDS airfoil (Dave Fox's N444DD.) Stall characteristics in 4DD were altered from abrupt wing drop to the right to a stall in which the nose bobs up and down for several seconds before eventually breaking right (stick held full aft). Buffet is very pronounced as with the standard wing T-18.

For Dave's folding wing we experimented with strip positions immediately inboard and outboard of the dihedral break, with no noticeable difference in behavior between the two positions. We elected to place the strips on the center section. The folding wing appears to respond to stall strip treatment just as well as the "standard" wing.

The stall strips we have been using are described in Newsletter number 92 and may be made from scratch or by cutting Piper Cherokee strips in half. Piper part number 765399, approximately, \$53 at an FBO, includes two strips which may be cut in half to treat two T-18's. Best Wishes, Tom Kerns T-18 N10TK

# THE MCALESTER INTERCEPTORS

by Richard Snelson



At 6000 MSL and 75 NM out, McAlester traffic was loud and clear on 123.0 MHz. "That sounds like Bob Highley and Bill Williams" I said to my co-pilot Roy Farris. Then the familiar voice of Ron Hayes joined in. Ron & Jane Hayes, from Blue Springs, Missouri were just ahead. A call to Ron alerted our welcoming committee at McAlester.

The Highley and William's interceptors at McAlester quickly locked on their target to the north, and for the next 10 minutes it was a read back and forth of our "GPS" mileage indications, altitude and headings.

"Were showing 35 miles Bob."

"OK, Rich I'm at 18 miles out." The exchange continued until we made visual contact with the two speeding bullets coming our way. This was my first experience with 350 mph closing speeds and it did make my heart race. Highley made a steep banked climbing turn and was suddenly at my wing tip. All this from visual contact to interception in "5" seconds. The experience was an eye opener and showed just how little time you would have if meeting an unexpected aircraft head-on. It also proved that I wouldn't want to fly combat against "The Ace" Col. Bob Highley. Roy and I arrived at the fly-in with the welcoming committee strapped to our wing tip. I was glad to be back among the T-18 family and anxious to see old friends.

One friend that made it was Mac Booth.

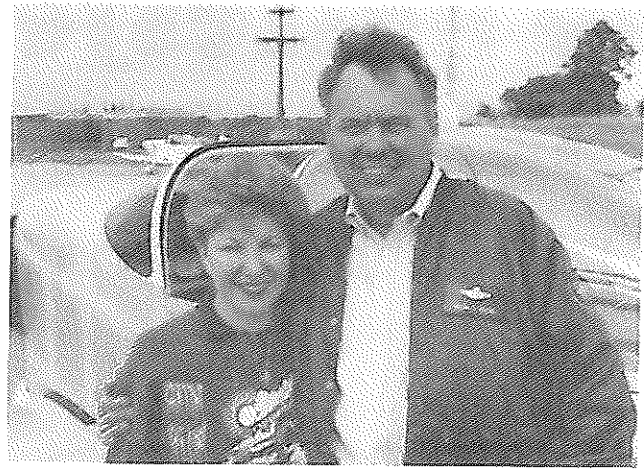
Mac is from Daleville, Alabama, and has attended every T-18 event that I can remember. In the past he has flown his white and orange trimmed Thorp through all kinds of weather to be with us. It was good to see Mac, realizing that he had serious health problems and two major surgeries this past year. Mac said his flying days are over and quickly added that he could still drive. He certainly proved that by driving over 600 miles to be with us at McAlester. That's real dedication.

A new T-18 called "Spot" was on the flight line this year. This chromate decorated Thorp belongs to Bill & Debbie Williams of Lakeland, Florida. Bill's metal work is top notch and I'm sure the aircraft will be beautiful when painted. Ask Bill why his T-18 is called "Spot" when you see him? Another Florida pilot and his wife making the trip to McAlester was Jim & Sue French with their newly purchased white with blue trim Thorp N66WT. I didn't think Jim would be out of the T-18 business very long.

If you noticed a lady walking the ramp taking down airplane numbers, don't worry it wasn't an FAA Inspector. It was Pat Eby. She makes it a point to get a list of the pilots and airplanes in attendance at each fly-in. Pat counted 19 airplanes this year. Thanks Pat. I'm still trying to get my count straight: let's see there were three look alike T-18s from Wichita Fall, Texas, Dave & Pat Eby, Stash Simpson flying with Doug

Ripley, and John Mihahla flying with Steve Kirik. Another Texas couple that makes it to most of the T-18 events was Bob & Helen Slagle of Clute, Texas and I don't want to forget Ken Morgan was there he's also from Texas. Gary Cotner's (Collinsville, OK) new paint job is beautiful and his Aymar-Demuth Prop (goes real fast) is costing the T-18 pilots lots of bucks as they try to slip a small upgrade, past their wives. Also from Oklahoma was Gary Holt and his T-18. Didn't get much of a chance to talk to him since he spends all the time in the air. Another Oklahoma couple will be spending their time in the air next year, that's Coyt and Wilma Johnston of Snyder, Oklahoma. He reports that it's down to the finishing touches on his T-18. Hurry up Coyt! We want to see your T-18 at Kentucky Dam this year. Gar Root & Paul Kellas made a long trip from California. It was good to see California represented at the event. A surprise person, heavy beard and long hair asked me, "Remember Me?" "I'm Marion Smallwood." I had given Marion his first tail-dragger check-out (case of the blind leading the blind) about 15 years back when we lived in Missouri. Marion has purchased a single place, retractable gear T-18 and was looking for tips on flying it. He lives in Lowell, Arkansas.

Saturday evening was another famous "Cook Out at McAlester". Leroy and Mary Holt of McAlester did a wonderful job getting our plates loaded with Big Burgers and lots of tasty side dishes. After stuffing our selves we set around the "camp fire" and watched the sun go down in the west. Don't believe the camp fire bit! We really did sit around the old flight service station, and talked T-18 adventures. An unnamed T-18 pilot asked, "What does a T-18 pilot do when he flies into bad weather? Well he does a 360 degree turn and gets the heck out of there." As the stories got deeper Jim and Judy Paine slipped away for a hop into the clear Oklahoma sky to watch the sunset. Judy says it's their favorite time to fly. There's romance folks!



*Bill & Debbie Williams with "Spot"*



*Ron & Jane Hayes, Tuning up to go to Dayton for the Wright Brothers Award!*



*Steve Kirik and John Mihahla*

Sunday morning brought an overcast sky and good flight conditions to the east. Not so lucky to the west and south. Steve Hawley, from Tucson, started home early and returned after about 40 minutes. He said he was down to 200 feet and it was time to do a 180. A little later Rick & LouAnn Jones from Cedar Hill, Texas, made it in to say hello. Rick said he had grass all over his tail wheel from the low flying on the way up. It was good to see the Jones and we're sorry about their bad luck on the way home, but glad they're safe and the airplane can be repaired. (See the Flight Safety Note on their

Fuel Starvation Problem) I left McAlester early and didn't get an opportunity to thank Gary & Maxine Green for their effort in planning and setting up another successful McAlester event. Thanks to the Greens!

When you attend a T-18 gathering, like McAlester, make sure that you're not the last person to fly or drive away. One minute you will be on the flight line with the T-18 family of friends and their airplanes and just a little later, they will have flown away and you will be there staring at the empty ramp. Boy does that spell l-o-n-e-l-y.



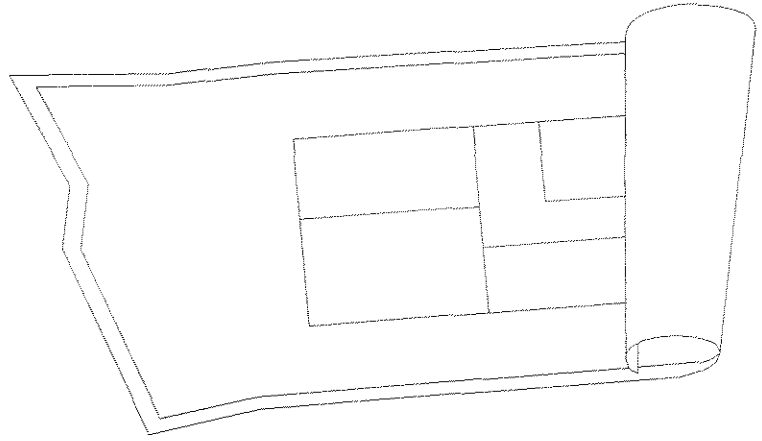
*Left to right Roy Farris, Rick Jones, Mac Booth and Jim Paine*



I

# Starting a T-18 Project

by Joseph L. Kroupa



Joseph L. Kroupa, #800  
505 Twinning Dr. Dayton, Ohio, 45431

My interest in the T-18 started about two years ago, when I arrived at Oshkosh looking for a simple, cheap, and clean flying machine. I narrowed my choices down to the RV-6 and the T-18. Finding out that the RV-6 requires a massive permanent jig and blind drilling into underlying parts, I looked closer at the T-18. Learning the impressive design experience of John Thorp gave me confidence that the T-18 was the airplane for me.

Where to start? Get educated!! Join the local EAA chapter and get to know your fellow airplane builders. Find a person who exhibits great knowledge of aluminum construction, and adopt him/her as your mentor. Obtain copies of the old newsletters and start reading. The first task is to determine what you want from your airplane. Learn the possible options and the success other builders had with these options. Some options include, power-plants selection, folding wing, IFR capability, and wet wing. The knowledge gained from the newsletters will help you chose the right options for you.

The second task is building and furnishing a work shop. This includes, the purchase of hand tools, air tools, and a compressor. Working with your mentor can help you figure out which tools are required or just nice to have.

Some of the newsletters articles don't make a lick of sense until you start building an actual component. The ailerons are a good place to start. There are so-many little tricks and traps to fall into that you going to make that first mistake anyway, so don't be afraid. You will soon learn that 1) your work bench need not be 38 inches high, 2) predimpled holes may not necessarily line-up, 3) deburring your holes before and after dimpling is not required and can enlarge your holes, 4) driving rivets into enlarged holes is not the easiest thing to do, 5) drilling out bad rivets from enlarged holes can enlarge your holes, 6) driving rivets into enlarged enlarged-holes is the worst thing to do, and 7) working with a fancy \$12.95 back-bucking tool with a nylon sleeve is not as good as a hammer and a small steel block.

When you start to fully understand the news-letters and encounter your first experience that causes you to sweat profusely, then you will be proud to say that you are building your own T-18.

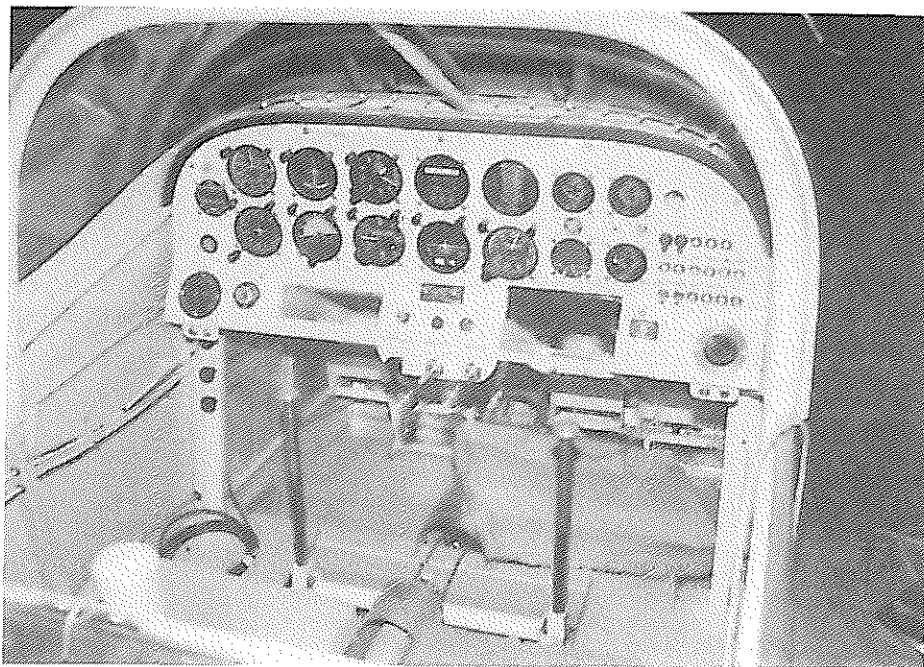
### A letter from Coyt & Wilma Johnston:

Dear Richard,

I am again going to try and send you a progress report on my T-18. I have been spending about 6 hours a day and 6 days a week on the T-18. It has a 0320 B1B Lycoming with B&C Alternator, starter and voltage regulator, an Oberg oil filter, all the instruments are electric, Northstar Loran, MKII 760CHG comm., AT-150 transponder/Alt encoding, Softcom intercom/recorder.

I have reached the tedious small operations which seem to take more time than all the rest. I have the cowling fitted and installed, I have had the canopy on order the last 2 months, no canopy yet. I am now fitting the carb heat box and preparing to once again cut the lower cowling for it. All electrical completed, am only waiting to complete the heat box and am making molds for exhaust fairings and modifying the wing tips to accommodate nav lights and strobes.

I am enclosing some photos of the T-18 for your use if you see fit. I am expecting to complete the project by June, and can hardly wait but you know all good things take time. I appreciate the newsletter and your time spent on it. We have a private airstrip and an annual fly-in, next to the last weekend in October. Am hoping to get some T-18s here next year. The closest we got to a T-18 was Charles T-18-6 from Enid. (An RV-6 folks) This year we had 22 aircraft fly-in and about 65 persons for our free barbecue lunch. Hope you and RoxAnne can make it sometime. Keep up the good work we appreciate it. Coyt & Wilma Johnston Pleasant Valley AP. Snyder, OK 73566. N160CJ.



*That's a good looking instrument panel Coyt*

## FOR SALE

### T-18 PROJECT #1070

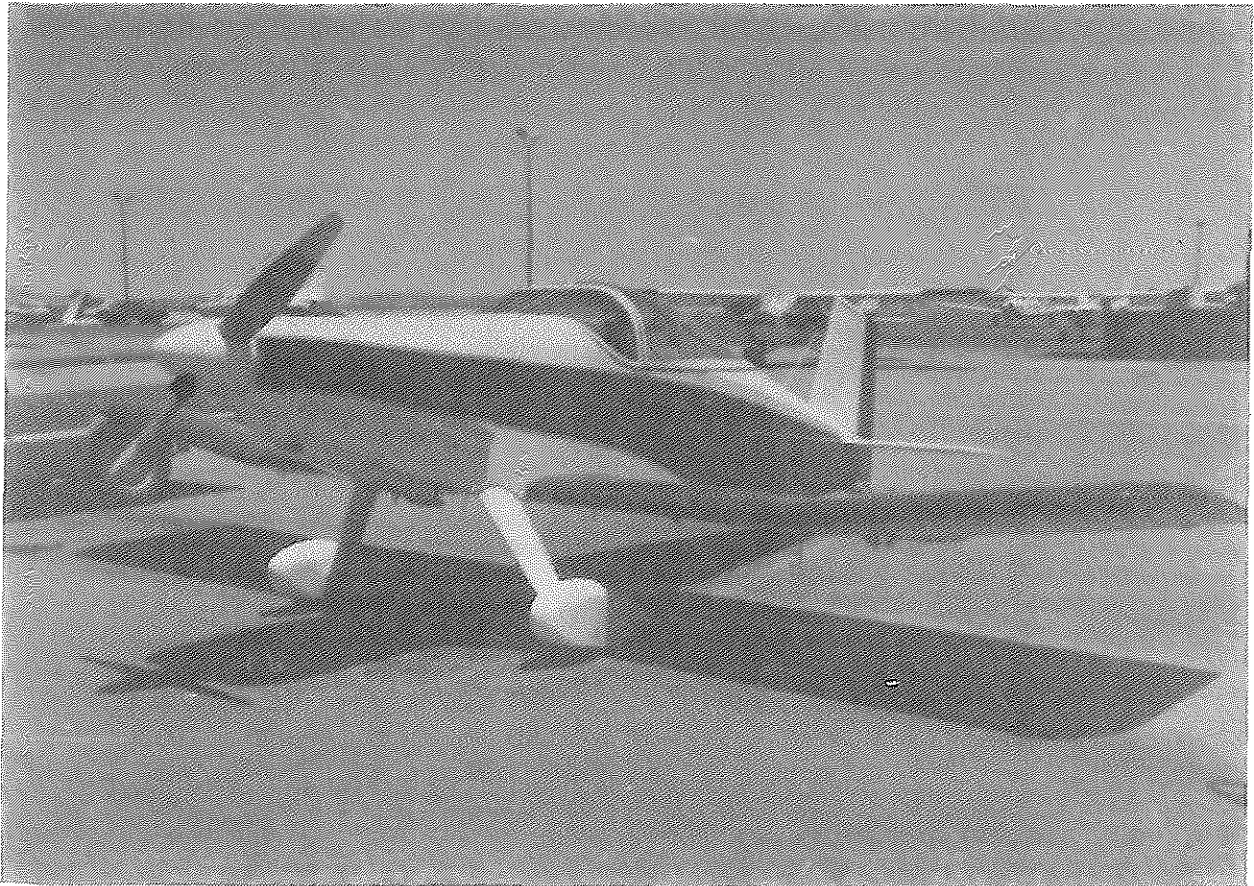
Standard Fuselage, Standard Wing, Fuselage metalwork 90% Complete,  
Wing, Ailerons, Flaps, Vertical Fin, Rudder, Stabilizer : Complete  
.2" Gear, Roll Bar, Windshield, NEW Cleveland Wheels and Brakes (Chrome),  
Tailwheel, Instrument Panel, Main Tank, Flap Actuator, Control System,  
Tunnels, All Fiberglass (Thorp Cowl), Metal Prop (M76), Some Flight  
Instruments. Basically, everything to complete, less : Engine, Electrical,  
Canopy, and Paint, All of the fun stuff is left to do! Price: \$8000  
Call Me in Texas (713) 440 - 8093 (Lee Walton)

This really is a great project, the previous builder was an **engineer**, had a machine shop, etc., and did really nice work. I hate to give this one up! I hope all is well with you, your family, and the T-18. See you in Oshkosh!

*Editor's Note: The pictures that Lee sent with the letter show fine workmanship on the project.*

## FOR SALE

THORP T-18 0320 150 HP, TT A 740 SMOH 275  
Escort II, Terra Xponder W/mode C, Flybuddy, Intercom, 10 out, 9 inside. \$20,500  
Contact, Jerry Brueckner Phone 805-944-6061

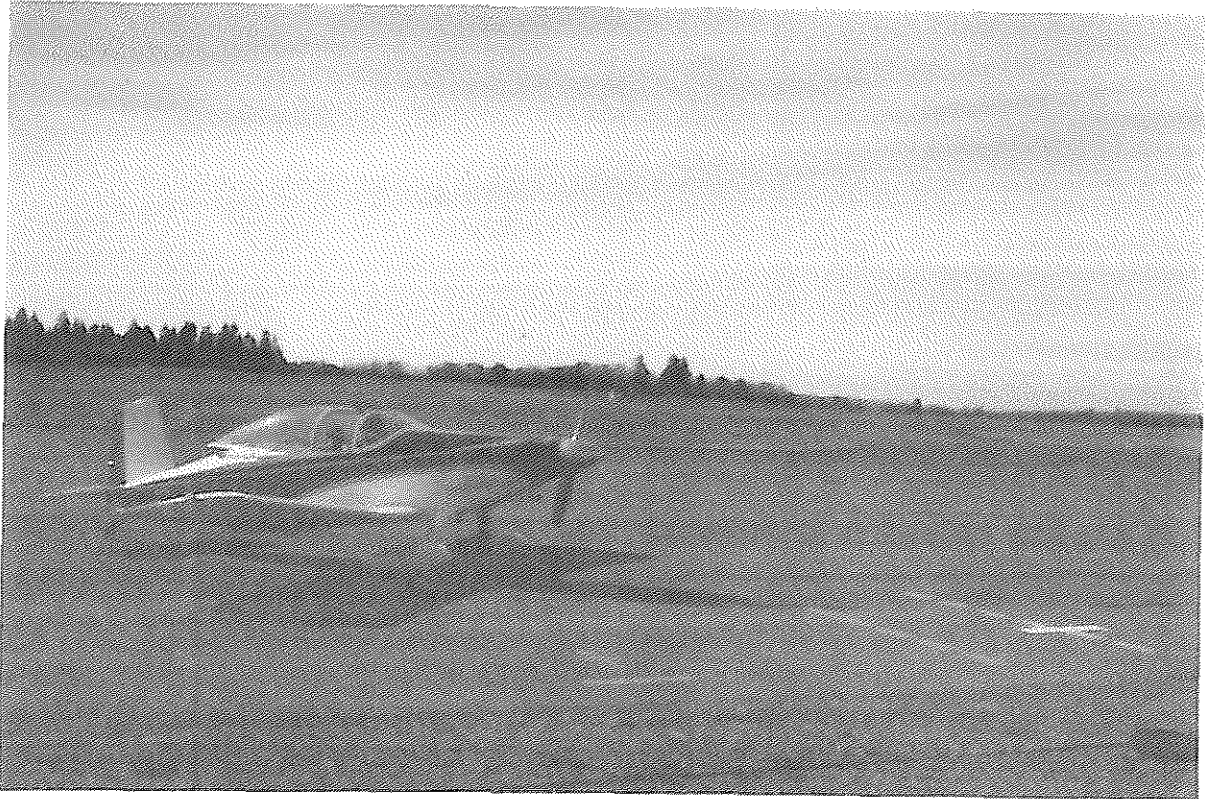


*Jerry Brueckner's Thorp ----For Sale*

## For Sale.

Thorp T-18 std. cockpit, folding wings serial number 2 6 2  
constructed by C.N.Fast Aug.1970 empty wt. 900# , loaded 1400# Metal Cowl  
Brakes Cleveland (Hyd)  
Prop Hendrickson 466F63  
Lycoming 0290-G H.P. Max 140 7:1 comp. ratio  
installed 1989:  
KT 76A Transponder  
AR 850 Encoder  
Flitcom 401 intercom  
Loran II Morrow 604  
A23 Loran antenna  
New Altimeter

WILLIAM L. AIRIS  
6416 EAST MERCER WAY  
MERCER ISLAND, WASHINGTON 98040



William Airis's Thorp T-18 "For Sale"

### FOR SALE

Stick Grips: Hard rubber 7/8" hole- will make full length spacer (alum) sleeve for \$5.00 each, The grip are \$24.95 plus ship & handling of \$3.00 each. Only have 5 pr. Really nice - If not satisfied return for full refund. I may have more coming from manufacture. Erwing Darby, Grants Pass, OR. Phone 503-862-2074

### FOR SALE AND WANTED

Howard Colling of SanMateo California has a T-18 project that he would consider selling. He would like to buy a completed or damaged T-18. Would also consider paying someone to do the work on his project. His phone #s are: (415) 358-9036 after 6:30 PM and (415) 349-9009 work.

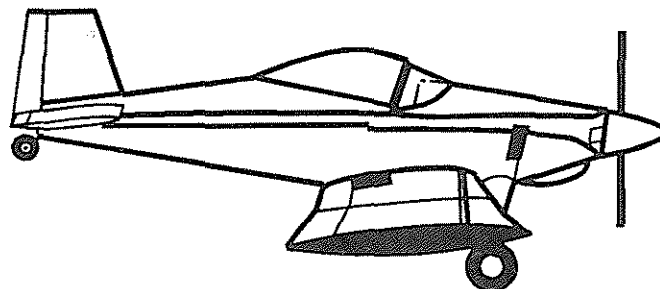
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# T-18 NEWSLETTER



*Mac Booth and his Thorp T-18  
he's from Daleville, AL  
a very familiar face at our events.*

## IN THIS ISSUE:

**Oshkosh 94**

**Building a fiberglass dash cover**

**Thorp T-18 Mutual Aid Society Membership List**

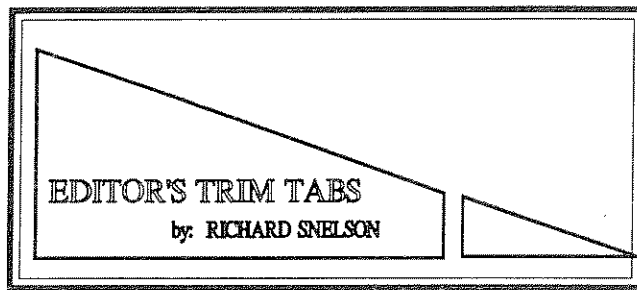
## Upcoming Events

**Kentucky Dam Oct 7-9**

**Placerville, CA Sept 23-25**

**NOTICE: (STANDARD DISCLAIMER)** As always , in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.





To our Members:

I've included the latest membership list in this newsletter, because, I believe that only through our sharing of knowledge and acting as mentors, for new builders, will we keep the T-18 adventure alive. Use the list to find someone that lives near you. Give him a call and ask if he is building, flying or just thinking about it. If you can, go see their project, better yet, take them for a ride in your T-18. Believe me, this will get a stalled project going again.

Our Kentucky Dam fall gathering, October 7-9, is nearly here. Call now and make your reservation. This event is the best time to share building and flying experiences with our new members. We have a great fellowship of old friends, and want to welcome and open our minds and cockpits to the new members wanting to learn about and build their own Thorp T-18. Drive to this event folks, even if you can't fly. We promise a great time and many opportunities to ride in a Thorp T-18.

Sept 23-25 is the 3rd annual Placerville Fly-In. I hope you get this newsletter in time to know about this event. I did send Hal Stephens a membership list, earlier, so he could send out a special mailing about it. Call either Hal Stephens at (408) 365-8836 or Jim Critchfield at (916) 621-1584 if you plan to attend.

Future articles for the newsletter include: Cleveland Brake Maintenance, the list of T-18 drawings, Mark Landoll's Harmonic Dampener for Lycoming Engines, and Installing a Navaid Devices Auto Pilot. We still need your articles on building and flying the T-18, so please continue

to write and send articles.

Congratulations to Coyt Johnston of Snyder, OK he flew his T-18 for the first time. He is having a fly-in on October 22, 1994 and we are all invited. Let him know if you plan on attending. His phone number is 405-569-2895.

And finally, I didn't forget the Flying Nut Contest Winners. I promise to get the Don Taylor T-18 parts off to those of you contributing articles soon.

Rich

## Oshkosh 94

Call it Oshkosh jitters - I was not looking forward to flying into Whitman Field again, after the crazy traffic encountered on my trip last year. Being wiser, I didn't go a day early like everyone else. Instead, I waited until Thursday, the first day. Leaving Decatur, IL early, we were over Ripon in 1hr. and 45 mins with only one airplane in sight, in front of us. We had guessed correctly the field was closed except for inbound show planes. It was simply follow the railroad tracks and then a close in base to final turn. The controller had time to comment, "Good job by the Thorp". We all have to get lucky once in a while and set it smoothly on the numbers. Not like last year when our clearance to land was; "You guys just keep coming you're doing fine" and my landing wasn't crisp.

With more luck, I managed to get a parking spot near the end of a row in the general area of the long established T-18 parking. The ground crews were letting RV's take over all the central parking, therefore, pushing everyone else out of the area. With the large number of RV's being completed, in the future, there won't be any parking for other types in the rows 9-11 area. I think we should try to rope out a couple of rows, if some of us get there early next year.

I'm sure the last minute change in the forum date from Tuesday to Thursday resulted in a lot of folks missing it. I'm sorry that happened, and want to explain that, we got the call from headquarters after the newsletter was in the mail. I did like having it on Tuesday, however, since it allowed us to get the T-18 events over before the weekend. In spite of the date change, we had more than 100 people in the tent. I'm never quite sure what to discuss in YOUR FORUM. It is your forum, and you should choose the topics we cover. I've been covering safety concerns in the past and would like to keep that a part of the agenda but need help in selecting other topics. So please send: Suggestions for the forum.

The Friday noon cookout at the Nature Center is my favorite T-18 event. It's a chance to relax and enjoy the company of a lot of old friends. We had a good crowd, a good lunch and a good time. I hope Bob Highley can get the Nature Center again next year. (By the way, we collected too much money and have a surplus toward next year's cookout.)

Our Friday's banquet attendance was good and the crowd enjoyed Lee Skillman doing his usual fine job as master of ceremonies. Thanks Lee! It was especially nice to have Dick Cavin with us at the banquet. Dick has done so very much for all of us by his contribution of writing and getting the newsletters out for so many years. The organization wouldn't be here if not for Dick's efforts. We greatly appreciate your help Dick.

Bob Highley, our T-18 owner and resident Sun-Fun staff member, gave a talk on what it takes to put on a big airshow. It sounded like he needed to get back to Florida right a way, to start work on 95. Right Bob? Our second speaker, serving with short notice, was Don Pridham a member of Don Taylor's, round the world, flight crew. His talk was very interesting, but too short and left us wondering about "the rest of the story." Maybe Mr. Pridham will honor us with that next year.

Again this year, Phil Tucker of Sport Aviation furnished the Thorp T-18 awards. Four new T-18s were flown to Oshkosh 94 and won a copy of Charley-Mike-Charley the book by Clive Canning about his famous T-18 flight from Australia to Great Britain. Our congratulations to the builders; Bill Williams, Earl Ody, Harlo Mckinty and Larry Whetzel. This was really our lucky year since RoxAnne and I brought home the award for the best Thorp T-18 at Oshkosh. This award winner is chosen by the former Wright Brother's award winners and this year we had seven at the fly-in to do the selection. My thanks to those folks for awarding us this honor. I'm sure they had a hard time making a single selection from the large number of fine T-18s on the flight line. The 1994 Wright Brother's Award winners were Ron and Jane Hayes of Blue Springs, Missouri. They were in Dayton just before Oshkosh to receive the award. Congratulation to the Hayes.

The Saturday afternoon airshow brought an absolute mob to the flight line. There were too many people and lawnchairs. A few had no appreciation for the show planes. I saw folks leaning on wings and putting their feet on wheel pants. This gets my dander up real quick. I couldn't take it any longer so we pulled out before the airshow Sunday. It might have been that I really just wanted to get back to flying instead of watching others doing it. Until next year. Good building and flying.

Rich.

## Wanted

Not certain about building, buying or finishing. Will consider buying parts/plans, unfinished project or flying T-18. Please call or write. Don King, 19876 Route 52, Hopewell Jct. NY 12533. (914) 227-5084

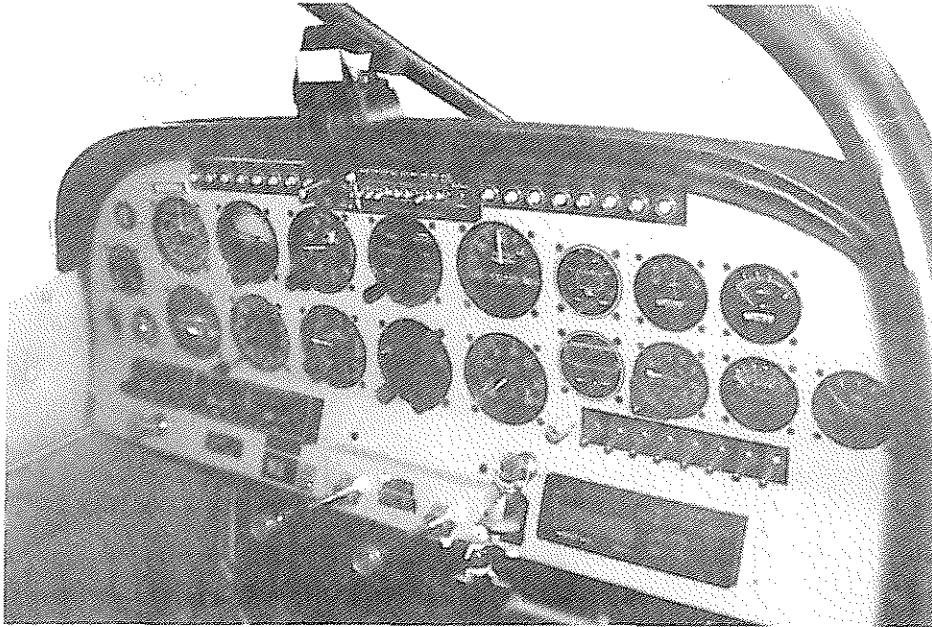
## For Sale

Dean Cochran of Broomfield, CO is again supplying exhaust systems. Call him at (303) 466-3472 for details.



# FIBERGLASS DASH COVER

Charlie Brown, a Glasair builder and hanger neighbor insisted that flying a new Thorp T-18 with a piece of black carpet draped across the dash top just wasn't to aviation standards. So with Charlie's instruction on the use of foam and fiberglass, a dash cover project for my "All Metal T-18" was started.



*Note: This article describes the steps to follow in building an attractive lightweight panel top that can be used to house instrument panel lights. Using foam as the core material provides two safety benefits: it will crush in a crash without cutting your head, as aluminum could, and it's an insulator so it won't short out fuses and wiring if there located at the top of your panel.*

The dash cover is designed, using a sandwich construction, and extends aft over the instrument panel to provide a glare shield for night flying. The overhang is 2 inches thick at the instrument panel, 3 inches long and tapers to a 3/4 inch rounded end. The core material for the cover is Clark Foam. It's a small cell rigid foam that can be bent into position and fixed in shape with an application of fiberglass cloth and resin. The foam is available in 1/4" thick 24x48 inch sheets from Wicks Aircraft's Supply 410 Pine St. Highland, Illinois. Their phone number is (800) 221-9425. Purchasing two sheet will give you some extra material for future projects that may come up.

Using the instrument panel top as a

pattern, cut a 3/4" plywood former to the profile of the top. A second former is then cut to match the curvature at the rear of the top cover. In the T-18 this second former matches the dash bulkhead that is under the front edge of the windshield. Space the formers apart to match the distance your instrument panel is located from the bottom of the windshield and fastened them to a work table using drywall screws (Fig 1). To stabilize the mock-up add two spacers between the formers flush with their tops.

Four pieces of foam are then cut to extend across the width of the instrument panel former and to build up the tapered panel lip. Each one is increased in width by 1 inch. The

first should be 3" wide x 34" long, the second 4" inches etc. to 6". Using a hot glue gun fasten the 3" wide strip to the instrument panel former letting it extend out about 3/4". Just put 3 to 4 spots of glue across the top, so it won't be difficult to remove the top assembly from the former later. The 4" wide foam is glued on top of the previous piece and extends 3/4" out over the edge of it. Use more glue here as we want the two pieces to stay together permanently. Continue the process for the other two foam pieces building up the front edge height and sloping profile.

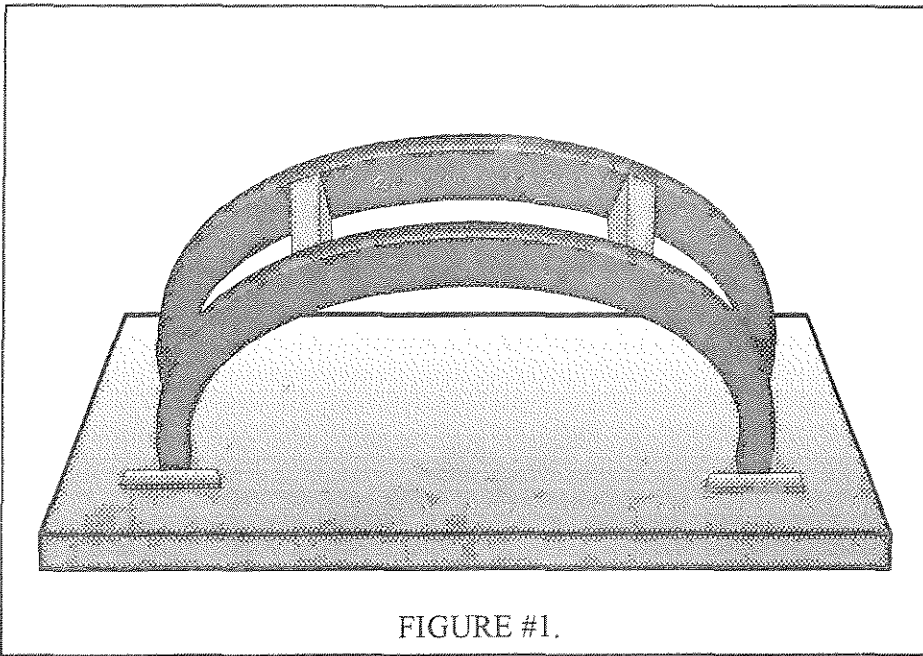


FIGURE #1.

A single piece of 1/4" foam is then used to cover the build up and extend to the windshield former. But first it's necessary to profile the sides of the build up for the top to lie in place without gaps. Fig. #2 shows the panel side profile after the pieces are attached and cut to shape. Using a sharp knife do the rough profile shaping and then finish with a rasp or Stanley Surform Plane. Test fit the top cover sheet as you proceed with the trimming. If you're satisfied with the fit, hot glue the top in place. Cut one more strip of foam 3/4" wide and glue it to the top front edge of the whole assembly. Using a rasp or sandpaper round this piece over on the front and back edges. Don't trim the top cover at this time as it will be done after the assembly is removed from the formers before it is covered.

The next step is to seal and fix the foam shape by applying fiberglass and resin to the top. First a coat of either Polyester or Epoxy Resin is applied to the top surface. After it

cures knock off any rough spots with sandpaper and cut a piece of fiber glass cloth to extend from the back edge of the 3/4" inch rounded strip to the windshield end of the panel. Trying to get the cloth to lay down over the 3/4" front edge and across the flat top at the same time is impossible and isn't needed anyway so don't bother. Wet the surface of the top with the resin and lay the cloth in place. Brush on additional resin as needed to fully wet the fiberglass. Allow the assembly to cure over night and then remove it from the forms, being careful not to tear it at the glue spots.

Using a rasp shape the profile of the underneath front edge to a nice taper and round the front edge. The material

is soft and will shape easily. I have a compass hanging down from the windshield center post right into the dash top center. So an addition cut out was necessary in the top to allow for the compass. Again coat the cut-out with resin to seal it. Complete the fiberglass foam sandwich by painting the underside and edges with resin. You won't need any glass cloth here as the assembly is strong and will hold its shape without it.

Before covering the top trim and fit the cover to the airplane. Since my instrument panel is supported at the top by two shock mounted brackets in just the right location, and the top is very light, two long # 8 screws through the top into two Rivnuts in the brackets will hold it in place. Just let it float at the back. It should just extend up to and under the windshield flange without touching it.

To cover the top use a non-reflective naugahyde for the front edge. Start by gluing (3M Upholstery

Figure # 2

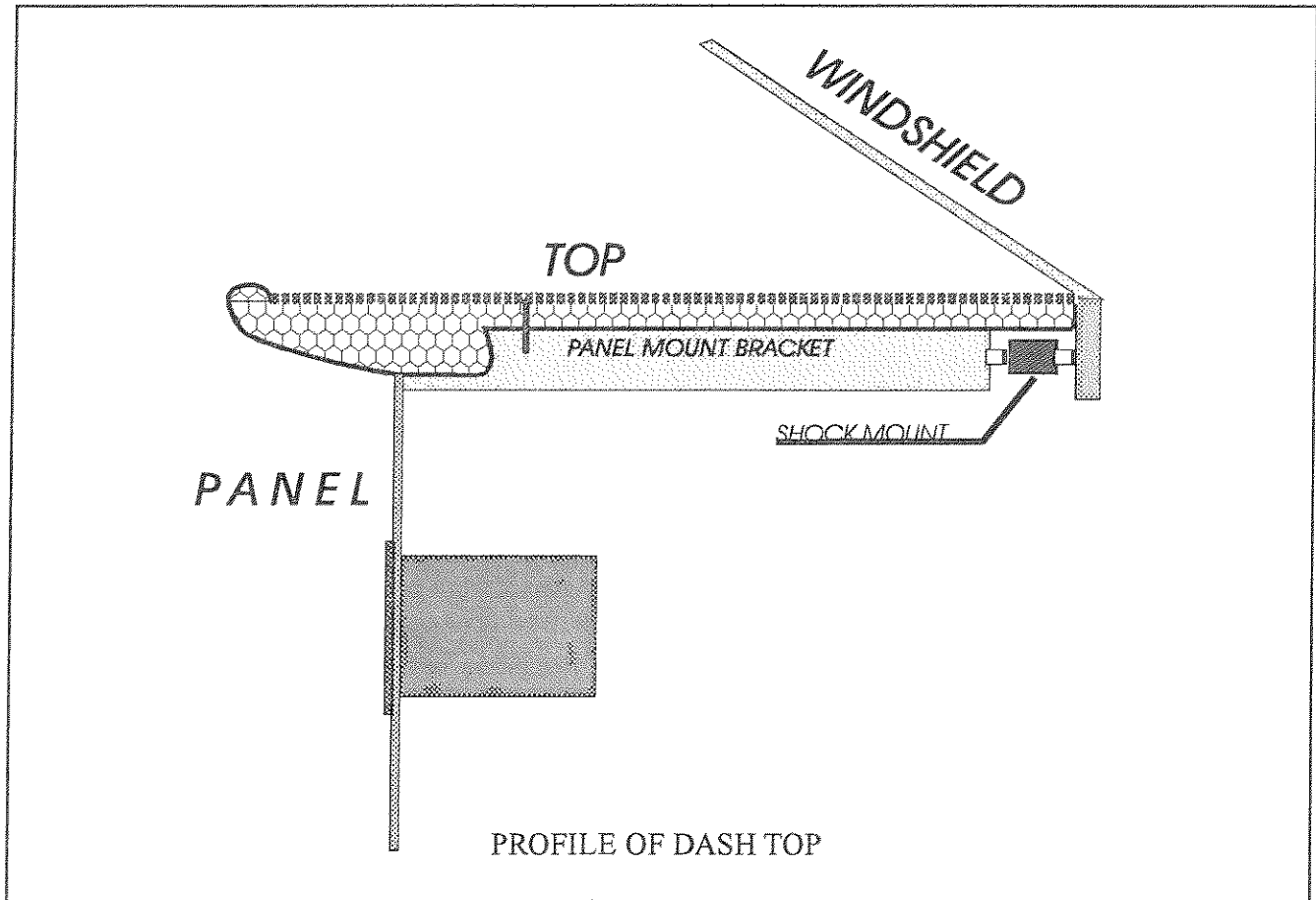


Cement) and stapling one edge of the material across the top just behind the 3/4" strip. A heavy duty hardware store stapler is best for this. Starting at the center the material is stretched over the front edge and over the tapered bottom front. Pull it tight at the center and glue and staple it working out from the cen-

ter. Working carefully the material will stretch and cover the edge without any wrinkles. Cut around the compass cut out and cover it separately. To complete the top covering glue on a non-reflective carpet or upholstery material.

My thanks to Charlie Brown for

the idea and method used to make a light weight good looking dash cover for my all most all metal Thorp T-18. By changing the shape and size of the forms this dash cover method should work for any aircraft type. Good luck!



#### Material List

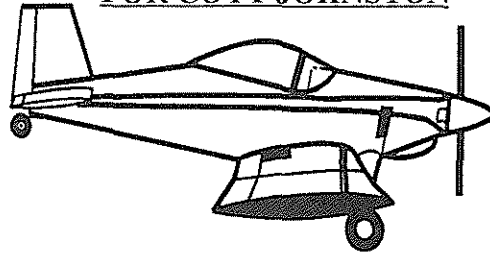
2- Sheets of Clark Foam 24x48  
 4 Sq ft of fiberglass cloth  
 3 ozs. of resin  
 10" x 40" of black carpet  
 10" by 48" of black Naugahyde  
 for the front edge  
 Mounting hardware

#### Tools

Jig saw or bandsaw  
 Sharp knife  
 file or rasp  
 sandpaper

# FIRST FLIGHT

FOR COYT JOHNSTON



I FINALLY FLEW N-16OCJ ON THE 16 DAY OF THIS MONTH. I DID NOT HAVE MY TRIMS FOR WAITING ON THE CONTROL GRIPS AND WAS READING THE NEWSLETTER SUNDAY NIGHT WHERE JOHN GOT THE T-18 APPROVED LESS A TRIM INDICATOR DUE TO IT BEING LIGHT ON THE CONTROLS. AFTER GETTING DUAL FROM GARY GREEN AND DAVE EBY AT McALISTER I FELT I NEEDED SOME TAXING PRACTICE ON MONDAY. TAXIED TO THE NORTH END OF MY RUNWAY, NO PROBLEM THEN TAXIED BACK SOUTH INTO THE WIND RAISED THE TAIL,(JUST FOR TAXI) IT FELT SO GOOD I RELAXED FORWARD PRESSURE AND IT LIFTED OFF. IT FLEW GREAT. THE ONLY PROBLEM I HAD WAS GETTING IT SLOWED DOWN FOR LANDING. I THINK MY A.S. IS SLOW ABOUT 20 MPH. LANDED GREAT AFTER SLOWING. I AM SOLD ON THE T-18 AS ALL SEEM TO BE. I HAD DOUG RIPLEY FROM WITCHITA FALLS FLY IN SUNDAY MAY 29, HE FLYS JOHN SIMMONS AND DAVE'S T-18, BE FLEW 16OCJ ABOUT 30 MINUTES, DID STALLS AND ROLLS SAID IT WAS A GOOD ONE.

I STILL LIKE A FEW LITTLE ITEMS HAVING IT READY FOR PAINT BUT IT WILL FLY FOR A WHILE WITHOUT PAINT.

I WANT TO THANK GARY AND DAVE FOR THEIR HELP WITH DUAL IN THEIR T-18S, IT WAS A GREAT HELP.

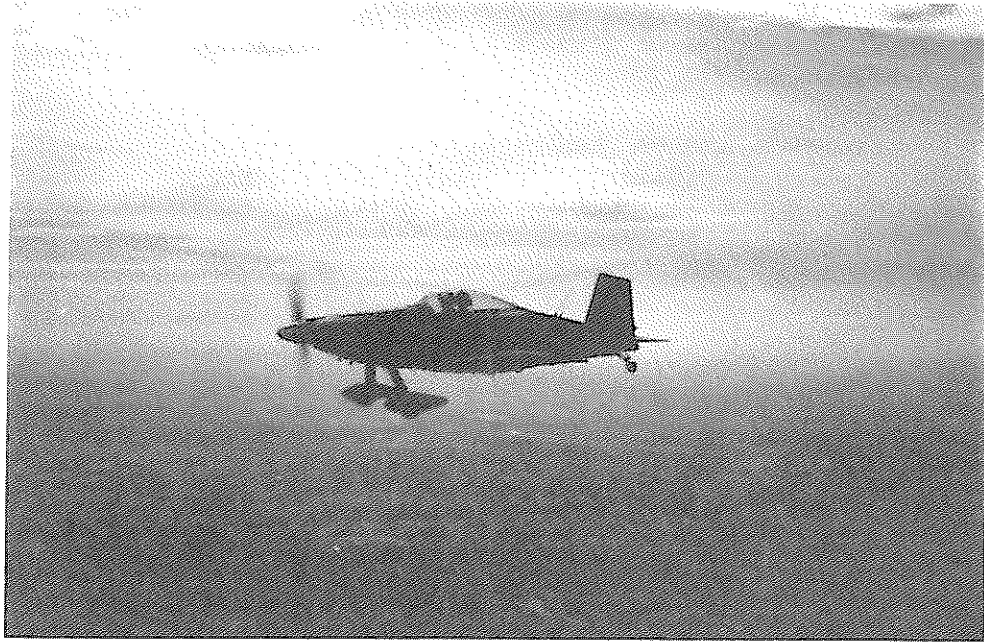
I AM ENCLOSING A FLIER FOR OUR FLYIN IN OCTOBER INCLUDE IT IN THE NEWSLETTER IF YOU LIKE. WE WOULD LIKE TO HAVE A FEW T-18 HERE.

(keep up the good work on the newsletter. its a great help to have somewhere to go when you stump your toe)

SINCERELY  
COYT JOHNSTON

RT. 1 BOX 178 SNYDER, OK. 73566

*Editor's Note: I ran out of space and couldn't include the flyer. The date is Oct 22. More details in the editors column.*



## T-18 FALL GATHERING KENTUCKY DAM VILLAGE STATE RESORT PARK

The Fall 1994 T-18 weekend at Kentucky Dam Village State Resort Park will be held on October 7-9. The private dining room has been reserved for Sat. Oct. 8, at 7:00 PM. We will again use the buffet.

**MAKE YOUR RESERVATIONS WITH THE PARK DIRECTLY. YOU MUST SPECIFY YOU WANT THE PAINE PARTY IN ORDER TO RECEIVE THE QUOTED RATES.** THE LODGE MAY BE FULL OTHER THAN THE ROOMS THEY ARE HOLDING FOR OUR PARTY AS WE HAD TROUBLE GETTING RESERVATIONS THIS YEAR. RESERVATIONS MUST BE MADE BEFORE SEPTEMBER 7, 1994.

RATES ARE: \$46.40 (single) \$55.68 (double)

**KENTUCKY DAM STATE PARK  
P.O. BOX 69  
GILBERTSVILLE, KY 42044  
1-800-325-0146**

Camping is also available on a first come, first serve basis as well as cottages. Contact the resort for information.

Kentucky Dam State Park Airport is 30 miles east of the Cunningham VOR (Paducah) on the 90 degree radial, 8 miles south of V178. The runway is paved, 4,000 feet long. The Airport is approximately a mile from the resort, however transportation is available for those who do not wish to walk.

**BRING YOUR OWN TIE-DOWNS.**

**Note: If the lodge is full, there is a Ramada Inn at Kentucky Dam, not far from the airport.**

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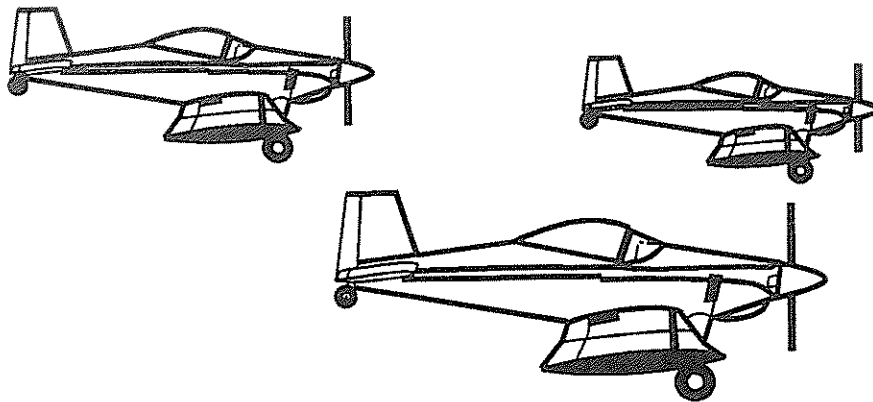
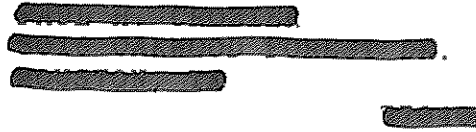
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Kentucky Dam Fly-In is Oct 7-9

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# T-18 NEWSLETTER



*Barry Hall & Jud Carter's Thorp T-18, N31BD was build by Bob Dial*

## IN THIS ISSUE:

**BLAZING A TRAIL** by Richard Snelson

**SUN & FUN 95** by Richard Snelson

**0-290G** by Bob Hartmier

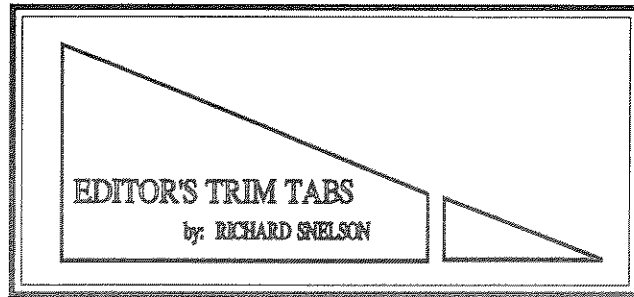
**ENGINE TIPS** by Ron Gerrard

**FLAP TRIM SYSTEM** by Doug Frantz

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Let's get the events for Oshkosh in here first: It's simple everything is on the first Friday. We have the EAA Nature Center starting at 11:00 AM to 3:00 PM. We will cook Brats and serve lunch at noon. Sign up on the flight line Thursday or early Friday so we can have some idea of how many will be there. We will buy extra so don't stay away if you forget to sign up. Cost will be about \$3.00. We will hold the T-18 Forum right after lunch, also in the Nature Center. It was either that our hold it Sunday night at 8:00 PM, that's the time Wes Schmidt offered us. Who in the heck wants to spend Sunday at the fly-in and then stay or return for an 8:00 PM forum. Ben Owens was gracious to get a notice in Sport Aviation for us. Let's put a couple of signs up on one of the Thorps on the flight line Thursday about the Forum/Lunch and banquet. **Would one of you early arrivers please volunteer for this.** That same Friday evening we will again return to Butch's Anchor Inn for our annual banquet.

Bad weather kept the attendance at McAlester down this year. Leroy Holt said about ten Thorps made it. Sorry we missed this one. We will try to have the Spring event in June next year, the weather should be a little more settled by that time of year.

I got a call last week that there will be a Thorp T-18 included in the Wright Brother's Awards again this year. I'm proud to say that I have been selected to receive this award, by the previous Thorp T-18 Wright Brothers Winners. Each year at Oshkosh the past winners select one T-18 and it's builder for this award. The award is given at the Dayton Airshow on the weekend before Oshkosh. I promise to write a story about this award and the fabulous weekend that comes with it.

As always: I can use your help in getting articles together for the newsletter. Send me what you can. There are a lot of folks that would like to know how you accomplished and solved the many small problems that occurred while building your Thorp T-18.

## OSHKOSH 1995 EVENTS

**Friday July 28, 1995**

**11:30-1:00 pm Nature Center**

**Join us for lunch followed by**

**1:00-2:30 pm Thorp T-18 Forum  
in the Nature Center**

**6:00 pm Thorp Banquet  
at Butch's Anchor Inn**

My Email address is:

**RSNELSON1@aol.com**

I check for mail twice a day and respond quickly.

## FREE

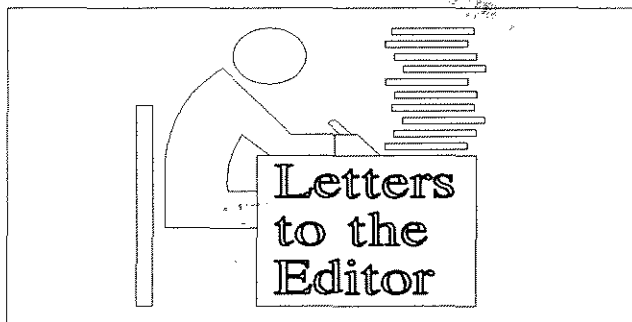
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Dear Richard,

I encountered a problem with my fuel gage that stumped me for over a year and only found the solution out of desperation. It would work fine on the ground but would be intermittent in the air. I tried everything I could think of from grounding, new wires and connectors, to a new sending unit. None of which corrected the problem. Finally, I took the sender wire which was ty-wrapped to the tachometer cable away from the the cable and it has worked perfectly ever since. I would suggest not tying anything to the tach cable.

Another problem developed with my compass after ten years of satisfactory operation. I thought the compass needed repair but it was fine. It had always been mounted near the tachometer with no problem, but over the years the tachometer case became magnetized and effected the compass. Moved the compass and it works fine.

Maybe other people are aware of these things and know to avoid them but I didn't, and it sure caused me a lot of aggravation. Sincerely, Jim Hockenbrock



Dear Rich,

Happy to report that my wife, Elaine, is recovering from last year's cancer struggle. She looks great and says that she feels the best that she has felt since Christmas 1993! In fact, she is planning on going to Oshkosh with me this Summer. Ain't that great?!  
Bad news on the job issue. My company is in

trouble and they are giving incentives to leave. I probably will do that and go on to something else. I have a fair amount of ability in the area of precision flow measurement and I believe that I have a lot of energy left in my body to continue to pursue this career. Besides, I love it!

Boeing has some of our special turbine fuel flow meters on the 777 for flight test and I was fortunate enough to visit the plant a week and a half ago. Got to get on the prototype and a Brit Airways aircraft on the ground and I saw a couple take off. Wow! What a monster!

Well I expect to be very busy for the next few weeks and I hope that I can log some Thorp building time. It is excellent therapy for me.

Sure appreciate the great job that you are doing with the newsletter. It is top rate and I can tell that you put a lot into it. Thanks again! See you this Summer at Oshkosh. Sincerely, Don Ruffner  
*Glad to hear your wife is doing fine--- Rich*



Auburn Field - Seattle Washington 11/94 What a wonderful airplane ! Got a opportunity to take a ride with Cecil Hendrix who has been flying his T-18 for some 20 years. I've been flying gliders so the little stubby wings of the T-18 made me feel like I was riding on top of a 20-foot long hotdog bun at liftoff. However, any comparison to a hotdog ended there.

The T-18 really moves out. In no time we were out of the pattern and had the little craft at cruise speed, on step. The forward visibility with the nose down approx. 15 degrees is really fantastic. Thorp really had the pilot in mind when he designed this ship.

After making several turns and a couple of aileron rolls, we did some slow flying. This seems to be a real honest little ship with no surprising tendencies. Next to no back pressure on the stick and little rudder input was needed to

make moderate turns at cruise speed. Also, It slows up fast when you throttle back. This should be helpful for slowing up for other traffic in the pattern. Slow speed characteristics were what you would expect from a well designed airplane.

Roll response was terrific I'll have mine flying next year. Steve Barrett, Seattle Washington



Hi Richard,

I'm in the process of making a new drawing of my tailwheel installation, which adapts parts of a Scott Tailwheel to a Whitman type tailspring and mounts on a standard Thorp "Bolster" at the fuselage attach points. It increases the ground angle of attack by about one degree, which in combination with the extended gear gives the T-18 a more compatible ground attitude with respect to stall angle of attack. It takes off sooner, lands slower, and has about half the drag of the flat tailspring. In addition, the spring rate of the tailspring more nearly matches up to the main gear spring rate so the rebound from a hard landing is flat - not tail high. On top of that, you can put a streamlined fairing on it if you really want to get fancy. With all of that you still have a steerable, full swiveling tailwheel for the same price as a Scott and a flat spring. Interested?

I've been reading the mail on the T-18 Forum and thinking of jumping in with my two cents. I've been flying my airplane for 21 years and have about 2,250 hours on it now. I just finished putting an Electronic Ignition on it incorporating aircraft spark plugs, (not automobile plugs) and have shielded the primary coils, which have to be mounted in the engine compartment. It's a bit of a Job! The benefits show up mostly at high altitude with lower fuel consumption and increased reliability.

I talked to Bob Archer on Saturday, at the Rosamond Air-Park Fly-in Pancake Breakfast/

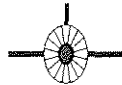
Lunch sponsored by EAA Chapters 49 & 1000. He is the guy that designed the antennas for the T-18 fin tip and wing tips, sold by Sport Aircraft. I had never been able to get an explanation of what kind of antennas these were before. I learned they are Gamma Balanced and the design goes back to spacecraft antennas. I had put a Bird Wattmeter on mine and was quite surprised to see the results - up to twice as much power out compared to a regular aircraft antenna. He is available for consultation/design work. His number is (310) 316-8796. He lives in Torrance, CA.

On the subject of fuel tanks:

I started off back in New York with 29 gallons in the main, period. With a 150 HP engine and flat country where I rarely had to go over 5,000 feet that would get me over 400 miles down the road. That's quit a ways back there in the weather patterns prevalent. When I came out west I suddenly found I had to climb to 8 to 10 thousand feet to go most places from Lancaster and my legs were not long enough. So I put in a 10 gallon aux tank in the baggage compartment. That was much better. Then I put on a 180 horsepower engine. My first long trip was to Alaska. Since we had 65 pounds of gas in the baggage compartment and we had to carry 35 pounds of Survival Gear, most of our baggage went under the seats, into the seat cushions or on our backs. Not too red hot! So I redesigned the wing when I got home. There are several benefits that accrued, however, I'll stick to fuel. I put 14.2 gallons usable in the first two bays out from the fuselage, 7.1 on each side. Now I have a total of 42.6 gallons usable, which gives me 4.3 hours endurance at 75% power. I cruise at 170 to 180 KTAS, depending on gross weight, so I can make 3.5 hour legs. That is a good usable 600 nautical range with excellent reserves. Albuquerque is 599 NM and I regularly make it in 3.3 hours no wind. When running around California I like to put 28 in the main and 4 gallons in the wings. That gives me the ability to run the main way down if I choose to and still feel comfortable with the wing fuel there.

Because I have a fuel flow computer I had to put in an electric fuel pump on both wings and the main which provide fuel to the engine driven pump, and to the engine if the main pump fails. Its axiomatic that if you have an engine driven pump you must also have an electric pump in any low wing aircraft.

Enough for this time, Thanks for the advise on AOL T-18 Forum access. Lyle Trusty  
Email address is DadTrusty@aol.com



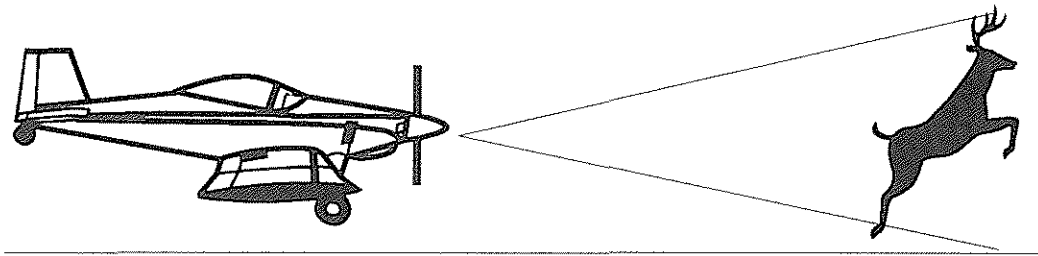
Dear Richard,  
Vicki and I hope to see everyone @ McAlester. We plan to fly up to Branson, MO afterwards, on Sunday, and probably stay a couple of nights and see some shows. We really love to travel in the T-18.

It seems as though very strong winds have been a problem the last couple of months here in Denver (at least on the weekends, of course!) --- Haven't flown nearly as much as I wanted to. My T-18 is flying very well - around 350 total hours now. I just replaced my battery for the first time. The old one was 4 1/2 years old and still going strong, so I probably wasted money, but I didn't want to get caught somewhere - been told that 4 years is probably a good average life, and that they fail rather suddenly. The original (and replacement) are Gel-Cells, Johnson Controls Mod. U1-31. It's a 30 AH rating and sure has been good. I have a Ford Motorcraft electronic regulator, and Delco Automotive alternator (45 amps).

I recently completed a new set of wingtips for my T-18. They're a Hoerner style tip with position/tail lights and strobes. I made them "Ala Rutan" by hot wiring blue styrofoam, and laying up 4 layers of 8 oz. bidirectional fiberglass with West Systems' Epoxy. Then removed the foam core. As a test I put the new left tip on and left the old tip on the right side. My ship is well balanced, and normally with just me in the left seat will be a

little left wing heavy, requiring some roll trim. Well, during this test flight, I had a strong right roll/turn tendency, requiring a fair amount of left stick force. The new tip was producing considerably more lift! The first few landings with both tips (new) on proved that my approach speed needed to be slower than normal in order to avoid excessive "float" in ground effect. Not bad! I'm really excited about these! I see some potential for increased cruise speed -- we'll see.

Also, I made another change recently, I made some new control sticks, straight ones, as per John Throp's drawings. I made my originals offset to the outside, as I had seen others do, to exactly center the grips with the center of the seats. Well, let me mention something that others may have noticed. If you have long legs, as I have, your legs may be positioned right between your stick grip and the sidewall of the cockpit. Or is you passenger has thick thighs, the result is the same to the right. Either way, you may find it rather hard or impossible to get full stick throw either direction (However, you can always shift your leg towards the center). Granted, there are few times when full stick throw is needed in a T-18, but when you do it's nice to have that extra 3/4 to 1". This may not be a problem with widebody versions. Just food for thought. Sometime, you know, it's pretty hard to better John's design. Best Regards, John Evens N71JE

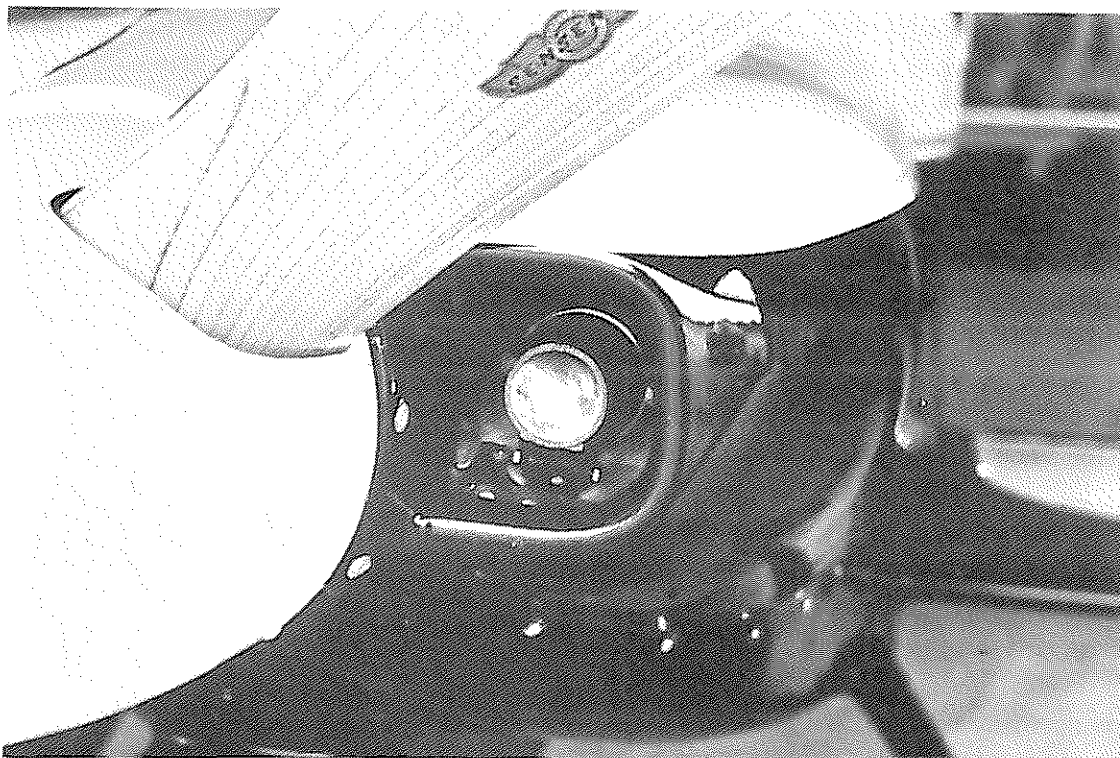


## "Blazing a Trail"

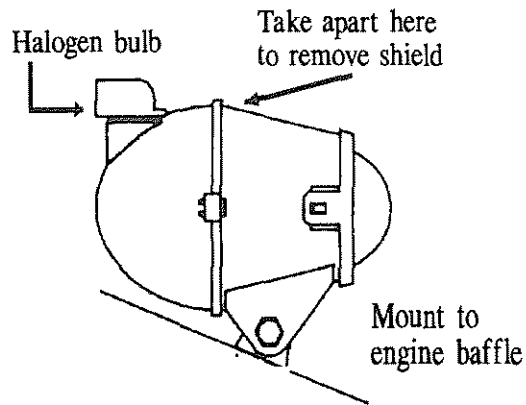
by Richard Snelson

Here's a tip on a neat landing light. It's compact, lightweight and puts out a flood of light. As I visited the Lancair display at Sun & Fun, I noticed a tiny coke bottle lens staring at me from the air inlet of a factory built Lancair cowling. I had been looking for a landing light for some time, and had put off purchasing one because I didn't want the problem of building a bracket for a conventional type bulb. Sitting there in this \$75K airplane was a little marvel of a light, with its own case and mount. I was sure that the thing would cost at least \$100 bucks and that it could not put out close to enough light for landing. The near-sighted coke bottle lens "BLAZER" sure fooled me.

Before I tell you where to get this little gem and how much it will set you back, let me tell you about its features. It's powered from 12 volt dc, has a quartz halogen bulb, internally is all reflector with a thick coke bottle lens in front. Trying it out in my backyard it lights up backyards four houses away. It's made of light weight thermoplastic and takes the heat of the halogen bulb with no sweat. Really folks it's not a lot bigger than the bottom of a coke bottle. The really big surprise came when





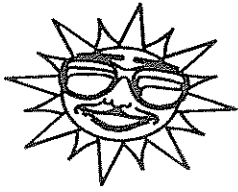


the salesman told me, "It's called a Blazer and you can pick it up at WALMART in the automotive section". Two of them cost \$39. What a deal!

The Blazer is a driving light that you can mount in the lower front bumper of a number of cars. One thing you will notice, when you turn it on, the light pattern is cut off sharply across the middle. The Blazer has an internal aluminum shield that keeps the light out of oncoming drivers eyes. To remove it, for a full pattern, you must take the light apart. Here's how- with a small pen knife work around the large diameter cutting the small amount of rubber cement away and gently prying the lip up as you go. This will take several trips around and some patience to do without breaking the case so stay with it. Two plastic keepers hold the case together- by compressing them it will come apart. Don't touch the halogen bulb, or the reflector portion of the light while it's apart. Oil from your skin will shorten the life of the bulb. Remove the aluminum cross reflector with a small phillips screwdriver and you can reassemble it and get a full lighted pattern. Remember to put a little rubber cement in the grove as you put the two halves to together This will keep out moisture and help hold it together. Let me know how this little guy works for you. I'm on the way to the airport to install mine now. The Wal Mart product is called: Blazer projector "THE ULTIMATE DRIVING LIGHT" C8004K.







# Sun & Fun 95

The flight operations team at Sun & Fun had the arrival path well established and engraved in the clear blue sky over the Lakeland area. Arrive north at the power plant on the north east corner of the lake, fly west along the north shore and turn south following the path of strobes to the airport control tower. At that point, the tower provided turning instructions to the appropriate downwind. "Black and white Thorp keep it in close", was the call. On final, "Thorp, keep it coming, fly to the orange triangle on the runway". Touching down on the triangle shortly beyond, I went back into the air from a dip in the taxiway being used as the runway, It was sure funny as I passed a flag man signaling a turn. The Thorp was still about a foot in the air- that would have been some turnoff!

Pulling into the homebuilt area I found the Thorps parked well up front. Bob Highley's T-18 was marking the corner position. How did he get there first? Just kidding. He had made sure we had a prime location for our T-18s. Thanks Col. Highley. Bob has the best job in the country, he works for the Sun & Fun organization full time. During the fly-in Bob is the Flight Operations Officer. He's one busy fellow during this event. Looks like a great job, any openings on the staff Bob??

I counted 10 Thorps in the row, later to increase to 12 or more. A surprise to see Sweet Marie, Ken Brock's Thorp from California. Ken had problems with his Cessna 210, so he jumped in the Thorp for the trip. Ken and Marie were very busy at Sun & Fun working their booth and flying in his



*Part of the Thorp line up at Sun & Fun 1995*



*Les Conwell new Thorp with it beautiful paint job.*

gyrocopter during the airshows. They still had time to show their love for the Thorp. I found Ken out on the flight line each morning wiping the dew off his T-18. A new T-18 was in the lineup, it belongs to Les Conwell who lives in the Lakeland area. Les had just had it painted a beautiful cream color with red trim. Congratulations Les, you have built a fine looking airplane.

At first glance it had appeared that Sun & Fun was just another, only smaller Oshkosh. But the more I experienced, the more I realized that Sun & Fun stands on it own. Or putting it another way: "outstanding on its own". Everyone I talked to told of the many things that Sun & Fun had to offer. They mentioned good camping and lot of good places to stay in and around the Lakeland area. Everyone talked of the friendly folks- the volunteers- that really make Sun & Fun happen. We had the best of the best in that category. Debbie and Bill Williams, a real "T-18 family" had invited us to stay with them. They live about three miles from the airport and both take their vacation, to work as volunteers during the fly-in. Each morning it was off to the airport, for them, to work inside all day, while all the rest of us are out having fun on the flightline. My stay with them was great. Their new home is beautiful, and shows the great craftsmanship of Bill and Debbie. They are doing all the interior finishing and it show Bill's careful attention to details. Bill's new Thorp still isn't painted, and I can sure understand why. The house had to come first.

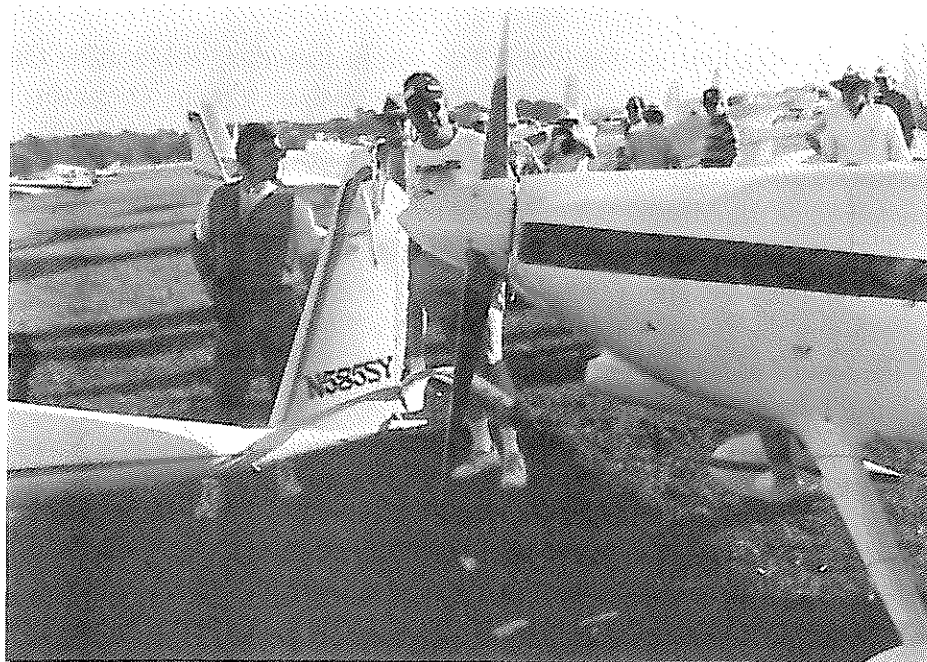
The more I talked to Bill about Sun & Fun the more I was impressed with the many traditions and fun things that go on there. These folks really do like homebuilts and go out of their way to make all feel welcome. Warbirds, were there too, but they weren't running the show like at Oshkosh. Bill suggested the Corn Roasts as one evening event I had to go to. One of the local EAA Chapters put it on each evening in the campground. They sell hundreds of roasting ears that are first soaked in water and beer then cooked in their husks over large pits. What a taste, a cold beer and hot roasting ears.

Sun & Fun has lots of little guys selling used aircraft parts and equipment, many more than you find at Oshkosh. I think it's because the cost of booth space is much more reasonable than Oshkosh. Sun & Fun also has a large warehouse that's used to set up a parts sales for anyone wishing to assign parts. Everything from engines to airframe were for sale. It's the place to go to find that part you've been searching everywhere else.

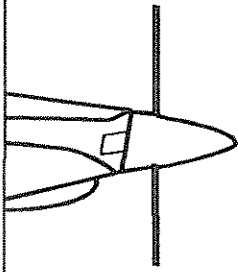
The food service at Sun & Fun is run by the "Boys Club". They service a great breakfast for a fair price. Lunch is another matter and doesn't come cheap. Food is good and selection isn't bad, but be prepared to spend a bunch for lunch. That's about the only thing I found to gripe about and only did that because several of my EAA chapter members brought it up at one of our meetings.

The Thorp forum was scheduled for Tuesday morning at 11:00, I really wanted to attend but with a new job I had to get home. A weather briefing showed a cold front heading for northern Florida and Georgia. I made the decision to leave Lakeland early Tuesday to get far enough north so that I wouldn't get caught in the peninsula. The plan worked, showing 195k GPS ground speed I got to Rome Georgia very quickly, landing into 35 mile winds as the front approached. Spent the night there to let the front pass. Got out the next morning and made it as far as Evansville, Indiana. Winds were high and turbulence was nasty. Got the Thorp in a hanger and drove home from there. Flew down the next day in club plane with my instructor, got an hour and half instrument practice on the way, so not all wasted time.

It was a great fly-in, I recommend we turnout the Thorps for Sun & Fun next year. We can all get together at one of the local restaurants for a feed and social roundtable one evening. How about it Thorp owners? Let's set a new record for Thorps at Sun & Fun 96? Thanks again to Bill and Debbie Williams for having me.



*Just threw this in to show the dangers of taxiing a tail wheel airplane.  
RV-6 "ATE" the tail off poor little N585SY*



## 0-290 G ENGINE

BY Bob Hartmier

Back in 1991 Ken Morgan contributed an article on the Lycoming 0-290G engine. Since I had several reasons for tearing down my engine anyway, I decided to see what could be done about incorporating his suggestions during the rebuild. My engine had been built up from a GPU engine about 15 years ago, but it had been sitting all that time without being run or ever having been properly "pickled", so I decided that a tear down and inspection was warranted. Also, my father had used an adaptor plate over the vacuum pump pad for a breather, and since I intended to use a vacuum pump, I needed to split the case so a hole for the breather fitting could be drilled and tapped in the boss on the top left front of the case as per the standard aircraft engine set up. In the interest of smooth running, I also wanted to get the moving parts balanced. Since a member of my local EAA Chapter owns an engine shop, this could be easily accomplished. Charley will do any kind of engine work, but he and his brother specialize in building up the engines used in those off-shore racing boats that go about 500 mph, and he knows what he's doing when it comes to engines. And on top of all that, my engine also needed a cosmetic clean-up and paint job.

So anyway, since I was going to do a tear down anyway, I dug out Ken's article and began to do some research. I found out that the part number Ken referred to for the higher compression ratio piston was a little bit confusing. Just to review, the 0-290D2/D2A uses 7.5:1 compression ratio pistons, P/N 69841, and the D2B/D2C uses 7.0:1 compression ratio pistons, P/N 70396. Oddly enough, both engines are rated at 140 hp at 2800 rpm (take-off for 5 minutes) and 135 hp at 2600

rpm (continuous) using 80/87 octane fuel. Also, the timing for the D2/D2A is 18 degrees BTDC instead of the usual Lycoming 25 degrees BTDC. As far as I can tell, they are identical in every other respect. I discussed this with the folks at Don George Custom Engines, and they recommended that I go with the 7.0:1 pistons since the D2B/C engines have a better reputation in the reliability department. You can take this advice for whatever you think it's worth. It seems to me that a higher compression ratio should give higher power, but for some reason Lycoming doesn't agree. The 7.5:1 pistons seem to be fairly abundant from the used parts suppliers at about \$75.00 each, but the 7.0:1 pistons are virtually non-existent as far as used but serviceable is concerned. I ended up buying new ones from El Reno for about \$130.00 each. You pay your money and take your choices.

Enough about pistons, what about the valves? Ken's info was right on target as far as the valves go, although prices have increased in the last four years. Intake valve seat P/N 72057 P30 is required to allow enough material for the machine work to be done. This is an 0-290D part. The intake valve is P/N 73938 from the 0-290D2/D2B/D2C, 0-320, and 0-360. This valve has a slightly larger area in the face, and I'm also told it has a "venturi" shape to the bottom of the stem which aids in better breathing.

As Ken stated, the standard GPU exhaust valve can be retained, but if you want the "hot set-up", the sodium filled exhaust valve P/N 17235 can be installed. This valve aids in the heat transfer from the combustion chamber to the cylinder head

cooling fins, and hopefully helps to extend engine life. They were first used in the more powerful versions of the 0-235, some of which went as high as a 9.7:1 compression ratio. This valve has a larger stem diameter of about 7/16" and will require reaming of the guides. They are also expensive at \$185.00. Each! The standard seat is retained, so long as it is the hardened "stellite" type. I might add that both valves can be used with solid lifters, although the intake comes from an engine with hydraulic lifters. Don't, however, under any circumstances, attempt to use the cam from the hydraulic lifter engines with the solid lifters in the GPU or the basic 0-290D.

The combination of the D2 intake valves and the higher compression pistons gives us an extra 10 horsepower at 2800 rpm. if you want to experiment with props and carburetors, more rpm will give still more grunt. Note that the GO-290A helicopter engine(gearred) is rated at 170 hp at 3400 rpm. This engine has the 7.5:1 pistons, and requires at least 91 octane fuel. Can we plot 140 hp at 2800 and 170hp at 3400 rpm and interpolate? I'm not sure, but I guess we would be arriving at some sort of realistic figure. Does anyone out there know how to determine horsepower without a dyno? At present I have the wood Sensenich 66LM72 prop designed for the 125/130 hp engine which I'll use at first to get started. I'll report on the performance as soon as I'm flying and have some data.

Oh yeah, the cost. Don George Custom Engines in Orlando did my cylinder work for me. They are a certified shop, and will return yellow tagged cylinders, but they don't ask what kind of engine or aircraft you are going to install them on. They are also very knowledgable about what mods are practical to do, and the required parts to use. My cost to have new intake and exhaust guides installed and reamed, new intake seats installed, cylinders disassembled, cleaned, inspected, honed and reassembled, used intake valves and new sodium-filled exhaust valves was \$1,734.28. If you retain the original exhaust valves, you could save \$740.00, so it would come out to about

\$250.00 per cylinder, which is more than the \$160.00 that Ken stated, but reasonable considering inflation and the fact that I got completely reconditioned cylinders. Of course I strongly recommend that you have a GPU and 0-290D parts manuals and an 0-290D overhaul manual to refer to while undertaking the rebuild of this engine, and follow all standard aircraft practices. If anyone has any questions, my number is 908-521-3069, or perhaps you could try using Email at 70422.3151@compuserve.com. Bob Hartmaier S/N 573

## FOR SALE

II MORROW Appollo 618TCA Loran, includes installation kit, Documentation and Manuals. It has been updated to the latest configuration, will be yellow tagged and data base updated at the time of sale. It is a great deal for someone who wants the best Loran receiver made, at a very low price. You can hook this one up to your CDI, Autopilot, and Altitude Encoder very easily. They are going for \$700 to \$800 in Trade-APlane but I will sell it to any member of the T-18 Mutual Aid Society for \$550. Call Lyle Trusty at (805) 949-1131

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SENSENICH 66/78 WOOD PROPELLER. BRAND NEW, NEVER INSTALLED. FACTORY PAINTED GRAY WITH LEADING EDGE "ESTANE". POSITIVELY RAIN PROOF. KEN BROCK T-18 SPINNER CUT TO FIT THE 66/78 PROP. SPINNER USED 300 HOURS. NO CRACKS IN IT OR FRONT AND BACK PLATES. 6 PROP BOLTS GO WITH SALE. A 66/78 IS THE PERFECT PROP FOR A 160 HP. T-18. VALUE \$1200 - ASKING \$800. 817 766 2523

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LYCOMING 0290G overhauled with new pistons #68338 & #62916; 0320 oil pan with intake tubes; Camshaft & Tappets reworked by Aircraft Eng. & Acces-, Dallas Texas; 1/2" Valves; MA-4SPA Carb. not to latest AD; two Bendix Mags. reworked to latest AD as of 1985 & not used since. \$5000-00 FRANK RONCELLI (805) 943-7625



# ENGINE TIPS

from Ron Gerrard

A couple of items I would like to pass along. In regards to rough running 4 cyl. Lycomings I think part of this is inherent in the engine but they really should run smoother than some I have experienced. My T-18 has a O-320 B3B with the flat mount and never has been very smooth running. I have about 900 hrs. on it now and it has been trouble free except for the vibration. In fact at about 300 hrs. when I upgraded the panel for IFR the vibration was a problem with gyros and I had to use some innovative panel shock mounting to prevent gyro precession and accelerated bearing wear. I have done all the standard things such as prop balancing, both static and dynamic, installed the 12# weight on the ring gear support, changed the carb induction system, checked fuel flow, changed hydraulic lifters, checked cam lift duration, and valve timing, and even installed a new carburetor. Every one of these things seemed to improve the operation at the time but I think part of that was psychological.

At the same time I was doing these things another chapter member with an RV- 4 was having the same experiences, doing all the same fixes. He finally called Lycoming and one of the engineers told him if he had done all these things and still had roughness it could only be one thing and that would be what he termed "dust" in the engine oil system, apparently a very fine metallic residue that causes lifters to malfunction. Anyway he pulled all the lifters out, drained and flushed the engine out as thoroughly as possible with solvent, and swears the engine runs fine now. I am currently doing a top overhaul and will flush mine out prior to reassembly also.

If anyone is interested in aileron gap sealing, I found on my first test flights back in 1987 the lateral stick forces seemed rather high at cruise speeds and in talking to a friend with a Christen Eagle he reduced his with gap seals. I installed a product called TUCK tape, available in automotive stores. It comes in clear or various colors. I used the clear, installed it in late 1987, and it is still functioning very well. It significantly reduced stick pressure and probably reduced drag to some degree.

Our T-18 N586RG has been a delight to fly. We have been to OHSKOSH four times and by last count have landed at over 85 airports in the central and western states. We fly out of the Willamette valley in western Oregon so we have a lot of fog and low stratus days, consequently I did all my IFR training and took the check ride in the T18 which was a very satisfying experience.

Well I have rambled on but one more thing. In the latest newsletter there are pictures of the Kentucky Dan gathering, and one T-18 appears to have a auto engine installation. I can't quite make out the N number. I would really be interested in talking to the owner. I have a 230 V6 engine and Blanton PSRU with a Skybolt project I'm working on but may end up installing an aircraft engine in the Skybolt due to inverted issues, etc. If so, I may sell the engine package or think about converting the T-18. I have enclosed a ssa envelope Rich if you could put me in touch with the owner. Ronald Gerrard  
Phone 503-746-0452

*Editor's note: Owner is Ben Cupp of Yellville, AR More pictures of his airplane in this issue.*

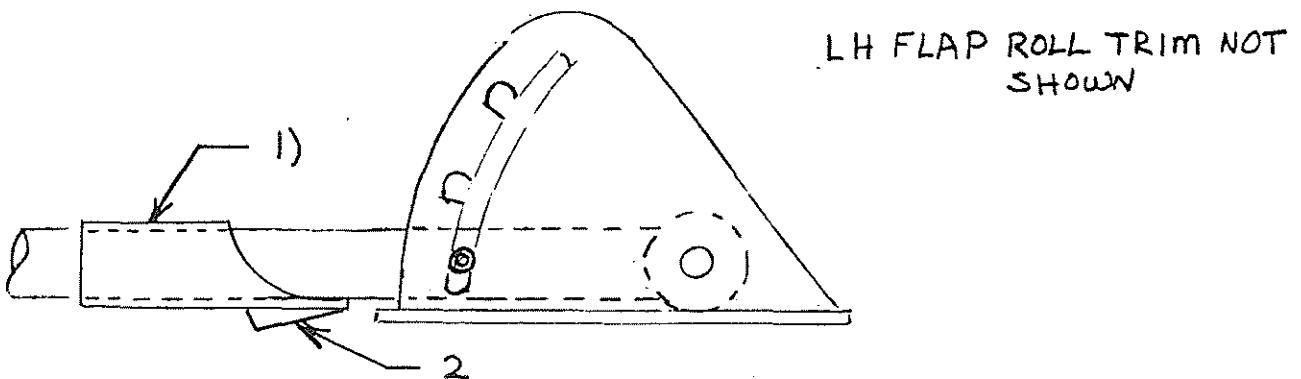
# FLAP TRIM SYSTEM

by Doug Frantz

Hi Richard,

I was glad to read in #94 that extending your vent tube solved the lean-running problem. My T-18 still has the -32 carb, and has the reverse problem - too rich. I take off with the mixture out and about 1/2", and this works fine. I do have a 10-5009 carb which I plan to install if I ever get caught up with my procrastinating. My fuel vent is the same length as yours is now (3"+ or -) and provides plenty of ram air.

I am enclosing a drawing of the roll trim device we discussed on the phone. I have been using this for five years, and it works great. The downside is that it only works with manual flaps. My airplane always flew right wing heavy with another person in the right seat, but this allows the RH flap to be trimmed down in flight to compensate.



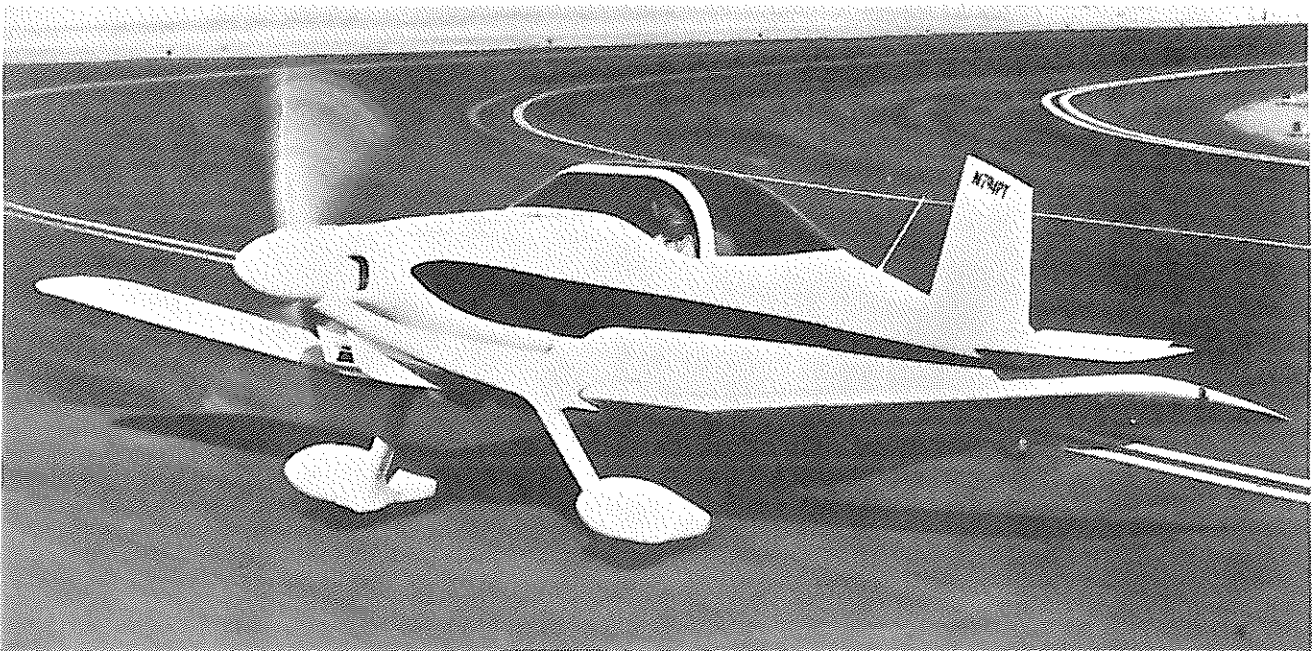
- 1) Aluminum Tube Sized For Slip Fit On Flap Handle
  - 2) Weld (TIG or Lumiweld). File to wedge shape.
- Slide rearward to trim RH flap down. LH roll trim knob should be screwed OUT all the way.

# OUR SUPPLIERS

## SPORT AIRCRAFT Inc. and KEN BROCK MANUFACTURING

**SPORT AIRCRAFT:** Phil Tucker, Mr Sport Aircraft continues to be our primary supplier for Thorp T-18 parts. Making parts over the years for hundreds of T-18s, Phil has also built his own Thorp T-18, pictured below. Phil makes most of the parts he supplies himself but does purchase some items from other fabricators. This includes fiberglass and some welded assemblies. Phil is very helpful and will do his best to assist builders when problem arise. Including replacing items that are not correct. A complete parts list is available from Phil, it is very useful and make an excellent reference for any builder or owner. His address and phone follow:

**Sport Aircraft Inc.**  
44211 Yucca, Unit A  
Lancaster, CA 93535  
Phone: 805-949-2312



*Phil Tuckers Thorp T-18*

continued next page



Our Suppliers (continued)

## Ken Brock Manufacturing

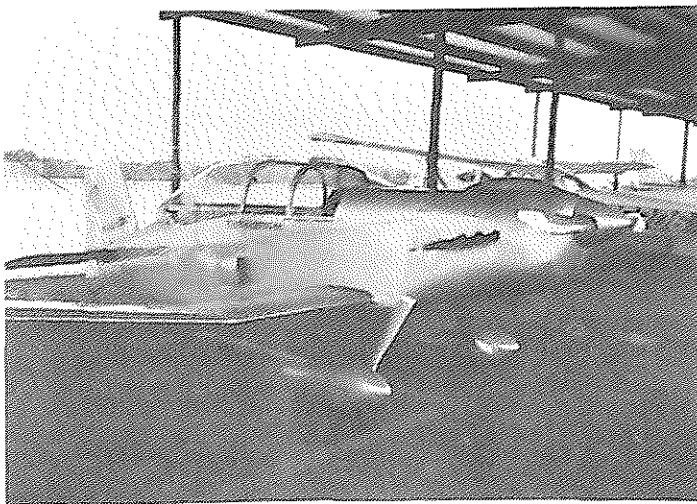
Ken Brock is no stranger to the T-18 bunch. He's been right in the middle of Thorp building and flying for years. Ken has two Thorps and doesn't hesitate to jump in one and fly clear across the country. Ken builds a number of Thorp T-18 parts and really believes in making quality parts. Ken builds the Thorp landing gear and I can say that I've never heard of one of his landing gears cracking. (Others will and should be checked at each annual for cracks) When you buy a gear from Sport Aircraft you will get "A Brock Gear". Need a Thorp Spinner? Ken build the only one that fits the Thorp Cowling correctly. He also supplies prop extentions, constant speed props and many other parts. Ken is best known for his pioneering work with Gyroplanes and flies in the airshows across the country.

### **KEN BROCK MANUFACTURING**

11852 Western Ave Stanton, CA  
714-898-4366



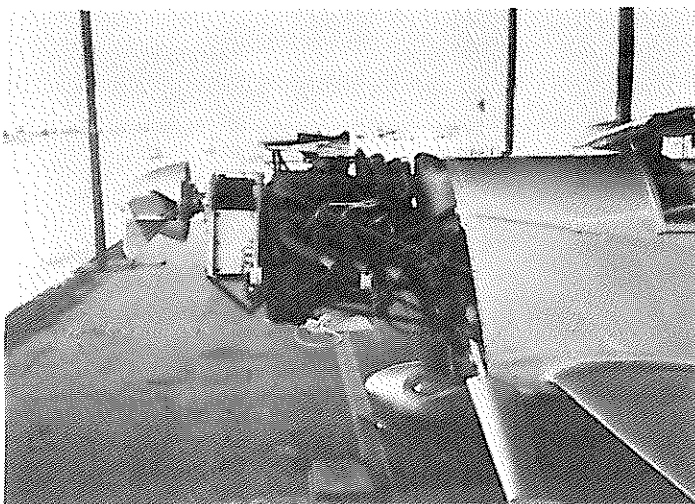
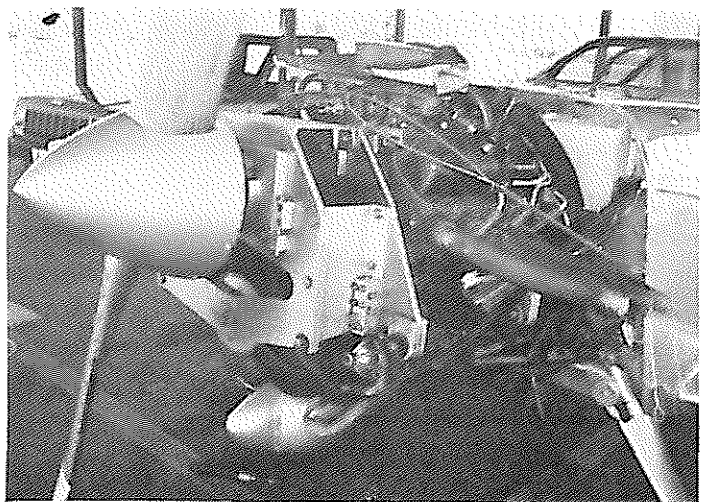
*Ken Brock wiping down his Thorp T-18 at Sun & Fun 1995*



## BEN CUPP'S FORD POWERED THORP

Just behind the wing, you can see the air inlets for Ben's radiator. Ben's quote: "I have had no problems since I got it to cool" When this airplane made a low pass at Kentucky Dam last year, everyone stopped talking to watch and listen. It looks and sounds fast!

Ben says the cruise is 170 mph on about 10 gph. The rate of climb is 800 fpm. It stalls at 65 mph.

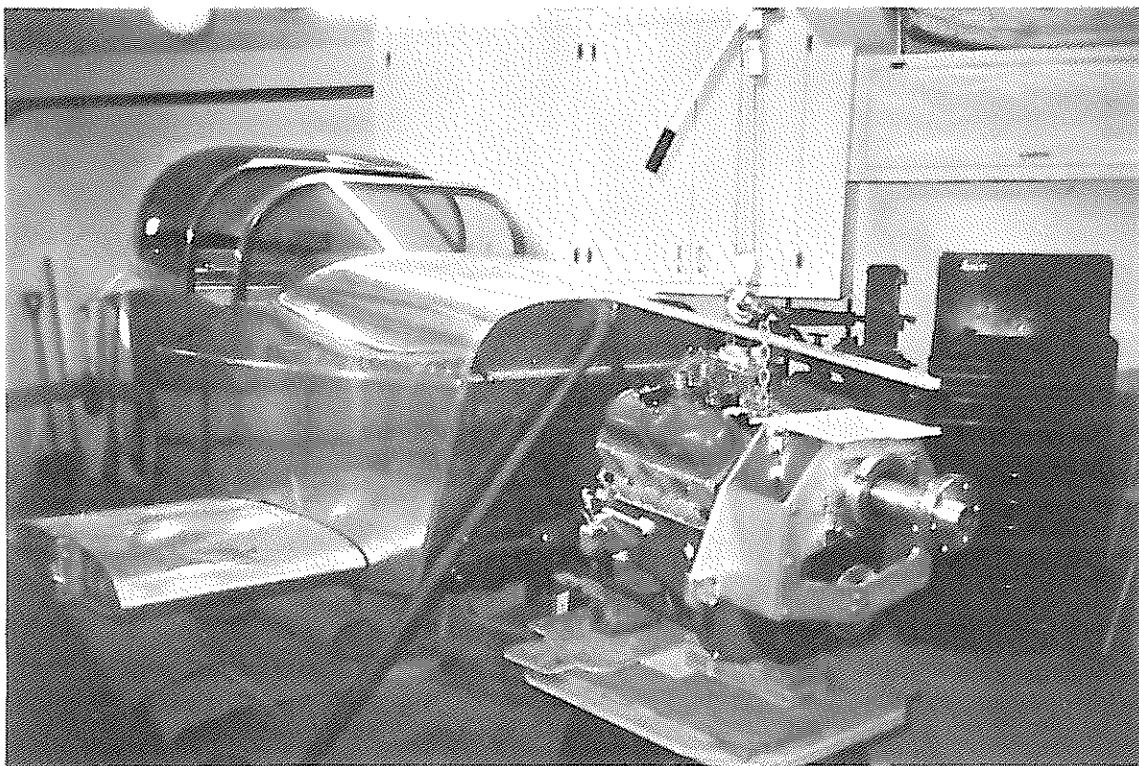


Ben's first flight in 301BC was in 1988 and his Thorp has 350 hours on it now. For those of you wanting more information on the engine installation Ben's address is RR 1 Box 300 Yellville, AR 72687.

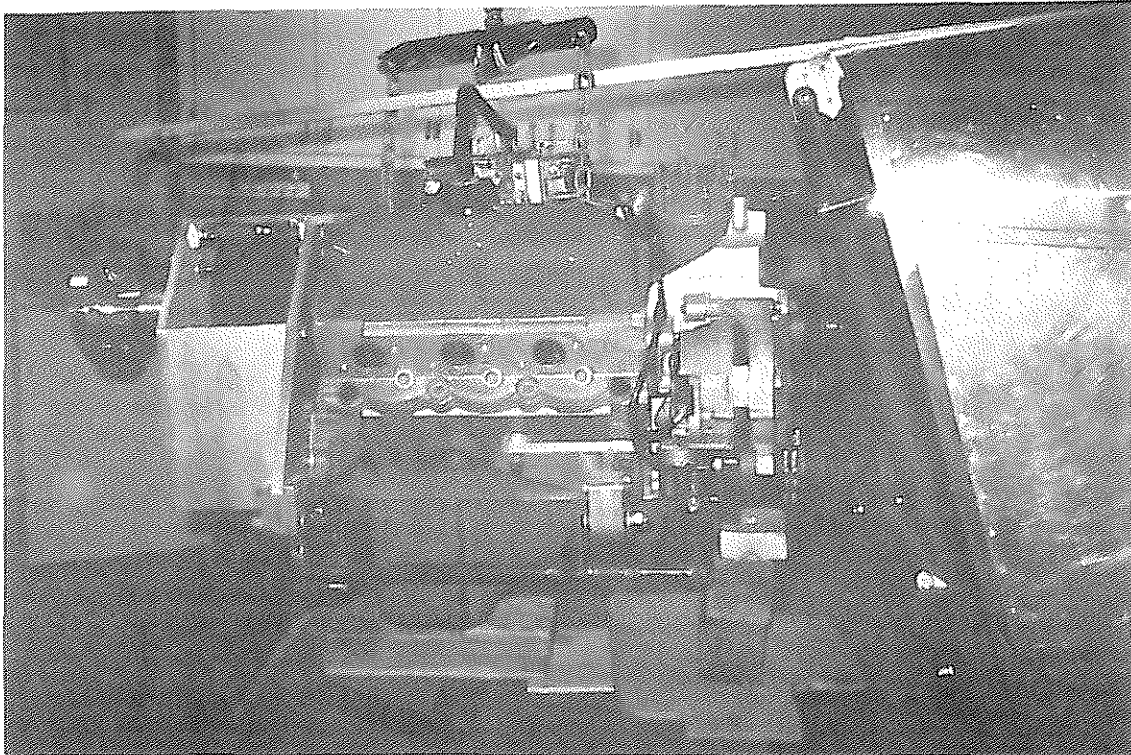
FOR SALE - (BUSINESS PRESSURES LEAVE NO TIME TO COMPLETE)

S-18 PROJECT (FOLDING WING, WIDE BODY VERSION OF THORPE T-18)

- All metal AIRFRAME 98% COMPLETED - on gear, wings folded, trailerable.
- Ready for instrumentation, wiring
- Ready for installation of newly built up V-6 Ford with Blanton 1.6:1 Drive (included)
- Or ready for installation of Lycoming - by others
- windshield and canopy installed
- have incorporated all the desired features harvested from 30 years of T-18 Newsletters.
- T-18 to S-18 i.e. - 38" to 40" wide fuselage
  - 1" increase in headroom
  - 5" increase in fuselage length
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continued on page 19

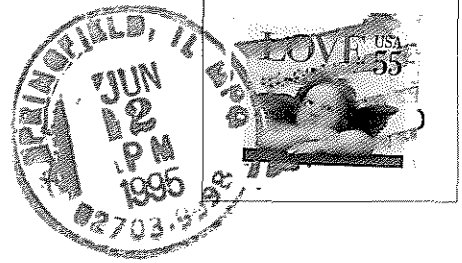


- Wet wings 2 X 12.5 gals + 29 in main tank.
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- Solid - flush rivet craftsmanship in the 9's
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T-18 NEWSLETTER  
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CLINTON, IL 61727  
1-217-935-4215  
Issue #95 May 95



25

Please check the mailing label for dues paid. A red circle means "NOT PAID FOR THIS YEAR". I still about 10% of the membership in this category at this time. I have been mailing the letters first class postage which is much higher so I need those due now folks! Please.....

## OSHKOSH 1995 EVENTS

**Friday July 28, 1995**

**11:30-1:00 pm Nature Center**

**Join us for lunch followed by**

**1:00-2:30 pm Thorp T-18 Forum  
in the Nature Center**

**also on Friday**

**6:00 pm Thorp Banquet  
at Butch's Anchor Inn**



# T-18 NEWSLETTER



**"NOSE ART THORP T-18 STYLE"**

## **IN THIS ISSUE:**

**THORP CHECK-OUT** by John R. Sullivan

**HAWTHORN HILL** by Richard O. Snelson

### **BUILDER'S CORNER**

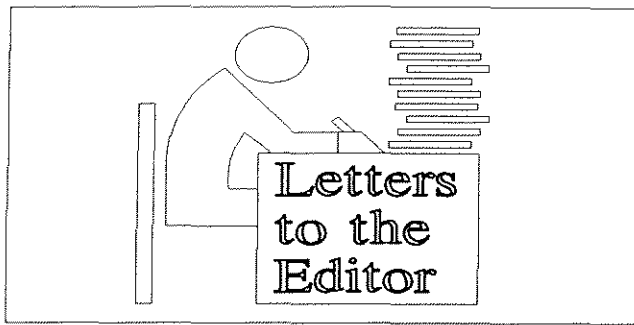
Electric Trim control by Ken Morgan

Email by John R. Sullivan

Lots of things for Sale

**THORP T-18 DRAWING LIST**

*NOTICE: (STANDARD DISCLAIMER) As always , in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.*



Dear Rich,

Well, I don't write often, and unfortunately I am writing with bad news. Last week I learned a good lesson the hard way and wound up ground looping my T-18. On roll out from a wheel landing I hit a large bump across the middle of the runway at about 35-40 mph. I was in the typical roll out mode with the airplane in a three point attitude, flaps up, and the stick aft. After reviewing the situation, it appears the main gear were bumped into the air as the tail wheel remained in contact with the runway. The limited rudder authority at this speed did not compensate for a movement to the left which became extreme when the main gear returned to the runway. The result was a runway departure and ground loop. Thankfully, no one was hurt.

Due to finances and time, I probably will not get into the rebuild until this winter, and maybe fly next spring. I will be on the lookout for the following parts if you or any of our readers have any leads for me:

**Right Outerwing Panel parts**

**Right Aileron and Flap**

**Wing skins (I may go ahead and replace the center section with .032 " skins)**

**Fiberglass Wheel Pants (Rat Ray)**

**Rat Ray aluminum spinner**

It was a real eye opener. Remember, until you're dead stopped, things can get out of control in a hurry! Take care and I would appreciate anyone's response.

Sincerely, Jim Cash 9003 Green Leaves Dr.  
Granbury, TX 76049 Home: 817-573-7766  
Work: 817-224-0658

Dear Richard:

The last issue of the T-18 news letter was among the best yet! Keep up the good work.

I have my T-18 certified for Day-Night and VFR-IFR and fly it pretty much as I would a factory built of comparable speed etc. The similarity ends about there however. In a Bonanza, for instance, I was accustomed to more cockpit room and better roll stability. Most of the good cross-country factory machines are equipped with an autopilot of some kind. I found that the T-18 was a real handful IFR in a little chop if one had to fold charts or look up an approach plate. Pitch (altitude control) didn't seem to be much of a problem however.

I looked at the experimental aircraft type wing leveler but decided in favor of an Edo-Aire Mitchell Century 21. The used Century 21 I bought had been removed from a 1980 Mooney. It cost \$1500. including late model square face DG and Horizon, harness, Mooney installation kit, panel unit, and servo.

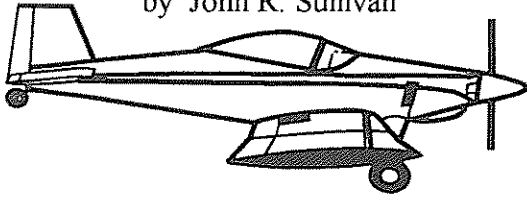
The installation was easy. The servo fit under the passenger seat and required a large hole in the aft side of the spar box. I fabricated a doubler to beef up the area around the servo hole and help distribute the load. The gyros were too deep for behind the panel mounting but front mounting worked OK. Everything else pretty much bolted in. The Mooney install kit is perfect for the T-18. The push-pull tube bolts up directly to the walking beam. Some forming of the right aileron push-pull tube was required to clear the servo shaft but this conflict could have probably been avoided had I mounted the servo a little lower. The servo drives from the bottom of the wheel rather than the top as on the Mooney. This requires the reversal of the roll left & roll right wiring to the servo to obtain proper sensing. The servo doesn't know the difference however.

I now have a very good wing leveler with other nice features. If others are flying much X-C VFR or IFR, I suggest they look into this relatively inexpensive device to enhance safety and decrease workload.

Also, Rich, please update my address if not already done. Sincerely, Evan Roberts P.O Box 8288 Horseshoe Bay, TX 78657

## THORP CHECK-OUT

by John R. Sullivan



I sort of promised this a long time ago, and started to write it a couple of times. But it never seemed right. Then, this morning, I was going through back issues and came upon your "Check-out" story of 2-3 years ago, and the whole thing came into focus. That is, I figured out what I wanted to say. (This is the problem when you deal with somebody who makes his living with words. Everybody else just writes and it works out. We work hard at it.) Anyway, here's what I have to say on the subject of learning to fly a T-18, based on my own (expensive) experience. You guys who have been at it for years can skip to the next article.

When I bought N2357 last Fall, I knew I was in for a learning experience. I just had no idea what I'd learn. Although I have a fair number of hours and ratings (900+, Comm., Instrument) I'd never, in 10 years, flown a taildragger until a couple of months before buying the Thorp. And those were the first hours I'd logged in any plane in two years. When Ed Jones handed the plane off to me, I had about 5 hours tailwheel time — in a Champ. Now, you folks who live further West seem to be in better shape than we in the East; that is, you have a fair number of experienced Thorp flyers — many CFIs — to tap for checkout experience. Not so around here (Northern Virginia). In fact, my search turned up no CFIs within striking distance with any experience at all in the T-18. Mistake number one was doing what I thought was the next best thing: climb in the plane with an instructor who had lots of time teaching in other taildraggers. This might have been acceptable with other instructors, but not with mine. We didn't exactly hit it off personally, and he seemed more nervous than I was about flying the plane. Worse, he tried to cover up his

uncertainty with macho-man behavior. Ugh. But we did fly. Fortunately, I had read the newsletters and talked at length with Ed Jones, the previous owners, Rich Snelson and others, so I had a good grasp of the numbers and aircraft behavior to expect. And things went pretty well: airwork was no problem — and more fun than I'd had in a plane in years — and my first few landings were (miraculously) greasers, with the plane softly flying onto the runway at 90 mph, just as the previous owner had promised. My "instructor" was more like a tour guide, occasionally telling me which direction to fly to the next out-of-the-way airport. I was just getting a firm grip on directional control when the "tour guide" came to life — at about 80 mph and 3 feet off the runway — and suddenly twitched the stick aft. The result, of course, was a quick, brief climb, followed by a sudden stall onto the concrete. I never did learn why he did that. My own guess is that he got scared and thought that was the way to get on the ground quickly. I guess it was, but.... He certainly learned what I would do to him if he ever did it again, and we went home. And so it went for five flights: I'd take off and land, he'd yell about the landing checklist, and neither of us learned much. My landings ranged from great to terrible, and my so-called mentor, not having a clue about the plane himself, was unable to suggest how to make them consistent. The end (well, not quite THE end) came early one morning as I was making my fifth landing of the day, each worse than the last, with no comment from the right seat. This time, I just let it get too slow, too high over the numbers, with the result that the poor bird stalled and slammed in on the mains, hopped twice, and rolled unsteadily to a halt. Fortunately, I had learned the value of good directional control; we conducted all these gyrations right along the centerline. Unfortunately, the strong Thorp isn't that strong, and the mains were irreparably damaged. There had been no prop strike, thank God. Over the winter, I installed new landing gear and motor mounts, generally rehabbed the brakes, interior, electrics and other parts, and built some taildragger time in a Citabria. And when Spring came, on the



advice of an EAA tech counselor who was a lot smarter than I. I called the insurance company, told them my instructor was no longer available, that I had what I thought was a reasonable amount of experience in the plane, and won their okay to solo. Without a tour guide around, I've done well ever since and even managed to safely land in a very strong, gusty crosswind during a recent trip to Montreal. There are several lessons that I took away from this experience: 1) Find a check pilot with knowledge of a Thorp. 2) If your insurance insists that he be a CFI, and you can't find a qualified CFI, have a frank and full discussion of reality with the company. 3) If they still don't get it, ignore them and choose experience over credentials. Life is a better choice than pleasing the paper-pushers. 4) Don't let the T-18's performance and hot reputation intimidate you. It's not quite a pussycat, but it is a straightforward, no-surprises plane that will not let you down if you treat it right. 5) If you don't have much tailwheel time, park the Thorp for a while and fly a Citabria, Champ or other similar plane until you have made most of the mistakes available to taildragger pilots. As Jim Reed, who built my plane, wryly remarked one day, "Thorps don't make the best primary trainers." But once you have reduced the possibility of surprises, smile, get in your Thorp and have fun. With a little time to acclimate to the T-18's fast, powerful control response, you will find that twitches that would give you fits in a Champ are nothing more than interesting moves in your Thorp. And you can get around the pattern fast, fast, fast. 6) Install stall strips if you don't have 'em already. I followed Tom Kerns' instructions, but substituted 3/8" aluminum angle 5-1/2 inches long, riveted halfway out on the inner wings. Among other benefits, the strips convert the traditional Thorp stall-plunge into a stall-mush — a lot safer (and cheaper) event when you get slow a couple of feet above the runway.

John R. Sullivan

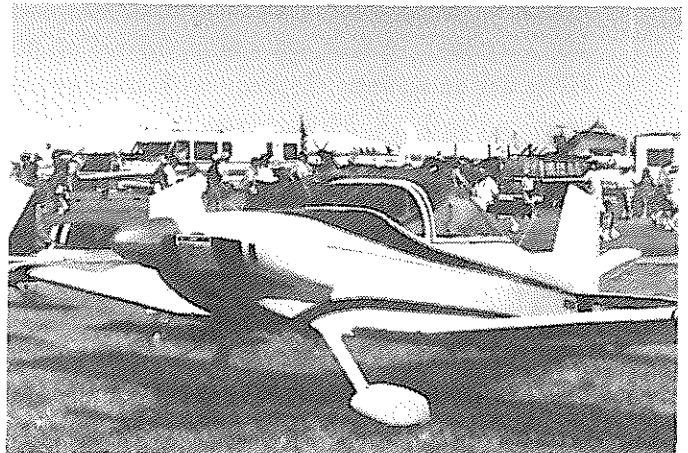
## A TASTE OF OSHKOSH 95!



The Nature Center Picnic followed by the forum was well attended. The tent was nearly full. Lyle Trusty was on center stage telling about some of the modification he has made to his Thorp T-18.

Well lets see! I think I know that airplane anywhere, it's Bob Highley? No, I don't think so.

I've got it! It's Spot! Bill Williams got it painted ! Congratulations Bill!



ready for the 7:00 A.M. trip to the airshow.

I'm not sure we thought they really meant "0700 hours," but the motorcade departed for the field on time and at 7:30 the ten aircraft were pushed out to the display area. The Dayton 610 Chapter members had coffee, juice and donuts available after the planes were in place. At 10:00 A.M. we moved the planes to the flight line and after a lot of photos we taxied to the show ramp for our 20 minute fly-by. It was great fun, bringing the Thorp around the field and over the runway in front of that large crowd. After the fly-by it was back to the display area for an afternoon of questions from the many interested show visitors. Sunday was more of the same and found us sitting under the tent with our feet up, tired but very happy at the end of the day. The weather was not cooperating so we spent another night hoping for better conditions on Monday. With bare VFR minimums, we finally got off at 2:30 P.M. for our flight home.

RoxAnne and I wish to thank The Dayton Airshow and all the members of EAA Chapter 610 for their hospitality and work to make this the premier award event of homebuilding and flying.

*Please don't think that this piece was written to show off for winning the award. RoxAnne and I didn't start out to build a show plane. We built a practical safe flying machine that is perhaps a good representation of the Thorp design. Our message is, that the Wright Brother's Award is obtainable even by us. Keep in mind that the committee selects five kit and five plans built types each year. This is to insure the kit folks don't get all the awards. The former winners vote on which types will receive the awards. For the Thorps, we select a winner or best T-18 at Oshkosh each year that becomes the candidate for the Wright Brother's Award. A little extra work on your bird and you might get you a trip to Dayton in the future. Past winners of the Wright Brothers award include T-18 builders:*

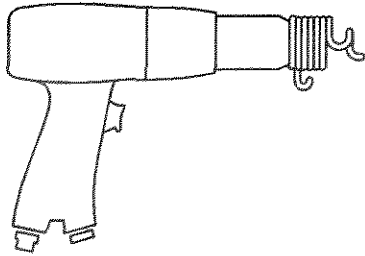
### Past Winners of the Wright Brother's Award

|      |                        |
|------|------------------------|
| 1994 | Ron and Jane Hayes     |
| 1993 | John & Vickie Evens    |
| 1991 | Ed and Janattee Ludtke |
| 1990 | Gene & Thelma Sloan    |
| 1989 | Paul and Steve Kirik   |
| 1988 | Gus Gordon             |
| 1987 | Dave Eby               |
| 1986 | Jim Paine              |
| 1985 | Carl Lipscomb          |
| 1984 | Nate Eastman           |
| 1983 | John Walton            |
| 1982 | Lee Skillman           |
| 1981 | Henry Steiginga        |
| 1980 | Richard Schaefer       |



*If the Thorps are lucky in 1996 this fine gentleman will be the next winner of The Wright Brother's Award. Mr. Tom Kerns pictured here with his daughter Betsy at Oshkosh 95. They're holding the trophy for the best T-18 1995. Congratulations Tom.*

## Builders Corner



In the Builder's Corner this month: A trim system limit switch setup that Ken Morgan submitted. It's very clever in that it avoids the use of relays for reversing the trim motors travel. When installing the wiring for the trim it could be useful to install a circuit breaker of the switch type that would allow turning off the trim motor in the rare case that it would become stuck on.

At the request of several members I have included a list of the complete set of Thorp drawing with revisions and dates. This should be helpful in checking which drawing you have in your set. The list was sent to me courtesy of Ecklund Engineering, who now supplies the original Thorp prints.

### CUTTING ALUMINUM- ANOTHER WAY.

In one of Tony Bingelis' books, he lists about 12 or 14 different ways to cut metal. Shears, snips, band saw, hacksaw, torch, maybe a chisel. A different way (at least for aluminum) is to use a router. In my other hobby (cabinet making), I frequently use my router to cutout parts, especially if I have a pattern to follow. Based on a suggestion from an RV builder, I tried my router to cutout some aluminum. It works like a charm. The first thing you need are a pair of earmuffs. This is not a quiet operation. I have a Black and Decker 1/2 horsepower router, and equipt it with a 1/8 carbide tipped blade (nothing special, a single flute wood type blade from Home Depot). Set up a straight edge and follow along the straight edge with the router base. one pass will true up one edge of an aluminum sheet. You can procure (for about \$12 at the B & D dealer) a template follower. This bolts onto the router

base, and is a flanged bushing that will permit you to follow a straight edge or a pattern. The pattern has to be cut undersize by a function of the little bushing size, but once set up, multiple copies of a given pattern take no time. I generated a pile of rib blanks in just a few minutes. The edges left by the bit are pretty clean, and require minimal attention (polish up with some 400 grit paper). I have used this method on .020, .025, .032 and .040 stock aluminum. Haven't tried any thicker stock. A little practice will give you an idea of how much support the edge of the cut will require. I would like to acknowledge Chris Ruble (RV-6 builder) of San Jose for showing me the routing way to go. Sincerely, Ed Lambert. email address is: [ed\\_lambert@qmsmtp.rdyne.rockwell.com](mailto:ed_lambert@qmsmtp.rdyne.rockwell.com)

### Shop Note:

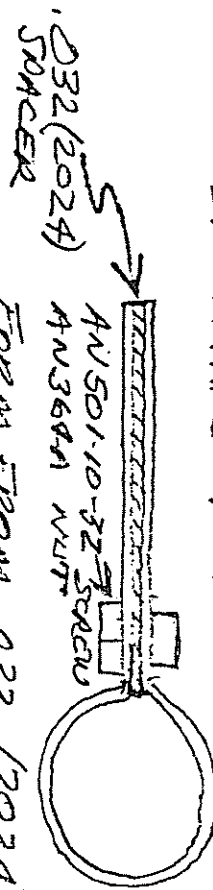
Stubborn Phillips screws can sometimes be removed by putting a dab of lapping compound in the criss-cross slots. I use Permatex 34A, Valve Grinding compound. The Abrasive gives the screw-driver more bite.

If you have to cut the screw head off with an abrasive wheel, it is helpful to have installed a washer under it. This prevents cutting into the underlying sheet metal. from: David Hamilton



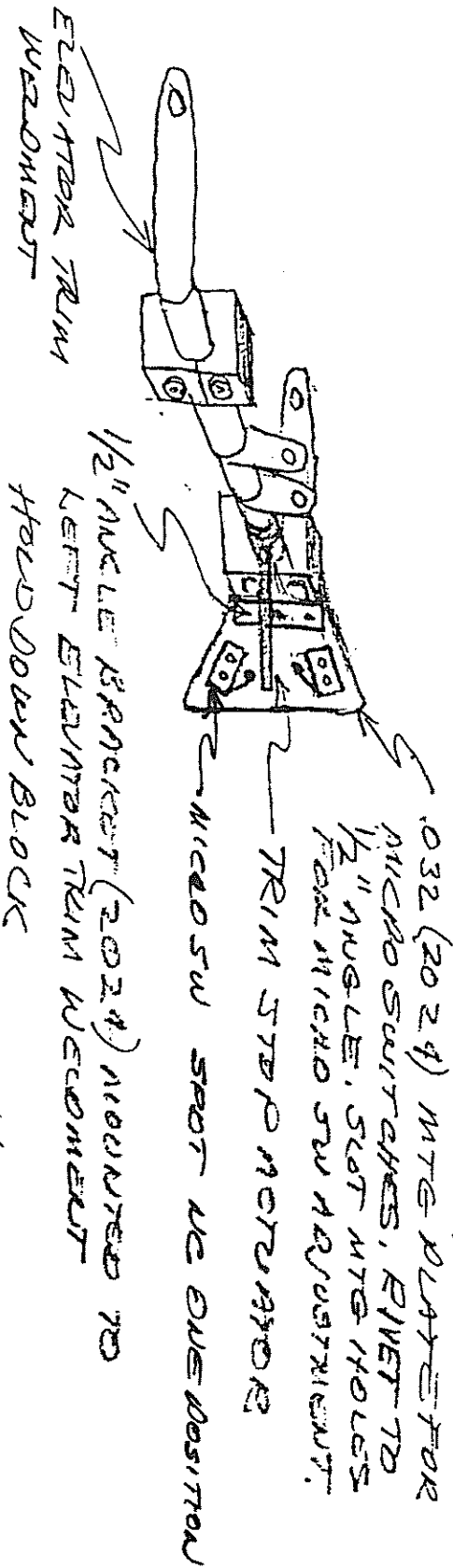
# TRIM SYSTEM UNIT SWITCH ASSEMBLY

NOTE 1. TRIM STOP MECHANISM

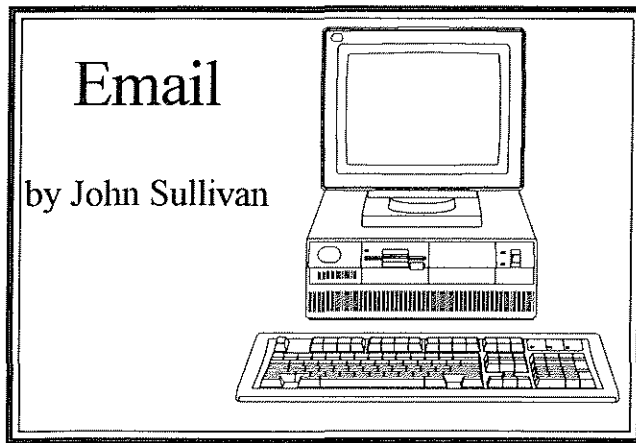


FROM FROM 032 (2024) TO CLAMP

AROUND ELEVATOR TRIM WECCOMENT



KEN MOORE  
1/15/91



For those Thorp owners and builders who just can't wait for the next newsletter, or who need an answer now, to a pressing question, there is an alternative to bugging our long-suffering editor. It's called America Online(AOL), the electronic on-line service, where a growing number of Thorp flyers and builders are exchanging information (with the usual ration of nonsense) through a T-18 bulletin board. The service is easy to use, once you get the hang of a few simple steps, and fast. Granted, you have to have a computer and modem, but you always wanted an excuse to buy one anyway, right? And what better reason than this. AOL is also very versatile. Not only do Thorp folks trade questions, answers, and other information, but they also sent mail directly to each other. A fringe benefit is that you can also glean knowledge about other planes, equipment, building techniques, etc. via dozens of other aviation bulletin boards. (Yes, other on-line services have similar facilities. But the Thorp bulletin board is active on AOL.) You can join AOL by calling 1-800-827-6364 and requesting a disk that contains the necessary software. Or, ask at a local computer store; often the on-line services give away disks through retailers (a month or so ago, computer magazines included free on-line software, too). With the disk comes 10 hours of free air time. After that, AOL costs \$9.95 a month for up to 5 hours of time. Unless you become a cybernerd, that's plenty. I won't go into the steps to set up your computer. The AOL disk will lead you through it. But, once you connect with AOL, you will want to race right into the Thorp forum, right? Here's how:

1) On the top of the screen is a string of little icons. One features an arrow that curves down from the top of the box. If you click your pointer on that arrow, the "Keyword" box will appear; type in the word "FLY" and click OK or press the ENTER key. 2) In a few seconds, the aviation screen will appear, and in the lower right corner of it you'll see a box that says, MESSAGE

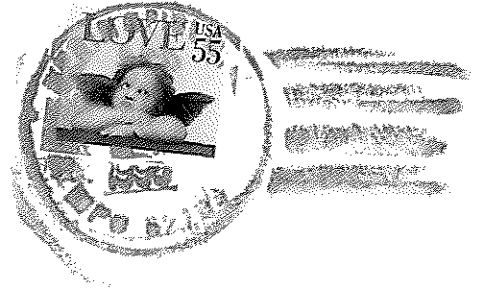
BOARDS. Click on that. 3) When the next box comes up you'll have several choices. Click on the box that says LIST CATEGORIES. 4) What appears next is a list of all the available message boards. There are a lot of them, and you'll probably want to explore some. Right now, however, you should scroll through until you see a line that says HOMEBUILTS AND EXPERIMENTALS. Highlight the line by clicking on it, then click on the LIST TOPICS box. 5) Now you'll see a list of all the message boards devoted to homebuilts. There are boards for Pitts, Glasair, RVs — you name it. There are boards on metalworking, engines, instrumentation, and on and on. Scroll about half way through and finally a board for THORP T-18 will appear, along with the number of messages that have been posted (on the day I wrote this there were 120) and the date of the last one. Highlight the line and then click on one of the boxes at the bottom. There are several choices: You can list all the messages, starting at the very first. Or, you can begin reading the very first message. Or, you can ask to look at only those messages that have been posted in the past so many days (you tell it how many days you want to search). Once you have entered the bulletin board, the system keeps track of the date of your last visit, so in the future you can ask to see only those messages posted since you last looked in. (You can also get help any time you need it.) The bulletin board is used by many Thorp owners to ask questions relating to the operation or maintenance of their planes. Rich Snelson uses it to post information about upcoming events. Anyone with an answer to a question they see, can immediately send a response. If you have a question of your own, or want to pass on a bit of advice, tell about a recent experience, or bug Rich Snelson, all you have to do is click on the box at the bottom of the screen that says, POST A MESSAGE. If you want to send a note directly to someone, move your pointer to the top of the screen, click on MAIL, and use the person's "Screen Name" to address the message. (As you scan the messages, you'll see the screen names of the writers. Some appear frequently — not too much, just a lot — and others less so.) Rich Snelson is RSnelson1. I'm JRSullivan. Lyle Trusty isDadTrusty. Tom Kerns is N10TK. Eventually, as more folks start using this medium, a list of Screen Names will probably appear in the newsletter, and be attached to the membership list. Try AOL. I think you'll like it. The Thorp bulletin board has the potential to be a real forum of news, technical information and ideas.

|    |        |                                |        |         |            |
|----|--------|--------------------------------|--------|---------|------------|
| A- | 582    | DOUBLER ASS'Y BLKH STA 199.75  | 576    | 11x17   | 10 DEC 65  |
|    | 583    | FITT'G-TAIL GEAR STA 199.75    | 576    | 8.5x11  | 8 OCT 62   |
|    | 584 L  | FITTING ASS'Y HORZ TAIL PIVOT  | 575    | 17x22   | 1 JAN 63   |
|    | 585    | RIB-SECOND - RUDDER            | 569    | 8.5x22  | 9 OCT 62   |
| A- | 586    | RIB-THIRD - RUDDER             | 569    | 17x22   | 2 JAN 63   |
|    | 587    | BEAM-UPPER - RUDDER            | 569    | 8.5x44  | 5 NOV 62   |
|    | 588    | BEAM-LOWER - RUDDER            | 569    | 17x33   | 6 NOV 62   |
| B- | 589    | SPRING - TAIL GEAR             | 590    | 25.5x22 | 23 FEB 69  |
| A- | 590    | INSTALLATION - TAIL GEAR       | 548    | 17x33   | 22 FEB 69  |
| A- | 591    | FITT'G-TAIL GEAR STA. 191.75   | 575    | 8.5x11  | 2 NOV 65   |
|    | 592    | BULKHEAD ASS'Y STA. 76.5       | 580    | 17x33   | 12 MAY 63  |
| B- | 593    | SKIN-FUSE. SIDE (FLAT LAYOUT)  | 580    | 17x44   | 16 NOV 65  |
|    | 594    | SPACER - HORIZ TAIL PIVOT      | 595    | 8.5x11  | 11 JAN 63  |
| C- | 595    | INSTALLATION - HORIZ TAIL      | 548    | 17x22   | 28 FEB 69  |
| A- | 596    | BULKHEAD ASS'Y FUS STA 94.2862 | 580    | 17x33   | 8 FEB 63   |
|    | 597    | FITTING FUSE STA 94.2862       | 596    | 11x17   | 10 JAN 63  |
| A- | 598    | FRAME FUSELAGE COCKPIT - AFT   | 580    | 17x33   | 8 FEB 63   |
|    | 598 -1 | FRAME FUSELAGE COCKPIT - AFT   | 580    | 17x22   | 1 NOV 65   |
|    | 599    | JOINT MAIN BEAM - FUSELAGE     | 548    | 25.5x33 | 8 FEB 63   |
|    | 601    | BULKHEAD ASS'Y FUSE STA 69.928 | 580    | 17x33   | 11 FEB 63  |
|    | 602 L  | FITTING MAIN BEAM - FUSE ATTCH | 601    | 11x17   | 11 FEB 63  |
|    | 603    | DASH                           | 580    | 17x22   | 21 APR 63  |
|    | 604    | FIRE WALL                      | 580    | 17x22   | 3 APRIL 63 |
| D- | 609    | DESIGN REFERENCE               |        | 17x33   | 4 APRIL 65 |
|    | 611    | AFT ROOT RIB - HORIZ TAIL      | 502    | 8.5x22  | 25 MAR 64  |
|    | 612    | LEADING EDGE RIB HORIZ TAIL    | 502    | 8.5x11  | 25 MAR 64  |
|    | 613    | REAR BEAM - HORIZONTAL TAIL    | 502    | 8.5x22  | 3 APRIL 64 |
|    | 615 L  | RIB-TRAILING EDGE CENTER WING  | 532    | 17x22   | 10 MAY 64  |
|    | 617    | JOINT REAR BEAM - FUSELAGE     | 548    | 17x22   | 28 OCT 64  |
|    | 623    | TIP WEIGHT - HORIZONTAL TAIL   | 595    | 17x22   | 28 FEB 69  |
|    | 631    | INSTALLATION - WING FLAP       | 548    | 34x66   | 12 OCT 67  |
|    | 632 L  | ASSEMBLY - WING FLAP           | 631    | 17x33   | 31 MAR 65  |
|    | 634 L  | RIB ASS'Y - INBOARD - FLAP     | 632    | 8.5x22  | 21 APR 65  |
|    | 635 L  | RIB ASS'Y - OUTBOARD - FLAP    | 632    | 8.5x22  | 1 APRIL 65 |
|    | 636 L  | BEAM WING FLAP                 | 632    | 8.5x33  | 2 APRIL 65 |
|    | 637    | HINGE PLATE WING FLAP          | 631    | 8.5x11  | 8 APRIL 65 |
| A- | 638 R  | MAST WING FLAP                 | 631    | 8.5x22  | 29 MAY 66  |
|    | 639    | REAR BULKHEAD - SPINNER        | 640    | 17x22   | 19 OCT 64  |
|    | 640    | SPINNER ASSEMBLY               | 548    | 17x33   | 19 OCT 64  |
|    | 641    | SPINNER SHELL                  | 640    | 17x33   | 20 OCT     |
|    | 642    | FRONT BULKHEAD - SPINNER       | 640    | 17x22   | 22 OCT 64  |
| A- | 650    | ASSEMBLY - CANOPY              | 548    | 25.5x55 | 4 JULY 72  |
|    | 651 L  | WHEEL FAIRING                  | 548    | 34x44   | 16 NOV 71  |
|    | 662 L  | NOSE RIB ASS'Y - WING FLAP     | 632    | 8.5x11  | 22 APR 65  |
|    | 669    | DECK - FUSELAGE                | 580-16 | 25.5x33 | 31 OCT 65  |
|    | 686    | BEARING CAGE ELEVATOR TRIM SYS | 701    | 8.5x11  | 10 DEC 65  |
|    | 689    | BEARING BLOCK ELEV TRIM SYSTEM | 701    | 8.5x11  | 10 DEC 65  |
|    | 694    | NUT ELEV TRIM SYSTEM           | 701    | 8.5x11  | 12 DEC 63  |
| A- | 701    | INST'L ELEV TRIM JACK ASS'Y    | 715    | 17x22   | 18 FEB 66  |
|    | 702    | BUSHING ELEVATOR TRIM SYSTEM   | 701    | 8.5x11  | 12 DEC 65  |
|    | 703    | TORQUE TUBE ASS'Y ELEV TRIM    | 701    | 17x22   | 15 DEC 65  |
|    | 704    | JACK SCREW ELEV TRIM SYSTEM    | 701    | 8.5x11  | 12 DEC 65  |
|    | 707    | SPACER ELEVATOR TRIM SYSTEM    | 701    | 8.5x11  | 5 JAN 66   |
|    | 715    | INST'L ELEVATOR TRIM SYSTEM    | 548    | 17x22   | 19 JAN 66  |
|    | 716    | CONTROL HEAD ELEV TRIM SYSTEM  | 715    | 17x22   | 17 JAN 66  |
|    | 719    | TERMINAL - FLEXIBLE SHAFT      | 701    | 8.5x11  | 18 FEB 66  |

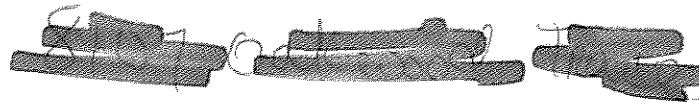
|    |       |                                |      |         |            |
|----|-------|--------------------------------|------|---------|------------|
|    | 721   | HUB - TRIM WHEEL               | 716  | 8.5x11  | 18 FEB 66  |
|    | 722   | BEARING - TRIM WHEEL           | 504  | 8.5x11  | 19 FEB 66  |
|    | 727   | RING ASS'Y - DYNAFOCAL MOUNT   | 728  | 25.5x33 | 28 APR 66  |
|    | 728   | DYNAFOCAL ENGINE MOUNT ASS'Y   | 548  | 25.5x22 | 13 MAY 66  |
|    | 733   | JIG - DYNAFOCAL MOUNT          |      | 25.5x33 | 13 MAY 66  |
|    | 734 L | BRACKET - WING FLAP            | 632  | 8.5x11  | 10 NOV 67  |
| A- | 736 L | FLAP PULLEY INST. OUTBOARD     | 631  | 11x17   | 26 MAY 66  |
| A- | 740   | FLAP PULLEY INST. INBOARD      | 631  | 17x22   | 1 JUNE 66  |
|    | 742   | LEVER INSTAL'N FLAP CONTROL    | 631  | 25.5x33 | 30 MAY 66  |
|    | 743   | DETENT - FLAP CONTROL          | 742  | 17x22   | 26 JUNE 66 |
|    | 744   | EXTRUSION - RUBBING STRIP      |      | 8.5x11  | 10-31-46   |
|    | 751   | SEAL - CARB. AIR BOX           | 781  | 17x22   | 8 OCT 67   |
|    | 781   | ASSEMBLY - CARB. AIR BOX       | 548  | 34x33   | 28 APR 68  |
|    | 782   | WELL CARB. AIR BOX             | 781  | 11x17   | 8 OCT 67   |
|    | 791 R | COLLAR - FLAP MAST             | 632  | 8.5x11  | 10 NOV 67  |
|    | 792   | INST FUEL GAGE SENDING UNIT    |      | 17x33   | 6 APR 68   |
|    | 796   | INSTALLATION PITOT-STATIC      | 548  | 17x22   | 11 JUNE 68 |
| A- | 850   | INSTALLATION - BATTERY BOX     | 548  | 34x33   | 8 JUNE 70  |
|    | 852 R | SEAT MOUNTING FRONT - OUTBOARD | 855  | 17x22   | 15 NOV 70  |
|    | 853   | SEAT BRACKET FRONT-INBOARD     | 854  | 8.5x11  | 9 NOV 70   |
|    | 854 L | SEAT MOUNTING FRONT - INBOARD  | 855  | 17x22   | 6 NOV 70   |
|    | 855   | INSTALLATION SEATS             | 548  | 34x44   | 24 NOV 70  |
|    | 856 R | SEAT BRACKET FRONT - OUTBOARD  | 852  | 8.5x11  | 2 DEC 70   |
|    | 857 L | SEAT SUPPORT REAR              | 855  | 25.5x44 | 20 NOV 70  |
|    | 858   | LOOP - HARNESS                 | 855  | 8.5x11  | 7 DEC 70   |
|    | 859   | ANCHORAGE SHOULDER HARNESS     | 855  | 17x22   | 8 DEC 70   |
|    | 860 R | ANCHORAGE SEAT BELT OUTBOARD   | 855  | 17x22   | 22 DEC 70  |
|    | 861   | ANCHORAGE SEAT BELT - INBOARD  | 855  | 17x22   | 23 DEC 70  |
| A- | 862   | TAIL SPRING - HEAVY DUTY       | 589  | 17x33   | 20 JUNE 71 |
|    | 863   | VALVE - CARB. AIR BOX          | 781  | 17x22   | 16 JULY 71 |
|    | 864 L | BRACKET - WHEEL FAIRING        | 651  | 17x22   | 8 DEC 71   |
|    | 865   | FAIRING LANDING GEAR LEG       | 866  | 25.5x33 | 26 DEC 71  |
|    | 866   | INSTALLATION GEAR LEG FAIRING  | 548  | 17x22   | 3 JAN 71   |
|    | 867   | BODY CANOPY LATCH              | 870  | 11x17   | 27 JUNE 72 |
|    | 868   | HOOK - CANOPY LATCH            | 870  | 8.5x11  | 28 JUNE 72 |
|    | 869   | INSIDE HANDLE - CANOPY LATCH   | 870  | 8.5x11  | 29 JUNE 72 |
|    | 870   | ASSEMBLY CANOPY LATCH          | 650  | 11x17   | 28 JUNE 72 |
|    | 871   | OUTSIDE HANDLE CANOPY LATCH    | 870  | 8.5x11  | 28 JUNE 72 |
|    | 872   | STUD CANOPY LATCH              | 870  | 8.5x11  | 29 JUNE 72 |
|    | 873   | SHAFT CANOPY LATCH             | 870  | 8.5x11  | 30 JUNE 72 |
|    | 874   | PIN CANOPY LATCH               | 870  | 8.5x11  | 30 JUNE 72 |
|    | 875   | FLAT LAYOUT- BODY CANOPY LATCH | 867  | 8.5x11  | 2 JULY 72  |
|    | 876   | COVER PLATE CANOPY LATCH       | 870  | 8.5x11  | 2 JULY 72  |
|    | 877 L | CANOPY TRACK SIDE              | 580  | 8.5x33  | 19 JULY 72 |
|    | 905   | DRIVING LUG PROP SHAFT EXTENS. | 1072 | 8.5x11  | 26 OCT 69  |
|    | 1070  | EXTENSION PROPELLER            | 1070 | 17x33   | 7 OCT 64   |
|    | 1071  | DRIVING LUG PROP SHAFT EXT     | 1070 | 8.5x11  | 7 OCT 64   |
|    | 1072  | EXTENSION PROPELLER SHAFT      |      | 17x33   | 25 OCT 64  |
|    | 1159  | FILLER NECK FUEL TANK          | 514  | 17x22   | 19 MAY 64  |
|    | 1160  | ASSEMBLY FUEL FILLER CAP       | 514  | 8.5x11  | 8 JUNE 55  |
|    | 1188  | SEALING RING FUEL FILLER CAP   | 1160 | 8.5x11  | 8 JUNE 55  |
|    | 1189  | COVER FILLER CAP               | 1160 | 8.5x11  | 8 JUNE 55  |
|    | 1190  | PLATE ASSEMBLY FILLER CAP      | 1160 | 8.5x11  | 9 JUNE 55  |
|    | 1191  | PLATE FILLER CAP               | 1190 | 8.5x11  | 8 JUNE 55  |
| A- | 1192  | WING NUT FILLER CAP            | 1160 | 8.5x11  | 9 JUNE 55  |
|    | 1439  | SEAL CANOPY                    | 650  | 8.5x11  | 26 AUG 61  |



T-18 NEWSLETTER  
 ROUTE 3, BOX 295  
 CLINTON, IL 61727  
 1-217-935-4215  
 Issue #96, Sept 95



25



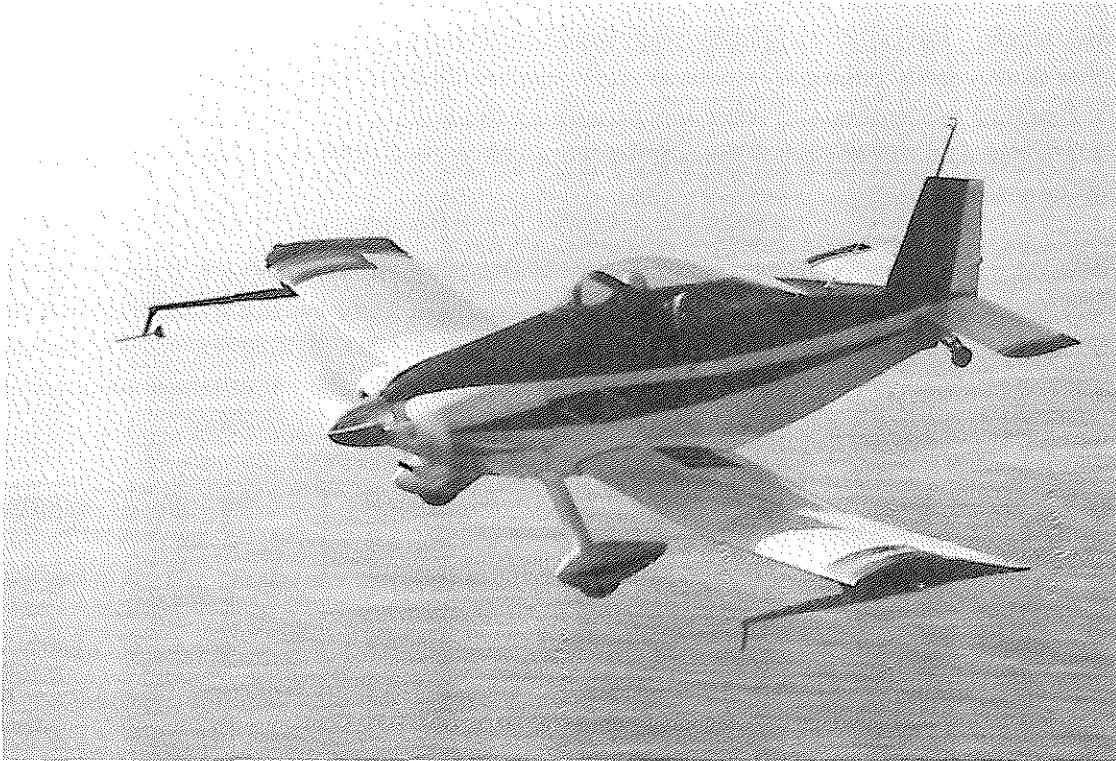
4th Annual Placerville Fly-In  
 Sept 22-24  
 Info: 408-365-8836

NOTE: I had so much good material for this newsletter that I left out the editors column. I would like to mention that the Oshkosh Friday events in the Nature Center were well attended. The picnic and the Thorp Forum were held there starting at noon. We will try for that same combination next year. We had a lot of comments about how much everyone like it there. Take note: I heard you say that it was very hard to hear the speakers, no PA. I'll work on that for next year. There are a lot of For Sale Items in this newsletter so check out the good deals folks. I have had numerous calls from individuals looking for Thorps. The word is out, we have a great airplane. I will try and put airplanes and buyers together. Let me know if you plan to sell. (217) 935-4215

**T-18 FALL GATHERING**  
**KENTUCKY DAM VILLAGE STATE RESORT PARK**  
**OCT 6-8, 1995**

Come to this event if you enjoy flying, flying, flying. It's true we do spend a little of the weekend looking at the gathered Thorps, but a lot of the time is spent giving folks a Thorp T-18 rides. Kentucky Dam State Park Airport is 30 miles east of the Cunningham VOR (Paducah) on the 90 degree radial, 8 miles south of V178. The runway is paved, 4000 feet long. Phone number for the lodge is 1-800-325-0146. !!! I doubt if you will be able to get a room there at this late date! Call anyway and ask for the Paine Party. If you can't get in there, try the Ramada Inn it's not far. Bring your own tie downs.

# T-18 NEWSLETTER



**Ken Brock's T-18 equipped with the CAFE Foundation's Barrographs**  
*See letter from Dick Ecklund on page 8, more to follow.*

## IN THIS ISSUE:

Flight Safety Bulletins  
AeroElectric Connection  
First Flight by Joe Gauthier  
Wood Propeller Refinishing  
Why Vacuum Pumps Fail  
A report from "Down Under"

**NOTICE: (STANDARD DISCLAIMER)** As always , in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.



## FLIGHT SAFETY BULLETINS !

During a routine inspection of the outer wing panels of a recently purchased Thorp T-18, standard wing model, the outer wing bolts were found to be loose. Closer inspection showed that some of the holes were greatly enlarged, some to .410" and one that had been drilled to a figure eight shape. Evidence of movement and wear was present on the bolts and in the holes. If this problem had gone undetected a failure of one of the fittings would have eventually occurred. The aircraft has less than 200 hours on it.

Great care should be taken when fitting and drilling the outer wing attach fittings. Any slop in these holes will show up as play that allows the wing junction to move, this movement will eventually enlarge the holes even more. A check of these four bolts should be added to all T-18 yearly conditional inspections ("The annual"). It should also be added to the list of things to check when buying a used Thorp.

Both bolts on the outer to inner wing fittings are designed for sheer loading. No normal amount of torque will keep the wing together if this sheer arrangement is enlarged and loose. In fact by checking the torque table for this size bolt, you will find it's quite low. Therefore, just torquing the bolts at the yearly inspection won't cut it. It's necessary to loosen the bolts and move the outer wing up and down to check the play. Better yet, remove the wing panel and get a first hand look at how the bolts fit the holes. They should have started life as a tight fit, at least a hard push to get them in. If they're so loose that you can slop them around side to side, you have a problem that must be corrected. If the bolts are still snug, you did the job right in the first place. Torque them back up and go flying.

The only way I know to fix the looseness problem is to use an adjustable reamer and open the holes oversize and then find some NAS oversized bolts to fit. Alatec in California can supply NAS 6606-15X bolts that measure .388". This may not be large enough to fill all problem holes. Their phone is (818)727-7800. Drilling the holes out for the next regularly sized bolt is a solution but it removes much of the design margin material around the holes. A design analysis should be done to determine the limits for drilling the holes oversize. Let's hear from the mechanical engineers out there!

### Prop Failure during flight:

Gayle LeCount of Georgetown, Illinois reports that his Aymar Demuth prop failed during cruise flight. Gayle made an emergency landing on a highway without any damage to himself or the Thorp. Here's what I know from talking to Gayle and Mike Demuth. Gayle states that the prop was looked at during preflight, no damage was evident. Failure occurred at cruise, about 1/2 of one blade came off. Prop didn't delaminate. Gayle doesn't think a bird strike was involved. Gayle's Thorp is 180 hp and the prop had been in use for one year. A call to Mike Demuth: He has about 1000 props in use. He stated that, any sort of inflight failure is extremely rare for any type of wooden prop unless external damage is involved. Mike has asked for the prop to be sent to him for evaluation and replacement. *Update: Gayle has sent the prop to Forest Products Lab in Madison, Wisc for evaluation. This is a federal lab that Ben Owens recommended. More on this when Gayle gets a report.*

## MORE PROBLEMS---- FLIGHT SAFETY

Dear Rich,

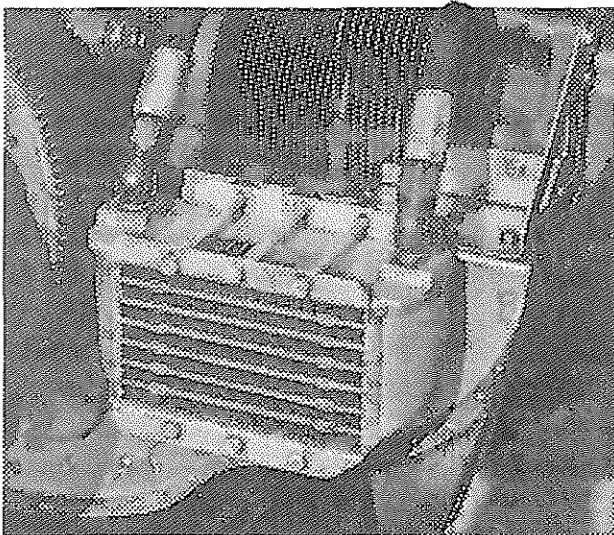
I am enclosing a letter and photos which I sent to the FAA regarding the recent failure of my Stewart-Warner oil cooler.

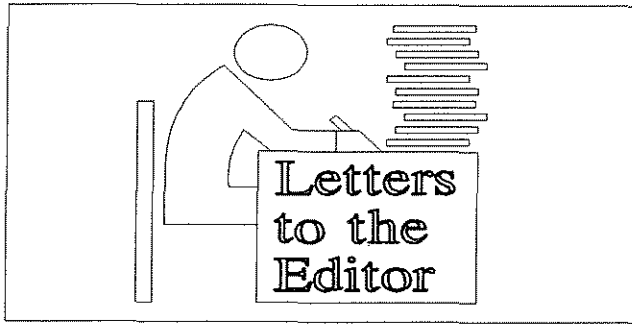
I should emphasize that no knowledgeable person will blame the failure of the weld on the installation for two reasons: first I repeat: 2 experienced aircraft welders who saw my cooler said, in any circumstance, if the weld is properly done, the material around the weld should break before the weld. Secondly my installation is identical to that used by all other T-18 builders. I'm aware of at least in So. Calif. This installation was used on my first T-18 for 2009 hrs. and on this one for 350 hours. Sincerely, Earl Ody

"Alert": I would like to inform you of the failure of a Stewart Warner oil cooler on a O-360 Lycoming engine on my Thorp T-18, N992PE, on 1 Nov 1995. As you can see in the enclosed photos, the weld broke where the boss is welded on to the cooler on the inboard side. The oil was quickly pumped out of the engine spraying over the engine creating much smoke in the cockpit and zero reading on my oil pressure gage. Fortunately I was over an airport and made a safe landing. The installation of the cooler is standard on most T-18's.

I am calling this to your attention so you may alert many owners of aircraft with this cooler of the danger of a possible failure. Many of my T-18 friends using this cooler are very concerned after learning of my emergency. Although some may fault my installation, experienced aircraft welders have told me that if a weld is properly done, the material around the weld should break before the weld breaks. As you can see from the photos, the break is precisely in the weld where the boss joins the cooler.

When I contacted Stewart Warner, they offered to replace the cooler, free of charge, which they have done. When I suggested they pay to disassemble, inspect, repair if necessary, and reassemble my engine they indicated that they would not do so without being forced by litigation, which I am in no financial position to do. The Stewart Warner people I have dealt with are Tom Ridenour at 812-547-7071 and Scott Eberle at 317-486-2629. If you need further information regarding this incident please call me at 310-833-6872. Thank you. Earl Ody 28903 Gunter Rd. Rancho Palos Verdes, CA 90275-2019





Dear Richard:

Enclosed please find my 1996 subscription fee for new membership in the T18 Mutual Aid Society.

I completed T18 serial number 137 3-1/2 years after purchasing the long-abandoned project; it had passed through a succession of owners over many years. In fact, I have some correspondence from John Thorp transferring registered ownership of the serial number from one owner to another. Apparently, the originator of the project did most of the work I took over. The cost of the materials was considerably less in 1964 than now, as some of the material receipts I have from then plainly show!

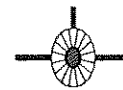
Serial number 137 is registered with the FAA as N137EP. It was inspected by designee Jay Foster of Enstrom Helicopter on Good Friday, April 12 1995, and made its first flight a few weeks later. It has over 90 hours on it now and was at Oshkosh this year; the dark red/light gray/black one parked on the aisle. It is powered by a converted 125 HP GPU engine turning a 68 x 70 Aymar/Demuth prop. The engine was assembled using new 3-ring standard-size pistons, rings, bearing and rod bolts, and really does a good job getting N137EP off the ground. Except for a rudder trim requirement, it flies well.

I am a student pilot, having constructed the airplane before learning to fly, and am now taking flight instruction in my brother Bob's C170. Brother Bob and nephew Dave Pernic flew off the required 40 hours without any problems other than relocating the crankcase vent on the engine. I think after the initial

apprehension associated with a new airplane, they had a good time!

A worthwhile change was to fabricate a new mounting block for the tailwheel. The original mount had a 45-degree angle between the tailwheel fork pivot axis and the mounting surface which is bolted against the spring. The new mount has a 35-degree angle there. This change put the fork pivot axis into the vertical plane and increased the trail of the tailwheel axle behind the fork pivot. The tailwheel is more stable now, with less tendency to shimmy during rollout.

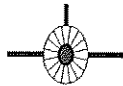
Looking ahead into the future, I plan on changing out the Goodyear brakes and wheels for a set of Clevelands. I know I missed a good deal on a set a few months back, so if this letter is published and any readers know for a set of Clevelands... call me, please! I also am thinking about building a 309 cubic inch GPU engine as described by John Thorp in one of the Newsletters. Have any members done this? Can anyone with experience with this conversion comment on this project? I haven't located a 340 cubic inch Lycoming crankshaft which forms the basis of the engine. Sincerely yours, Edward Pernic 17801 Tanager Ln South Bend, Ind 219/272-3917



Hi Rich and everyone,

I was surprised and delighted to see my T-18 "Nose Art" Tiger on the cover of our recent newsletter. There is a little story behind it, as it was one of the first things I did after I got my T-18. I was extremely nervous about hiring a total stranger to put paint on my new baby, and you always read that T-18's are supposed to have straight lines, so I only imagined what kind of disaster I might be getting myself into. I didn't know a thing about art, I still don't, so to find a good artist I started calling all the art studio's in Los Angeles. The name Jim O'Conell kept coming up so I figured he must be the best. I called Jim and told him point blank that I wanted

perfect realism and no "Tony the Tiger" type pictures on my plane. He didn't bat an eye and we met. His portfolio included work for the group "Kiss" and he is the resident illustrator for the LAPD and Suicide Prevention. I asked how much. He said \$1600 bucks. I broke into a sweat but agreed (I've since found out from numerous artist's that's about right). He said he would research about four days at the library and then take a week to complete both tigers. He said don't come back before then. When I did come back I couldn't believe my eyes. He air brushed the underlying Tiger and then hand painted the detail over it. They are so lifelike they look as though they will bite you if you get too close. A lot of people think they are decals. It still amazes me that someone can have that kind of talent, and he didn't discover it till he was age 30. So what started out as a scary foray into art by a knownothing has turned into one of the favorite parts of my airplane. It is a never ending joy for me to see other people enjoy them. Take care- Don Schindler, Woodlanhills, CA.



Dear Rich, We appreciate your time on the newsletter we couldn't do without it. I have painted N-160CJ which keep me from flying for several months. Am now trying to get familiar with the T-18 again. I have about 23 hours on it.

I made several changes during the paint time, one I feel is worth while is an electric primer. I removed the mechanical pump and installed a solenoid valve on the gascolator and from it to the engine primer lines. I used a door bell button for the switch, this is only good for fuel pressure systems, which I have since getting rid of the Marvel Carb. I had the usual problem (running to rich) with it.

I went to a Ellison Throttle Body and am well pleased with it . Back to the primer: turn on boost pump, hold button down and count to three and start the engine. It is easier that the mech primer and cleans up the installation with no fuel lines in the cockpit.

I am sending a couple of pictures of the T-18 if you choose to use them.

We had our annual fly in Saturday the 21 and was glad to see two other T-18s fly in, Gary Green and Gary Cotner, we had a total of 43 aircraft and 86 people for the free barbecue lunch. The flyin is cosponsored by the local EAA Chapter 1014. Not bad to have been on the same date as Keerville and another only 19 miles south. Keep up the good work on the newsletter. Coyt Johnston RT. 1, Box 178 Snyder, OK 73566



*Coyt Johnston's beautiful new Thorp T-18 N160CJ*



*More Email:* Subj: Thorp CA to FL in 2 Days  
Date: 95-11-12 14:10:44 EST From: Speedy11  
Well, I made it to Florida without a hiccup from the plane.

I hopped from Bakersfield, CA to Oklahoma City in one day, parked the plane for about a month, and then recently hopped to Tampa, FL. GPS average groundspeed was 160-170 knots for entire trip thanks to good tailwinds. During several 200 FPM descents, had GS of 195-205 knots. Route of flight was Bakersfield to Victorville to Kingman, AZ to Albuquerque to Tucumcari to OKC to Tallahassee to Tampa. Engine ran perfectly. Ailerons are out of trim, so had to hold about 10 pounds of right stick pressure during entire trip. Canopy and windscreen got scratched during OKC layover due to dust getting under plastic tarp and wind causing tarp to rub against canopy. Does anyone have experience with Micromesh or another scratch remover?? Any advice appreciated.

Airplane climbs like an angel at 85 mph indicated, but engine cylinder head temp goes above redline. May be due to lack of spinner, but suspect that CHT probe is improperly located. I've got to check that out. Oil temp stays well within normal range at all times.

Now I need to start my clean up work. I plan to redo the interior and panel. The paint is ugly, but can't afford to repaint right now. It's a great flying little plane. In fact, I think I'll go fly RIGHT NOW!! Bye. Stan Sutterfield.



Dear Rich,

We sure did have a great time at OSHKOSH this year especially on Friday during the Thorp activities. It was great seeing you and Roxanne as well as the rest of the Thorp people!

All of the events went very well and as usual, I

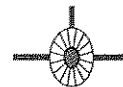
learned a lot and had a good time doing so.

As I have mentioned in the past, things weren't going too well at the job and as a result I am starting off on a new venture - tomorrow. I will be traveling to Scottsdale, Az. to work with a friend, in flow measurement, and I expect to be moving there in the near future. This doesn't help my project in the short term but, I expect that the project will benefit in the long term.

Therefore, I would like to list some surplus parts for the T-18 in the next newsletter. These parts are extras that I have accumulated and do not want to move. My wife, Elainel may be contacted at home, (215) 321-0446. If necessary, I then can contact the interested party for more info.

The parts are for a standard T-18 as follows:  
Wing spars (complete) and ribs - \$400.00.  
Bulkheads and fuselage skins (which could be used as templates) \$100.00.  
Miscellaneous fittings for wing, etc. - \$25.00  
Cowl nose piece and bottom of cowl - \$25.00.

Prices are reasonable and negotiable.  
I will forward my new address when it is available. Thanks for your help.  
Sincerely, Don Ruffner



October 11, 1995

### **O-290-G on Three Cylinders**

Few of us can intentionally shut down one cylinder in flight just to see how the engine performs. That's why I want to describe what happened when my T-18, #844, swallowed an exhaust valve. I was flying near Corvallis, Oregon, intending to measure airspeed with my new prop, Pacesetter 68x64, by flying between two VOR's. This is described by Barry Schiff in "Proficient Pilot II", p. 162.

A change in the sound of the engine drew my attention to the tach, which abruptly dropped from 2600 to 2200 rpm. After switching to left mag, right mag, then back to both, I tried playing with the mixture. This proved to be a mistake, since the engine died, leaving the shiny new prop perched board-like out front. An attempt to re-start indicated a mechanical interference.

I almost made Corvallis. Touchdown was on muddy grass. Dodging around runway lights and a sign structure let me come to a stop on the runway. The airframe was undamaged.

The piston on the offending cylinder looked as if a muscular, angry person had attacked the top with a three-pound sledge and a cold chisel. In addition to a hole the size of a quarter, the exhaust valve head was stuck on edge in the surface like a coin in a pie. The lesson seems to be that if you have an abrupt, substantial drop in rpm, don't play with it, because it may stop completely.

### Shop Note - Baffles and Patterns

You may not need to get baffle patterns from others, since you can make them yourself out of posterboard (thin cardboard), using a method similar to that described by Tony Bingelis in "Firewall Forward" p. 271. The problem is to fit a pattern to an irregularly-shaped engine crankcase. The basic idea is to refine a rough pattern, fixed in position, by taping on small pieces of posterboard, each of which is cut to fit just a small portion, say an inch long. This first-attempt pattern can be removed and traced around to produce pattern number two. This is put back on the engine in the same position as the first (reference marks) and further refined in the same way. A leather punch may be used to make a one-eighth hole in posterboard so that it can be clecoed to a previously-made baffle piece.

How about the problem of matching an existing hole, hidden under the pattern? The baffle on top of the cylinder head can be fitted to

the rocker-arm cover in the way described above. Now we have to locate the baffle retaining screw holes. Cut a hole the size of a dime in the approximate location. With the pattern fixed in position on the cylinder head, draw cross-hair lines on the pattern centering on the screw-hole, which is of course visible through the dime-sized hole in the pattern. These cross-hairs can be used to locate the hole when you go to make it in metal. This method of hole location is not accurate enough for rivets, but works quite well for clearance holes. David C. Hamilton 6203 Shaw Lane Aumsville Oregon, 97325 (503) 749-1374



Dear Rich,

Please keep your eyes open for a pair of 5.00 x 5 inch Clevelands. I'll need them in a month or so. I may start calling some of the Trade-a-Plane ads to see what I can locate at a decent price. I also need the flat engine mount for the Lyco 0-29OG on the T-18.

Since we wiped out my T-18 on July 1st I have been intending to write you with some cautions for others. A friend of mine offered to do the initial flights for me since he is more tail-wheel current. In fact during the initial flight in the morning my friend, a CFII, felt so confident with the airplane he did an aileron roll with only an hour or so on the tach! He completed six successful landings at the Fitchburg MA airport; both grass and pavement with no problem. In the afternoon he and I shot six landings as part of my check-out at Fitchburg and returned to home base at Minuteman Airfield in Stow, Massachusetts. On landing, the first with two people, at Minuteman which has a narrow rough runway directional control was lost. We veered off the runway, hit some boulders, flipped inverted and ended up in an adjacent pond upside down and under water. Luckily we both got out without any significant problem. When I saw muddy



water coming in from the top of the canopy I knew we had a substantial problem, took a deep breath and reached for the seat belt!

On retrieval from the pond one tail-wheel spring end clip was found unhooked from the tail-wheel arm AN-43 eyebolt. We feel strongly that due to the rough runway the steel tail-wheel support spring was bouncing so much that the clip rotated around and came off as the tiller springs slacked off.

The mandated caution to all other tail-wheel operators is to safety wire these clips so that it is impossible for them to come off under any circumstance. I had tension springs installed that were adequately tight under static conditions but obviously not adequate under dynamic conditions.

When we hit the water the canopy luckily shattered or we would have become statistics. The local EMTs insisted I go to the hospital since my arm was torn up from the Plexiglas as I departed in a hurry.

Major damage was to the fuselage rear top skin, right hip skin and some minor rework needed between windshield and firewall. Only wing damage was the left outboard panel leading edge at the tip; now I'll add a landing light in that area as I rebuild it.

Both rudder and fin were wiped out by rocks in the pond so I'll build new ones.

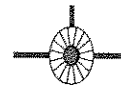
The shame of the whole incident was that the airplane was performing beyond expectations. All the instruments were not only in the green, they were in the middle of the green. There was no cross-talk of the strobes on the radio and we were easily doing 155 mph at 2500 rpm on an O-290G that I'm guessing is putting out about 135 hp.

It was such a "high" to fly it even for such a short time that I can't wait to rebuild it and get going again. If the plane did not perform as well

as it did I would not attempt to redo it but just walk away from it!

Enough of my rambling, but I wanted to get my thoughts on to you for passing on to others. The lesson learned the hard way is to safety the safety clips and assume that they will come off at some time although here I still blame the rough runway since we made a dozen no problem landings before the incident.

Keep up the good work on the Newsletter Rich, we all appreciate your above and beyond efforts. Sincerely, John Q. Cragin  
T-18 #554 160 Stratford Road Needham, MA  
02192-1432 phone (617) 444-3105



Subj: T-18 CAFE Foundation Test

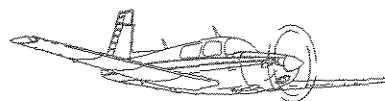
Rich, On Friday, 3 November I flew the Skooter to The Santa Rosa County airport to join Ken Brock who had arrived the day before. Ken and his able assistant and co-pilot, Olliver (Smitty) Smith (builder of N104X), were hard at work with Brien Seeley, Otis Holt, and Ed Vetter to instrument N42KB (better known as "Sweet Marie") for the CAFE flight test series. If you are not familiar with the capabilities of the EAA assisted CAFE Foundation, read the "W10 PERFORMANCE REPORT" article in the 29 June 1994, Sport Aircraft. They had all stayed up late the night before to get most of the hard work accomplished to take advantage of promised good weather for the weekend. The test date had been in question due to fog conditions during the preceeding week. I was constantly impressed during the weekend testing with the dedication of this volunteer group. As soon as the instrumentation installation was complete Ken and Otis took the T-18 up for a shakedown of the data aquisition. C.J. Stevens, Chief Test Pilot for the foundation was busy flying the Cessna Conquest II for his regular boss. C.J. arrived back later on

Friday and was able to finish some of the shake-down of the complex data system. Ed Vetter is constantly improving both the instrumentation and software used and was busy into the dinner hour (with his laptop at the restaurant) on Friday evening. Ed commutes into Santa Rosa with his Mooney from San Jose. On Saturday the weather was great and testing began in earnest. There had been some concern that the zero thrust system that the Foundation has pioneered and refined would not work properly with the constant speed prop. This was the first constant speed propeller installation instrumented by CAFE. With some usual final glitches in software and hardware fixed, the zero thrust system proved to be correct and instrumented testing was completed by the end of the day. Stephen Williams arrived to start the data reduction on Saturday and it was verified that the instruments could be removed on Sunday for the handling qualities evaluation. Larry Ford, Vice President of the Foundation, provided crucial help on Saturday with his great chilli feed and again on Sunday when he provided a new airspeed indicator. Saturday night Betty Stephens, C.J.'s wife treated Ken, Smitty and myself to more of the great hospitality with her delicious lasagna dinner with all the trimmings. It was a great evening food, wine and airplane stories. I owe a big "Thank You" to Dr. Brien Seeley, President of the CAFE Foundation and all the members who allowed me to participate in the T-18 tests. Look for the test results in a Sport Aircraft article in February or March, 1996. You in the T-18 community all know how good John Thorp's design is, and soon the rest of the homebuilt community will be able to appreciate the numbers. Richard Eklund 11/29/95

### **FOR SALE**

Chromed Ken Brock T-18-5-2 Spinner for Constant Speed Prop.

I have over \$355 invested in the spinner and would like to sell it for \$300 and I'll pay for FedEx shipping. If it doesn't fit your prop, I'll buy it back so you're not stuck in the same situation I am (assuming it's returned in the same condition). Call Stan Sutterfield, 813-653-1189



## **AeroElectric Connection**

submitted by: Robert Clayton

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*Editor's Note: The following information about Robert L. Nuckolls' AeroElectrical Connection was sent in by T-18 Mutual Aid Member Robert Clayton. Thanks Robert, it really looks like the service that Nuckolls provides would be very helpful for building and/or reworking an electrical system. This is one area of homebuilding that needs to be improved. I know of one T-18 that had an electrical fire that could have ended in disaster if the pilot hadn't acted quickly.*

*Letter from Nuckolls to Robert:*

Robert,

Sorry to be so hard to catch! I've been working a certification package for Bill Bainbridge - the new SD-20 alternator (vacuum pump pad driven 20 amp machine) is going onto the production Mooneys. We've had a really tight grip on spare time; had to put some things on the back burner. I just got out of a meeting with the FAA this morning - things went well and I can now catch up on other matters.

I think you were wanting some stuff about the Connection to put into print . . . here 'tis . . .

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72770,552

The AeroElectric Connection is an information service, now 9 years old and 800 readers strong. The printed portion looks like a book but it's published in a 3-ring, loose leaf binder format permitting periodic updates. Presently, 270+ pages and 14 chapters cover d.c. fundamentals, batteries, regulators, alternators, over-voltage

protection, grounding, circuit protection, electrical instrumentation, switches and contactors, wire, wire termination, antennas and feedlines, lighting and pressure measurement. Appendix A lists vendors of services plus new, used and surplus components of interest to builders. Another appendix contains do-it-yourself avionics projects which may be scratch-built, kit-built or purchased assembled and tested. An expanding group of power distribution diagrams describe several design philosophies unique to plastic and metal airplanes. Chapters are being planned and written on systems instrumentation, motors, audio and transmitter control systems, custom wirebook development, failure mode effects analysis and electrical noise management.

Perhaps most important is the consulting service. Since we cannot all sit down in a classroom together, questions are answered by active dialog with readers. Over the years I've become dependent upon reader contact to guide my writing; it is impossible to answer questions when you don't know what they are! Use e-mail when you can, I check my mailbox several times a day. If you're not yet "treking the nets", a phone call will do.....

The 'Connection fills a gap between 'cookbooks' and engineering texts; not light reading, but it is fun. We don't get into discussions of sub-atomic particles but we do take things apart far enough to have an idea about how they work. The style is conversational and I often use anecdotes from my experience in Wichita aircraft manufacturing. From time to time, "Hot Flashes" (newsletters) are mailed when important subjects must be addressed between regular issues of the 'Connection.

The 'Connection is a dynamic work which grows with new technology and our collective experiences.

**Custom Wirebooks:** A completed electrical system installation can easily require more than 1000 pieces of material and hardware. Trying to remember where all the wires go and where parts were purchased can add a lot of frustration when future repairs or modifications are needed. Further, at some point in time, you will probably want to sell your completed project. A prospective buyer will be more willing to pay the asking price if the electrical system is well documented. Custom wirebooks from the Connection are professionally prepared, page per system drawings which rival those provided with any certified, general aviation airplane. Optional wire numbering kits permit wires to be identified using numbers called out on the finished drawings. Purchasing custom wirebook services for your project provides an enhanced level of consulting

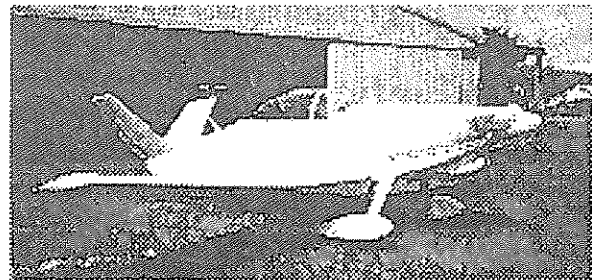
during assembly. \$42.00 (\$62.00 overseas) gets a new subscriber all materials in print plus a subscription for the next regular issue of new chapters plus all intermediate newsletters. Calls to (316) 685-8617

## FOR SALE ITEMS

Act RT 359A Transponder \$350  
Genava Radio, "works" Cheap  
3- Great American wood props  
asking \$300 each. Contact Ed Ludtke  
Phone: 605-361-2301

Magellan Skyblazer GPS  
Used 2 months (traded aircraft)  
all accessories: moving map, extra  
antenna: Works great! \$600 OBO  
Bill Essenburg (608) 637-2663

12 sheets of .025 alum, Dynafocal  
engine mount, 210413 Woodward  
Governor contact: Lyle McCullough  
414-642-3876

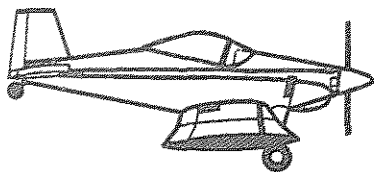


*built by Gale Abels an Award Winner*

TT since new A/E/P 0-360 180 HP, Hartzell CS prop, is 750 hrs. The interior is very well done. Some of the equipment includes- King K VOR W/GS, KI204 Indicator, KMA-24 Audio Panel. EDO-AIRE RT563A Navcom, EDO-AIRE RT661A Comm, Ball Variometer, Narco AT50A Transponder, Terra Encoder, (freshly certif.), new ELT battery, and the airplane is licensed thru September 1996.

Contact: Dean Cochran (303) 466-3472 he is selling it for Mr. Abel's family. \$42,500

## FIRST FLIGHT REPORT



by Joe Gauthier

November 28, 1995

My wife Carol and I enjoyed the Nature Center Lunch and forum this year at Oshkosh. That is a much better place to conduct such meetings and I trust you'll continue to use that place if it's available.

I'm very happy to tell you that our S-18 finally took to the skies on the 16th of Sept. The first flight lasted almost exactly one hour and went about as good as I could dream. I had previously flown several other Thorps' accumulating over 25 hours of experience so I knew what to expect. Last Saturday, the 25th of November I was signed out of the flight test area and gave several passenger rides. I take serious delight in seeing the expressions on my friends when they first experience the excellent way the Thorp handles. I still haven't put on the wheel pants or fairings on it yet, so I'm unable to tell your readers very much about performance (Speed). I can say that a straight and clean Thorp flies very well. It is a hands off airplane in smooth air, requiring very little assistance from the rudder pedals to make smooth coordinated turns. I can also say that it is the best "Wheel Landing" plane that I've flown. I'll provide all the numbers once the pants and fairings are installed.

About the only suggestion that I can make at this time is that the S-18, long, wide fuselage and convertible wing equipped with a 150 HP Lyc and Wood prop is tail heavy. That has been noted in previous newsletters and I'm simply adding my agreement with those who have already noted this condition. I've made provisions for relocating the battery to the right seat well, under the seat of course. I borrowed a Landoll Dynamic Balancer for the starter ring gear as the first change to improve CG. The Landoll balancer has been flown for about 22 hours and at this point, I don't see any great benefit except for the improvement in CG. Maybe I'll change my mind as my flight time increases. I'm currently using one of the old Sensenich Wood

Props, (66X76) which performs well. With outside tiedown in New England, the weather can be harsh on wooden propellers. I'm curious if your readers have any experience with the metal propellers that Sensenich has available for "High Performance" homebuilts. Vans aircraft is offering them to their builders and I know a local RV6 owner who loves the metal prop that he has. I also have one of the 1984 model Warnke "Almost Constant Speed" wood props that I want to try. This one was made from dark wood, looks like mahogany although I know it is not, and I've been told that they are troublesome. Anyone have a comment on that?

I initially thought that No. 3 cylinder was running 80 Deg F hotter (at 410 Deg F) than the others because my oil cooler gets it's air from the baffles behind No. 3. I found that completely blocking off the oil cooler for a short flight didn't lower the temp on No. 3 by 10 Deg F. I also noticed that the hot cylinders and EGT peaks swapped from No 3 at partial throttle to No 1 & 2 at full throttle. I spoke to Evan Roberts in Houston, Texas, remembering his comments in a recent T-18 Newsletter on the T-18 carb he is using. He gave me Bob Brashear's name from Waco, Texas. I spoke to Bob and he suggested leaking intake tubes as the cause for my EGT imbalance. I followed his suggestions and sealed the intake tubes where they join into the oil pan. I found only a very slight improvements in the data after sealing the intake tubes. While researching the carburetor part number options, as suggested by Evan and Facet Aerospace, I noticed a Lycoming service instruction that included a new carb nozzle to improve smoothness in certain engines. I tried that nozzle and finally settled on a jet opening in it's base that is slightly larger .111 vs the original diameter of .104" and have nearly solved the problem. The discharge end of the new nozzle has a very thick wall sections and a pattern of holes in the sidewall near the tip. Apparently this configuration results in better atomization of the fuel and better distribution. The EGT spread is quite good now at higher power settings up to but not including full power. I have to pull the throttle back 1/4" after takeoff to get #4 cyl to show any appreciable EGT at all. I'm still averaging 9GPH which is too high for a 150 LYC. In retrospect, I may have gone too far, by .005" or so, opening up the jet. I have an Ellison Throttle Body injector unit that I plan to install in the near future. Any suggestions or experience on that would certainly be welcome.

I have a significant amount of air coming into the cockpit from the aft canopy skirt. I would appreciate hearing from anyone with a simple solution to that problem.

The wing pins holes on the left side turned out a little too large and the wing tip could be moved an almost imperceptible amount. A friend who is a metallurgist and chief engineer for his employer suggested Electrolysis Nickel plating to replace the Cadmium and build up the size a bit. I had a local aerospace plater add .0015 to the diameter and solved the problem very well. Mil Spec plating and Hydrogen embrittlement baking techniques were used of course.

Does anyone have a simple way of getting rid of the stiff turning long shaft and universals for the pitch trim? I'd love to find a simple way of connecting an electric motor directly to the threaded screw that drives the trim arm and eliminating the universals altogether.

How about a long lasting lubricant for the aileron and servo tab piano hinge pins? I've tried WD-40 and LPS but they don't last more than a couple rain storms and then the rust starts over again. Has anyone tried Stainless pin for those hinges? I remember reading of some concern for dissimilar materials corrosion when mixing up aluminum and stainless steel.

I'll send more information as it develops. In the meantime, feel free to publish my telephone number and address with my offer to discuss any aspect of this project with all who are interested.

PS I have attached an item I wrote for our local EAA Newsletter on finishing wood propellers.

Sincerely, Joe Gauthier  
9 Kowal Drive Cromwell, CT 06416  
(860) 635-4058

*Congratulation Joe, it sounds like you have a fine flying T-18. Rich*

## WOOD PROPELLER REFINISHING

To those of us who love wood propellers, there's nothing like that gleaming hunk of nature's best composite hanging out on the business end of our trusty Powerplant. Nice spinner, or skull cap, properly installed, bright and clear with a fresh coat of varnish.

A few simple tips are all that is necessary to achieve the gleaming, varnish finish on your prop. It is usually not necessary to remove all of the old coating, just that which is loose or unsightly. If partial removal of the old coating results in a wide variation of surface coloring, then, complete removal may be necessary. 180 and 220 grit sandpaper, used dry worked well for me, followed by 4XO Steel Wool.

It's best to note the balance condition of your prop at various stages of this process to determine the need for asymmetric application of finish to one blade vs the other for balance. My professionally made prop needed two extra coats of varnish on one blade to achieve perfect static balance. A simple cable suspension balancer works great for me. It is simply two cones, a section of 1/2" steel tube to mount the cones in the prop hub, a small washer with hole for the cable to cover the end of the tube and some 1/16th steel cable to suspend the propeller with. The cable is secured in the center of the tube, slightly above the mid-point of the prop hub. When the washer lays exactly over the end of the tube, the propeller is in perfect static balance.

The best paint brush you can afford is absolutely necessary. Mine was a Chinese Ox Hair bristle and it worked beautifully. Most varnishes can't be stroked repeatedly when applying, so it has to be put on full, wet and smooth with as few strokes as possible. Use the largest brush you can handle to reduce the application time. This gives you an extra minute or two to smooth out any rough spots. Let it dry vertically if possible to give the falling dust in your shop the smallest possible target.

Spar Urethane seems to be the coating of choice. It should dry overnight, in a warm and dry environment. Dull the surface and knock off any dust with the steel wool and recoat until the finish and balance are acceptable. A clean, dry, dust free surface and work area is absolutely necessary. I used Automotive Tack cloths immediately prior to applying the varnish. Give this coating plenty of time to dry, at least several days before you fly in any kind of precipitation. The slightest amount of rain will eat away at varnish that has not been thoroughly cured. Even with a good UV rating, and effective cover, if tied down outside, the best finish will need regular attention. If you happen to have a heated workspace, propeller refinishing is a good winter activity.

## Why Vacuum Pumps Fail

by Mike Busch

*Editors Note: My thanks to Mike Busch for letting us use this great article on Vacuum Pump failure in our newsletter. Read it and take heed. It was downloaded from the internet Avweb on line aviation magazine.*

Modern dry vacuum pumps often fail prematurely—always catastrophically and without warning—usually at the worst possible time. Why do low-time pumps self-destruct, and what (if anything) can you do about it? Read on. This originally appeared in “The Aviation Consumer” Mike Busch

Most small aircraft depend on air-driven gyro instruments powered by vacuum produced by an engine-driven air pump. The vacuum system is a simple one, and it should be reliable and trouble-free. Too often, though, it isn't. Ambient air enters the system through a central vacuum filter, ensuring that the gyros breathe only clean air and are protected from dirt and other contaminants. The air passes through the gyro instruments (where it spins the gyros), then through a vacuum regulator, and finally to the suction inlet of an engine-driven vacuum pump. The pressure outlet of the pump usually discharges its air into the engine compartment. (Aircraft with pneumatic deicers use the discharge air to inflate the boots.)

### How Much Vacuum?

Air-driven gyro instruments are designed to operate with a pressure differential of about 5 inches of mercury (about 2.5 psi). The pump is designed to produce plenty of airflow to spin the gyros even when the engine is idling on the ground. At normal flight RPM s, its capacity is

much greater than necessary (as much as 20 psi). To maintain relatively constant airflow through the gyros, the regulator permits enough ambient air to leak into the system downstream from the gyros to limit the pressure differential across the gyros to about 5 in. Hg. The regulator is adjustable, and has its own foam air filter to protect the pump from contamination. The cockpit vacuum gauge is connected to read the pressure differential across one of the gyro instruments ( usually, the attitude indicator). The gauge normally has a green arc between 4.7 and 5.2 in. Hg. The vacuum regulator is adjusted so that the cockpit gauge reads about 5 in. Hg.

Most twins and some singles (such as the Cessna P210 and the Piper Malibu) use a redundant system with two engine-driven vacuum pumps. These systems employ dual regulators and a set of check valves to ensure that instrument vacuum remains normal even if one vacuum source fails. When the system is operating normally there is almost no pressure drop across the central vacuum filter, and only minor pressure losses in the rest of the system. The load on the vacuum pump should not exceed 6.5 in. Hg. in single-engine aircraft. (The max for twins, with their longer hose runs, is 7.0 in. Hg.)

### Dry Vacuum Pumps

Since about 1970, our gyros have been powered by “dry” air pumps which use self-lubricating graphite vanes spinning inside of an eccentric aluminum cavity. (Before 1970, oil-lubricated “wet” pumps were used) Because dry pumps don't use engine oil for lubrication, they don't require an oil separator, and provide oil-free discharge air for deice boots. But dry pumps have one big disadvantage, and that is their singularly unattractive failure mode: they work flawlessly for an unpredictable life span, then fail catastrophically and without warning (usually in a great puff of graphite dust).

The dominant manufacturer of dry air pumps is Airborne, a division of Parker-Hannifin Corporation located in Elyria, Ohio. Airborne manufac-

tures a wide range of air pumps, regulators, filters, check valves, air manifolds, and also control valves for pneumatic deicing systems. Most non-deiced aircraft use Airborne 200-series dry air pumps, while booted aircraft use the larger 400-series pumps. The small 200-series Airborne pumps list for about \$400 and have a rated warranty life of 1,000 hours. But don't feel bad: the bigger 400-series pumps cost \$1,200 and are warranted for a paltry 400 hours!

### **Graphite and Plastic**

All Airborne pumps are built with a slotted graphite hub and graphite vanes. The hub and vanes rotate within a polished elliptical interior cavity within the aluminum pump housing. The vanes are free to slide in and out of the hub slots as they rotate within the eccentric cavity. Centrifugal force holds the vanes against the cavity wall, providing the requisite air-tight seal.

The pump drive incorporates a frangible plastic coupling that is designed to shear instantly if the pump's rotational drag exceeds normal operating torque by any significant amount. This ensures that a pump failure cannot damage the engine's accessory drive.

### **Backwards is Bad**

The hub slots of Airborne pumps are canted in the direction of rotation. For this reason, Airborne offers different pump models for clockwise and counterclockwise applications. The most common model numbers are 211CC and 441CC (for counterclockwise rotation) and 212CW and 442CW (for clockwise rotation). It's not difficult to break the code.

Installing a wrong-direction pump is a sure prescription for premature failure. Most Continental engines require a clockwise pump, and most Lycomings require a counterclockwise pump. But not always. In fact, twins with counter-rotating props need one of each.

### **Sigma-Tek vs. Airborne**

For years, Airborne had the dry air pump busi-

ness all to themselves. But in the mid-1980s, Sigma-Tek introduced a new air pump STC'd as a direct replacement for the popular Airborne 211CC and 212CW pumps.

The Sigma-Tek model 005 pump is identical in principle to the Airborne pumps they replace. They use similar free-sliding graphite vanes and a similar eccentric cavity. However, the Sigma-Tek pump uses an aluminum (not graphite) hub with orthogonal (not canted) slots. Consequently, the Sigma-Tek pump can be used for both clockwise and counterclockwise applications.

The Sigma-Tek 005 pump costs about the same as the Airborne 200-series units, and has a comparable warranty. Some folks are convinced that the Sigma-Tek pump lasts longer, but we've seen no hard data to support this contention. On the other hand, if you've had a bad run of luck with Airborne 200-series pumps, it couldn't hurt to give the Sigma-Tek a try.

### **Why Pumps Fail**

Horror stories abound of dry vacuum pumps that fail before their time, sometimes just a few hours after installation. Owners who have been repeated victims of such premature failures often come to believe that obtaining rated life from a pump is a matter of luck, voodoo, or karma. This simply isn't so. Almost every case of premature dry vacuum pump failure can be traced to one of three causes: contamination, overstress, or faulty installation.

Dry air pumps are extremely vulnerable to contamination, particularly by liquids. The graphite vanes are designed to operate absolutely dry, and the introduction of any liquid can quickly destroy a pump.

One of the most common causes of premature dry pump failure is contamination by solvents used to wash down the engine compartment after maintenance. If solvent overspray enters the pump (usually through the discharge port or the



drive coupling), it will mix with the carbon dust in the pump to create a sticky residue. Even a small amount of this stuff can cause the brittle graphite pump vanes to fracture in short order. Consequently, it is absolutely essential to cover the vacuum pump and its discharge tube (usually with a plastic bag) before spraying solvent. Another common cause of pump failure is oil contamination. Oil can enter the vacuum pump in several ways. One frequently-seen culprit is a leaky pad seal gasket between the pump flange and the engine accessory case. Actually, any engine compartment oil leak that allows oil to get on the pump may find its way inside through the drive coupling. Alternatively, oil that gets on the vacuum regulator will quickly oil-soak the foam garter filter and start being sucked inside the pump itself. If even a tiny bit of oil gets inside a dry pump, it's history.

A dry pump can also be destroyed by carbon contamination. A dry pump normally fails suddenly when a graphite vane or hub fractures, generating a cloud of carbon fragments. When the failed pump stops pumping, residual vacuum upstream of the pump often cause some of these graphite chunks to be sucked out of the pump and lodge in the hoses or vacuum regulator. If the system is not meticulously cleaned of carbon before a replacement pump is installed, the new pump may ingest these fragments. This may result in failure of the new pump in just minutes or hours.

### **Overworked Pumps**

Another cause of short pump life is overstress. This may be caused by a dirty central vacuum filter, a kinked air line, or any other obstruction or construction that causes the vacuum pump to work harder than it should.

Here's a typical scenario. As a result of maintenance or old age, an air hose in the vacuum system becomes constricted (due to kink or collapse). The pilot notices that the cockpit vacuum gauge reads lower than normal, and squawks this condition to his shop. The A&P

readjusts the vacuum regulator to bring the vacuum gauge back to normal operating range, without troubleshooting the underlying cause.

The pilot is happy, and the mechanic is happy...but the vacuum pump is now profoundly unhappy because it now has to produce 150% of normal vacuum. A pump that is working too hard will run hot and will ultimately fail prematurely.

### **Installing Pumps Correctly**

Installing a replacement vacuum pump is a quick and easy procedure, but there are some important rules that must be followed to ensure that the new pump can enjoy a long, healthy life. Make absolutely sure that a new Airborne pump is the correct model for direction-of-rotation. A wrong-direction pump looks identical, but won't last long. (Sigma-Tek pumps don't care which way they rotate.)

Never clamp a new vacuum pump in a vise when installing the fittings. The soft aluminum pump housing can easily be distorted, ruining the pump. Airborne pumps come from the factory with a red-and-white "anti-vise" decal, but overhauled pumps typically don't.

Never use thread compound or Teflon tape when assembling threaded vacuum fittings. Any excess sealant could be ingested by the pump, causing its destruction. Airborne recommends a sparing application of silicone spray on the threads, but nothing more.

Make certain that the vacuum system is scrupulously clean before installing a new pump. Always blow out the hoses with compressed air, replace the central vacuum filter and the regulator's foam garter filter with new ones, and check the regulator seat for trapped carbon fragments. Any contamination left over from the failure of the old pump can (and often does) result in premature destruction of the new pump.

### **Troubleshooting tips**

Troubleshooting the vacuum system is a process



often misunderstood by mechanics. Most shops lack the proper test equipment, and rely on the cockpit vacuum gauge. But the cockpit gauge is a poor troubleshooting tool. It shows only the pressure differential across the gyro instruments; it does not show how hard the pump is working. Furthermore, it's not uncommon for cockpit gauges to be way out of calibration. For example, the vacuum gauge on one single-engine aircraft was found to require 9 in. Hg. of vacuum to indicate 5.0 in. Hg. on the instrument. The vacuum pump, forced to provide 10.5 in. Hg. instead of the normal 6.5, was being replaced every 300 to 400 hours, along with frequent gyro instrument overhauls.

Proper vacuum system troubleshooting requires special test equipment. Airborne's Model 343 Pneumatic Test Kit includes everything needed to troubleshoot both vacuum and pressure systems for instruments and deice boots: a vacuum source, calibrated gauges, adjustable regulators, and various other special fittings. For small shops that cannot justify the expenditure to purchase this test kit, Airborne's technical service department has several loaner kits that they can make available on short term loan.

Interestingly enough, one of the most helpful indicators of impending vacuum pump problems is the little red-and-white "anti-vise" sticker that comes affixed to every new Airborne dry pump. A darkening sticker is a reliable indication that the pump housing temperature is hotter than it should be. This usually means that the pump is working harder than it should, and is likely to fail prematurely. It's a good idea to check the color of the vacuum pump sticker at each oil change.

### **Overhaul vs. New**

Sooner or later, you're going to face vacuum pump replacement. You'll have to decide whether to buy a new pump, an overhauled pump, or a do-it-yourself pump overhaul kit. The first thing you should know is that Airborne's official position is that their pumps are not to be overhauled. In fact, Airborne

stamps "Do Not Overhaul" on the pump housing of each new dry air pump they make. Nevertheless, overhauled dry air pumps are available from RAPCO, Singer, and various other sources. Typical discount-house prices for overhauled 200-series pumps range from \$175 to \$225 exchange, with a 400-hour warranty. Overhauled 400-series pumps for booted aircraft sell for \$550 to \$650 exchange. In addition, do-it-yourself pump overhaul kits (containing a new hub, vanes, drive coupling, and gasket) cost only about \$70 for 200-series pumps and \$135 for 400-series pumps. (These prices come from Chief and San-Val ads in Trade-A-Plane.)

Overhauled vacuum pumps have received reviews that are decidedly mixed. We believe that it is not enough simply to replace the hub, vanes, and drive coupling. If the pump cavity is not polished smooth, then the new vanes won't last long. For that reason, we don't much care for the do-it-yourself pump overhaul kits. And if you opt for an overhauled pump, be careful what overhauler you choose. Ask whether he reconditions and polishes the pump cavity on his rebuilt pumps. (On a purely anecdotal basis, we've had good luck with RAPCO rebuilds, and poor luck with Singer.)

### **Rebuilds Worthwhile?**

Does it really make sense to buy an overhauled pump instead of a new one? For the big 400-series pumps, maybe so. A RAPCO overhaul can be purchased for \$600 less than a new Airborne. The author has a 400-series RAPCO rebuilt pump on one engine of his Cessna T310 that has reached 1,000 hours and is still going strong. For the smaller 200-series pumps, the merits of overhauled units is questionable. The same Trade-A-Plane ads that offer rebuilt pumps for \$175 to \$225 also offer brand new Airborne and Sigma-Tek pumps for less than \$300. The new pumps come with a 1,000-hour warranty, while the rebuilds are warranted for only 400 hours. For the extra \$75 to \$125, we'd be inclined to go for a factory-new pump.

We'd stay away from the do-it-yourself overhaul kits in any case.

### **Wet Pumps**

Back in the 1960s (when light plane IFR was young), piston aircraft were delivered with so-called "wet" vacuum pumps that used metal vanes and were lubricated by engine oil. The principal manufacturer of wet vacuum pumps was Garwin. These pumps were long-lasting, reliable, and usually did not fail suddenly; they wore out gradually, and eventually required overhaul.

The discharge air from a wet pump contains an oil mist, so these pumps require an oil separator in order to return most of the oil to the engine sump. Even with an oil separator, a certain amount of oil is discharged out the breather (and usually onto the belly of the aircraft).

Consequently, wet pumps aren't great for aircraft with deice boots, because the oil can cause the rubber to deteriorate. Also, pressure-type instrument systems (like the ones used in later-model Bonanzas and Barons) can't use wet pumps because the gyro instruments would become contaminated with oil.

But if you have an older airplane that uses a wet-pump vacuum system, you might do well to hang onto your old Garwin pump and oil separator, rather than converting to the newer-style system. In our view, a little oil on the belly is a small price to pay for a vacuum pump that doesn't fail suddenly and without warning.

### **Pressure Systems**

Although the accompanying article talks about vacuum systems, some light airplanes (particularly later-model Beechcraft) use a pressure system. Pressure systems use precisely the same dry air pumps and gyro instruments as vacuum systems do. The filters, regulator, and cockpit gauge are different.

Pressure systems suffer from exactly the same problems as vacuum systems do. The dry pumps

in pressure systems are equally vulnerable to contamination, overstress, and faulty installation. And the troubleshooting techniques and equipment are essentially the same.

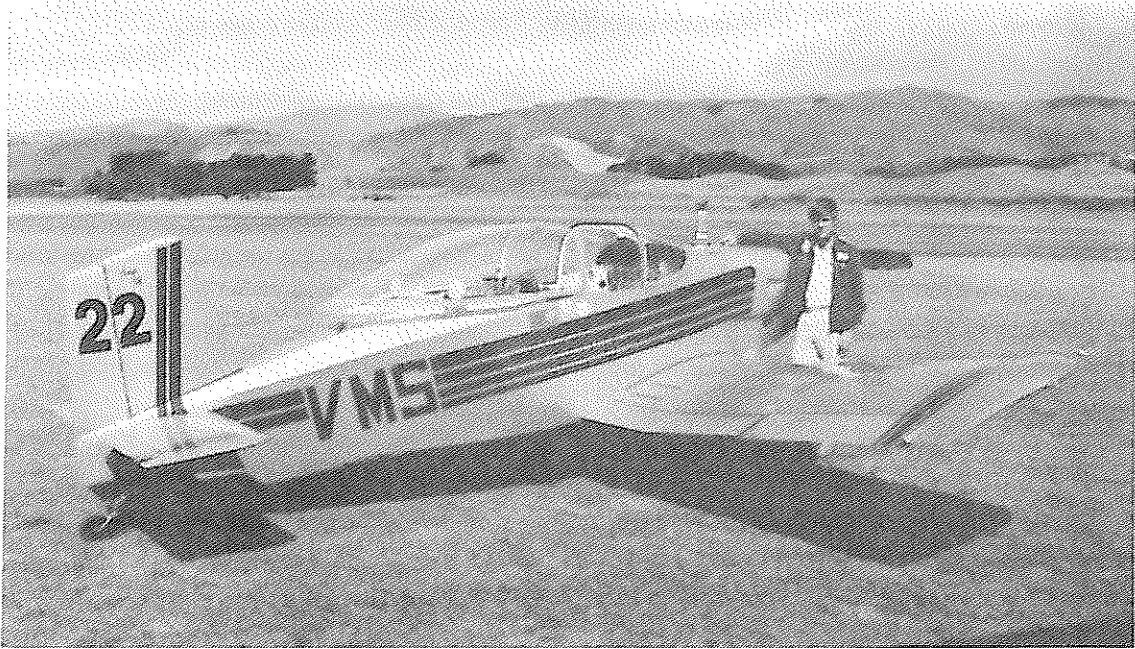
### **Standby Systems**

Because dry vacuum pumps fail suddenly, without warning, and usually at the worst possible time, backup vacuum systems have become popular add-ons for single-engine airplanes that fly serious IFR.

Some airplanes (such as the Cessna P210 and the Piper Malibu) are factory-equipped with dual engine-driven vacuum pumps, much like the system that twins use. The disadvantage of this arrangement is that both pumps are turning (and wearing out) all the time. If one pump fails, the probability of the other pump failing shortly thereafter is decidedly non-trivial.

Several manufacturers (including Airborne themselves) offer STC'd standby vacuum systems that use a dry air pump driven by an electric motor. These are excellent systems, and have the advantage that the standby air pump runs only when needed. Such systems are rather pricey, however.

Precise Flight offers a very inexpensive STC'd backup vacuum system that provides backup power to vacuum-driven gyros by using vacuum from the engine's induction manifold. This system works well, but has several limitations. It does not provide adequate vacuum at high throttle settings (such as one might use when carrying a load of ice on approach). Furthermore, the Precise Flight system should never be installed on turbocharged aircraft (although it often is, erroneously).



*Tony Schischka and his Thorp T-18*

We have finally arrived home from our trip to Oshkosh which included a further three weeks touring in the US. Tired but happy!

As you will no doubt appreciate, for first time visitors, you can not see every thing in one week! We tried though! The highlight was the T-18 dinner and forum, rounded off nicely by walking around the attending T-18's on the flight line. It was nice to be able to look over, under and around the aircraft to see how other builders have dealt with different areas and problems.

Lyle Trusty kindly spent some time with me explaining some of the improvements that he had incorporated on his T-18. I liked his tail wheel arrangement, I had been thinking of something like it myself! But there it was already thought out, he has plans, so a deal was done and hopefully they are in the mail at this time.

I enjoyed talking to builders and especially those with construction under way. I was surprised to find there were still many under construction and that the plans numbers are now over 3000.

Enough of all that! I promised to send some facts about my T-18C.

ZK-VMS is a T-18C powered by a Lycoming O-320 A2A coupled to a Sensenich W66LM76 propeller. My plans are #867 obtained in 1972. The first flight was in May 1989. You don't have to be a genius to see that equals 17 years! So builders out there don't give up, just persevere!

VMS is a true home built, I built every part of it save the fibreglass wing tips, wheel pants, spinner, aluminium roll over bar and steel main spar fittings for the folding wing. The engine cowl is all metal except the air scoop which is glass on foam. The canopy is a story in itself, while it has a few ripples in the rear section it does the job.

The engine which came out of a 1955 Piper PA18A-150 was run out. I bought it on a gamble, stripped it and found the measurements to be near new tolerances. I had the case and crank assembled at an overhaul shop but the rest I built myself, had to put half inch valves in. Total cost was about NZ\$3000, the biggest single cost in that exercise was the cost of fitting to a certified run in rig and do the full Lycoming break in procedure (\$700)

The airframe is strictly standard, (I didn't see the

need to change a perfectly good design!) the thing that is different is the cowling. If you look at the photo enclosed you will see it does not have the normal air intakes. The cowl is configured for a true up draft system a-la Rutan Defiant who I must give credit to for the inspiration.

Air for both carburation and cooling enters the lower divergent duct where it is slowed to a manageable speed. It flows up through the cooling fins and exits out the top of the cowl. The theory of it all is that the sump, fuel system and electrics all run in cool air instead of being fried with pre-heated air. The normally hot side of the cylinder is cooled first, effectively reducing the temperature gradient across the cylinder (should prevent typical cracking).

I guess the \$64,000 question is does it give any performance increase. The answer is I really don't know! Without having an identical aircraft with the standard cowl to fly against I have no means of measurement. Cylinder temperatures only fluctuate 40C between climb, cruise and descent, so that's a plus.

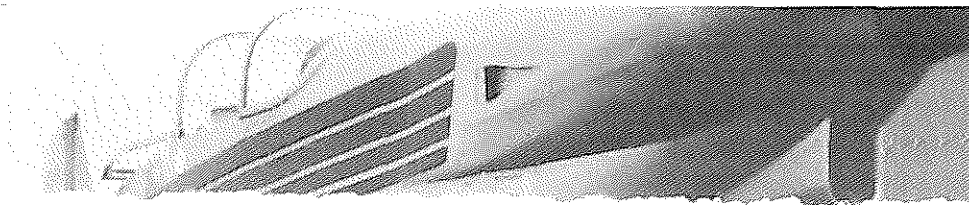
I can achieve a TAS of 155Kts @ 8000' using 2600 rpm and 19 in hg manifold pressure. This

equates to about 65% power. It chews the gas at these rpm, what I really need is a constant speed prop so I can get the rpm down and the manifold pressure up, the engine becomes more efficient at those rpms/MP.

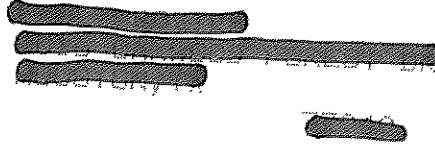
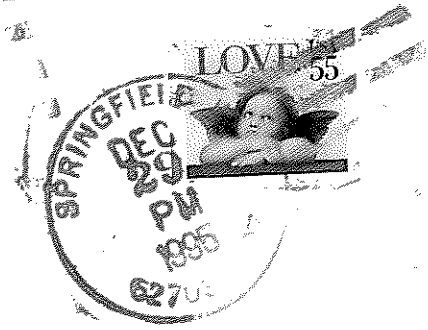
I still enjoy flying her and have no intention of replacing with a later design. The only thing I would have liked is the new airfoil section, this seems to allow the aircraft to fly some 5 kts slower and that represents a large change in energy which especially important if you are trying to squeeze into a short strip! Alas my folding wing drawings were produced before the change. I don't miss the wide body change since both my wife and I are of slight build, though I believe the extra five or six inches in fuselage length probably improves the tail plane/full flap problem.

Well that's enough from me, would love to hear from other T-18'ers and if any one is coming out to our fair country please make contact with me. Regards, Tony & Viv Schischka 17 Bodmin Terrace Plimmerton 6006 NEW ZEALAND

PS: had two T-18 news letters waiting for me when we arrived home. Have just about worn the print off reading them!



T-18 NEWSLETTER  
ROUTE 3, BOX 295  
CLINTON, IL 61727  
(217) 935-4215  
Issue #97, Dec 1995

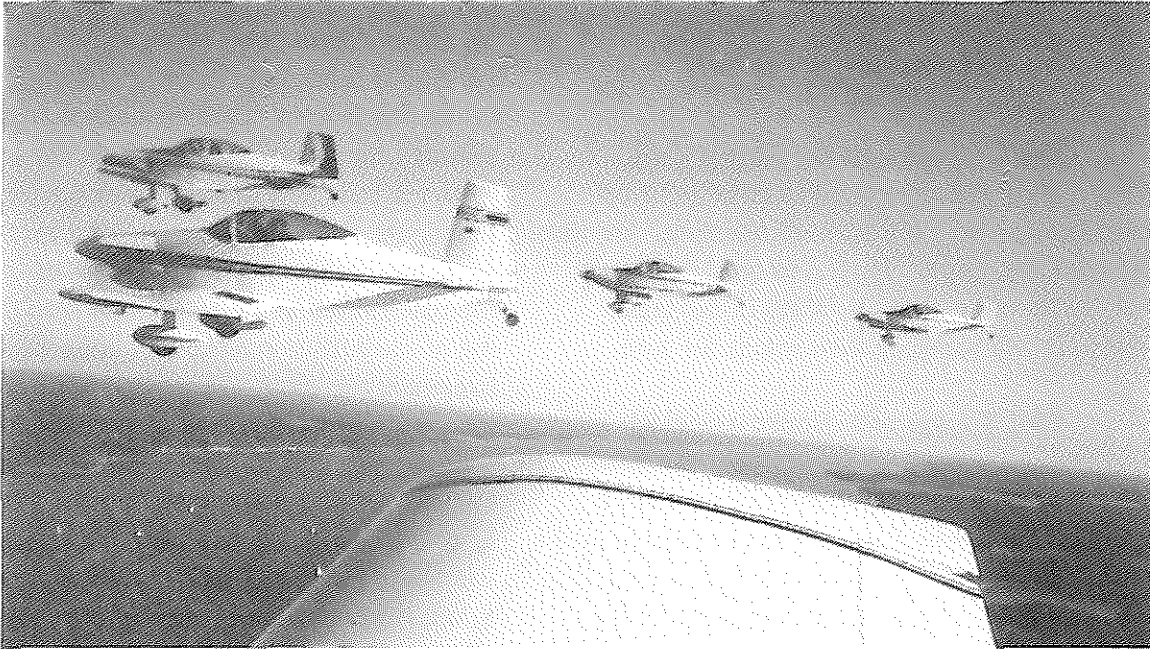


**All dues run from Jan to Jan. Please send your 96 dues now.**

I need everyone's help on this! In spite of several notices in the newsletters and two seperate personnel letters a small number of individuals put-off paying their dues until late in the year! This makes it difficult to plan and get my printing and mailing bills paid. If you've noticed I'm now mailing First Class Postage which is much higher, with no increase in dues. I need your dues now folks! **Please help by mailing now!** Some of you have paid for 96, check the label it will show a dollar amount if paid or a zero if you haven't.

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# T-18 NEWSLETTER



*Photo by Roy Farris/Gary Green: Off Gary's wing tip is, Dan Wolfe, Jim Paine, Bob Highley and Les Conwell. Taken at Kentucky Dam 1995.*

## IN THIS ISSUE:

Classic Sport Aircraft

T-18 Travel Club *by Joe Gauthier*

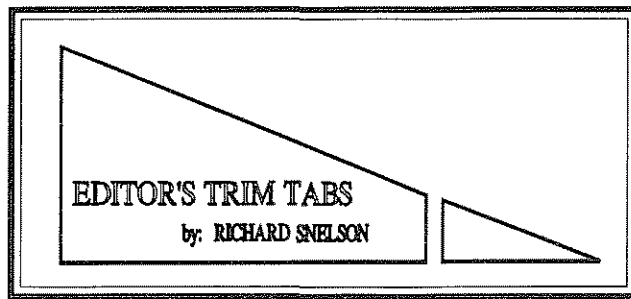
Fat Cat Flies! *by Harvey & Steffie Mickelsen*

Comments *by Gary Green*

Report on Prop Failure

Spring Fly-In "Grandbury, Texas" *at the Green's*  
*(see notice on page 19 for signup details)*

**NOTICE: (STANDARD DISCLAIMER)** As always , in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.



## **Headline News**

### **CAFE Report on the Thorp T-18!**

What a great report in the Feb issue of Sport Aviation. Quote: "It's a pilot's machine," Be sure and read the report. Show it to all your friends that are thinking about building or buying a Thorp. It will make up their minds for sure.

### **Phil Tucker sells Sport Aircraft!**

Mike Archer and Phillip Key have purchased Sport Aircraft from Phil. The new business will be called Custom Sport Aircraft and is located in Springvale, California. Both Mike and Phillip have been busy getting the inventory moved and set up in their hangar location. They have been very good about responding to orders that were called in on a rush basis. Word is they plan to kit the S-18 for sale later this year. Good luck with the business. Phone is 209-539-2755. (See their letter.)

On behalf of the Mutual Aid Society, our thanks goes to Phil Tucker for keeping the business going for many years. Phil has always been willing to stand behind his work and to do his best to get out a rush order.

### **Forest Products Laboratory Report**

I've included this report that was prepared by the Forestry Service at the request of Gayle LeCount. As of this writing Mike Demuth has not seen the report, or the failed prop so he could not comment on it. See the Letter and more comments later in this letter from Gary Green.

### **Spring Thorp gathering set for Grandbury, Texas**

See Gary Green's notice for this Thorp gathering, and call Gary **NOW** to reserve your room for what promises to be fun event. Rooms at Pecan Plantation are limited. So call now. Phone 817-579-1995.

### **New CFI in town.**

Last week I completed a goal, that I had set for my self two years ago, to be a Flight Instructor. Advanced ratings are becoming harder to get due to the shortage of complex aircraft (rental) required for the checkride. More about that later. With the ratings behind me, I plan to spend more time getting the Thorp ready for a busy summer of flying. I've been moving the oil cooler from the rear baffles to the firewall to stop the cracking of the baffles and the oil cooler flanges. It's happened too many times.

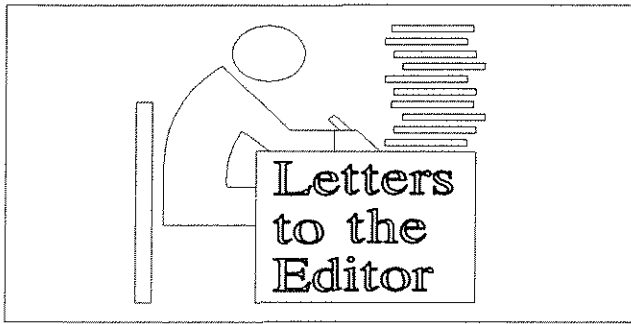
### **Sun & Fun ----- April 14-20**

Bob Highley and Bill Williams are looking for a big turnout of T-18s for this year's Sun & Fun. Look for a notice in the T-18 parking area, we will try to get together for some evening fun on Sunday. My current plans are to fly down Friday and stay till Monday. I'm having to shorten up because of limited vacation days. See you all there.

### **Report on the Dues:**

If you have sent your dues this message is not for you. Only 1/3 of the dues are in. That's making it difficult to plan and publish this newsletter. Last year was the same as it took two notices in the newsletter and two separate letters to finally collect the late dues. Twenty members never paid at all and they won't be reading this! I guess everyone is used to getting four to five notices for magazine subscriptions, so they tend to ignore my feeble attempts to get the dues in on time. It never fails when I cut some one from the mailing list, two months later "I didn't get my newsletter, what wrong??" When that happens it's extra postage and printing to get that member caught up. So bottom line: send you dues now. Thanks, Rich.





From: SchischkaA@caa.govt.nz (Tony Schischka)  
To: rsnelson1@aol.com (T18)

How are you getting on with the oil cooler? I had a real problem locating mine with the updraft cooling system. Re my baffles, I will try and describe them, if that does not work I'll draw a picture and post it to you.

Dear Rich,  
My new address is: Steve Hawley, 1285 W. Paintbrush Pl., Tucson, AZ 85704.  
Please renew my newsletter subscription. Send the back issues also if you think I am missing something important. I've been using the T-18 for a lot of traveling. I donate a day a week for a Mission organization named Tribal Air Communications in McNeal Arizona. I commute with the T-18. It is about 120 miles. Sure is better than driving. Last July my wife and I flew it back east. We left Tucson and went to Houston, Aberdeen Mississippi, Sanford, Florida, Orangeburg SC, Waxau NC, Winchester VA, Atlanta, Oak City, and home. My average ground speed was 186 and the fuel burn was 8.6 gph! That is economical flying - much cheaper than airlines. We were fortunate in that the weather was generally very good. Some bad visibility, but then I think that any time I can't see 60 miles things are not so good. We also flew up to Watertown NY a year ago. I just today ordered the B&C light weight starter and alternater. They said it would be a month before they could be shipped because of such demand. I plan on taking the plane apart, stripping the paint, and doing a general overhaul. Afterall, its been 17 years since it was built and I have 968 hours on it now. It might be a year before this work is done but it is in the works. I'm in the middle of a complete restoration of a 1946 Bucker Jungman at this time. I plan on making the T-18 Fly In in Texas next June. Good to be back in touch.  
Steve.

The baffling is very similar to the standard with the exception of the front end of the engine which is essentially identical to the back baffle. All quite simple really, only difference with the seal material is that it faces outwards rather than in since the higher pressure is in the lower cowl. The outlets are just placed somewhere in the upper surface of the cowl within the area surrounded by the baffling.

The basic principle of this system is that the top surface of the (average) cowl feels a depression thus assisting the cooling air to exit. BUT, the T18 cowl has a 5 or 6 degree downward slope in flight causing a positive pressure over the cowl hence the little deflectors in front of the outlets, these may be visible in the photos I sent. May be they could be a little further forward. See the article in February Sport Aviation page 39 paragraph refering to Fig 6. He has uncovered a similar problem. Now if I could only get a copy of that program!

Regards, Tony

*Editor's Note: See newsletter #97 for pictures of Tony's cowling.*





Subj: SALE OF THORP  
Date: 96-02-20 11:42:25 EST  
From: flythorp@eastky.com  
(BOB MORRISON)  
To: Rsnelson1@aol.Com

RICH

I have decided to sell my Thorp so that I can complete a LONG- EZE project that I started 10 years ago. If possible can you run the ad. in our next news letter. When I sell my S-18, I would like to buy an abandoned t-18 project to complete so let me know if you know of one.

THORP S/18 WIDE BODY SPORTPLANE .  
TOW IT WITH YOUR CAR, KEEP IT IN  
YOUR GARAGE.

LYC. IO-360 200HP, 266 SMOH , FACTORY  
NEW HARTZELL CONSTANT SPEED PROP  
53 HRS ,266 HRS. ON AIRFRAME  
165 KT CRUISE, 2000 FT. MIN RATE OF  
CLIMB  
LONG RANGE WET WINGS  
FULL IFR,DIGITAL MK 12D AVIONICS,  
COUPLED AUTOPILOT  
I MUST SELL TO COMPLETE ANOTHER  
PROJECT!  
\$35,000  
BOB MORRISON  
(606) 789-7379  
EMAIL: flythorp@eastky.com

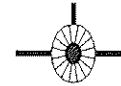


Dear Rich, Enclosed is my check for 96 Newsletter. I want to complement you on the fine job with the Newsletter the past year and I especially enjoyed the article from Tony Schischka of New Zealand.

His invitation to visit should not be taken lightly, My wife and I visited the Schischka's a few years ago. They were outstanding hosts, inviting us to their home and a flight in Tony's T-18.

Unfortunately I missed the dinner and forum at Oshkosh and the chance to repay the Schischka's hospitality!

Thanks again for the newsletters and the pleasant memories of a wonderful trip to New Zealand.  
Wendell Green, Monte Verde Argyle, Texas  
76226



December 22, 1995

Dear Rich:

Here's my \$25.00 dues for the 1996 newsletter. Been making some slow but steady progress on my T-18. I wasn't satisfied with my rear deck area and hip skins. My father had ended up with some buckles and such which he had filled in with bondo. I just had to do something about it. But didn't know just what. Then I remembered that you had written an article about that area, so I went back and read it. We'll, I got the drill out and removed everything. Then I called Phil Tucker and ordered new skins.. Haven't gotten the new parts yet, but the form blocks are finished and the flat area under the canopy is installed. So far it looks much better than before. Also fitted the prop spinner this fall. Seems to have come out pretty well. Also have a cowling on order from Phil, but still waiting for that.

Ran into a problem with a crossover exhaust system from Aircraft Spruce which might be worth mentioning in the newsletter; could save someone else some trouble. It seems that the "Special Crossover System" designed for the T-18. P/N 33250 is for the "wide-deck" engines. The exhaust pipe on number four cylinder interferes with the intake pipe on my 0-290 engine. Mr. Clinton Anderson of Custom Aircraft in San Diego who makes the systems for A/C Spruce assures me that the "Standard Crossover System". P/N 33251, will fit the 0-290 and will swap the 33250 that I have for a standard 33251 at no charge. However, he's not sure if it will fit inside the "Thorp Style" cowling. When I get the

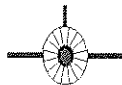
cowling and the 33251 exhaust system I'll let you know how it works. Bob Hartmaier



Dear Rich,

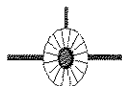
The Newsletter is great as always. I'll try to write something for you in the near future. My ship is flying very well still. I don't know if you saw my new wing tips? Also made a little modification in the air scoop area. I also installed a different main nozzle/jet in my MA4-SPA carb, with good results ---- better distribution & an increase in economy.

We made the Placerville Fly-In. It was great.  
Best Regards, John Evens.



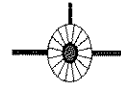
Dear Richard,

I finally finished my instrument panel, except for my vacuum system. The article in N.L. # 97 Why Vacuum Pumps Fail was good timing for me. All of your articles in 97 were very good. Keep up the good work. Sincerely, Mel Clark



Dear Richard,

My T-18 project #1030, is nearing test time, this year I hope. An old time T18 enthusiast, Howard Henderson, will look at my airplane within the next couple of months in preparation for the application for the FAA Airworthiness paper. This is a good time for me to review the newsletters & appreciate their value. Thank you for your part in making them available to someone like myself. Sincerely, Kim Nack 2940 Devonshire Dr. Florissant, Missouri 63033



Dear Richard, I found a copy of your newsletter and thought it looked pretty good. Enclosed is my check for \$ 25. I have built two T-18s from scratch. One is still flying and is at Arapahoe Co. Airport outside Denver. N3098. Last year I bought a project from Milly Warwick that Bill was working on when he died. I have known Bill and Milly for almost 25 years and was very happy to finish Bill's work. I should have it flying by the end of the year. I go to Sun & Fun every year. Maybe I'll see you there. Chuck Borden.



Dear Rich, Just a note to say Hello! Tell you how much I'm enjoying my T-18, N4MY and the T-18 Newsletters. Looking forward to summer and much more flying - - It was 30 degrees below 0 here last night - - too cold to fly anything!

Speaking of summer, I want to invite all T-18 Flyers and families to our annual Fly-In - Pancake Breakfast at Viroqua, WI. this summer. We plan the fly in the first Sunday following Oshkosh which this year will be August 11. We are in southwest, WI, 30 miles southeast of LaCrosse. The airport is I.D. is Y51. We have 3350 of paved runway and 2000 feet of grass, however the grass strip is used for camping and parking airplanes during the fly-in. Camping is available and we also have a Super 8 with pool about a 1/2 mile away.

I'd love to see a turnout of T-18s. I'll be glad to help with transportation and lodging assistance for T-18 attendee's . Come show folks these great little planes. We served over 700 breakfasts last year to Fly-In & drive in guests. Call me for info. Phone # evening is (608)637-2663 Bill Essenburg

15 Jan. 1996

Dear, Rich and Roxanne,  
I hope that both of you are, doing well in this new year. I sure do appreciate what the two of you have done and are doing for the MAS. The last newsletter was excellent and it just seems to get better.

Please do not faint just because I have sent in my dues almost on time. At least I took care of this task much better than I did last year.

Thanks again for sending a couple of people in the right direction to find me. Both of them are interested in the surplus parts which I have.

I have everything set up in my garage and I can get back to having fun working on my Thorp. I haven't done much of anything on it for the last six months.

The Scottsdale area is real nice and the weather is certainly better than I am accustomed to in Eastern Pennsylvania. However, I do miss the kids, grandkids, trees, etc. Sure is a lot to do here.

If you get out this way, you are certainly welcome to stay with us. We have a nice guest room and Elaine is a pretty good cook. We would love to have you visit here. Well must get busy and thanks for all of your help. Sincerely,  
Don Ruffner



Dear Rich,  
About a year ago I started a new company Aircraft Details. We manufacture small hard to find & get aircraft parts. One of the products we manufacture is a stainless steel firewall shield. We also manufacture 5" & 60 wheel shims. In the past we advertised in Sport Aviation & Kitplanes with limited success. Because of this our stainless steel firewall shields will be offered by Avery Enterprises, Wicks Aircraft Supply &

Aircraft Spruce. Also Vans & Mustang Kit manufactures are offering them to their customers.

I am sending you a copy of a new product release that will be published in Sport Aviation & Kitplanes and information about our products. I will offer our products to the T-18 group at wholesale prices.

Thanks for a great newsletter.  
Al Bosonetto 32625 BENSON DR.  
WESTLAND, MICHIGAN 48185-1573  
800-826-5118 313-261-5518 FAX 313-525-1633  
AOL N8AL

*Editor's Note: See pictures of product in this newsletter.*



Dear Richard,

I have some T-18 stuff for sale, I bought some parts from a wrecked T-18 and will use some in my new T-18 that I am building. Love flying my other T-18 but also like building!! Anyway, I have wing spar for sale, Main spar that is, but looks like some repairs have been made, one side has a row of rivet holes miss- matched (extra holes) other wise it looks good -, includes end fittings, walking beam and push pull tubes and control horns. \$150 for all. Elmer Hymen 36 Center St. Midland Park, NJ Phone is 201-444-7432



Note from Larry Eversmeyer, Stainless cowling fastners , 4002-N3S, are available from Skybolt at 800-223-1963

# Classic Sport Aircraft

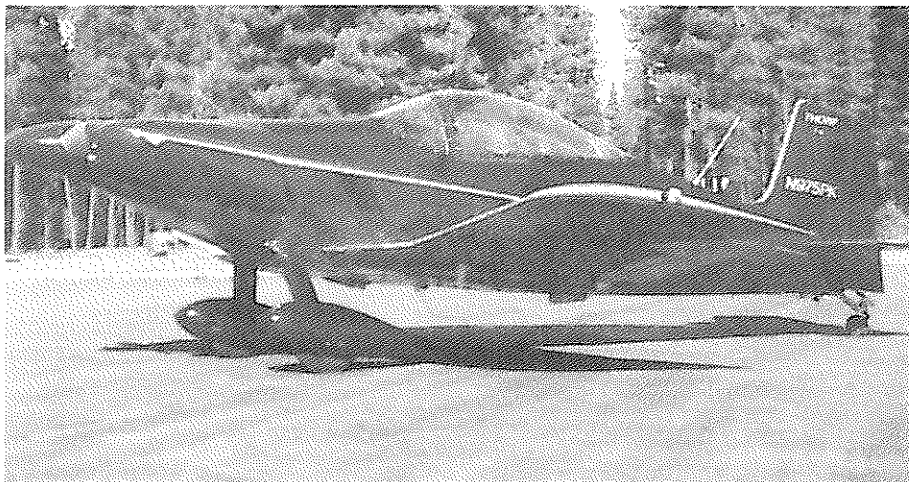
My friends Mike and Frankie Archer along with myself and my fiancée, Phyllis Ward have bought Sport Aircraft from Phil Tucker. The purchase was effective January 3rd, and we moved the company January 19th. The name of the new company will be Classic Sport Aircraft and will be based at Porterville Airport in Ca. Which for those not familiar with the area is about 150 miles north of Los Angeles. The mailing address is 19426 Campbell Creek Dr, Springvale, Ca 93265 and phone number 209-539-2755. The phone is not manned all the time but the recorder will always be on and we will return calls ASAP.

Right now we are trying to unpack and get things organized. This will take some time. Our goal is to offer the S-18 as a kit by mid summer. We have all agreed that we would like to continue to provide the trophy for best Thorp at Oshkosh.

Mike and I have both been Thorp enthusiasts since the early 70's. We both had the honor of meeting John at his workshop at Burbank Airport. We were hot to build, but one thing and another kept us from it. I eventually bought Earl Ody's original Thorp SN 480 in 1993 and have completely restored it. New instrument panel, new instruments, radios, new wiring throughout, new interior, strip and paint inside and out. I've enclosed a couple of pictures. Mike is now green with envy. He is currently in year 13 of a plans built Stuart S-51 project and he also has a Stearman project underway. Just to make sure we have no idle time, we will be building a new S -18.

We hope to be able to contribute to the Newsletter from time to time, and look forward to seeing every one at the Thorp Forum at Oshkosh 96.

Please change the address for my newsletter to 6050 Placer West Drive #302, Rocklin, Ca 95677. My phone is 916-974-9300 days, and 916-783-7756 evenings.  
Sincerely, Phillip Key



*Phillip Key's restored Thorp T-18*

12 February 1996

## CLASSIC SPORT AIRCRAFT

Dear Richard:

Here is some background on myself (Mike Archer), my wife (Frankie), Phil Key and his finance Phyllis Ward.

In the early 70's Phil and I had the pleasure of meeting with John Thorp at Mr "C"'s Coffee Shop in Sunland, Ca. We both wanted to build the T-18, but life had us wander in different directions. In 1993 Frankie and I called on an ad for a T-18 for sale and Phil and Phyllis went along and tried it out. They ended up borrowing our deposit check that we had taken with us and bought the airplane. It turns out it was built by Earle Ody. Phil has completely refurbished the plane (as you can see from the photo enclosed) and it is beautiful.

Some time later he heard Sport Aircraft was for sale and he proposed that we go together and buy the company. We did and made the move from Lancaster, CA to Springville, CA on January 19, 1996. We are still sorting to see where we are and what is good and not good. We are working very hard to get everything squared away so we can find what we do have.

Michael Archer (brief background)

*USN* - flew as flight engineer/plane captain in Martin P5M.

Employed as Operations Program Manager by Litton Industries.

Started my own distribution business in 1978 and developed a successful Aircraft/Parts sales business, specializing in agricultural aircraft and still operating today - will merge into Classic Sport Aircraft later.

My wife Frankie has been a major part of our aviation career, including bucking rivets, and can talk aircraft with the best.

### Phil Key

Commercial, IFR and Certified Flight Instructor. He is one of the few instructors qualified in taildraggers.

He was employed in Operations Scheduling also at Litton Industries which is where we first met. In 1978 he started a computer payroll service company. This too was successful.

### Phyllis Ward

New to the aviation way of life, but has clutched to it with both arms.

All four of us are active members of EAA Chapters 152 and 1124.

Our plans are to build parts and kits for both the S-18 and the T-18. We will have most of the items on the shelf this first year. We do not plan any major redesign to the airplane, but will incorporate minor changes to correct any problems identified in the field or cost reduction items.

We have started shipping from the parts built by Phil Tucker. Things will be slow at first but please tell everyone to hang on and be a little patient as we are backing up for a good start. As part of our drawing package we will include the first year membership to the T-18 Newsletter. We will then send

you the \$25 and their name and address. We believe your writeups in the newsletter will convince them the S/T-18's are the way to go. We will include your name and address for back issues.

So far, we plan to attend the following EAA Fly-In's:

|         |                       |
|---------|-----------------------|
| May     | Chino, CA             |
| June    | Camarillo, CA         |
| August  | Oshkosh, WI           |
| Sept    | Madera, CA            |
| October | Copperstate - Arizona |

Placerville T-18 Fly-In and others but do not have any dates, but we will be attending as many as we can. Thanks for your help and please advise us of anything we can do to further the S/T-18 airplane. Tell us what you need from us for Oshkosh.

PS Check enclosed for our subscription to your great publication.

Sincerely, CLASSIC SPORT AIRCRAFT

Mike Archer

19426 Campbell Crk Dr

Springville, CA 93265

(209) 539-2755

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## FOR SALE

**For Sale:** Thorp T-18 Standard Body built in 1985, 150 HP 720 hours. Airplane is a former winner of Best T-18 at Oshkosh and is a Wright Brother's Award winner. KT 97 Com, King Xponder and Loran. Price is \$32,000 For more information call 605-361-2301

**For Sale:**

Scott 2000 Tail wheel (New) \$300

Maule Tail Wheel (Used) \$75

Apollo Loran 612C (Used) \$250

Danny Cummings Phone Days, 615-473-5401

Evenings, 615-668-9899

**For Sale/Wanted**

For Sale: Flat engine mount with mounting ring.

Wanted: Dynafocal engine mount and Prop for 180 HP- 0-360

William Beswick 7144 Heathwood DR. Jenison, Mich. 49428

Email T18BES@aol.com

# T-18 Travel Club

December 28, 1995

Dick,

Back on November 28, 1995 I sent you a letter telling you about the successful first flight and subsequent flying in our S-18. Our Thorp is now resting for the winter in my garage. The convertible wing makes that very easy. I'll complete some detail work on the paint, finish the upholstery, install wheel pants and fairings and put on my new Sensenich metal prop and Ellison throttle body slide carburetor.

The reason for this letter is to specifically suggest that the Thorp T-18 / S-18 Mutual Aid Society (You) could publish a list of members who are willing to share hospitality with other members who would like to travel around the country without making millionaires of the Hotel/Motel and car rental agency owners. I for one, would be perfectly willing to offer our hospitality to any Thorp crew traveling in New England who would like to fly in and out of central Connecticut. I've discussed this with my family and they agree. It occurs to me that this may have previously been stated but I haven't seen it so forgive me if that is the case and add my name and phone number to the roster.

Within the next year or so, when I retire from the telephone business where I've worked for 34 years, my wife Carol and I are planning to visit friends in all corners of the country in our S-18. It would be comforting to know that there are other Thorp enthusiasts who feel the same way as we do regarding hospitality for the Thorp fraternity away from their home base.

I hope you think this is a good idea and are willing to pass it along to your readers and encourage participation. I would be happy to serve in some coordinating capacity if you think that would be appropriate. I could compile the list and keep you updated. Please use my address and phone if you agree .....

I offer my congratulations on your achievement at the Dayton Air Fair. I'm looking forward to meeting you again this summer at OSH and looking over your Thorp. Joe Gauthier 9 Kowal Drive Cromwell, CT 06416 (860) 635-4058

---

Good idea Joe! I'll be glad to add a note to the database for those that would like to add their names to "a come visit roster". We will put yours and our names at the top of the list as stopping places. I plan to publish a new membership list very soon so if you would like to be listed drop me a line now. Richard Snelson Route 3, Box 295 Clinton, IL 61727

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# *Fat Cat Flies !*

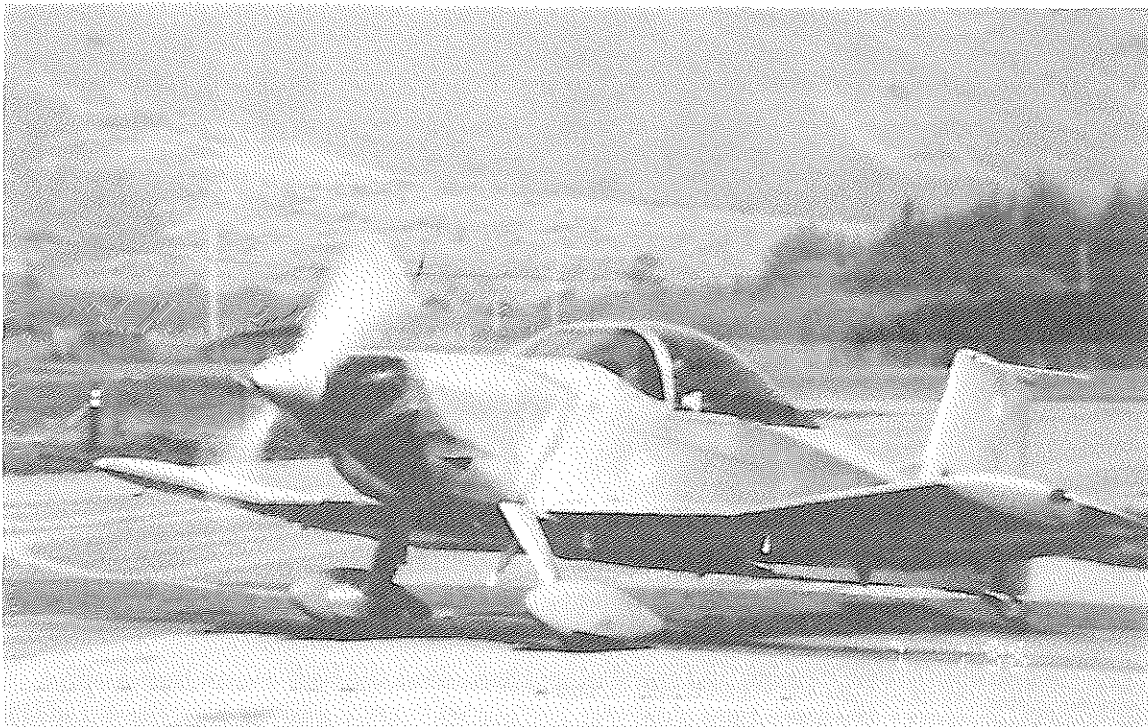
by **Harvey & Steffie Mickelsen**

Well folks this is what we have all been waiting for — “Fat Cat Flies”. The big event occurred at Half Moon Bay Airport (HAF), California on January 7, 1996.

When I received a letter from John Thorp in January 1979, letting me know that my plans (#1332) were on the way, I never thought it would be 17 years before my T-18 would fly. Some of those years were spent making modifications and not actually accomplishing much construction. (See Newsletter # 90, dated 2/18/94.) Fat Cat has an empty weight of 1080 pounds including 8 quarts of oil and lots of electronics. The engine is an IO 360 B2G6 and the prop is a Prince 68X78 wood with “P” tips. It is a wide body with non-folding (I can’t say standard!) wings.

When the article came out in Sport Aviation (Sept. ’95) on breaking in the engine on the ground, it solved the conflict between breaking in the engine and conservative flight testing. I made a hood out of galvanized iron and got the Engine Components booklet and a couple cases of their break-in oil. I then put on 2.2 hours of ground running with my tail spring towing adapter hooked to my truck tow hitch. The hood kept temperatures in the green and oil consumption went down as the rings seated. I highly recommend the procedure. Besides breaking in the engine properly, it builds your confidence in the engine.

I taxi tested Fat Cat next and got her up to 60 mph with the tail up. This also determined that the right break was inop. Many hours and bruised arms later the problem was located - a loose fitting. Cooling was no problem, with cylinder head and oil temps in the green, so the new cowling works. After some Summertime experience I may even close up the cooling air scoop a bit.



Fat Cat in the nude, Tiger paint to come



*Steffie Mickelsen, wife and navigator, camcordered the events of the first taxi test and flight test.*

Before doing any flight testing, Mac Booth let me fly the T-18 he inherited from his father. Mac is a student pilot and taking lessons in his Thorp from Hal Stephens who also gave me my biannual. Hal and I flew it for 2 hours. It is one of the original high back models. That experience was very helpful. Thanks Mac and Hal! Mac flew in to HAF for the test flight, one of his student solo cross country flights.

An old flying buddy, Mark Kadrach, talked me out of doing the first flight and recommended a friend Robin Reid as a test pilot. Robin is a First Officer on 747s for Northwest Orient, a CFI, an A&P, a Formula I race pilot at Reno, etc. He has flown two other Thorps including Mac's. He is Amelia Reid's son. Amelia is still flying airshows! Robin charged me \$250 and earned every penny of it. He's great! *(Editor's Note: Amelia Reid was my first flight instructor back in 1963.)*



Steffie and Harvey with Fat Cat

Robin first spent 4 hours inspecting the plane. (The FAA inspector had spent 10 minutes.) To my total amazement Robin found a wrench in the tail cone! Then after Robin's inspection, I spent the next few days working off the small list of squawks.

Then on January 7, 1996, Robin and many others arrived at the Half Moon Bay Airport. Robin began his inspection work. He helped me close the airplane up. After another very careful preflight, he put on the 'shute', jumped in and did two high speed "taxi tests" never exceeding 5 feet altitude. After another thorough inspection it was time for THE FLIGHT.

What a thrill! Watching and hearing my airplane take off. The flight lasted about 30 minutes and consisted of conservative flight testing and feeling out what trim adjustments needed to be made. His log book entry concluded with NO PROBLEMS, NICE FLIGHT! Someone in the crowd of airport denizens broke out a bottle of champagne and that was the end of the first day of testing.

*The first moments of lift off were so beautiful - Fat Cat flew straight and smooth - engine sounded quiet and purred like a kitten. I camcordered the event and really had a hard time keeping up with our T-18. This bird flies real fast.*

On Monday, January 8, Robin flew it two more times over an entire afternoon expanding the envelope and recording the performance figures. By that time it was getting dark, but he invited me into the right seat for a 10 minute flight. Thrills again when I took control of MY airplane! Stability in pitch is greater than Mac's Thorp which is to be expected in a wide body with it's longer tail. The controls felt great!



*Harvey's buddy riding in the rumble seat!*

*I watched Robin all afternoon flying at approximately 4 - 5,000 feet making lots of turns, stalls, plus a left and right roll. His final comment was this is a real "screamer" ' It is! I'm so thrilled for my husband - we will take Fat Cat to OSH - by - Gosh the first week of August '96. Look for us.*

I'm going to take an hour or so of dual from Robin when he gets back from the Orient in 2 weeks, so that I can learn how to do those 3 point greasers he was doing. Then I will have another thrill when I solo in Fat Cat.

Now for the numbers. The top speed was 197 mph true at 4000 ft. on a balmy California day, 60 degrees (in January). This was determined from two-way runs and GPS readouts. The airspeed indicator read 185 mph and that agreed with the GPS within a few mph. RPM was 2700 so the prop guess was right on. A paint job and some more cleanup should improve the top speed. No-flap stalls were straight forward with a slight pre-stall buffet at 60 mph indicated!!! Stalls with 30 degrees of flap did not register on the airspeed indicator!!!! but were straight forward with a slight buffet. I don't have stall strips. Climb rate at 100 mph is 1100 fpm indicated. No timed climbs have been

made yet and the airspeed indicator has not been calibrated at the low end so these numbers are preliminary. The plane seems to be going very slow on landing. I plan on flying formation with our Half Moon Bay Flying Club Robertson STOL C172 to check the low end airspeeds.

The Riblett GA 35U-A315 airfoil and Clark Y flap airfoil seem to have given the results I was looking for, improved low speed performance with no decrease in the top end. The new cowling improves the top end performance, however and thus clouds that second conclusion. Switching from filtered to ram air causes a 150 rpm increase.

*There were so many people, including Eddy Andreini (Airshow performer) watching - all Harvey's expectations have been more than filled with this T-18.*

I thank my wife, Steffie for her help with the project and patience with me. There are so many other people I must thank for helping me with my project that I cannot list them here, but thank you all! I will write a further report after the test period (40 hours) with some solid data.

Note the new address and phone number below. Update your membership list, Newsletter #81.

Signed: Harvey Mickelsen *Steffie Mickelsen* 657 Terrace Ave. Half Moon Bay, CA 94019 phone 415-712-1438

## FOR SALE

THORP S/18 WIDE BODY SPORTPLANE . TOW IT WITH YOUR CAR, KEEP IT IN YOUR GARAGE.

LYC. IO-360 200HP, 266 SMOH , FACTORY NEW HARTZELL CONSTANT SPEED PROP 53 HRS ,266 HRS. ON AIRFRAME

165 KT CRUISE, 2000 FT. MIN RATE OF CLIMB, LONG RANGE WET WINGS

FULL IFR,DIGITAL MK 12D AVIONICS, COUPLED AUTOPILOT I MUST SELL TO COMPLETE ANOTHER PROJECT! \$35,000

BOB MORRISON (606) 789-7379 EMAIL:

Distress Sale - Thorp T-18 Project:

Vertical Fin - Complete with fittings, Wing Ribs, Wing Spar ,Wing Fittings, Fuselage Skins - drilled for clecos, Fuselage fittings, Tail Fittings, Maple form blocks for wing, fin & tail ribs, Rib blanks cut & drilled, Plans set With mylars of fittings. All for \$ 1100 O.B.O.

Also: 0-290 G conversion complete & running on Stits Skycoupe project. Crossover exhaust & muffler, starter & generator. New Hegy prop. \$4500. O.B.O.

AND: Stits Skycoupe (2 seat high-wing) project. Nearly finished. Fuselage covered, painted, engine running. Lexan doors & Huge skylite for great vis. Wings almost done. All mat'l to finish. Finish & fly in 2 months. \$7450 or make offer.

Call (919) 662-0720 or write. Hopefully someone can finish and fly these two projects. Larry Oppegaard 1102 Brucemont Dr. Garner, NC. 27529-4505

Some thoughts from:

Gary Green

Jan 4, 1996

Dear Richard,

I forgot to include my '96 dues with the flyer on our Father's Day T-18 Fly-In. So, here's my check for \$25. By the way, that is a bargain. You do a great job on the N.L. and I appreciate it. Every article in this last issue was very good.

I have a comment on some of the items in N.L. No. 97. First, on the failure of Gayle LeCount's Aymar-Demuth prop. To my knowledge, there has never been an O-360 Lyc certified with a wood prop. They all ran fixed pitch metal or constant speed props which are much heavier than a wood prop. Now, you know I'm no engineer and the following is just my opinion/suspicion. I think that the added mass acts as a flywheel and absorbs and smooths the power pulses of an O-360. I suspect the heavy power pulses of the O-360 tend to shock the light weight wood prop and may have contributed to its early failure.

I flew a fixed pitch (68-82) Sensenich metal (EM-76 that was cut down) for 12 years and about a thousand hours. In March of '93, I installed the Aymar-Demuth 68-80 wood prop. It out performs the metal prop in every regime. It takes off quicker, climbs better, and cruises faster. I flew it to Sun 'N Fun that April. I noticed it started very abruptly and shut down abruptly also. It idled OK, even down at 600-700 RPM. But I didn't like the explosive start and instantaneous shut down. My C.G. also shifted aft so much I lost some baggage capacity. So, I bought one of Mark Landoll's dynamic balancers. This is a 1 3/4" thick disc weighing 12 pounds that bolts to the front face of the ring

gear. I doesn't interfere with the cowl, spinner, or extension. It requires no modifications. Now, the engine turns through more smoothly on starts and shuts down much more smoothly. Landoll claims you will see a performance gain of as much as 100 RPM increase. I didn't see any difference. My engine had been mass balanced and the cylinders flow matched by Monty Baffett, so it was smooth with the metal prop and the wood prop without the balancer. The improvement with the dynamic balancer was slight but noticeable. However, I believe the O-360 needs that added mass bolted to the crankshaft to absorb the heavy power stroke. I would like to see some qualified engineer do a study on this and publish a report in *Sport Aviation*.

Next subject: Earl Ody's oilcooler failure. I've seen several oil coolers fail on T-18's, RV-4's and RV-6's that were mounted in front of the #2 cylinder like Earl's or attached to the baffling behind the #4 cylinder. Rich, you've seen that also. It is my **opinion** that those are not the best locations for coolers on a T-18. You cannot isolate the cooler from the shake and vibration of the engine in either place. With the cooling air exiting out of the side gills of the T-18 instead of out the bottom of the cowl, an ideal location is on the firewall on either side. I placed mine on the left side. This is a simple installation, isolates the cooler from all engine vibration and provides excellent cooling air flow. You have to make a little fiberglass duct to attach the air hose and funnel the air to the cooler. That's the most difficult part. Mine cools too well so I built a throttle valve into the fitting on the aft baffle plate so I can choke off part of the air flowing to the cooler. Even on the hottest days, I have to choke off the air when cruising at altitude to keep the oil temp at 180-190 degrees.

Next subject: Stan Sutterfield's letter states *"...climbs like an angel at 85 m.p.h. indicated, but eng cylinder head temp goes above redline.* " Is this a misprint? He surely isn't actually climbing a T-18 at 85 M.p.h. IAS! The pitch attitude would be so high, he couldn't see over the nose, the RPM (fixed pitch prop I assume)

would be lugged down to 2200-2300 and there would be so little air coming in the cowling inlets, he'd fry the cylinder heads. Even a mouse motor 0-290 powered T-18 climbs best at 120 or better. I prefer to climb a 150 HP T-18 at about 140 IAS and a 180 HP model at 150 or 160 M.p.h. indicated.

Final item: Its sad to hear of John Cragins mishap with his new Thorp. Sadder still that it was possibly due to a disconnected tail wheel tiller spring/chain. I have a friend who is a very proficient tailwheel pilot who almost lost his Skybolt a few years ago due to that exact disconnect on a rough grass strip. It probably won't bite you on smooth pavement. As a Tech Counselor, I try to discourage use of those light weight sash chains and little wire clips connecting tail wheel springs. I use an AN 42B-4 eyebolt on the rudder horn, an AN 43B-5 or AN 43B-6 eyebolt (page 163 in Wicks Catalog) on the tail wheel arm and an AN 115-8 cable shackle (Page 203 in Wicks Catalog). I run the compression spring thru the eyebolt at the rudder horn, run the other end of the spring thru a link in a chain (not sash chain) and put the cable shackle at the other end of the chain (I use three links). The cable shackle attaches to the AN 43B-5 eyebolt at the tailwheel arm. I wish I had a close up photo of this to send you. I'll try to draw up a crude sketch. Its sunny and nearly 70 degrees here today..think I'll quit this and go flying. Keep up the good work. Gary Green



*View of Pecan Plantation, Grandbury, Texas*

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### For Sale:

SENSENICH 66/78 WOOD PROPELLER. BRAND NEW, NEVER INSTALLED. FACTORY PAINTED GRAY WITH LEADING EDGE "ESTANE". POSITIVELY RAIN PROOF. KEN BROCK T-18 SPINNER CUT TO FIT THE 66/78 PROP. SPINNER USED 300 HOURS. NO CRACKS IN IT OR FRONT AND BACK PLATES. 6 PROP BOLTS GO WITH SALE. A 66/78 IS THE PERFECT PROP FOR A 160 HP. T-18. VALUE \$1200 - *ASKING* \$800. (817) 766 2523

## Letter from Forest Products Laboratory to Gayle LeCount on failure of his wooden prop.

*Editors Note: Gayle's engine is a 180 hp.*

**File Code:** 4710-GL

**Date:** February 7, 1996

Dear Gayle:

This is the written report of our findings as to probable cause of the in-flight failure of the AYMAR-DE-MUTH laminated-lumber propeller on your Thorpe T-18 homebuilt airplane. The nature of the failure has already been reported to you by phone. The propeller was returned to you by UPS around January 26. I am sending a copy of this letter to Ben Owen of EAA because of his interests in airworthiness of EAA-member aircraft, and because he referred you to me.

Dave Kretschmann, an engineer here at the Lab with expertise in fracture of wood, also examined your propeller. Both of us came to the same conclusions as to probable cause of the fracture. Because of the nature and location of the failure on the propeller, we think impact loading on the leading edge was the probable cause, although diagonal grain direction, with respect to the leading edge, greatly reduced the propeller's resistance to impact bending. The following observations are offered as possible contributors to failure, but none are clear and observable causes of failure.

- (1) There was no indication of strength loss due to overheating (hydrolysis of wood) either in the hub or blade trailing edge.
- (2) There was no indication of splitting or checking of wood from moisture losses at blade tips or other edges.
- (3) There was no indication of biological deterioration (decay or insects).
- (4) There was no indication of fracture initiating along the trailing edge where failures from flutter often begin.
- (5) There was clear evidence of propeller vibration, as indicated by scoring of both blades by the edges of the propeller openings on both sides of the spinner. These scorings probably occurred after the failure when severe vibration and deflection from load imbalance would have continued until engine shutdown.
- (6) The failure appears to have initiated along the leading edge—actually with two splits. The primary splitting failure developed along the grain, and an adjacent and shorter split ran parallel to the primary. The splits initiated at the base of the painted tip on the leading edge. The primary split followed the grain to near the trailing edge, then abruptly stopped at the spinner opening where the broken piece tore away. The splitting began in the third lumber laminate (from the leading edge) and continued radially through the weaker ray tissue, parallel to the longitudinal fiber direction.

The slope of grain along the split, with respect to the leading edge at the point of fracture, was an approximate 20 degree angle or a slope of 1 in 3. For maximum impact bending strength, grain angle to the leading edge should be 0 degrees, or essentially straight-grain. Obviously, the steep grain angle severely lowered the laminate's ability to resist impact loading. As you will see in Tables 4-9, Chapter 4, Mechanical Properties of Wood, of the enclosed Wood Handbook, impact bonding strength for a 1 in 3 slope of grain would be less than 36 percent of straight-grained lumber. The grain direction in the fourth and fifth laminates that partially supported the third, was almost exactly the same as the third. Therefore, there was minimal diagonal grain from adjacent laminates to resist splitting in the third laminate.

- (7) The second and fourth laminates in the blade opposite from the failed one contained diagonal grain in close proximity to knots. Such cross-grain is weaker than straight-grain wood, but failures did not occur here.
- (8) The advantage of a propeller laminated from 60 veneers, rather than 5 pieces of lumber, is random distribution and orientation of defects such as cross-grain. In this 5-ply laminated lumber propeller, only one 26/32-inch-thick laminate with very steep slope of grain (from leading edge) resisted impact loading.
- (9) Wood in the hub beneath the outboard retainer plate is compressed nearest the bases of both blades. This probably occurred from extreme vibration at failure. There is also a small dished area in the hub that does not contact the retainer plate. This appears to be of no consequence.

If you would like to discuss this report further, then please call me at (608) 231-9295. Congratulations on the safe landing for yourself and your T-18 Sincerely, Charles B. Vick Research Scientist  
Wood Adhesives Science and Technology Enclosure cc: Ben Owen, EAA, Oshkosh

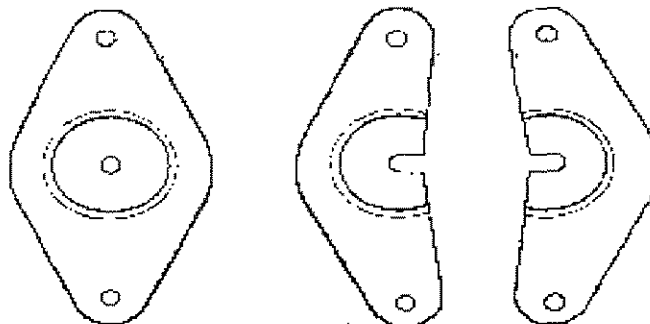
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\*\*\* NEW PRODUCT RELEASE \*\*\*

AIRCRAFT DETAILS, INC. of Westland, Michigan is pleased to announce that it is now manufacturing a complete line of one and two piece DIMPLED STAINLESS STEEL FIREWALL SHIELDS. Shields are also available in flat stock for use in thick firewalls. The one piece is designed for use in new installations while the two piece is perfect for adding grommet protection to existing installations. Hole sizes range from 1.811 up to 3/411 to accept wire bundles, Bowden cables, vernier push/pull cables, battery cable up to 0 gauge and fuel line hose and fittings. Also included is a new miniature shield with gasket for installing a single wire or 1/811 tube through the firewall. Three dimpled styles are available for grommets with 3/4", 1" and 1 1/4" outside diameter. The shields are similar to those installed on factory aircraft ( but only 25% as expensive) and are designed to protect the grommet or sealing material from excessive heat or flame. Preserving the life of the grommet or sealing material is critical to preventing smoke, CO2 or fumes from entering the cockpit. For more information call or send SASE for free catalog to:

AIRCRAFT DETAILS, INC.  
32625 BENSON DR.  
WESTLAND, MI. 48185  
(313) 261-7766  
FAX (313) 525-1633

|                     |                        |
|---------------------|------------------------|
| SINGLE PIECE        | TWO PIECE AVAILABLE    |
| 5/32 PILOT W/DIMPLE | 1/4, 3/8, 1/2 W/DIMPLE |





# THORP T-18 FLY-IN

WELCOME T-18 PILOTS AND ENTHUSIASTS

**JUNE 14-16, 1996**

**PECAN PLANTATION (0TX1)**

**GRANBURY, TEXAS**

As discussed at last Fall's Kentucky Dam T-18 gathering, we are planning for our Spring '96 gathering a little later in the Spring than before in hopes of getting a better weather pattern.

Pecan Plantation is a private airstrip community 40 NM southwest of the DFW airport. It lies well outside of the DFW Class B (TCA) airspace. It has 3500 feet of asphalt (newly resurfaced!). Runway 18/36 is located 5 NM south of the Acton VOR (110.6) on the 180 degree radial.

**ROOMS:** Gary & Maxine Green have reserved **15** rooms at the Pecan Plantation Clubhouse for arrivals on the 14th and departures on the 16th. They are \$58.30 single occupancy and \$73.14 double occupancy including tax. Cancellations will require **24 hr advance notification**. Full rates will be charged for no shows and cancellations later than 24 hr prior. These rooms will be charged to the Green's account and reservations will have to be made through the Green's. If you want one of these rooms, you must contact the Green's at **817-579-1995** or mail to **9111 Bellechase Rd, Granbury, Tx 76049**. Please don't put this off until the last minute.

**MOTELS:** There are several nice motels in the town of Granbury which is about 14 miles from Pecan Plantation. We'll work out shuttle vans/cars to get folks back and forth if they choose to make their own reservations in town. Following is a list of local motels:

Best Western Classic Inn 1209N Plaza Dr. 817-573-8874 or 800-528-1234.

Brazos Motel 900 E. Pearl 817-279-7779

Comfort Inn 1201 E Hwy 377 817-573-2611 or 800-221-2222

Dabney House Bed & Breakfast 817-579-1260

Days Inn 1339 N Plaza Dr 817-573-2691 or 800-DAYS INN

Lodge of Granbury 400 E Pearl St. 817-573-2606

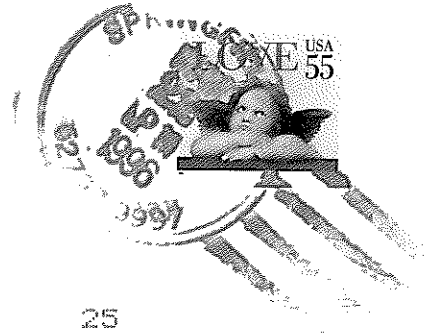
Plantation Inn on Lake Granbury 1451 E. Pearl St. 817-573-8846

**BRING YOUR OWN TIEDOWNS**

**P.S. If you think you may attend, PLEASE let the Green's know as soon as possible to help them in their planning.**



T-18 NEWSLETTER  
ROUTE 3, BOX 295  
CLINTON, IL 61727  
1-217-935-4215  
Issue #98, March 96



Look!! Look!! for a RED ZERO on mailing label, it means I don't have your dues for this year!!

All dues run from Jan to Jan. Please send your 96 dues now.

**1996 DUES**

**T-18 Mutual Aid Society.**

**Please continue your support by sending your dues in now.**

**Name:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**City:** \_\_\_\_\_ **State:** \_\_\_\_\_ **Zipcode** \_\_\_\_\_

**Phone:** \_\_\_\_\_ **N** \_\_\_\_\_

Send your check for \$25 in U.S., \$30 Others.

to: Richard Snelson Route 3, Box 295 Clinton, IL 61727

# T-18 NEWSLETTER



*Bill Cordoza's Thorp with its beautiful rainbow paint scheme. Bill's from Woodland, CA.*

## IN THIS ISSUE:

Correction to article on Stabilator Alignment, by David Neustel

BAGGAGE COMPARTMENT IDEAS by Les Krumel

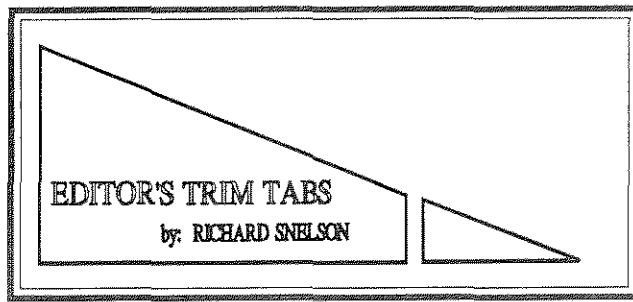
An invitation to visit Perth, Australia from Brian Olney

Propeller Finishing

The Armadillo Check by RoxAnne Snelson

Let's Fly 5th Annual Placerville Fly-In (Sept 6,7,8, 1996)

**NOTICE: (STANDARD DISCLAIMER)** As always , in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.



## **Oshkosh 96**

Again this year we have our T-18 events scheduled for the first Friday (August 2). We have the Nature Center reserved from 11:30 - 2:30 and will serve a lunch (\$4.00 each) followed by the forum at 1:00 PM. I have an amplifier and mike to use, so we should be able to hear the speakers this year. Friday evening our Banquet will be held at Butch's Anchor Inn.

## **Aymar Demuth Prop**

I had a call from Mike Demuth last week and he said that he got to take a look at the prop failure that we had discussed in the last newsletter. He stated that the propellor had indications on the blade of severe rock strikes. He felt that this may have happened on takeoff and could have caused the blade to fail. In our discussion about propellor damage, Mike said that any mar or break in the propellor finish can cause later problems. A break in the finish will allow the wood to dry out!! Note: "dry out" and this can cause separation of the glue joints or a failure of the wood itself. So keep the finish in good condition folks. Send the prop to the manufacturers if you need help in getting it refinished. We have an article in this newsletter on prop finishing, so read on and go to work.

## **Granbury "Pecan Plantation" Fly-In**

With 35 airplanes in Gary Green's yard it still had room for more. (22 of them were Thorps). Gary and Maxine were wonderful hosts, going at a fast pace to make sure all had a great time. For the details of the fly-in see RoxAnne's article in this newsletter.

## **EVENTS**

### **OSHKOSH 96**

**T-18 Lunch** (\$4.00 each)

Friday August 2 at 11:30 AM in the Nature Center

**T-18 Forum**

follows the lunch at 1:00 PM

**T-18 Banquet** Friday August 2 at 6:30 PM at Butch's Anchor Inn

### **OTHER EVENTS**

**Fall T-18 Get-together at Kentucky Dam**

Oct 11, 12, 1996 Phone:502-362-4271 Ask for the Paine Party rooms, to get the discount.

**5th Annual Placerville T-18 Fly-In**

Sept 6,7,8, 1996

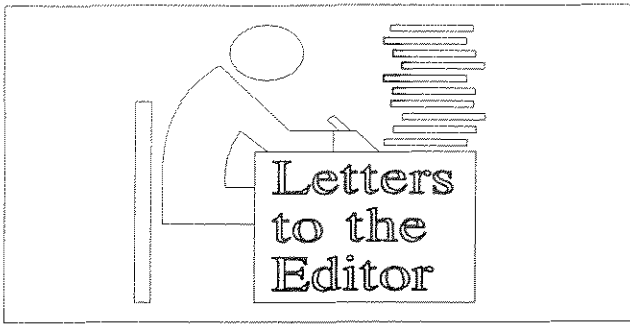
See the notice in this newsletter.

### **A THANK YOU!**

Most of the dues are now in. The red zero worked so I'll continue to use it to indicate late dues. I did mess up and didn't get credit to a couple of folks for checks I had received. I'm sorry for that and will try to do better next year.

### **My Thorp**

It's time for my yearly "Conditional Inspection" so I'll be spending the next week or so at the airport going over the bird from front to back. I'm still having problems with the fiberglass cracking on the edges of my cowlings cheeks so plan to replace the whole darn thing. I think there is a lot of room for improvement in the cowlings area and am waiting for Gar Root to let me know how his modification to the inlets is working out. Gar was in Texas for the fly-in and said he would fly the new cowl very soon. Bob Parker's modification to the T-18 he purchased from Leroy Holt is quite different and makes for a tighter fit with a center hinge line so it can open. Pictures of Bob's T-18 are in the Texas fly-in section.



Sincerely,  
Jimmy Cash  
9003 Green Leaves Dr.  
Granbury, TX 76049  
Home: 817-573-7766

P.S. - Steve Kirik, give me a call you Twin Tailed Sissy!!!



May 14, 1996

Dear Rich,

Things are beginning to click here in Pecan Plantation. Gary Green and I are preparing for the June 14-16 fly-in, and I'm finally starting to put my airplane back together. I've been recalled back to flying with American Airlines in June, which will allow me the free time to get to work on my T-18 (you know how hard us airline guys work).

Gary Green and I recently looked at all the T-18 standard body, standard wing parts which we have accumulated, and decided we easily had enough parts to build two complete wings! We are considering assembling these wings for sale, if there is anyone interested. If so, please have them call me, Jimmy Cash, at 817-573-7766.

Also, I have a standard short gear which has a damaged right gear leg. If someone is out there with a damaged left gear leg, give me a call! I've looked at the feasibility of splicing the gear together, and it seems realistic. If someone has some feed back, please call or write me.

I encourage everyone to attend the fly-in at Pecan in June. It is a fantastic area, and we plan on having a great time. I spoke with Mike Archer from Classic Sport Aircraft and they will be unable to attend. However, they just finished their catalog and will be sending me copies for distribution at the fly-in. I look forward to seeing you in June.

Dear Richard,

The T-18 Newsletter has been continually improving since you have decided to get involved with it. This seems to be somewhat caused more people to be willing to contribute their own ideas and experiences.

I for one, will be very interested in the continued reports from Harvey and Steffie Mickelsen, about their "Fat Cat" T-18. Jacque Fletcher 103 877-64 Ave NW Calgary, AB Tak5J4



March 27, 1996

Dear Richard:

How time does fly, even when you can't fly yourself. Here is my annual dues check, sorry to be so late. The reason I haven't been attending the T-18 FLY INS is that I have lost my physical. This really does break my heart, I miss all of you. I am lucky that my son Jug, who is retired from the AF after 24 years lives in Denver and he comes over and flies with me, we even went to Oshkosh last year. He is really interested in the mechanics of aircraft and attended Colo. Aerotech and received his AP. He worked at that for a year and is now teaching at the school. N2NE is based here because I have a closed hanger which rents for \$25/mo.

(Continued ----- next page)

I don't seem to find my NL#97 but I do have a comment about wooden props. When I was building my Thorp I called Bill Cassidy a proppmaker of renown in Denver. His comment about wooden props with an 0-360-"I don't know you and I don't know what kind of pilot you are but unless you are a helluva lot smoother pilot than I think you are, don't put a wooden prop on an 0-360!" Why don't you use a CS prop?" In fact he said he wouldn't make one for me. He said that the high torque of the 0-360 was too much for any wooden prop. Bill Cassidy is dead so we can't talk to him about it. I don't know how he died. I forgot to ask Dean Cochran that question. Dean said that he had sold his propeller business to Pacesetter 200 in Oregon.

Anyway, this is just my comment to add to the discussion. I did use a CS prop and love it. It has all the attributes in whatever flight conditions you can encounter.

N. L. "Nate" Eastman  
800 E 6th St  
Kimball NE 69145  
E-Mail NateEast@AOL.com



Dear Richard,

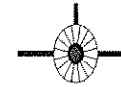
All info still the same. No plans for moving in the near future.

This retirement business is the greatest idea since they first canned beer! Skillman warned me that in eight months I'd begin to wonder how I ever found time to go to work. It didn't take eight weeks. Best of the New Year to you & yours,  
Ben Scola

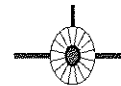


Dear Richard,

Put our name and address on the Travel Club list. We would love to have some T-18'ers visit us. We have ample room for up to four people who might enjoy a beautiful mountain home. The airstrip, 23s, Seeley Lake is a 3500' hand pack sod strip. Land to the North and take off to the South and is open only in summer months. I flew my T-18 out of here for a few years. Be happy to have any and all. Bob and Juanita Ryan Box 954 Seeley Lake, MT 59868 Phone 406-677-3117



Dear Rich, Here's the dues for the year. I graduated American Airline Training Academy in 94 for airframe & powerplant mechanic and went through the program with a 4.0 average and a perfect attendance record. I didn't bother to become a certificated A&P until now. Because I had to pay my shop off before looking for airline work. In March I took the written tests for general, airframe & powerplant. It was a bit of a chore to prepare for the tests after being away for almost 2 years, but I scored a 100% on the general test, a 97% on the airframe, and a 98% on the powerplant test. I'm currently studying for the oral and practical tests, and will be taking them in about 2 weeks. Chuck Polinski  
*(Editor's Note: Nice work and Good luck on the tests)*



Rich, I talked with your wife RoxAnne about a week ago & she gave me information regarding the T-18 Newsletter, as well as a good dose of enthusiasm.

I have recently purchased the fuselage from a T-18 about 90% complete along with all the material to complete the entire airframe; all ribs, spars,

canopy etc, etc, etc! The plans are #491 (some of the early ones). I have contacted "Sport Aircraft Inc." in Lancaster, CA. regarding using the S-18 folding wing on this fuselage & weather I can utilize the spar material & ribs that I have in this conversion. Please let me know what your thoughts/experience is/are in this matter.

I am very excited about this project & am currently in the planning and reading stage of this project. I have a thousand questions & look forward to meeting other T-18 flyers in this area. Sincerely Jeff Wilde 183 Lawn St. Oviedo, FL 32765



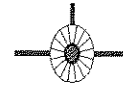
Dear Richard, My \$25 check is enclosed for a new membership to the T-18 Newsletter. I've seen a couple issues & thought they were great.

My T-18 is S/N 883 built by Fred Ferguson who made the first flt 2/16/84 and finished the 40 hr. test program in June 84. The airplane was sold to Jim Taplin so he would have an airplane to fly while building an RV-6. Jim let me start flying it in April '89 and I bought the airplane in April '92, after he finished his RV-6. It's registered as N8883FF and currently has 200 hrs on it. Engine is an 0290 GPU converted to 135 hp@2700 r.p.m.

It has electric pitch trim (volvo windshield wiper motor) and I recently found out the "T" splitter gear box @ the horiz surface should be lubed once in a while. When it gets difficult to move, other things ahead of it wear out- such as the 8" flex cable driving it. I recently broke this flex shaft & replaced it with the solid shaft that looks like a 1/4" socket set extension with "U" joint on both ends, from "Sport Aircraft".

Also, my manifold press. gage used to get oil in it. Solved the problem with a small automotive in-line fuel filter which I installed in the manifold sensing line. By the way, this airplane has a Ted

Hendrickson 68/68 woodprop on it, which seems ideal to me --- good performance & cruise. I'm looking forward to my first newsletter. Ed Ullrich 23850 - 43rd. Ave. So. Kent, WA 98032



Dear Mr. Snelson:

Richard Eklund tells me that You are handling a newsletter for T-18 builders. In 1966 I purchased a set of plans and some aluminum. Before I got very well started on my project I was shipped to Korea, and upon returning home was never able to get started again. At least not until now. 30 years went by very quickly. Now that I am handicapped, however, I have more time on my hands than I did before, and have pulled out the plans and some plate aluminum for fittings. I'll be slow building but intend to do everything in my power to get a plane in the air.

My e-mail address is  
SVTF44B@PRODIGY.COM  
I am looking forward to hearing from you  
Sincerely, G. Van Dorpe Jr. MD Aurora, CO

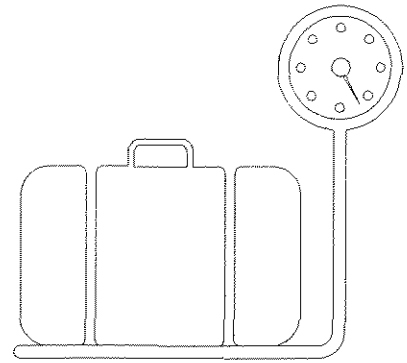
### FOR SALE

T-18 Project for sale, fuselage clecoded & ready to rivet, Horizontal tail complete with internal weights and 80% of parts complete including main spar, wing ribs etc. Have all aluminum to complete. \$3900 OBO. Plans #476  
Call days or evenings, Bob Sanderson 817-321-3505

S-18 Project for sale, fuselage (Lou Sunderland's) folding wings all structure complete for details on this call Jim Consigleo in Carson City, 702-885-2703

# BAGGAGE COMPARTMENT IDEAS

by Les Krumel



Dear Rich,

So glad we've got the newsletter still going for sharing information and as a point of contact. In particular, it's great to see technical info and items for sale. Currently I'm on the look out for a canopy, and materials for the wing and spar, and would like to sell a fiberglass gas tank for \$100.

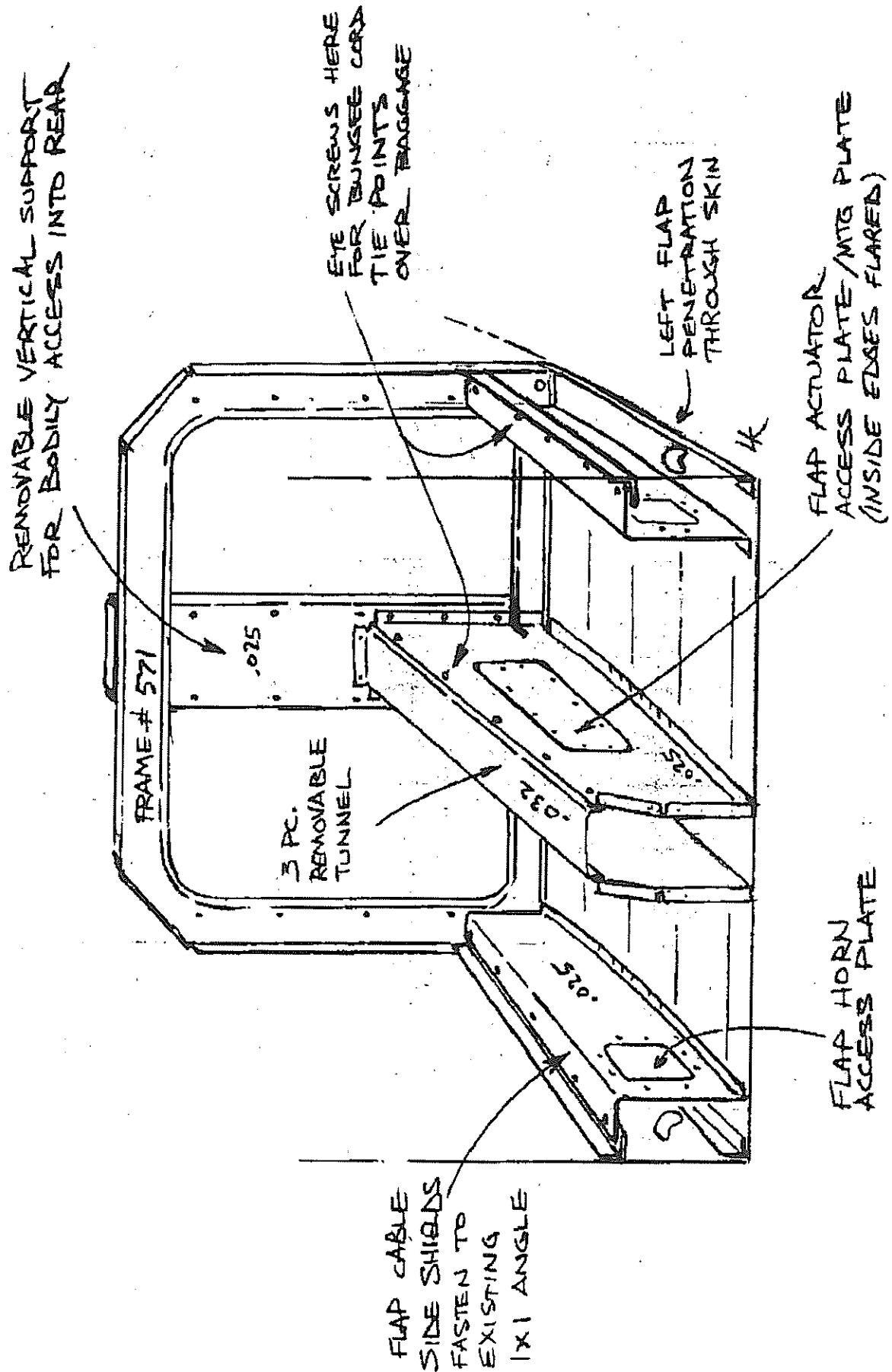
This is the first time I've got anything to offer, being kinda new at this. So far this flying machine consists of tail feathers and a fuselage, sitting on its gear. It's about time to drive rivets so I've been trying to finish up the 101 details while things are removable and easy to work on. Of course, the bottom skin will be last to go on, sometime in the future.

I thought I'd send sketches of my baggage compartment, as built, and some ideas for flap controls. Roll trim is accomplished by tweaking the tension on one flap cable, similar in concept with the plans. The actuator however, is located within a tunnel in the baggage compartment. This may incorporate either a worm gear or lead screw mechanism. Admittedly, it is not good practice for the tensioner to produce side loads on the 90 degree pulley; but it might be acceptable for only +/-6 degrees. Otherwise the bellcrank, etc. should be rotated into the horizontal plane. A false floor can be installed right onto the bottom skin, utilizing lateral stiffeners or honeycomb material. Typically I've seen floors built onto the heavy 1 x 1 angles, about 6 in.

above the bottom. I've gained about 2.3 cu. ft.; simple side shields protect the flap cables along the edges. I'd expect relatively lightweight, bulky things like duffel bags and sleeping bags usually take up most of the baggage space, and the extra volume is most useful. The Lord willing, I'll find out someday.

Hey, what do you think about having the McAlester fly-in some time other than Mother's Day? What do others think? I know of at least one more person who would come. Chances like these are great for checking out details on 'how to do,' learning new ideas, and meeting other builders. And if anyone's ever around Albuquerque, even just a fuel stop, please give me a call. I work right on the AFB, yet without wings, and appreciate anytime I can see another T-18. There's a pretty good surplus store here too. I found a box of realistic looking pistol grips from a computer game that would look good on a control stick. If anyone would like, I'd pick up a pair for \$20 if they're still around.

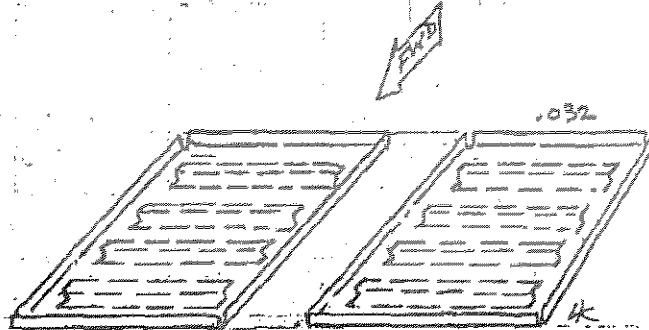
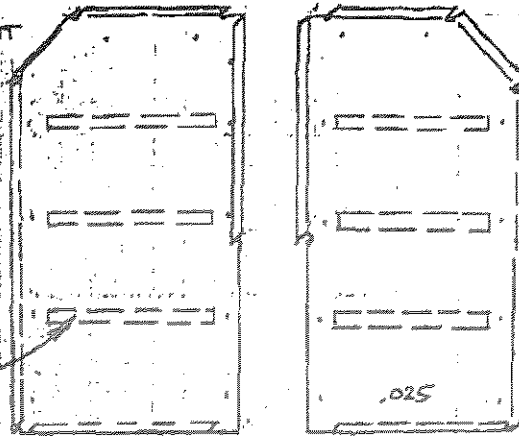
Les Krumel (S/N 1187)  
P.O. Box 1115,  
Cedar Crest, NM 87008  
(505) 281-4406 home  
(505) 844-5386 work



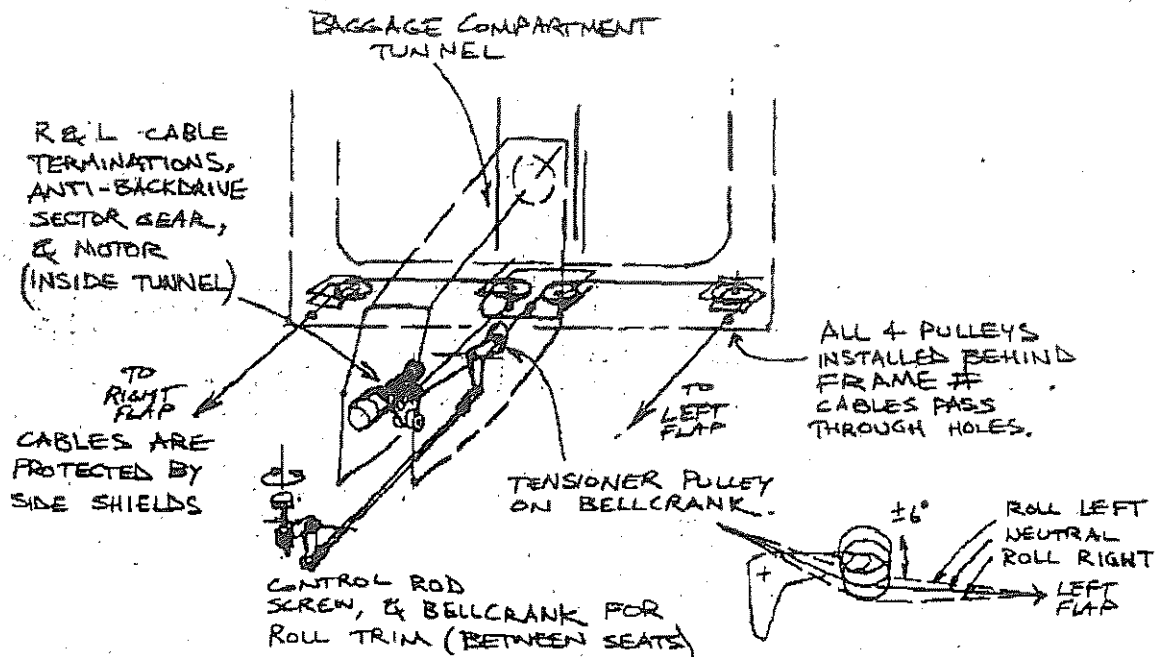


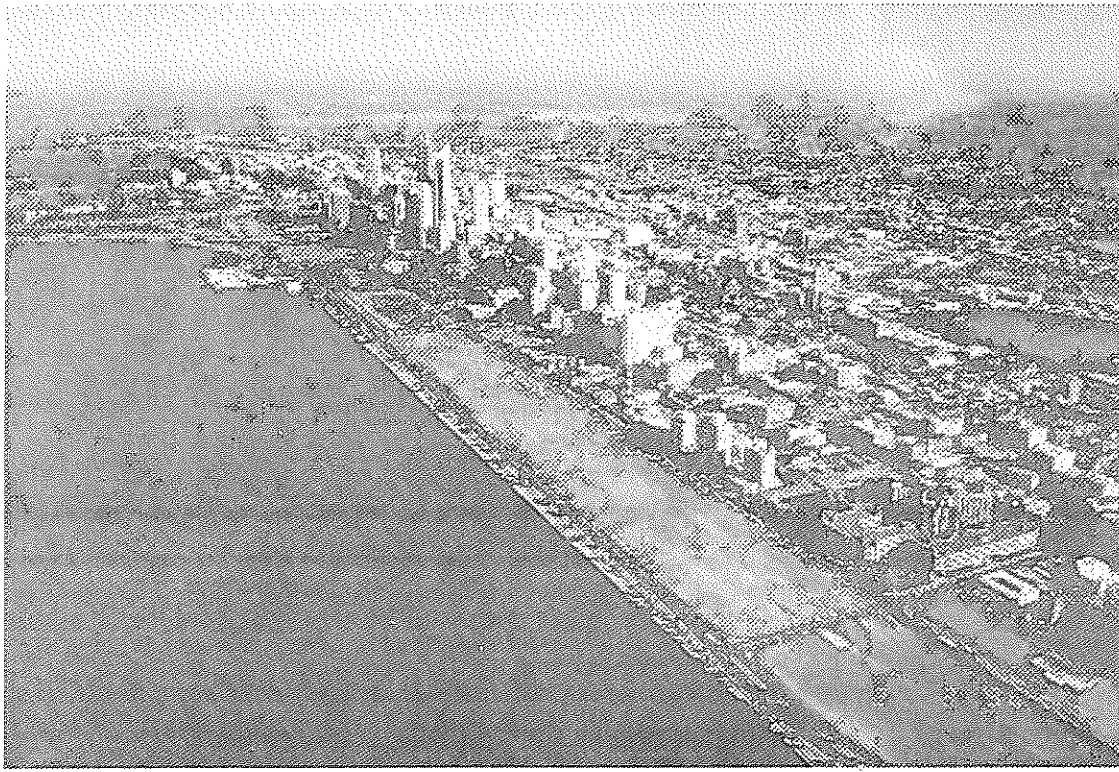
REMOVABLE  
BAGGAGE COMPARTMENT  
REAR PANELS:  
INSTALL BEHIND  
FRAME #571 BUT  
IN FRONT OF  
VERTICAL SUPPORT.  
EDGES BENT 90°  
FOR STIFFNESS

ADDITIONAL "L"  
STIFFENERS  
ON BACK



FLOOR PANELS MOUNT  
DIRECTLY TO BOTTOM SKIN.  
"L" STIFFENERS VARY IN HEIGHT  
TO CONFORM TO CURVATURE  
ALONG FORE/AFT AXIS.  
EDGES BENT FOR ADDED  
STIFFNESS





Langley Park, Perth, Australia

*(A letter from Brian Olney)*

I read with interest Joe Gauthier's suggestion of the T-18 Travel Club. Although there are only about 24 T-18's on the register in Australia, but strategically placed around the country, I am sure that, wherever you travelled in Australia, with or without your aircraft, you would find a T-18er who would be pleased to offer or arrange accomdation etc to any visiting MAS member. I certainly would for anyone visiting Perth, Western Australia.

One event held in Perth recently which attracts aircraft from all over Australia is landing on Langley Park from which the first air-mail service in Australia departed in 1921. One of the pilots was Charles Kingsford-Smith who later made the first flight across the Pacific. The event has been held every third year since 1984 and is organised by our local branch of the Sport Aircraft Association of Australia (SAAA) which is affiliated with EAA.

In the photograph I have enclosed you can see the grass strip, which normally is used for sporting activities such as netball, rugby, soccer, hockey, baseball in the weekends, is sandwiched between the Swan River and Perth city. Due to palm trees one end and power poles the other the usable length is

about 1880 feet. The photo was taken turning right downwind for runway 11 looking west with the Indian Ocean on the horizon. Flying down final, right on the doorstep of the city, with tall buildings just off to your left is an unforgettable experience. Nowhere else in Australia can you land right on the edge of the city itself.

To be eligible to land on Langley you must be an SAAA member and preference is given, in order, to homebuilts, vintage and military and then factory built aircraft. On this occasion we had 97 aircraft land with a waiting list of about 60. The limitation is due to room available for parking. We were only allowed 18 " gap between wingtips!

There have been various proposals throughout the years to develop gardens, artificial lakes and the like on Langley Park but, by drawing attention to the historical significance of the site in this way we hope to stave off redevelopment and repeat this event in March 1999. Overseas visitors would be particularly welcome. Regards, BRIAN OLNEY

28 Brian Ave

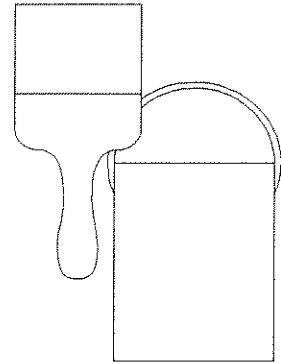
Mt Pleasant W.Aust 6153

AUSTRALIA

13 April 1996

## Propeller Finishing

Sorry but I'm not sure who sent this article, it got seperated from the letter and didn't have a name on it. Good article Thanks ?? Let me know.



To those of us who love wood propellers, there's nothing like that gleaming hunk of natures best composite hanging out on the business end of our trusty Powerplant. Nice spinner, or skull cap, properly installed, bright and clear with a fresh coat of varnish.

A few simple tips are all that is necessary to achieve the gleaming, varnish finish on your prop.

It is usually not necessary to remove all of the old coating, just that which is loose or unsightly. If partial removal of the old coating results in a wide variation of surface coloring, then, complete removal may be necessary. 180 and 220 grit sandpaper, used dry worked well for me, followed by 4XO Steel Wool.

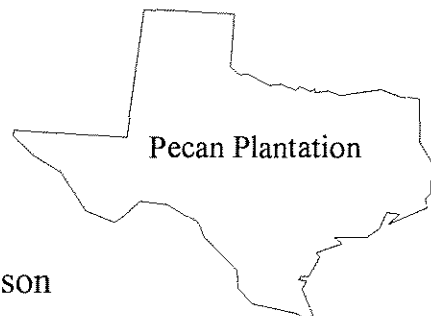
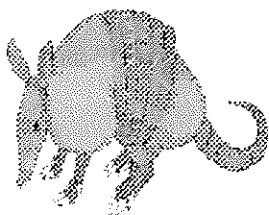
It's best to note the balance condition of your prop at various stages of this process to determine the need for asymmetric application of finish to one blade vs the other for balance. My professionally made prop needed two extra coats of varnish on one blade to achieve perfect static balance. A simple cable suspension balancer works great for me. It is simply two cones, a section of 1/2" steel tube to mount the cones in the prop hub, a small washer with hole for the cable to cover the end of the tube and some 1/16th steel cable to suspend the propeller with. The cable is secured in the center of the tube, slightly above the midpoint of the prop hub. When the washer lays exactly over the end of the tube, the propeller is in perfect static balance.

The best paint brush you can afford is absolutely necessary. Mine was a Chinese Ox Hair bristle and it worked beautifully. Most varnishes can't be stroked repeatedly when applying, so it has to be put on full, wet and smooth with as few strokes as possible. Use the largest brush you can handle to reduce the application time. This gives you an extra minute or two to smooth out any rough spots. Let it dry vertically if possible to give the falling dust in your shop the smallest possible target.

Spar Urethane seems to be the coating of choice. It should dry overnight, in a warm and dry environment. Dull the surface and knock off any dust with the steel wool and recoat until the finish and balance are acceptable. A clean, dry, dust free surface and work area is absolutely necessary. I used Automotive Tack cloths immediately prior to applying the varnish. Give this coating plenty of time to dry, at least several days before you fly in any kind of Precipitation. The slightest amount of rain will eat away at varnish that has not been thoroughly cured.

Even with a good UV rating, and effective cover, if tied down outside, the best finish will need regular attention. If you happen to have a heated workspace, propeller refinishing is a good winter activity.

# THE "ARMADILLO CHECK"



by RoxAnne Snelson

"There's the dam. I think I see the field."

"Well, we are going south from the VOR."

"Oh Yeah! From what I can tell from the moving map, we should be very close."

"Yep.....There's the field, and it's getting hot in here..."

That was our 3-way check to find this trip's final destination -- Pecan Plantation -- and the Spring gathering of Thorp T-18s.

And what a wonderful Texas welcome we received. Four other Thorps had recently arrived-- Ed and Jeannette Ludke from SD, Jim French from FL, John and Vicki Evens and Walt and Bev Giffin from CO. Gary Green was there to greet and show us the way to the main event! Gary, showing us the way with his golfcart, led us to where several other T-18s were already parked next to--yes, next to Gary and Maxine's house! AN AVIATOR'S DREAM. As my husband, Richard, (you know--Snelson) taxied down the runway, I was expecting to hear the ping ping ping of a turn signal as though we were traveling on down any 'ol street. And as we pulled in I see Gary's yellow Thorp in the GARAGE next to a T-18 project and 2 car garage. Of course this was all attached to a wonderfully relaxing Texas home. Oh how nice it was to relax and renew our long-distance friendships.

Let me see if I can list everyone ( I hope I don't miss anybody) that came in on Friday or Saturday. Here goes--(some are T-18ers, airport residents, EAA, and flyers of those other air-

planes!) Julie & Peter Reinhart, John Reinhart, Don Doubleday, Charlie Long, Paul Jani, Tony & Melanie Munday, Bob & Dottie Wood, George & Gloria Van Dorpe & family, Ron & Marriann Havelaar, Pat & Rhonda Stanley, Bob & Nancy Sanderson, Garlan Root, Bill Cordoza, Ken & Jene Morgan, Al & Morinne Pereira, Bill Hall, Jack Waxenfelter, Ted Conrad, Eddie Eiland, Leroy Holt, Bob Parker, Evan Roberts, Gordan David, Frantz, John & Vicki Evens, Walt & Bev Giffin, Ed & Jeannete Ludtke, Jim French, Tom Landhal, Richard & RoxAnne Snelson, Charlie & Wanetta Scott, Bill & Dottie Williams, Bob & Susan Highley, Bill & Debbie Williams, Rick & Louann Jones, Coyt & Wilma Johnston, Richard & Kathy Brandiger, Dick Amsden & wife, Les and Margie Conwell and of course, Gary & Maxine Green. disclaimer: Maxine says your name appears as you signed up!! except of course for typos! I guess it would be nice to say that we had several other experimental airplanes in attendance. They WERE very nice-- a Glasair, and RV -3s, 4s, and 6s.

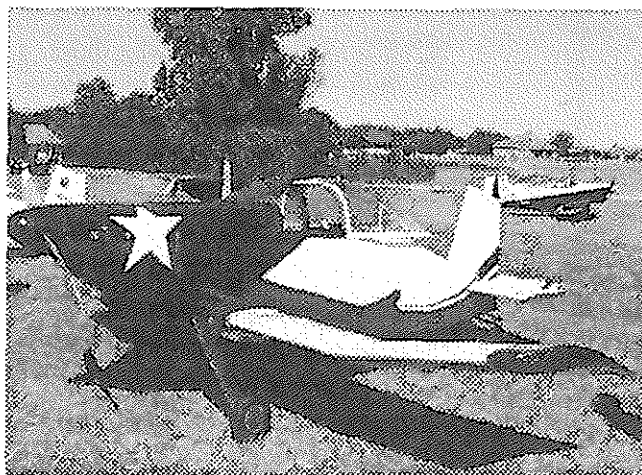
The weekend was warm, correction, hot, but certainly didn't sizzle any pilot's plans of flying, so off and on the fellows would sing out that they were going up to make an armadillo check. They would soar off and then the unmistakable purr of the engines could be heard as they made a low pass. I found out later, from a grinning ear to ear husband, that the local aviators call a low pass an armadillo check. I guess after all, you wouldn't want to hurt one of those "cute" critters--now would you?!

The "boys with the toys" also did some wonderful formation flying, some aerobatics, and on a somber note flew a missing man formation or two. This was to honor several of our comrades that are no longer with us. Those who were mentioned were Gary Holt, Mac Booth, a friend of the Greens and a long time Thorp enthusiast and newsletter editor, Dick Cavin.

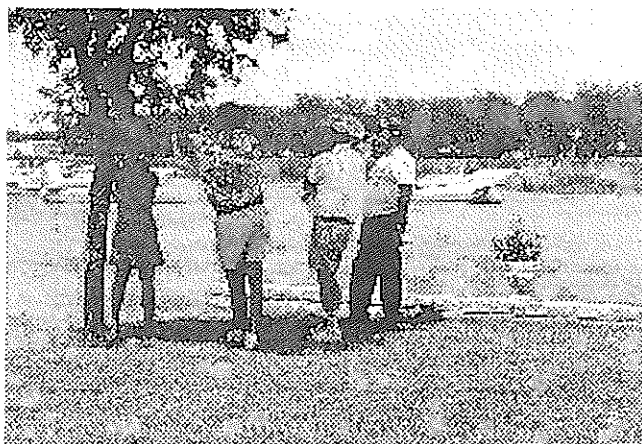
A special visit from Leroy Holt, with pilot Bob Parker flying Leroy's old, but now, very newly re-furbished Thorp, was enjoyed by all.

Throughout the weekend we didn't have any worries about our food intake. Maxine had arranged to have Pizza Friday night and the EAA Chapter 983 set up a picnic style lunch and supper on Saturday. Yeah, you know, less down time to have to worry about food! It was great and we all send a great big thank you from the T-18s. Our sleeping arrangements, made by the master planner--Maxine, were (as far as I know) superb. However, it took the whole weekend to decipher the meaning of The House, The Ridge and The Club. I for one remembered where I was to be but sure got hassled by my fellow house mates about HOW TO LOCK THE DOOR. I'll get ya Highleys! Speaking of Highleys, Susan taught Jeannette and I the BEST ever way to play solitaire. I think you could maybe even play it while flying in the Thorp... well, maybe.

Let's see, what else can I add about ... oh yes, the ideas, building tips and the infamous stories always associated with our fly-ins were abundant throughout the weekend. Hopefully you guys will write down some of the ideas and send them in to be published. I heard a couple of things that Richard was thinking about doing to our Thorp that sounded great. Of course we had the rides for those who came to Texas to experience the T-18 Thrill. I really give a hand to all pilots who do this to allow the not-quite-done or wanting-to-know people in our group. I was a wife who was NOT QUITE SURE about all this stuff a



*Rick & Louanne Jones's new "Star of Texas" paint job.*



*Not a drop of shade went to waste!*



*Bob & Dottie Wood in their beautiful Thorp*

few years ago. I was lucky enough to get a ride from a pilot that--actually, his wife promised--would not do any loop-d-loops, or who knows what. Of course being the assertive person I was, I vowed I would not kill him in the air but when we landed he would be dead meat, if we did anything but straight and slow!!! You know, it is amazing how CALM Rick Jones CAN be...by the way check out the new paint job on the Jones' bird. I understand Louann came up with the paint theme when the time was "right" to do a new one. I love it!

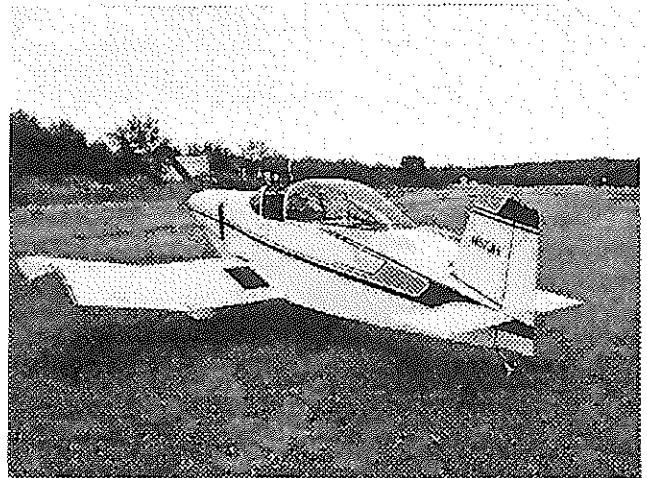
Well, should I tell a story or two ....? No, better not but some did include rather interesting landings, friends that had to shoot at their airplane (NOT a Thorp) because when handdropped it took off into circles--so how to stop it--well, get out the 'ol shotgun! We also had a too close for comfort, look at runway markers and trees on a grass strip, pilotage arguments--I mean disagreements--on HOW to find this place (which damn dam DO I fly to?), we even had a T-18 husband and wife with no home--well they do have a lot just down the way(!), the secret desire of an aileron roll on the day of retirement, and just the always good and friendly chatter about family and in some cases, dogs, cats and a bird.

As always, the weekend ended too soon but the fun memories and friendship will help to tide us over to yet another Thorp T-18 fly-in.

If you are wondering why Richard put me to work on this newsletter it is because he is getting desperate for articles.....SO guys.....unless you want me, Rosie (RoxAnne) the Riveter (and I'm 4 years out of practice) to write an article on tail flutter or weight and balance, etc., you better get out your pens, computers, or even a cassette recorder and send something to the editor. Either that or I may have to contribute a chocolate chip cookie recipe for the 100th issue of the newsletter!! See ya.....in WI



*Evan Robert's Thorp, from Horseshoe Bay, TX*

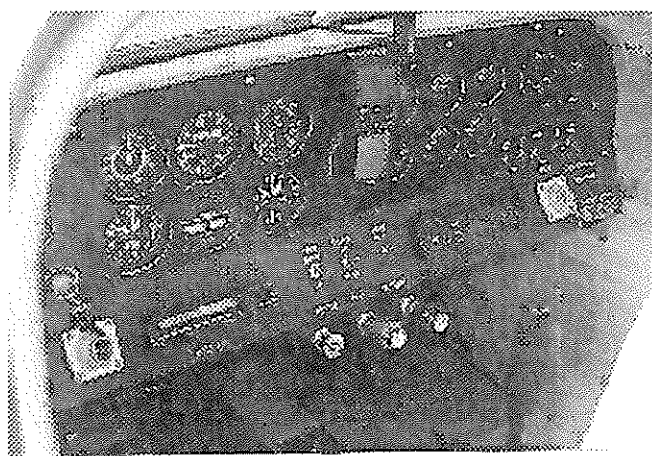
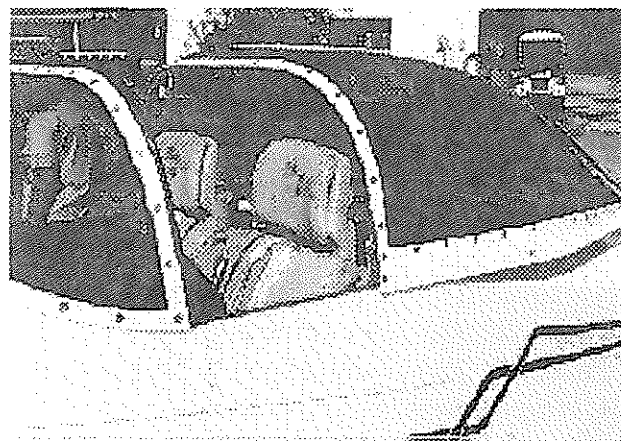
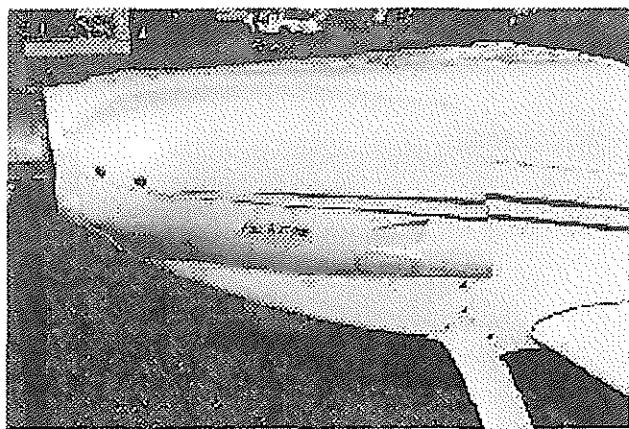


*Pat Stanley's Thorp*

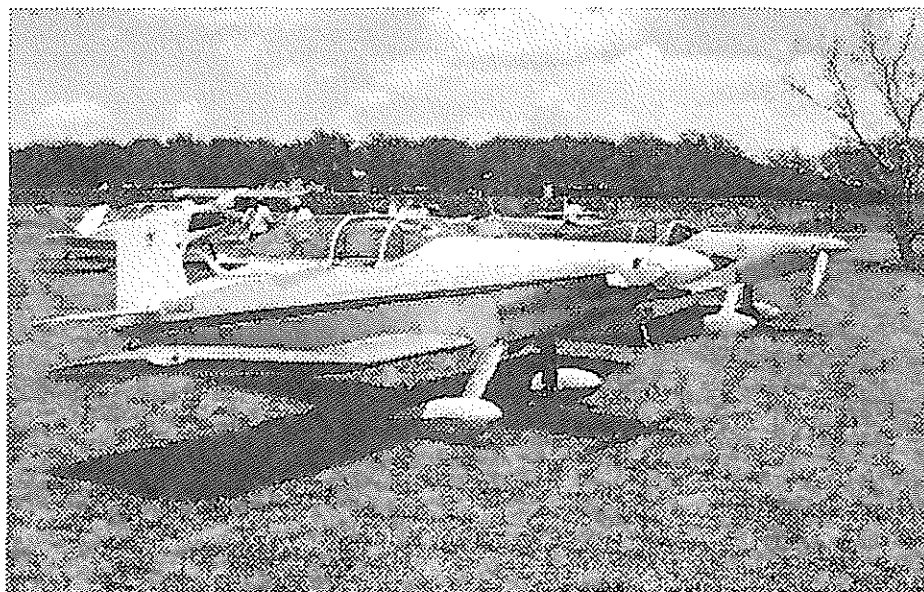


*Les & Margie Comwell's Thorp, nice job on the paint and interior folks!*





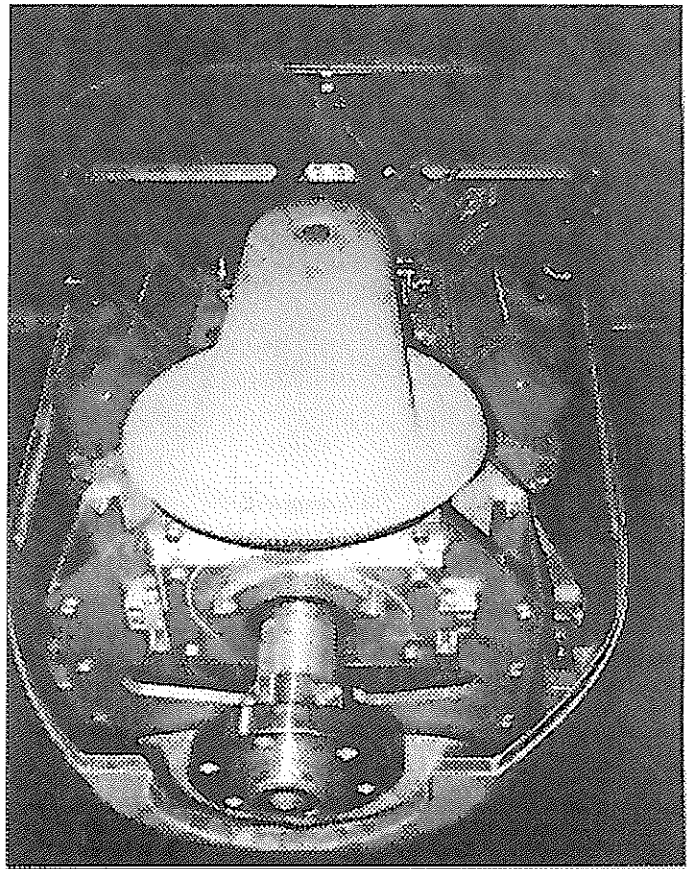
**Here are some of the modifications Bob Parker has made to the Holt's Thorp.**



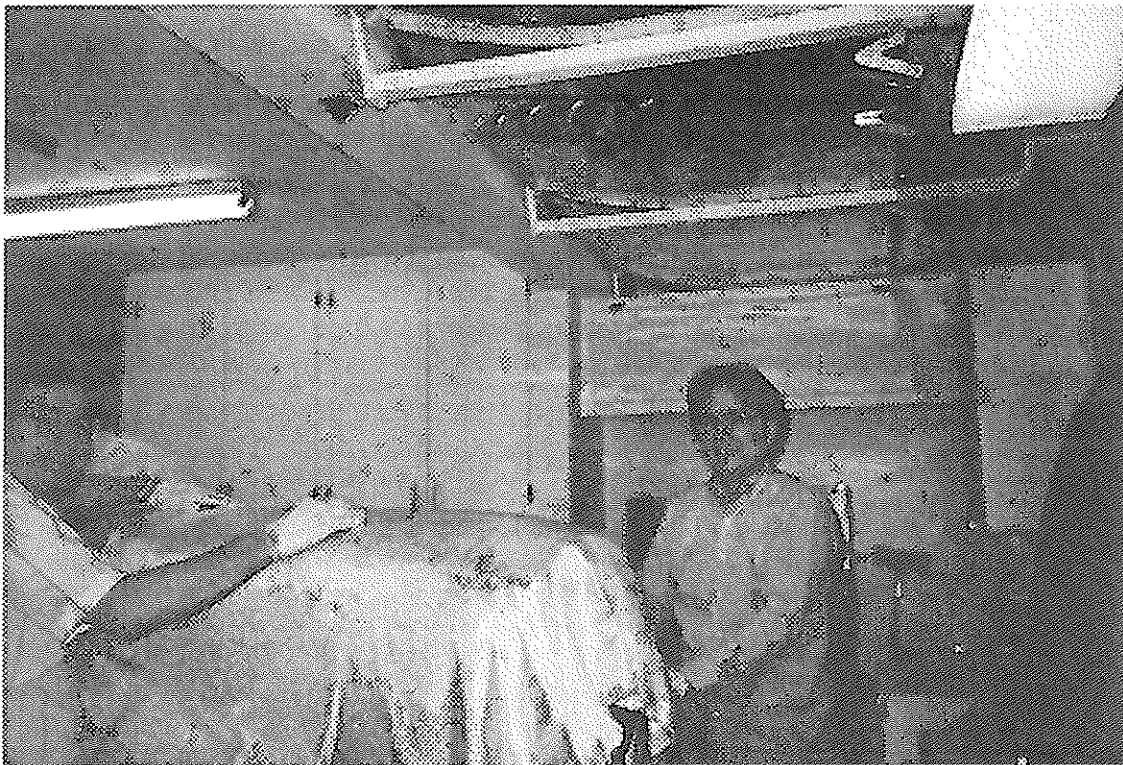
*Here's a shot of Coyt Johnson's new Thorp, nice looking bird!*

# Project Update

Hello Richard: For your info- many calls of interest in my project during the past year, but as we all realize no one is ready to pay near the dollars we have invested. Thus I'm continuing to complete the A/C as time permits. Since we've last spoken - engine mount complete, & engine installed, cowling scratch built, see photo's - plug layup - finished product. My first attempt at fiberglass "West System" quite satisfied. Next is exhaust system c/w mufflers within cowling; dual radiators in the wings a'la Spitfire & ME 109; also a 3 or 4 blade warp drive prop. See you in "MECCA" 1st week of August. Sincerely W.T. Forsythe Montreal Quebec, Canada

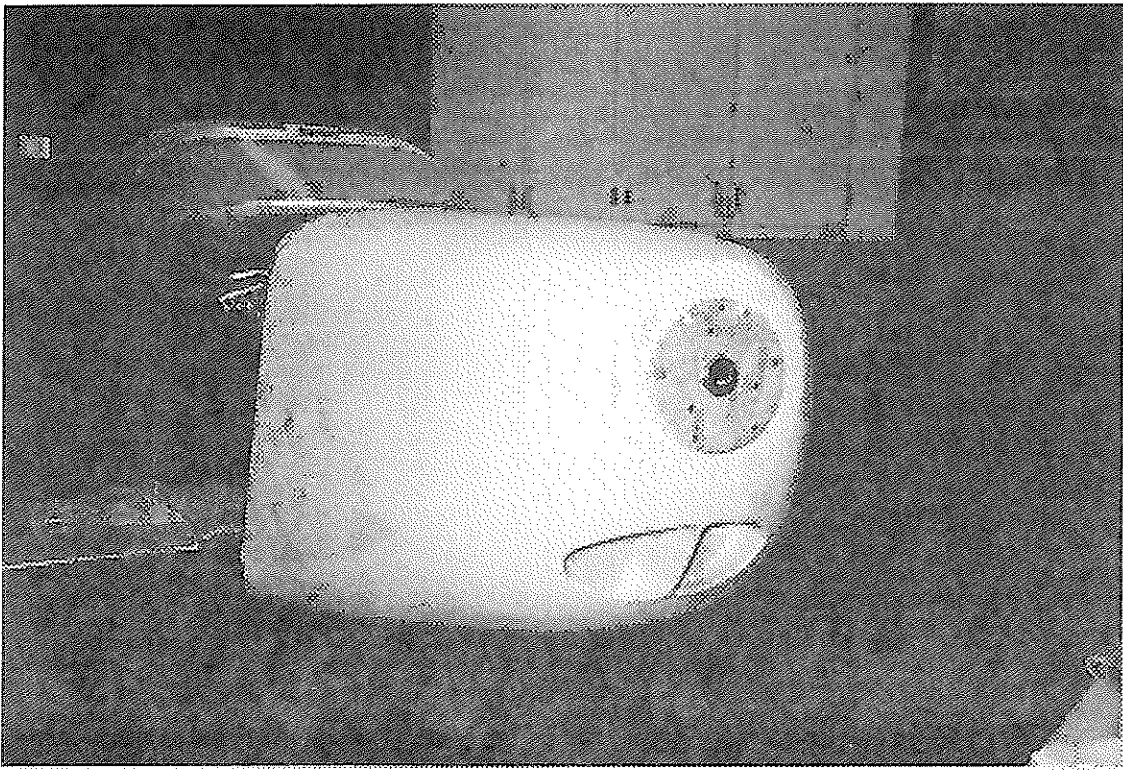


*Good view of the V-6 installation*

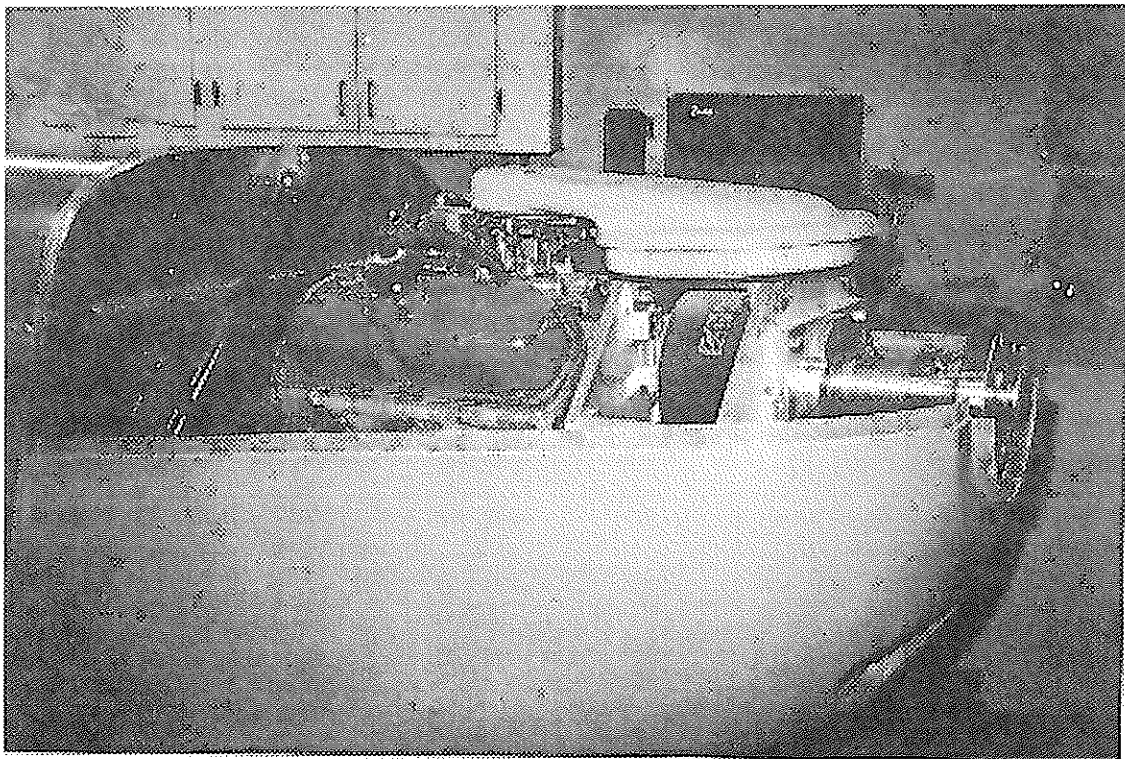


*Hard at work on the fiberglass layup, looks like there having fun!*





*W.T.'s New West System Cowling*



*V-6 Ford with Blanton 1.6:1 Drive*

# **LET'S FLY**

(Exclusively):

(Again)

## **THORP**

### **5 th Annual Placerville Fly-In**

**Placerville, CA at the Hangtown VOR, (40 miles east of Sacramento)**

**DATE: September 6, 7, 8, 1996**

**WHERE: Placerville (Hangtown), California**

#### **SPONSORED**

|            |                                      |                     |
|------------|--------------------------------------|---------------------|
| <b>BY:</b> | <b>Hal &amp; Nancy Stephens</b>      | <b>408/365-8836</b> |
|            | <b>Jim &amp; Lillian Critchfield</b> | <b>916/621-1584</b> |
|            | <b>Mac &amp; Rena Booth</b>          | <b>408/363-8720</b> |

**EVENTS: Yes! - Cork Flying, Bring champagne (BYOB)**  
- Bring goodies to sell/Give away  
- We're thinking, Ideas?

**PRIZES: Yes! - For attending/most rides given/others**  
**Model airplanes - Best Thorp**

**Accommodations:** Camp out under the stars at the airport or stay at:

|                              |                     |
|------------------------------|---------------------|
| <b>Placerville Inn</b>       | <b>800/854-9100</b> |
| <b>Days Inn/Best Western</b> | <b>916/622-3124</b> |
| <b>National 9</b>            | <b>916/622-3884</b> |



**Transportation:** Rental cars are available if desired.

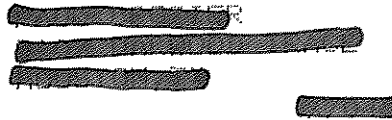
**Enterprise Rent-A-Car**                      **916/621-0866**

**Friday night - dinner at the Elks Lodge**

**Meals: Saturday noon - we'll go down town.**  
**Saturday night - Steak dinner (\$12.00 per person)**

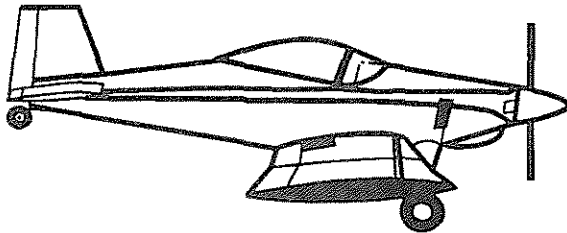
**If you fly a T-18 or a Sky Scooter plan to make this fly-in.**  
**Please! a RSVP call is required so parking places can be made**  
**available and a steak purchased for you.**

T-18 NEWSLETTER  
ROUTE 3, BOX 296  
CLINTON, IL 61727  
1-217-935-4215  
Issue #99, June 96



25

Red Circle around a "0" means that I don't show your 1996 dues paid. Please send them now. Next issue is #100 lets make it a great one. Submit your articles and pictures ASAP.



**OSHKOSH 96**

**T-18 Lunch** (\$4.00 each)

Friday August 2 at 11:30 AM in the Nature Center

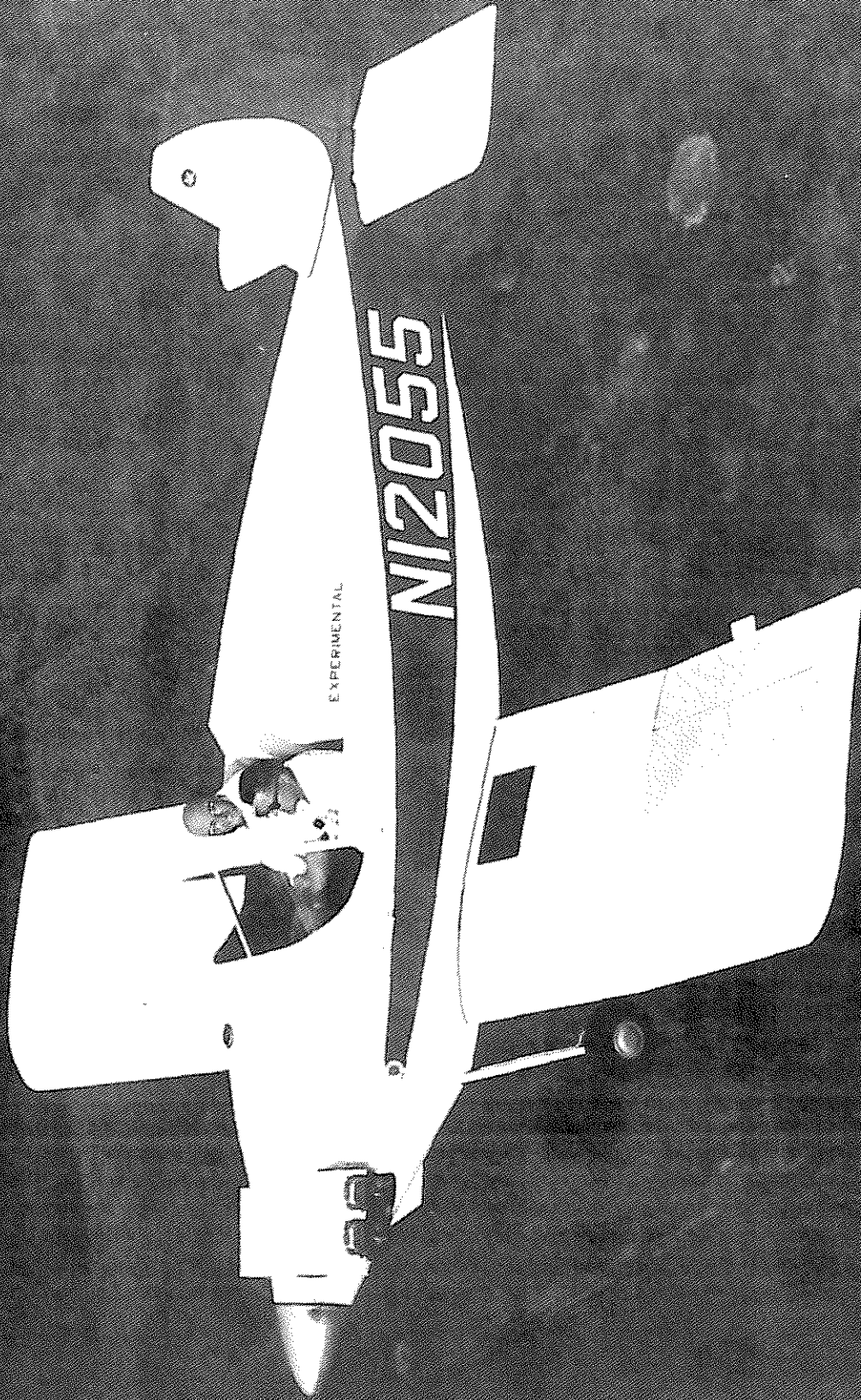
**T-18 Forum**

follows the lunch at 1:00 PM

**T-18 Banquet** Friday August 2 at 6:30 PM at Butch's Anchor Inn

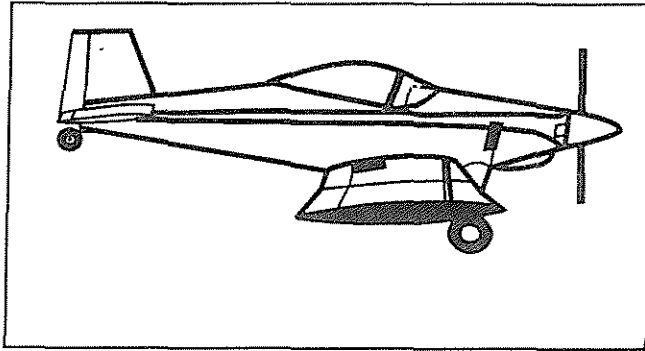
Editor's email address: [rsnelson1@aol.com](mailto:rsnelson1@aol.com)

# T-18 NEWSLETTER



SPECIAL EDITION NO. ONE HUNDRED





## The Newsletter

In 1963 when Dick Cavin wrote the article "Reflections from Rockford" for Sport Aviation, telling about building the T-18 fuselage in three and a half days he probably didn't realize that he had started the T-18 Newsletter. Dick and Lou Sunderland got their heads together in Dallas and quickly realized the need to exchange information for the growing number of Thorp builders. From this meeting the Newsletter was started. As it has been for over 30 years the newsletter continues, with the support and efforts of members of the T/S-18 Mutual Aid Society. The early newsletters are rich with "how-to" articles on what tools to buy, how to rivet and hand forming metal ribs. All of the early newsletters (1-44) were condensed in 1986 by Lou in the book "The All-Metal Airplane". Both Cavin and Lou produced the first 5 newsletters, with Lou taking over after that to write and edit the newsletter until Dick retired from Braniff Airlines in 1979. Dick continued the newsletter until I came on board in 1990 for issue #73. With the present issue we have reached #100, not that the number is significant in itself, only that this little publication has spanned over 32 years and through it the builders and T-18/S-18 owners have shared the experiences of building and flying hundreds of airplanes. It is my opinion that all T-18 owners should take the time to read and reread the old newsletters and profit from the mistakes and misfortune of those that have been there first.

The newsletter circulation has started to grow, slowly we add new members that either build or

purchase a Thorp. It was a pleasure to look over the crowd at the T-18 forum this year and notice that we have some young folks that are now taking an interest in our great airplane. Those of us that started Thorp's back in the 60s are starting to have a lot of grey hair, or lack thereof, and will need help to continue the newsletter on into the 20th century. "Keep those articles coming".

### FROM DICK EKLUND:

The T-18 Newsletter has always provided vital information for builders and owners. Although John Thorp started writing building instructions for the T-18 (14 were published in Sport Aviation), he relied heavily on Dick Cavin and Lou Sunderland to get information out to builders and operators of the T-18. The modifications required by the flutter test program and the warnings to stop the use of the cut down M74 Sensenich propellers are two examples of important safety data provided by the early newsletters. Material sources were publicized and much building instruction assistance was provided. Later safety additions, such as Tom Kerns's stall strips, have been documented in the recent newsletters.

Now that the T-18 is regaining recognition in the homebuilding community, many of the same issues previously covered need to be addressed. The aluminum materials business has changed and some substitution of alloys is now necessary to complete the airplane. Even though the aircraft is mature operationally, its age means that aircraft are being purchased and operated by new owners who did not build them. The newsletter will take the role of important information exchange for new owners.

Since the newsletter has many contributors, it can never be completely error free. Ken Brock picked up an error in the stick/stabilator position check detailed in Newsletter #34 with regard to the tab position when the stabilator is level with WL42. Since there is now a trim system involved in the tab angle rigging, the detailed

rigging procedure by Dave Neustal in NL93 and corrected in NL99, should be used to verify that the horizontal tail system conforms to drawing A-521.

I will do my best to provide any new information affecting the Thorp T-18 through publication in future T-18 Newsletters. Many thanks for the current tireless efforts of Rich and Roxanne in getting inputs from the membership and providing their own perspectives.

Richard Eklund  
Eklund Engineering, Inc.

## The Airplane

John Thorp started the T-18 design to enter it in a design contest sponsored by the Experimental Aircraft Association. The contest goals were to develop an aircraft that would be easy for a person with average home workshop skills to build, and could be converted for transport on the highway and kept in the family garage. Although John's design wasn't completed in time for the contest, it was still the winner in the end. It dominated the display area at Rockford and Oshkosh for many years and is still a very popular homebuilt. It has captured a number of records for homebuilts, including the coveted first homebuilt to fly around the world and to the North Pole. The T-18 was John Thorp's 18th design. Some of his other designs were the Fletcher agricultural plane, the Thorp Sky Scooter, Piper Cherokee 135, Lockheed P-2V Neptune, and Wing Derringer.

Although the original T-18 wing could be removed for road transportation, it proved to be a job for three people. In 1979 at John Thorp's suggestion Lou Sunderland design a wing that would fold for easier transportation to and from the airport. Thus was born the wide body S-18. Both the original T-18 plans and S-18 plans are available and both of the designs live on. The T-

18/S-18 individual parts are supplied by Classic Sport Aircraft, Ken Brock Manufacturing and Ecklund Engineering Inc. Address and information on each supplier is included in this newsletter. In my opinion the Thorp plans are without equal, no designer today spends the time to produce a complete set of plans of full detail. As many other early builders I built my first Thorp making every piece of the airframe, using the detailed information included in the prints. Today builders are in a hurry to fly, so they look to suppliers for precut and bent assemblies, still the detail is there so someone without the bucks to spend can produce an airplane making all of the airframe himself and thereby saving a heap of money.

## Our Suppliers

Eklund Engineering, Inc.  
P.O. BOX 1510  
LOCKEFORD, CA 95237  
209-727-0318  
FAX 209-727-0873  
e-mail 75627.613@compuserve.com  
6/20196

For the Thorp T-18 builder, the following components are offered:

**Thorp #506 6061-T4 Tip - Horizontal Tail - \$90 per set plus shipping**

These stretch formed aluminum skins have flanges for rivet joining the halves, or they can be trimmed and welded per the drawing.

**Thorp #537-1 Upper Main Beam Channel Extrusion - \$125 plus freight Custom extruded 2014-T6 aluminum, 133 inch length by 2 x 1.25 inches to reduce waste and trimming time.**

**Thorp #537-2 Lower Main Beam Angle Extrusion - \$105 plus freight**

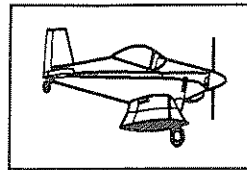
**Thorp #1072, 4" Prop Extension, Clear Anodize with #905 Driving Lugs for the Lycoming O-360**

engine - \$235 includes UPS standard delivery in USA International delivery quoted promptly.

Templates for all T-18 parts are available for use at the Lockeford California shop. These templates allow an individual to create a partial kit by pre-marking all hole patterns and bend line locations in flat stock and wing extrusions. Shop rental for this service is \$20 per day, by reservation only. Material coordination for on site sales or shipment to Lockeford should be accomplished in advance. E-mail correspondence is preferred, however phone messages will generally be answered promptly.



Ken and Marie Brock are familiar figures at both Oshkosh and Sun & Fun. Their sales booth is best known for Ken's gyroplanes but tucked away in it you will find most of the T-18 fittings. In addition he build the landing gear, which are then heat treated followed by a straighting process before shipping. Ken's Thorp spinners are the only ones made that fit the Thorp cowling correctly. They're about 1" larger in diameter than standard. Ken also sells Hartzell constant speed propellers and matching spinners. Ken takes great pride in the products he builds. Ken has two T-18, and by checking the flight line you will surely find his beautiful "Sweet Marie" Thorp at all major events.



**Classic Sport Aircraft**  
19426 Campbell Creek Dr.  
Springville, CA 93265  
Phone:209-539-2755

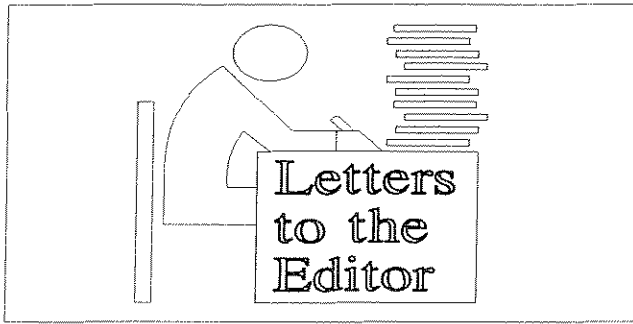
Located at the Porterville Airport in California Classic Sport Aircraft is now the major supplier of the T-18/S-18 airframe components. An update on how they are coming along with the new business follows.

It is time for an update for Classic Sport Aircraft. We finally completed our new info pac/catalog with current pricing. As you can imagine, this was no easy task and a few items are still in review. Also being sick for six weeks (Mike) didn't really help matters.

We have completed several orders and we want to thank everyone for their patience. Things should move faster as time progresses. Actions in work are as follows.

1. We have made contact with Lycoming for O.E.M. status. If things go as planned we will have new engines available with prices similar to Van's. Other products manufacturers have also been contacted.
2. We are verifying all tooling against the prints and will adjust as required. Anyone who has found errors or items needing clarification, please let us know. We are updating drawings as well.
3. We attended our first EAA Fly-In at Chino, Ca and received very good response from current builders, wanabe builders and those that thought the Thorp had disappeared. Our next outing is the EAA Fly-In at Camarillo CA. June 14 & 15.

As many of you know, our office is located 17 miles from the shop so our answer machine is usually on. We will be in the office for calls from 6pm to 8pm M-F west coast time. That's all for now. We will get another update to you soon.



July 22, 1996

Dear Rich,

I had an unusual experience on my way to the Pecan Plantation Fly-In a couple of weeks ago. I left Tucson at 1:15 pm and headed for Odessa, Texas, about 510 miles to the east, my usual fuel stop. Every thing was fine until about 60 miles west of Odessa. Gigantic thunderstorm! The Kermit Texas airport was under the black cloud (many bright sparks emitting therefrom) so I prudently turned to the north to JAL, New Mexico. The name comes from a West Texas cattle ranch in the 1870's whose brand was JAL so that is how the town got its name. When I landed, the wind was blowing about 5 mph. By the time the plane was tied down and my bag out, the wind was somewhere around 50mph. You have to experience the suddenness of a West Texas thunderstorm to believe it. I was very lucky because there was a man there walking his dog and he helped me get the canopy cover on. He then took me into town, but the one motel was booked full, it being the height of the social season in JAL- they were having rooster fights that week. By this time it was raining like crazy. The power in the town went off and a few trees went down. (There are only a few trees in SE new Mexico to start with!) My new friend then very graciously offered to take me down to Kermit, Texas where there was another motel. He said 23 miles was nothing to them in that part of the country. I accepted, thinking it had to be better than a park bench, especially since they were all wet. He took me down there and promised to pick me up at 7 in the morning. He

did. Boy was I grateful. We drove out to the JAL airport and my T-18 was gone!!! My immediate thought was that it had broken the chains and was blown back toward Tucson. We drove around the field looking for tan colored wreckage but didn't find any, thank goodness. I then went back to the tie-down chains and found a plastic bag tied to one of them. Some nice airport user had thought there would probably be heavy hail and locked my T-18 in a steel roofed hanger. I don't believe there was any hail but I sure did appreciate his thoughtfulness. I called the man and he came out and let my plane loose. I gave them a fly-by in appreciation and went on over to Odessa and then on to an uneventful trip to G-ranbury. Sure did have a good time at the fly-in and hope it wasn't so much work for Gary and Maxine that we won't have it there again. Their place is beautiful!

I have a complete set of maple form blocks to build a T-18. I will be happy to give them to anyone who needs them. They were built by Russ Bayse back in the '60s. He built the most beautiful T-18 ever built. It was tricycle gear retractable. He won the outstanding workmanship award at Rockford. He lost his life in it a few months later. He was a good friend. I bought all of his tools from his widow. I used the form blocks to build mine.

Thanks for all the work you do for all of us. I sure was sorry to hear about Dick Cavin.

Steve Hawley

*Editor's Note: It's believed that Bayse passed out from lack of oxygen on a high altitude search mission. He was a heavy smoker.*



Dear Richard and Roxanne,  
8/18/96

This is something you can put in your Newsletter. I have about 100 hours on my Thorp now, and have finally gotten the carburetion to work. I have a 0-290 with an MA4 carb. I have tried three Venturies and each time it got worse. My



problem was mixture variation. At full throttle, all was fine. As soon as I backed off on power, the rear cylinders went lean to the point that I had to fly around 2300 feet to get an exhaust temp under 1400 degrees F on the rear cylinders.

The fix: I machined a flanged tube with an I D of 1 15/16" , same as the MA4 that sandwiched between the carb and the oil pan, and extended up into the manifold area 1 1/2'. This cured the problem. I think that if I had this to do over I would use an MA3 with the same fix. Also I have been using auto gas (Union 76) 89 octane, and this was working about as good as av gas until the State of Calif screwed up the fuel. I was using 9 gal per hour. I changed to 80/87 av gas and now burn 7 gal per hour. Thank you, and keep up the good work. Larry Cresse, N4975K  
P.S. Please note my new address Larry Cresse  
P.O. Box 133 Acton, Calif 93510



Subj: Thorp T-18 for sale  
Date: 96-08-16 07:07:42 EDT  
From: apilit@conterra.com (Alvin Post)  
To:Rsnelsonl@aol.com

Rich,

I have not been very aggressive in trying to sell my T-18 which I very reluctantly have to start doing. If you know of someone who would like to acquire a good little airplane, let them know about mine please. I have decided to offer it at \$26,500 (which is too cheap, yeah, I know) but I need to let it go to someone that will fly it more that once a month like I am doing. Alvin Post  
Phone:803-493-0066



Subj: Homebuilt web site3  
Date: 96-08-17 21:25:05 EDT  
From: steveh@wt.net (Steve Holbert)  
To:rsnelsonl@aol.com

Rich:

I was surfing the net and have ran across a number of web sites for homebuilts. In the ones that I have found so far there has been no mention of the T18 Newsletter. The last one that I looked at was <http://www.azstarnet.com/~cmddata/homebuilt/>. Most of them request readers to submit info, I was hesitant to start submitting your address, but it would be nice if there was a web page for the Thorp, or more specifically the Newsletter.

I have canceled my subscription to AOL and have a direct Internet account now that costs me \$14 per month, unlimited access. I miss being able to read the mail about T-18s on AOL, but AOL is not a very economical solution. If there is something else available for you in your area, I highly recommend checking into it. It would be great if there were a home page for the T18 and maybe even a forum that those of us that are not on AOL can access. I feel much more comfortable plodding along hunting for info about T18's not that I am not being charged by the minute, but I haven't been able to find any sites devoted to the T18. Chris Belobrajdic comes the closest so far. Hopefully more will follow. Well I guess that's about it. If there is a T-18 site or forum that I haven't found, please let me know.  
Keep up the good work!  
Steve

*Editors Note: I would like to set up a home page on the internet for the newsletter, but at the present we have no local access numbers and no local service provider, so everything would have to be done at the expense of a long distance phone call.*



Rich,

I finally got hooked up online last week and have already burned up 10 free hours just trying to learn this computer stuff. I've barely avoided becoming a road kill on the info highway.

If you're interested in my prop it requires a crankshaft flange with holes for 7/16in. bolts. I think that's standard for an O-320 but am not positive about that. You'd certainly want to be sure it's compatible with your engine if you decide to change to this prop. In any event, if you're not interested I'd certainly appreciate it if you could include an ad in the next newsletter. Here are the particulars. Hartzell HC-F2YL-IBF/7663A-4, 0 time SOH, Woodward Governor, Was on O-320 LYC powered T-18, \$3900 or best reasonable offer. Dan Wolfe (513) 864-2781 or E-mail AirLobo@aol.com

We had dinner with Jim And Judy Paine last evening and talked about the Fall Fly-In at Kentucky Dam. Jim has scheduled the dates 11,12,13, Oct. Same procedures as previous years, ask for the Paine party to get the room discount. ( KY Dam 1-800-325-0146) The Paine's are pretty busy as Jim's mother is with them full time now so I told them I'd pass the info along to you. Hopefully, it'll make the newsletter so we can draw a good number of T-18s. Thanks and say hello to Roxanne, Janey and Dan Wolfe

P.S. The newsletters are great. Don't know how you get all that work done as I'm sure you folks are as busy as anyone these days.



August 5, 1996

Hi, My buddy and I had a nice flight home Sunday morning - just 1hr and 55 min., Oshkosh to Romeo, MI. We both enjoyed the lunch (got there just in time) and banquet.

I have been using a Bracket air filter for many years, and it works just fine. The part number is BA 5705 and it will make two filters for the Thorp, just cut it with good scissors. Then I run a piece of safety wire thru it and attach to the screen on inlet to prevent blow out if a carb backfire should occur. Thanks again, Dick Amsden



Subj: Oshkosh Trip  
Date: 96-08-29 01:45:44 EDT  
From: T18THORP  
To:Rsnelsonl

Dear Richard:

We would like to congratulate Les & Margie Conwell of Lutz Florida for receiving the award for best T-18 at Oshkosh 96.

Congratulations also to Joe Gauthier of Cronwell CT, Bill Essenburg of Viroqua WI, and Carl & Sue Daughters of Arroyo Grande CA, all of which we were pleased to present with an autographed copy of "Charlie Mike Charlie" for bringing their Thorp's to Oshkosh for the first time.

As those who attended Oshkosh may know, my airplane was hail damaged in Medford Oregon on the way to Oshkosh. Someone jokingly said that with all the dents in the wing that it looked like a golf ball surface and would probably fly faster! Well, it doesn't seem to have effected the performance one way or the other. One of our chapter members said that in a metal seminar he had attended several years earlier, they said that dents could be taken out by wrapping your wings in black plastic and letting the plane sit in the hot sun for a few days. It sounded too good to be true that something so simple would work. Well on returning from Oshkosh we here in Northern California were faced with 100+ degree weather

so I thought I might as well give it a try. My plane sat in 105+ degree weather for four days. When the black plastic came off, it appeared that the dents were some what relieved, but not enough to let it go. So much for the easy fix. I will eventually build a new wing.

The control surfaces on Mike's Mooney were also damaged. We were told that the same storm destroyed three Cessnas north of Medford. A few bucks for an overnight hangar would have saved a lot of time and grief.

Thanks also to Lee Skillman for the "PLUG" he gave Classic Sport Aircraft during the homebuilt review at Oshkosh.

Mike & Frankie and Phyllis and myself certainly enjoyed meeting all the T-18'ers.

Finally, I would like to pass along our new AOL address, someone got our password so we had to get a new account, the new address is T18THORP@AOL.COM  
Hope to see you all at Copperstate.

Mike, Frankie, Phil & Phyllis  
Classic Sport Aircraft



Dear Mr. Snelson

It was good meeting once again with the T-18 bunch at Butch's Anchor Inn. As I mentioned to you, here is my \$25 check for the newsletter. My address follows:

Worthy R. Warnack  
3415 Maple Park Drive  
Kingwood, Texas 77339  
(713) 358-2892

I finished my T-18 (N2WW) In 1974, so it is one of the "old ones" -a "round back", started by the Dick Cavin group In Dallas. "Two Double

Whiskey" has been to Oshkosh three times, California once to the Mohave Air Races, many, many places In Texas— and even won first place at the Memphis Tennessee 1975 Fly In. But that was long ago, and the plane has been inactive for a couple of years.

Last year I passed my flight physical without a great deal of trouble- so I decided to put Two Double Whiskey back in the air also. The engine had been run occasionally during the inactive period, but that's about all. So I started at the tail and worked completely through the plane to the nose spinner. Surprisingly, I really didn't find any significant problem. The trim system had to be completely disassembled, cleaned and lubricated, one instrument had to be overhauled, and the carb air control had to be cleaned and adjusted. With general repair of "rash", thorough cleaning and lubrication, new tires, tubes, a new battery, and fresh oil- she flew just like always.

Have to admit I got another thrill from this second "test flight"- but couldn't have been nicer. Going through these planes from stem to stem has a lot of value, if nothing more than to renew confidence that all is like it should be.

Just wanted the group to know that one of the old ones is still in the air and providing a great deal of pleasure. Please keep up the good work and keep in touch.

Yours truly, Worthy Warnack

### *Our Prayers are needed !*

*I heard from Ed & Jeannette Ludtke this week and they had bad news for us. Jeannette has been diagnosed with a brain tumor. Surgery is not an option. It's still very small however and with your support and the help of some of the finest doctors in the world, there is hope! Their address for cards and letters is Ed & Jeannette Ludtke, 2301 Dartmoor Sioux Falls, SD 57106 Phone is 605-361-2301*



## Oshkosh 96

This year the Snelson's made the list of "Strange & Stranger" things that are seen in Camp Scholler. Arriving with our 24foot three horse/ camping trailer in tow, we were greeted with a strange look at the camp entrance, as I asked, "where do we tie up the horses?" After a good laugh and an assurance that we really didn't have any horses we were directed on into the fast growing tent/RV city. RoxAnne says the large bunk in the horsetrailer beats the heck out of sleeping on the ground.

After walking to the warbird area realized that the T-18s weren't in their usual area, the growing Rv fleet had finally pushed us out. The T-18s were south of the tower and I think it worked out better because the rows are deeper there and it allows getting the planes back from the flightline. I have always been nervous during airshow time with the zillion people and their lawn chairs, not watching were they are going.

At noon the now famous beer soaked brats were cooking, in the nature center and the T-18ers was starting to arrive. I believe we set a record for attendance at the picnic and forum with a head count of over 100 people. Our thanks to Bob Highley and Bill Williams for cooking the brats and to RoxAnne for doing the shopping.

The forum started with a letter from "John Thorp", really, I found a letter John had sent to Don Taylor giving the "G" loading for various weights of the T-18 up to 2200 lbs. I don't recall seeing those figures before. Look for it in this newsletter. Dick Ecklund gave an update on his support for the T-18 builders and talked about things he has for sale. I have included a page in this newsletter that describes his T-18 items. The folks from Classic Sport Aircraft then brought us up to date on their new bussiness startup efforts. We were all glad to hear that the supply of T-18 parts will continue into the future. They have a write up in this newsletter. Several individuals contributed building ideas and safety suggestions to the group. For you that asked, John Even's oil separator is described in this newsletter.

Friday evening we again filled the downstairs banquet room at Butch's Anchor Inn. The award for the best T-18 went to Les and Margie Conwell of Lutz, FL. What a beautiful airplane it shows a lot of attention to detail in finishing and interior design. Les and Margie never fail to make the Midwest T-18 fly-ins. I understand they left Oshkosh and went on to the west, with the Highley. Must be a story there folks, start writing, Les and Bob! First time T/S-18s at Oshkosh included Joe Gauthier of Cronwell, CT, Bill Essenburg of Viroqua, WI and Carl & Sue Daughters of Arroyo Grande CA. I hope we didn't miss anyone! Weekend went fast and the weather was beautiful. Hope you enjoy the pictures from the flightline and banquet.

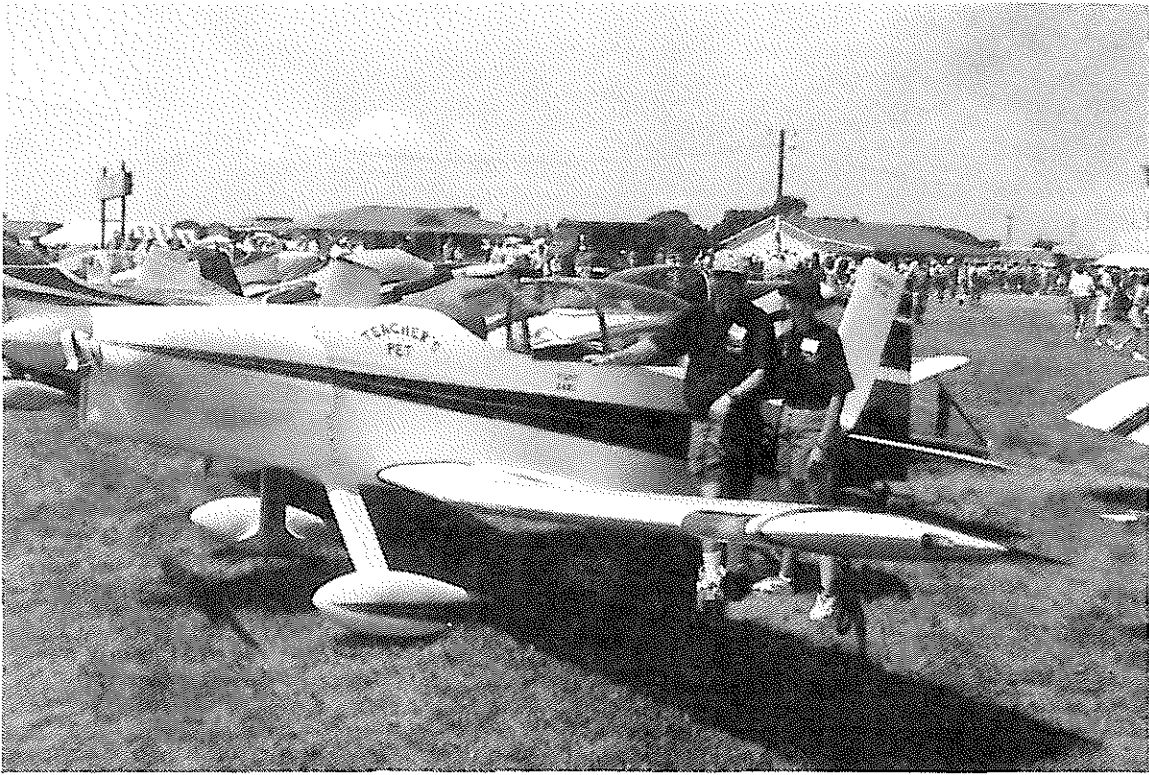


*Carl & Sue Daughters, Les & Margie Comwell and Bill Essenburg*



*Richard, RoxAnne and "The Horse Trailer"*

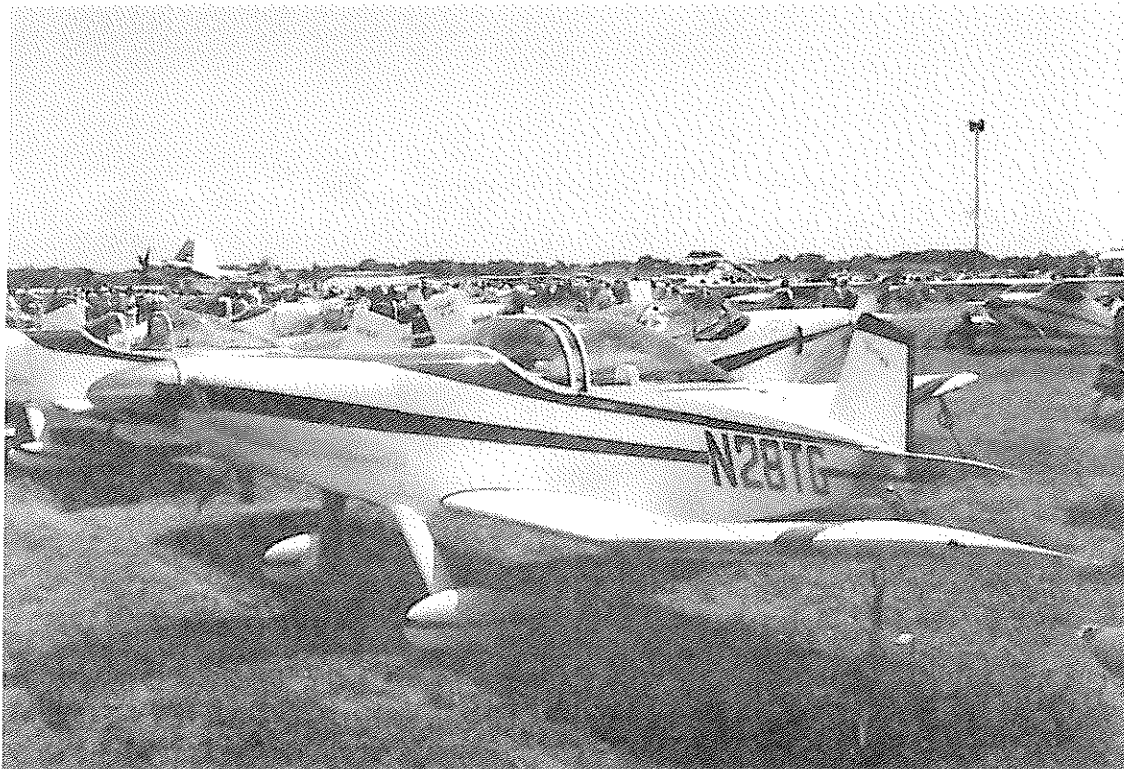




*Carl & Sue Daughters of Arroyo Grande, CA. Check out that different cowling folks!  
No two T-18 are alike. Ain't it grand!*



*Joe Gauthier of Cromwell CT, another first time at Oshkosh T-18. Beautiful yellow with  
green trimmed Thorp.*



*Bill Essenburg's Thorp, first time at Oshkosh, he's from Viroqua, WI, Nice work Bill!*



*And we have our winner for the "Best T-18 Oshkosh 96. It was built by Les & Margie Comwell of Lutz Florida*

# THORP Engineering Company

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P. O. Box 516, Sun Valley, California 91352

March 28, 1973

Col. Donald Taylor  
Star Route, Box 316  
Hemet, CA 92343

Dear Col. Taylor:

For your information, the T-18 airframe structure is designed in the F.A.A. aerobatic category at a gross weight of 1,250 pounds. The limit load factors for this condition are +6.0 and -3.0.

At 1500 # the maneuvering limit load factors are +5.0 and -2.5.

At 1600# they are +4.7 and -2.3.

At 1800# they are +4.1 and -2.0.


At 2000# they are +3.7 and -1.8.

At 2200# they are +3.4 and -1.7.

These load factors do not include the beneficial effect of any fuel weight carried in the wings.

Very truly yours,

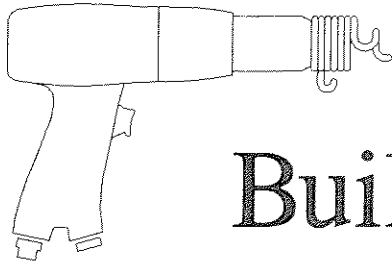
THORP ENGINEERING COMPANY

  
John W. Thorp

JWT:k

Editor's Note: I found this letter that John Thorp wrote to Don Taylor. I don't think this information has ever been in the newsletters. It's important because it is a reminder that at the airplane is designed around 1250lbs, and at higher weight the "G" capability is much less.





by John Evens

## Builder's Corner

Dear Richard,

It was good to see you and all the T-18 guys at Oshkosh. We are also planning to be at Placerville in September, weather permitting.

As promised, I'm enclosing a crude drawing of my oil separator. If anyone interested in building one has questions, they're welcome to call me (303-420-2724, evenings). A few comments- First, I wrote an article about a breather system for the newsletter, many issues ago, which used a check valve, and a tube going into the exhaust pipe. It is now my opinion, that is probably not a good way to go. It seems to work alright, but there is a possibility (strong) that the check valve or exhaust pipe tube will clog or become carboned up. I've done quite a bit of experimenting with oil separators and I think they're fine, but just dump your output overboard (down gear leg, or whatever). We go to such extremes, sometimes, just to avoid a little oil on the belly. Sometimes the old tried and true ways are the best ways.

About the separator-- It's light, compact, and as efficient as any I've tried. Keep in mind though, that even if a separator causes all vaporous oil to drop out and be collected, the oil will still creep along interior surfaces, and anywhere the air is going the oil will eventually find it's way also. Most of the oil is collected, but a small amount will come out. I let mine collect in the separator,

and drain it every so often. You can easily feed it back into the engine, but I don't like the dirty look of the oil that's collected, mixed with moisture, etc.

There are a couple of details not shown on the drawing. First, I use some "Scott" foam (air filter material ) loosely packed inside to increase efficiency. Since I did that, I added a little pressure relief valve to the top cap in the form of a thin, springy, stainless steel "reed" with a small rubber gasket covering a 1/4" hole, just in case oil and moisture froze in the winter and clogged the foam. The engine compartment is warm, but you never know. The thought of a blown propeller shaft seal is not pleasant.

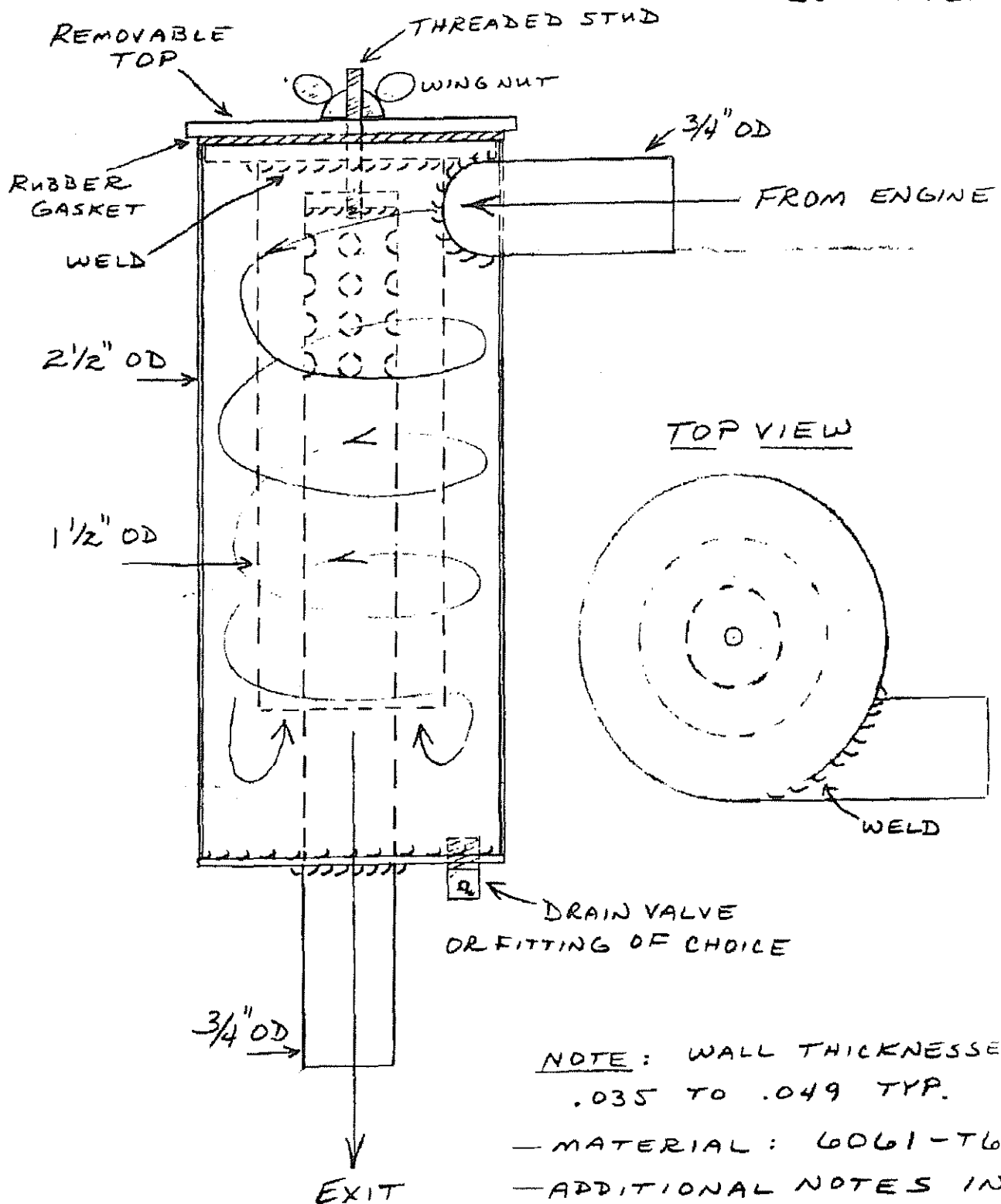
A few guys have asked me about the propeller leading edge tape. It is very effective protection against rock nicks & rain erosion of the leading edge. I haven't seen any performance problems, but I'd be interested in other people's experiences. I've had this stuff on the leading edges of my props for about 6 years now - it is extremely durable. It's a polyurethane tape with acrylic adhesive made by 3M. It has excellent UV resistance. It comes in 2 thicknesses -- #8671 is .014" and #8672 is .008" thick. I like the 3/4" wide #8671 tape. You can stretch it and make it conform to a curve. A friend in Boulder, Colorado used to sell it in a kit, but not anymore. Best Regards John Evens N71JE Arvada, CO

# OIL SEPARATOR

APPROX. FULL SIZE

BY:

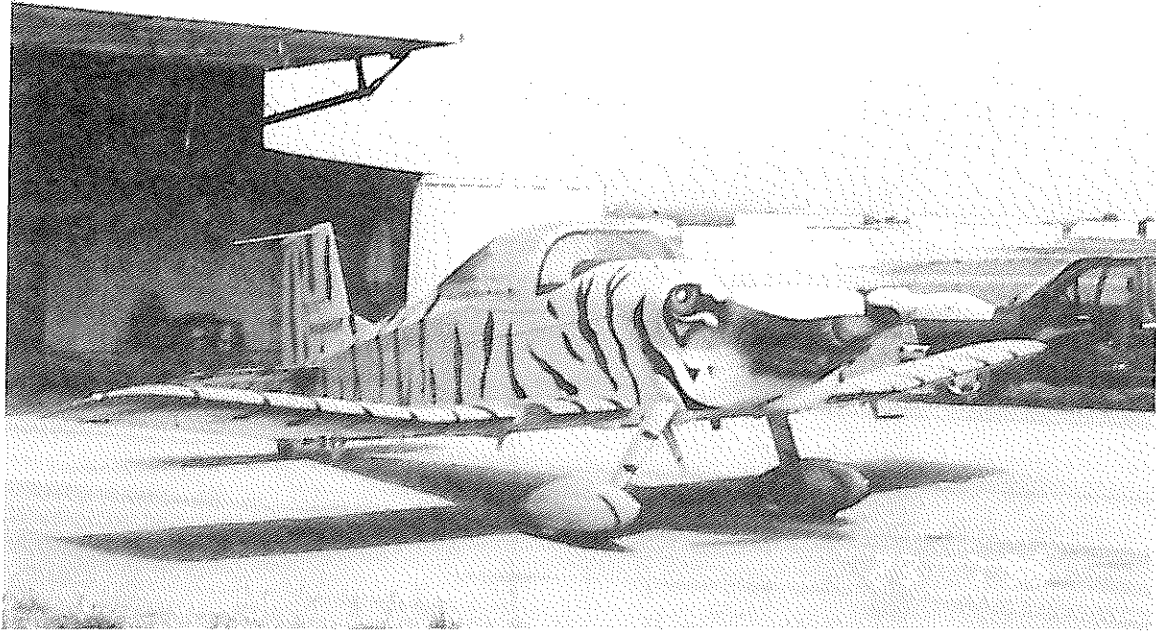
JOHN EVENS



NOTE: WALL THICKNESSES  
.035 TO .049 TYP.

— MATERIAL: 6061-T6

— ADDITIONAL NOTES IN  
TEXT.



## FAT CAT REPORT

by Harvey Mickelsen

### Why She Was a No-Show at OSH '96!

#### Performance Data

It was the night before launch to OSH. Fat Cat was positioned at Reid Hillview Airport in San Jose to get out from under the coastal fog that plagues Half Moon Bay in the Summer. I fueled the main and both wing tanks (a total of 56 gallons), stepped back and watched as the right wing tank started leaking! A pail was positioned to catch the fuel, and about 15 minutes later the leak stopped. Thinking that it was the sender unit gasket and that it had swollen when wetted by the fuel we put her in the borrowed hanger and I drove home.

When my wife, Steffie, heard of the fuel problem she decided that she was not going to go to OSH. There were just too many things not quite right or that were not fully tested. Disappointing as it was for me, I decided that I didn't want to go without her, so I canceled our trip to OSH for '96. It was a good decision when I looked at it from a more detached point of view. We then received a phone call that the tank had started to leak again and Fat Cat had been ejected from the hanger. The mag compass had not yet been swung, the airspeed indicator had not been calibrated, and the fuel pump and fuel injector servo only had two hours on them.

Shortly after the 40 hours were flown off, the engine driven fuel pump diaphragm broke. Stephie noticed fuel running out of the left wheel pant! At first I doubted her report until I remembered I had routed the fuel pump vent line to the gear leg to get it away from the engine compartment. I got a new pump from the mechanic who had rebuilt the engine and installed it myself. Flying with the new pump I could get no more than 10 gph flow, and the engine ran very lean at full throttle. It was the wrong pump! It was

only putting out 6 psi, my fuel injected engine needs a 30 psi pump. I exchanged the pump, and while at it, I got a rebuilt injector servo unit since the diaphragms in it had the same history. They had all sat dry for 17 years while I built the plane.

While you were enjoying OSH, I swung the compass and calibrated the airspeed indicator by flying formation with a C182. The static ports have been moved from the under-wing pitot tube to the aft fuselage correcting a large low speed error. The following tables give Fat Cat's performance today with a 180 hp 10-360 and a fixed pitch Prince prop. There are some improvements that will be made so the numbers will get better.

**Climb Rate:** 1300 fpm at 100 mph I 100 fpm at 120 mph (a more comfortable deck angle)

| <b>Stall Speeds:</b> | <b>Flaps</b> | <b>IAS</b> | <b>CAS</b> |
|----------------------|--------------|------------|------------|
|                      | <b>0 deg</b> | 68 mph     | 74 mph     |
|                      | 15           | 65         | 72         |
|                      | 30           | 63         | 70         |

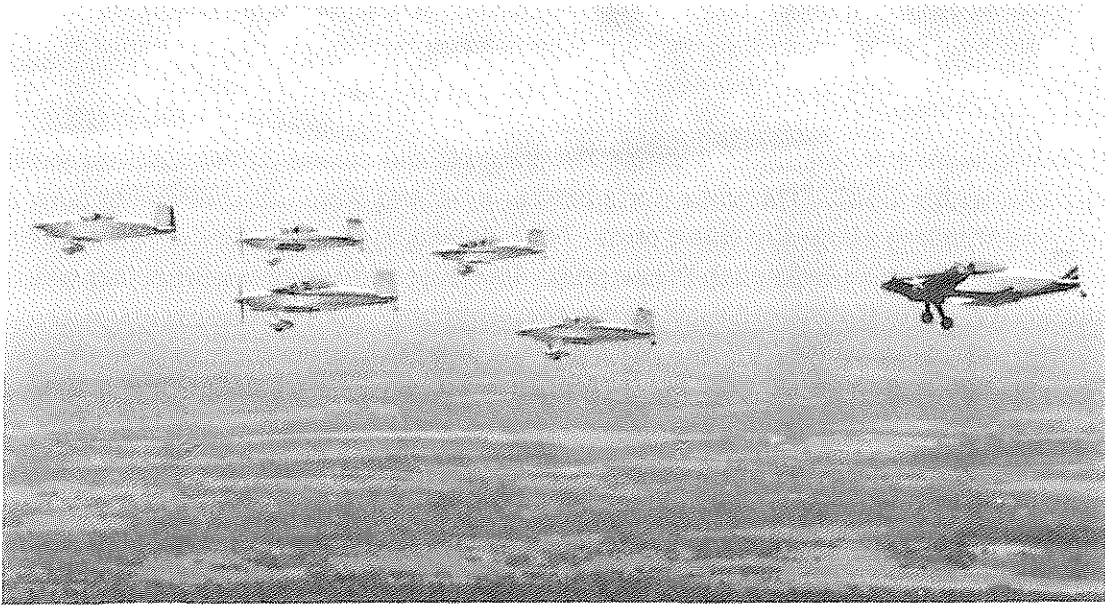
| <b>Performance:</b> | <b>Power</b> | <b>CAS</b> | <b>TAS at 7000 ft</b> | <b>GPH</b> | <b>MPG</b> |
|---------------------|--------------|------------|-----------------------|------------|------------|
|                     | 65%          | 145 mph    | 156 mph               | 8.5(1)     | 18.4       |
|                     | 75%          | 159        | 170                   | 9.5        | 17.9       |
|                     | 85%          | 172        | 185                   | 12.5 (2)   | 14.8       |
|                     | 95%(3)       | 186        | 200                   | 13.5       | 14.8       |

- (1) Best economy mixture
- (2) Best power mixture
- (3) Maximum with current fixed pitch prop

The basic paint job you see in the pictures was done by Don Copeland of Arizona Aeropainting in Eloy, Arizona. The job took 2 1/2 weeks with me helping every day. Temps were in the 100s every day, 110 3 days and 120 1 day! Every bit of the Bondo work I had done came off and the prep work took a week. Masking the stripes took me 3 1/2 days. A local flight instructor judges paint jobs by how close you are when you first see imperfections. The flying club plane has a 6 foot paint job. He says Fat Cat has a 1 inch paint job! I recommend Don if you have the time and the money and want perfection.

The face and paws were done by airbrush by Cindy and Kathy of Gilly's Signs in Placerville, California. They did the detailing on the latest Gee Bee to be flown (see Sports Aviation June '96, page 9 1). Fat Cat really draws attention on the ramp!

I intend to show her at Hayward, CA August 3 1, at the T- 1 8 Fly-In at Placerville Sept 6, the Half Moon Bay Airfair Sept 28, and the Tracy, CA EAA Fly-in Oct 5. Now the fun begins!



*Thorp's over Texas, Spring fly-in at Grandbury picture by Pete Reinhart's brother.*

## **T-18 FALL GATHERING KENTUCKY DAM VILLAGE STATE RESORT PARK**

**OCT 11-12-13, 1996**

Come to this event if you enjoy flying, flying, flying. It's true we do spend a little of the weekend looking at the gathered Thorps, but a lot of the time is spent giving folks Thorp T-18 rides. Kentucky Dam State Park Airport is 30 miles east of the Cunningham VOR (Paducah) on the 90 degree radial, 8 miles south of V178. The runway is paved, 4000 feet long. Phone number for the lodge is 1-800-325-0146. I doubt if you will be able to get a room there at this late date! Call anyway and ask for the Paine Party. If you can't get in there, try the Ramada Inn its not far. Bring your own tie downs.

## ABOUT OUR COVER

As I was going through the hundreds of Thorp photos in my file cabinet looking for just the right one to use on this very special 100th issue of the Thorp Newsletter, our friend B.C. Roemer sent me this great air to air shot. His timing couldn't have been better. The pilot and builder of this airplane, one of the first five to fly, is Bob Keargaard, of Chicago. It looks as if Bob and his passenger are having a great time in the open cockpit beauty. As B.C. states in his letter, this is where we started! The T-18 as John Thorp conceived it.

July 15, 1996

Rich,

Some T-18 pilots might want to know what its like to fly without a canopy as in the photo. As I flew in this airplane it was very pleasant-so to speak-but noisy! You didn't have to wear a helmet and could wear your glasses. The turtle back and doors keep this air flow on the tail fairly smooth.

Now more than one "modern" T-18 has lost a canopy in flight-and landed just fine.

We deliberately took our's off and Peter Roemer flew the pattern few times then I did the same. I can report that on take off and landing I could tell no difference than with the canopy on, but in cruise (if you want to call a loss of 80 MPH "cruise") of 130-135 MPH the drag is so great that's all we could get (we have an 0-360 fix pitch). The air noise is terrific. The tumbling air hits the tail and it is shaking to a point where something is going to let go.

So — If you lose a canopy—no sweat—just slow down to 90 or so and fly to an airport.

We flew at least 10 times—even to another airport—without the canopy. It's just not practical without the turtle back.

BC

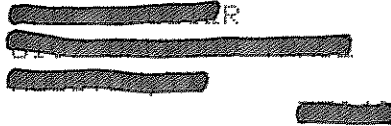
## The Thorp T-18 Mutual Aid Society

It the goal of the Mutual Aid Society and it's newsletter to provide an information exchange that will aid in the safe building and flying of T-18/S-18 model aircraft. Each of us who is building or has built a Thorp has spent time calling and asking other members, questions on the fine points of getting one of these air-machines together. Without the help of others, I'm not at all sure that I would have gotten that job done. As the fleet of Thorps exchange hands and new owners face the problems of maintaining and safely flying them, it becomes even more critical that we continue the sharing of past experiences and new ideas. It's through the contribution of this material by the members of the Mutual Aid Society that the newsletter will continue and contribute to all.

Richard O. Snelson  
Thorp T-18/S-18  
Newsletter Editor

T-18 NEWSLETTER  
ROUTE 3, BOX 296  
CLINTON, IL 61727  
1-217-935-4215

Issue #100, Sept 15, 1996



25

Red circle "No dues for 96" please!!

**Don't forget Kentucky Dam Gathering is Oct 11-13  
See you There!**

## FOR SALE

New MA4-5 Carburetor PN 10-464-1  
Never been used Asking \$1050

Woodward Prop Governor PN B210776  
Has 13 hours time since new, has been  
flushed, resealed tested and yellow tagged  
Asking \$800

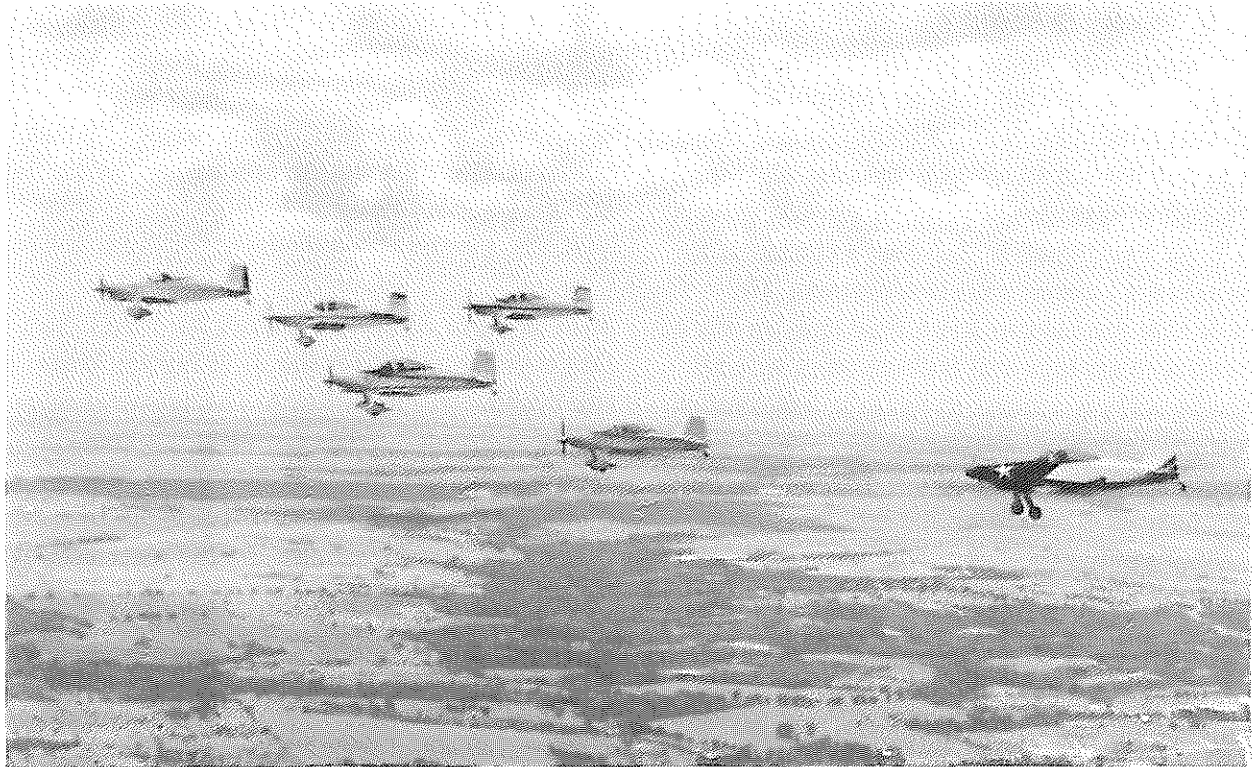
4 inch Prop Extension, \$175  
Call, Ed Ludtke at 605-361-2301

Hartzell HC-F2YL-IBF/7663A-4, 0 time SOH,  
Woodward Governor, Was on 0-320 LYC powered  
T-18, \$3900 or best reasonable offer. Dan Wolfe (513)  
864-2781 or E-mail AirLobo@aol.com

Thorp T-18wc, serial #001. TTAF 450hrs. TTEngine,  
550hrs. since new. Electric Stab. Trim. Aileron Trim.  
Electric Flaps. Cleveland Brakes. Scott Tailwheel. wing  
tip strobes, Lyc 0-320A2C. Harmonic Prop Balancer.  
4cyl EGT/CHT. 2 Terra 720 CH Comms.& Nav  
Recvs. Terra 350D Audio Panel/MKR/Inercom. Terra  
Xponder & encoder. Narco ELT. Flybuddy GPS.  
Annual due 12/96. \$28,000 Paul Eubanks (719)583-  
1230

*NOTICE: (STANDARD DISCLAIMER) As always , in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.*

# T-18 NEWSLETTER



*"Wings over Texas"*

## IN THIS ISSUE:

**Lessons Learned The Hardway**

**Wood Prop Care** *by Mike Demuth*

**5th Annual Placerville Fly-In** *by Jennifer Hill*

**Project Progress Report** *by Robert Clayton*

**"Bogey" "Bogey" "Bogey"** *by Marion Smallwood*

**Classic Sport Aircraft up Date**

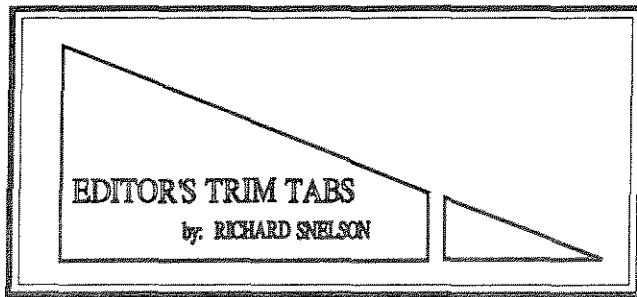
**Will the Real Bill Essenburg? -- Please stand up!**

**Kentucky Dam Photos**

**1997 Renewal for The T-18/S-18 Mutual Aid Society**

*NOTICE: (STANDARD DISCLAIMER) As always , in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.*





As the year winds down, the Midwest winter offers an opportunity for sitting in front of the south window and thinking about both the high and lows of another year of great flying fun and adventure. I want to tell you about a call that came a few days ago. The caller is looking for a T-18. He has owned two T-18s, a Glasair and now owns a Lancair with two partners. He relates that the Lancair has a fluid leak on one of the retract gear legs and both partners wonder when he will get around to fixing it. His answer, "You guys can have the darn thing, I'm going to get another Thorp. If I had a T-18 I'd be flying now, instead of sitting on the ground." What does that say for the T-18? Just as we thought, it's a classic airplane that provides great transportation and lots of flying enjoyment.

With the help of a couple of friends and the addition of a local internet service provider we now have a World Wide Web homepage. To find it point your web browsers at:  
<http://homepage.dave-world.net/~rsnelson/thorp.html>

I will post important information there. Both events and safety concerns, so add a bookmark to your web site list to make it easy to get back to it. It starts out with "Snelson's World" but don't despair, I had to call it my homepage to avoid paying special commercial rates for it. You will find info about Sun N Fun, Placerville Photos, and information about the newsletter. I will be adding T-18 specs and info on the suppliers of drawings and parts. One of the best parts of surfing the web is that homepages have links to other sites. I'll be adding them later. If you have

a homepage and want a link from the T-18 page just email me you http address. Please note I have a new email address:

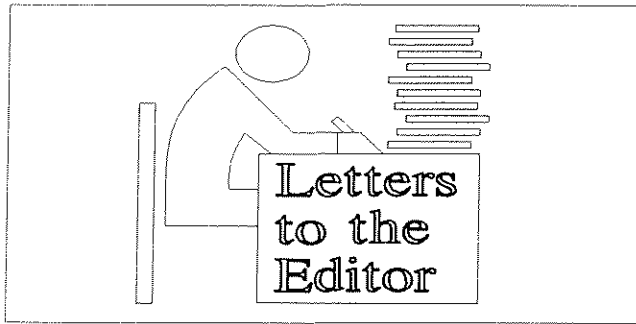
[rsnelson@dave-world.net](mailto:rsnelson@dave-world.net)

I gave up on America On Line when the local provider came to Clinton. No more long distance calls. I do think that AOL is the best way to get started with email and using the internet. I've tried to compile a list of email address but it's difficult. They keep changing as people move from service to service. Note, there is a free email service, it's Juno. They have an 800 number to call for information and free software. 1-800-654-5866.

Well let's get down to business for 1997! Sun N Fun is going all out for the T-18 bunch. Warm up you engines and head south. Join what we hope will be the largest gathering of T-18s ever on Florida soil. And then join the fellowship on Thursday evening when we cook the steaks. An to top it all off, award the "John Thorp Trophy" for the best T-18/S-18. How about that for a great event. See you there. **Classic Sport Aircraft is planning on rolling out their T-18/S-18 business at Sun N Fun '97 They have a booth and are looking forward to seeing and meeting you there.**

I am planning a T-18 Fly-In at Coles County Airport, Mattoon, Illinois. in May or June 97. It's a beautiful airport, nice places to stay, and hangar space for all T-18s that show up. There are several neat places to vist from there by ground and air. I'll have the details in the next newsletter.

On a sad note. There was a fatal T-18 crash on August 7, 1996, at the Double Eagle Airport near Albuquerque, New Mexico. The pilot, Howard Culbertson and his wife Marilyn were fatally injured. The NTSB report on the crash states that it appeared to be "Stall Spin related". Winds were around 30 knots at the time of the accident. Our thoughts and prayers go out to their friends and family.



From:

Lee English <wlee@hartcom.net>

I have picked up my Thorp from Tom Zuber in Columbus, Ga. It has 325 Total and 325 SMOH on an O320, 160 HP. It is a good flying airplane. I need the mailing address to send for the newsletter and back issues. If you would send me this plus any other helpful info, I will appreciate it. I tried to send you Email earlier, but have had trouble with my Email provider and don't know whether you received it. Looking forward to receiving the newsletters and will possibly see you at Lakeland. Thank you. Lee English



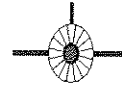
From: "Robert F. Clayton"  
rclayton@utah.uswest.net

Regarding the T-18 accident I mentioned earlier - I am trying to get hold of the pilot to get his permission to relate the story. I think it will be ok, but I haven't made contact with him yet. It was one of those stupid accidents that we could all learn from, and I don't think he will mind reviewing the events. More later. I am working on the cowling on my project now and also other areas. I was thinking of using a solenoid type primer on the firewall to keep one less gas hookup inside the cockpit. I am trying to keep things as simple as possible and this seemed to be one way of doing it. My 0290 has a complete priming system that was on the original engine. If the solenoid is a good idea, I will have only the main line from the tank to the shutoff and out the firewall which I like. Your thoughts on that idea, please. Regards, R. Clayton

From:

woof2@ix.netcom.com

I was very pleased to find the T-18 Society is still alive and on the Net!! In the mid seventies while attending college I became very good friends with the Late Francis Richardson and Dick Cavin. At the time both of these Gentlemen were in the process of building T-18's. Francis was engaged in building his second T-18. They got me all fired up and I began building one, #1151 I believe. It wasn't long till I met Dick Cavin's brother who was building a round back model T-18 I liked it so much that I followed suit. When Francis was killed in his plane, it took some wind out of my sails. I let the project sit for years, plus being government connected I've moved around a great deal. I would like to know price of your newsletters(book form) if they are available. I now reside in New Orleans, LA. I am also building the C folding wing and a type of Gull wing door arrangement. Thanks, Gordon L. Cronin jr.



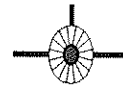
Subject: Howdy!

Date: Thu, 28 Nov 1996 13:02:37 -0500

From: BHigh22406@aol.com

To: rsnelson@dave-world.net

Just stopped by your site, (T-18 homepage) but you weren't home. Looks great, keep up the good work! Bob Highley (the other one)



Subject: HAO Builders Group

Date: Sun, 24 Nov 1996 19:54:17 -0500

From: GRAUM@aol.com

To: rsnelson@dave-world.net

Rich,

Just a short note to let you know how things are going. We're still plugging away on some of the "small projects." We've begun to assemble the rudder and have completed rib construction for

the horizontal stabilizer meaning we can begin to assemble that as well.

Joe Prokpop(?) flew down Saturday before last and Jim Paine and friends showed up last Saturday in beautifully restored (J-3) observer and a Luscombe. Certainly is nice to have them offer words of encouragement and advice. Best Wishes, Tom Graumlich



Subject: Experimental Wanted  
Date: Mon, 18 Nov 1996 16:01:30 -0800  
From: rkulp@atl.mindspring.com  
To: rsnelson@dave-world.net

Dear Richard,

Please keep me in mind if you come across a really nice T-18/S-18, Midget Mustang, RV-4, RV-6A, Glasair I FT or similiar sport plane for sale. I wrote you about a month ago after selling my Glasair I RG. Thanks, Bob Kulp P. O. Box 1102 Roswell, GA 30077 Phone: (770) 998-1794 FAX: (770) 992-8841



Richard,

I joined the T-18 M.A.S. @ Oshkosh,'96 & got to eat some "Brats" with the crowd. As a current T-18 builder it was exciting & inspiring and a confidence builder. Since Oshkosh we've had a small storm named hurricane Fran which has caused lots of upheaval in North Carolina. Among other damages my construction hangar @ South Raleigh Airport was flooded by a broken dam plus 9" of rain. The result was 4 1/2' of water & silt in and on everything, plane, tools, and building supplies. A lot of work later it is 95% cleaned up. Thankfully there is not much permanent damage. My T-18 is completely built, on

tis gear, 0-360 W/Hartzell C-Speed prop installed, fully plumbed static system, and all electrical & instrumentation installed. Got the radios & Mac aileron & elevator trims @ Oshkosh they are yet to be installed. We're getting close to engine test run time. Hopefully Oshkosh '97 will find another T-18 on the flight line. Thanks for being there to help in such a friendly manner. John E. Cotten 1541 N. Main St. Fuquay-Varina, NC 27526 Phone: 919-552-7123



1 November 1996

3618 Lancaster Road  
Erie, Pa. 16506

Richard

I was in the Air Force in the late 50s, stationed in Rapid City, South Dakota. A lot of people suffered hail damage to their cars in that area. I was told of a quick and easy way of getting the indentations out of your car. I never tried it so I don't know if it works. Solution — place a piece of dry ice in the center of the indentation and the metal contraction will draw the dimple back out. It is worth a try. Wish-you luck, John C. Buffington



Hi Richard;

I received your phonemail message and it was nice to hear from you. I printed another copy of the newsletter using another print style hopefully this one should be easier for your scanner. I'll drop it in the mail on the way home this evening (or I should say on the way to the airport). I'm helping my friend on some maintenance things on the 172 I've been flying. (Honest, they aren't breaking because I'm at the yoke!!) He's very generous to let me use his plane for my training for nothing - not to mention brave. The plane has been in his family since it was new ('69).

I thought Hal was pulling my leg the other day when he said he saw my picture on the internet! I couldn't imagine where & why. I told Mac & he said he would get online & see if it was true. Funny, I was on the World Wide Web & didn't even know it. I'm thrilled that it was somehow related to aviation. The whole saga of me flying is kinda funny ... not much more than a yr ago I had a hard time sitting in the right seat of the 172. Now I'm off the ground in anything I can get near - last week at the AOPA event at Reid-Hillview (that's where I'm based, as well as Mac & Hal) I went up with Robin Reid in his 1930 Fairchild KR21 - a real cool bi-plane. Mac & I fly often in his T-18 or I'm off practicing my own skills. I just soloed in August & Hal would like me to get into my cross country stuff soon (I think by Fri!!) He says with my experience we can skip the dual & go on to mini solo cross country treks. So, that's probably what I'll be up to on my next day off (Fri).

My Email address is:  
Jennifer.Hill@SiemensCom.com

I hope that's the correct one, our company just changed names again & dropped the name Rolm off the end of Siemens, so now its Siemens Communications. Anyway, give it a try or drop me a phonecall, that always works. So, when do you plan on getting this newsletter out?? I'm so anxious to see the finished product. I've never written anything like that before. But, Hal & Mac said I needed to have a reason to be at the event - not just to have fun, meet nice people & fly around in everyone's plane!!!

I better run, I've got some work stuff to do before I sneak out early to go to the airport, but I hope to hear from you and I'll drop the new print of the article off to you today. Have a good day, Jennifer 'Take me Flying' Hill

*Editor's Note: Thank's for the story about the Placerville Fly-In. I hope to make it out for the next one. I just looked at my first logbook and my first dual was from Reid Hillview, I think it was Mountain View then, with Amelia Reid. It was in November 1962 and in her L2 Taylor Craft, N66713. That might be the first year she instructed. I still remember her bluejeans and cowboy boots. Say hi for me if you run into her.*



**Wanted- Four three ring pistons for a Lycoming 0290 D, D2 or D2B with new piston rings.** These are quite expensive from the suppliers and if anyone has an 0290G that they have never converted and have these parts I am interested in them.

Question- My plans have Thorps upgrade for the balanced horizontal tail. He did this to control flutter at 200mph+ speeds. I have never seen a horizontal tail on a T-18 with this feature visible. Have builders opted to not incorporate this feature or is there another fix to this problem or is it even a problem?

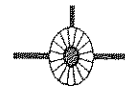
*Editor: I've only seen one T-18 without the tail mod.*

Question- I have been advised that there is a folding wing option that can be incorporated into the original fuselage. Who has/sells these plans as I am interested in them.

*Editor: Classic Sport Aircraft, see update from them in this newsletter.*

If there are other T-18 owners/builders in the central Florida area I would like to hear from you.

Thank you for your informative newsletter.  
Sincerely Jeff Wilde 183 Lawn St.Oviedo, Fl.  
32765 407-366-0512



Dear Rich, I have my Thorp T-18, standard body for sale. It was built by Jack Haynes and I am the second owner. The aircraft has 360 hours on it and the engine 50 hrs it was overhauled by Mattituck after a prop strike. It's a 0320, 150 hp. and is turning a Aymar Demuth prop. The radio and GPS is a KLX-135 King. Aircraft has new gyros and is equipped with a Mode C Xponder. My price is \$29,000. Thank you, Scott Keller  
Phone: 617-259-3153

# LESSONS LEARNED

## "the hard way"

Cleveland Brake Problems Again.....

My experience has proven that a dragging brake is a serious problem. If my accident isn't enough to convince you, then a letter from Rick and LouAnn Jones might.

THIS IS AN OPEN LETTER TO ALL OF THE T-18 PEOPLE

DURING OUR DEPARTURE FROM KY DAM THE LEFT BRAKE LOCKED AT 50KTS. THE AIRCRAFT GROUND-LOOPEd OFF THE RUNWAY AND NOSED OVER. THE REAL GOOD NEWS IS THAT NO INJURIES WERE SUFFERED, AND AS BAD AS IT WAS TO SEE A DAMAGED THORP, WE ACTUALLY HAD A VERY HEART-WARMING EXPERIENCE. WITHIN 3 MINUTES OF THE IMPACT, THERE WAS A TREMENDOUS TURNOUT (ALL) OF THE PEOPLE AT THE FIELD. THEIR (YOUR) MAIN CONCERN WAS FOR OUR SAFETY, AND FOLLOWING THAT WE HAD MANY OFFERS OF

- 1) AUTO AND AIRCRAFT RIDES TO ANY AIRPORT THAT WE COULD GET A DELTA FLIGHT HOME
- 2) TIME
- 3) EXPERTISE IN FIXING THE PLANE
- 4) LOANER PROPS, SPINNERS, BRAKES, TOOLS
- 5) OFFERS TO DRIVER 4+ HOURS TO MEET ME AT KY DAM TO FIX THE PLANE
- 6) AND IN GENERAL ANYTHING WE NEEDED!!!!

LOUANN AND I SINCERELY APPRECIATE EVERYONE'S CONCERN AND ALL OF THE HELP OFFERED. ALL OF THIS IS JUST A ROUTINE REAFFIRMATION OF THE FACT THAT THE T-18 GROUP IS THE ABSOLUTE FINEST BUNCH OF PEOPLE ON THE PLANET!!'

IT SEEMS THAT SEVERAL INCIDENTS HAVE OCCURRED WITH CLEVELAND BRAKES HANGING WITH NO PILOT INPUT. MINE WERE NEW (LESS THAN 30 HOURS) AND I HAD EXPERIENCED SOME DRAGGING WHICH I THOUGHT WAS A NUISANCE - I DID NOT THINK THAT THEY WOULD LOCK ON T/O WITH NO BRAKE APPLICATION. I WILL LET EVERYONE KNOW WHAT MALFUNCTIONED WHEN I TEAR THEM DOWN. IN THE INTERIM I STRONGLY SUGGEST YOU NOT FLY IF YOU SUSPECT THAT YOUR BRAKES ARE DRAGGING.

WE STILL HAD A GREAT WEEK-END AND LOOK FORWARD TO NEXT YEAR. THANKS AGAIN.

RICK AND LOUANN

And then for those of you that didn't read the first account of my brake fire:

During runup, a heavy application of the brakes, caused the right brake to partially lock.. Winds were 20 knots at the time and turning onto the runway didn't give a clear indication that the brake was dragging. When the aircraft didn't line up as expected I turned back off the runway. No pressure was needed on the left brake to control the taxi so I taxied about 500 feet after clearing the runway. At that time the dragging became extreme and the aircraft rotated in taxi to the right. My passenger exited the aircraft to check on the problem. Smoke was coming from the right wheel. Before I could get out of the plane the wheel was burning. The fire burned a wheel pant off and damaged the bottom skin of the wing. The fire was advancing up the gear leg cuff

toward the engine compartment when it was finally put out by an airport based fire dept that took 15 minutes to get to the airplane. Yes, I'm still pissed at them, but mostly at my self.

At Kentucky Dam, this year, I witnessed two of my friends (Jones) in their Thorp having a dragging brake on takeoff. It locked up completely after 75 feet of takeoff roll and caused them to veer off the runway. The aircraft nosed over destroying their gear and wiping out the prop. Thank goodness no one was injured. It's not extreme thinking that both of these accidents could have resulted in someone being trapped in a airplane.

In both of these cases, prior events had proven that the brakes were having problems. My Clevelands had locked up twice in the weeks before the fire. The first time, the problem was fixed by kicking the brake until it let go. The second time the assembly was kicked again and then later taken apart and cleaned. I had received the warnings but didn't go far enough with the maintenance. I didn't check the piston for problems. Jones' Thorp also had a prior problem, but they (Rick, sorry LuAnn) choose to put up with the nuisance and tried to kick the wheel and brake into submission. We both know that doesn't work.

#### Some of the Causes:

After my problem I asked an A&P, in our EAA Chapter, to go over the brakes and show me how he would maintain them. Most aircraft mechanics see a lot of brake problems and know what's necessary to prevent lockups from happening. He was a great help and I'm passing along some of his tips in this article.

When my new Cleveland brake assemblies arrived I found that older Clevelands have shorter pins or sliders. The outer calipers moves on the sliders as the piston pushes it. The older sliders don't extend far enough through the holes and when they get dirty or rusty they stick. When one side of the caliper sticks, it allows the whole assembly to cock sideways, this in turn allows the piston to

cock and stick. Kicking or hitting the assembly may loosen the piston and free up the brakes temporary. I learned that the first lockup often damages the piston causing a burr. This will cause later lockups and the problem only gets worse. The newer Clevelands have pins that are about a half inch longer and extend nearly through the holes. This provides less chance for the ends to get cocked in the holes. The longer pins help but without proper care the dragging problem can still occur when they rust or get dirty.

I now perform maintenance on my brakes three times a year. With the brake calipers removed, I clean the pins using a Scotch Brite pad, rubbing until they are semi-polished. They using a 1" wide piece of the same pad stick it through the holes and scrub until they shine. If the piston has locked up or been sticking I take it out to check for burrs and to check the o-ring. Removing the piston will make it necessary to bleed the brakes, it's worth the extra effort, to eliminate a potential brake lock up.

Don't put any grease in the pin/slider areas. All this will do is cause the whole thing to collect dirt and gum up the works. Use only dry graphite spray on the pins. Spray it on and let it dry for a couple of minutes. Reassemble the brakes and check carefully to be sure the brake lines and fittings don't cause any binding when the brakes are applied. It's a good time to pack the wheel bearing while doing the brake work, don't over grease. I think there was too much grease floating around in the axle area when I had the brake lockup. It caught on fire first.

I have heard other methods for fixing this problem, but believe, there is no substitute for regular maintenance. Once the problem occurs the piston should be pulled and checked for burrs. If you have older Clevelands, consider replacing the sliders.

**\*\*Don't taxi when the brakes are dragging.\*\***

# Wood Prop Care

Contribution by:  
Mike Demuth

Aymar - DeMuth Propellers  
8213 Elberta Dr. Ellicott City, Md. 21043  
Phone: (410) 461-4329

Thank you for selecting a high -performance Aymar- DeMuth propeller. We are confident that you will find it to be of quality workmanship and performance. All of our propellers are designed and hand crafted to meet your specific needs.

We take great pride in our work, that is why we carefully give the prop a final inspection before shipping to assure that it is perfectly balanced and that the track is less than 1/8" tolerance.

To store: Position horizontally on hub or hang from center hole. Once installed, always leave in the horizontal position.

To install: Insert waxed bolts through crush plate then through the prop and into the flange. (Note: do not bottom out bolt in the nut.) Tighten each bolt 5ft./lbs. at a time. Be sure to tighten bolts that are diametrically opposite.

Torque: 5/16" diameter bolts 11 ft./lbs. on a 5" diameter hub

3/8" diameter bolts 18 ft./lbs. on a 6" diameter hub

7/16" diameter bolts same as 3/8"

1/2" diameter bolts 28 ft./lbs. on a 7" diameter hub

**Always torque the prop when the engine is cold !**

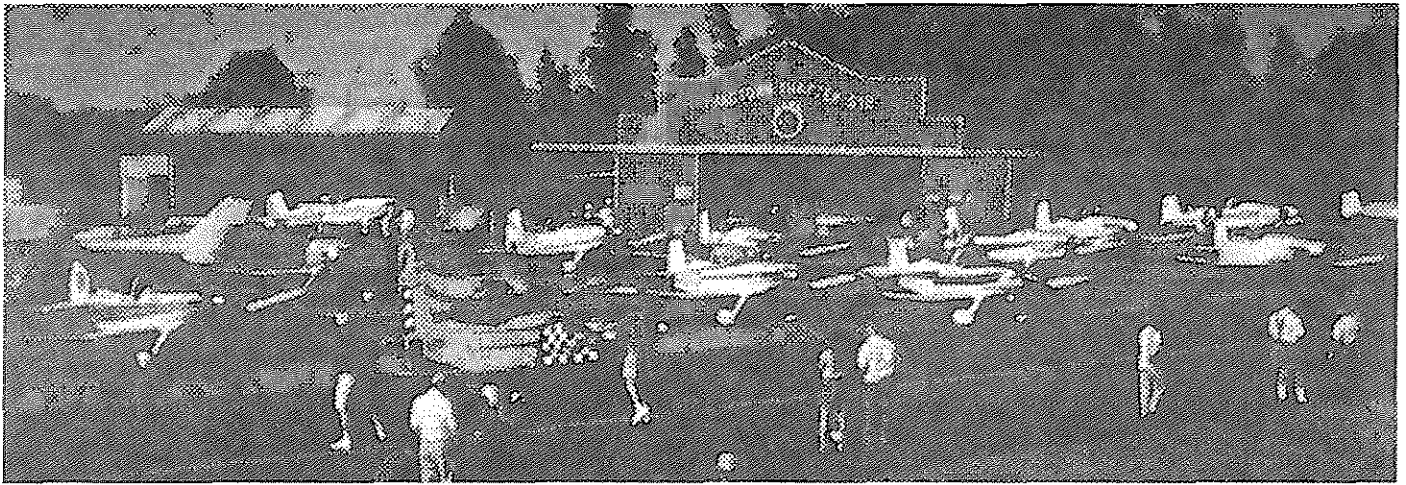
Retorquing: Check after first flight and after 10 hours. Then approximately every 25 hours. Also check if the plane has been inactive for a long period of time. Install shims where necessary to insure proper tracking. Safetying: Be sure to safety wire in the proper direction.

Even though our props have an ultra-violet sunblock, we recomend that you cover your prop whenever possible. Reduction of air speed and RPM should be practiced when flying In visable moisture. This is not necessary, when using our IFR prop.

Inspect and clean every flight. If any nicks are found, reseal with a good polyurethane. For minor damage fill with any good wood filler to just above the surface, when hard, sand flush and seal with polyurethane. Rough spots on the leading edge protection should be feathered smooth by light sanding. Don't put off refinishing timel Balance should also be checked. Your satisfaction is guaranteed when you fly with Aymar-DeMuth. Questions ?? Just call us !!

*Editor's Note: Thanks Mike for the advice, sounds like it can be applied to any wooden prop.*





## The 5th Annual Thorp T-18 Fly-In Placerville, Calif.

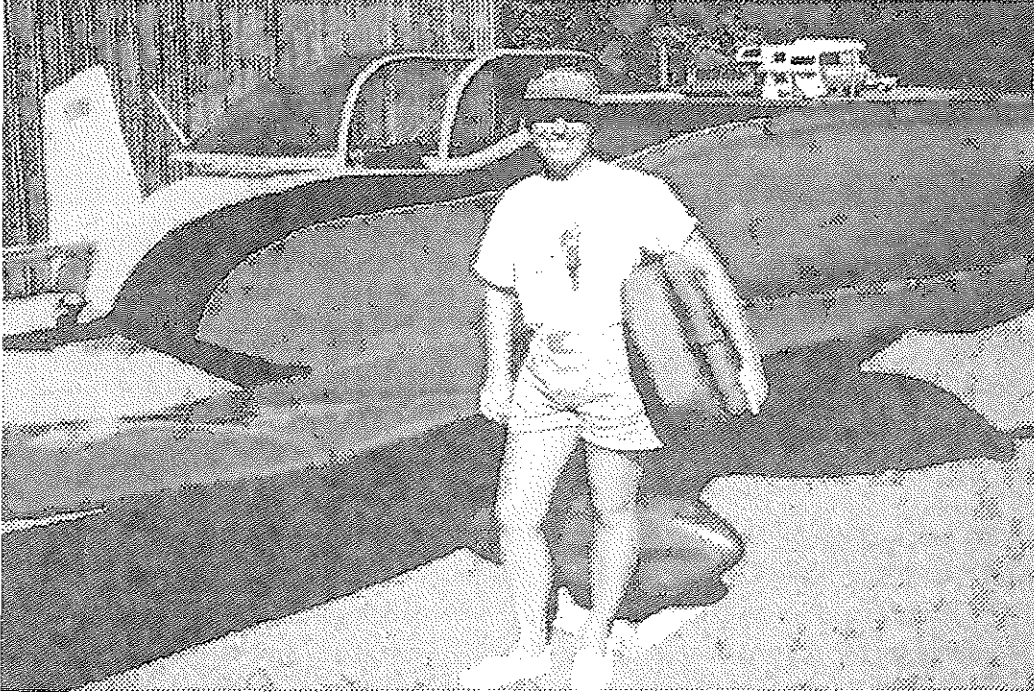
A spectacular weekend was enjoyed by all that attended the 5th Annual Thorp T-18 Fly In. The event was held Sept. 6, 7 & 8 at the Placerville (aka Hangtown) EAA Chapter 512 hangar. This years festivity drew 32 Thorp T-18's & 1 Sky Scooter and it was noticed that there were other non-Thorp T-18 aircraft in the proximity as well. Attendance for the event was roughly 70 people, larger than the previous years and it felt much like a family reunion for Thorpians. Although most of the travelers were from all parts of California others flew in from many different states. Amos Rauck, David Hamilton, Brad & Sonia Chapman, Brad Janzen arrived from Oregon. Ross Mahon came from Washington. Gary & Maxine Green winged their way from Texas. Al & Helen Chivers, Ann & Vern Lack traveled from Idaho. Dean Cochran, John Evens journeyed from Colorado. And last but not least was Bob & Traci Leider, Norm & Brenda Hibbard, Bob Park, George & Barbara Leider, Wes & Edwin Brush from Nevada. Hats off to those of you who ventured from these greater distances to be a part of this occasion. (I hope I didn't forget any names !) A generous write up in the local Placerville newspaper by the Critchfield's brought local town folk up to see all the beautiful home built T-18s first hand.

Great weather was on tap for the weekend which made for perfect flying conditions for those who offered rides to interested aviation enthusiasts or sitting in on the T-18 forum directed by Lyle Trusty. Visitors who wanted to venture down to Hangtown or up the road to Apple Hill were shuffled by the local sponsors Jim & Lillian Critchfield or Hal & Nancy Stephens. Once the bugle was blown by the bugle boy himself Hal, the long awaited Champagne Cork Fly Off contest was held on the taxi way. Taking 1st place was Gus Gordan, 2nd place to Mac Booth Jr. & 3rd place went to Sonia Chapman. This was Gus's second 1st place victory, we'll wait for next year to see if he can retain his champion status by pulling in a three-pete. Everyone celebrated the day by sharing & savoring the champagne and waiting for the feast that followed. And what a top notch feast it was. Steaks were imported from the Bay Area by Mac & Rena Booth and bar-b-que'd to perfection. Salads, dips, beans, tasty deviled eggs & more fresh Apple Hill pies than anyone could imagine were also on hand. After dinner a raffle was held and various aviation items were won. The 4 (or was it 5) T-18's from Nevada departed in the afternoon sun and flew a striking formation over the area and off towards the Sierra Nevada's.



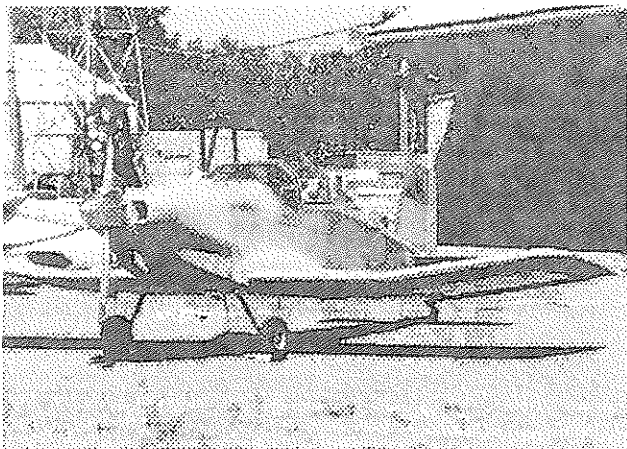
This years fly in brought together great people, beautiful T-18's and was lots of fun as well as successful. Special Thanks go out to the people who worked to put it together: Nancy & Hal 'Bugle Boy' Stephens, Lillian & Jim 'I want to fly my T-18' Critchfield and Rena & Mac '2nd place Champagne Champ' Booth. Also, Thanks go out to all of you who joined us this year and look forward to seeing more new faces & new planes at next years gala!

Written & Submitted by: Jennifer 'I want to go Flying' Hill Student Pilot & potential future T-18 owner



*Jennifer "I want to go flying in a T-18" Hill*

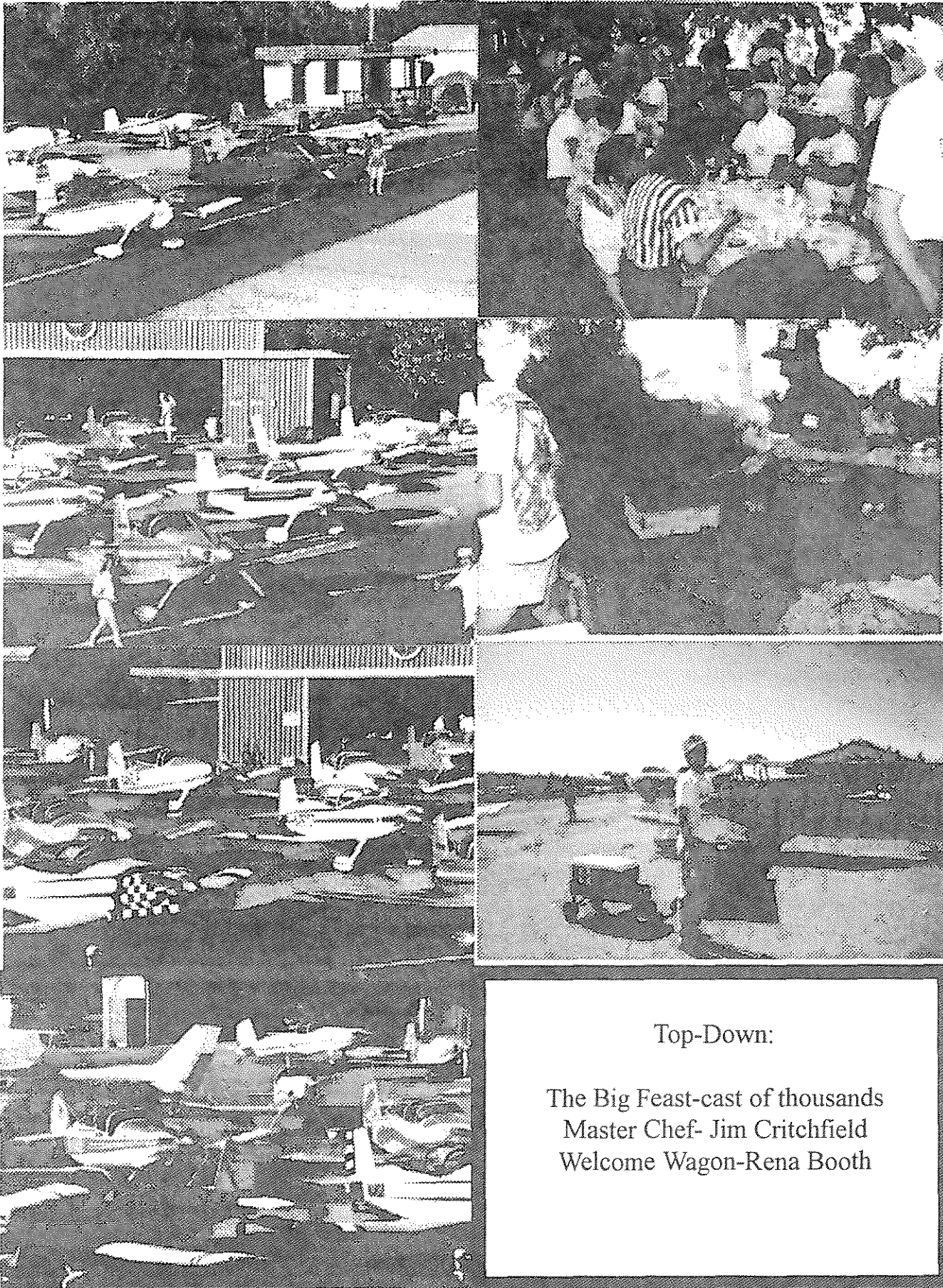
*Reporters Personal Comments; I want to thank the nice guys who gave me rides in their T18's & were brave enough to give the stick to a student. Bill Jennings & Dave Tennant. I got a particular thrill when Dave handed me the co-pilots stick that he keeps in the back of the plane during the flight and told me where to stick it. I did & we zoomed all around to the tunes of Top Gun! Bill asked me if I knew the way to Georgetown, (doesn't everyone?) I showed him and we did a touch & go. My special thanks to Mac Booth for flying me up & back. I had a 'blast' and have a few bruises to show for it. Maybe I'll be invited back next year. Currently, I am a student of Hal Stephens & am learning to fly in a friends Cessna 172.*



*Jim Critchfield's N8TT Ready for the first flight.*



*The Winners, Gus Gordon, & Mac Booth  
Hal Stephens giving congratulations.*

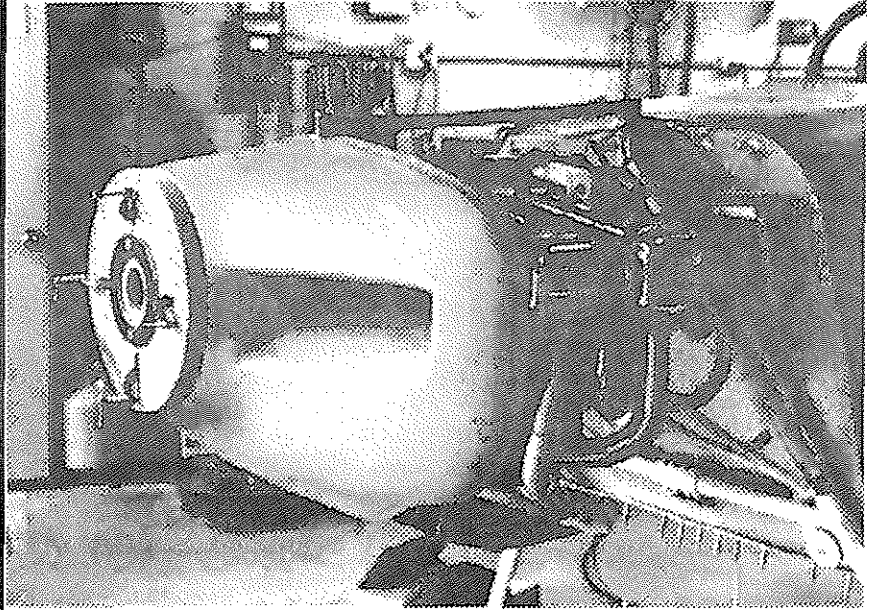


Top-Down:

The Big Feast-cast of thousands  
Master Chef- Jim Critchfield  
Welcome Wagon-Rena Booth

## Progress Report

by: Robert Clayton



*My method to lock the nose bowl in place. Since this was taken, I have added another 3/4" spacer disk next to the nose bowl to compensate for the flange on the rear spinner bulkhead. 1/4" space allowed between nose bowl and spinner. If Dean Cochran's exhaust looks a little shiny, it is coated inside and out with the HPC Thermal barrier coating. They claim it will never discolor.*

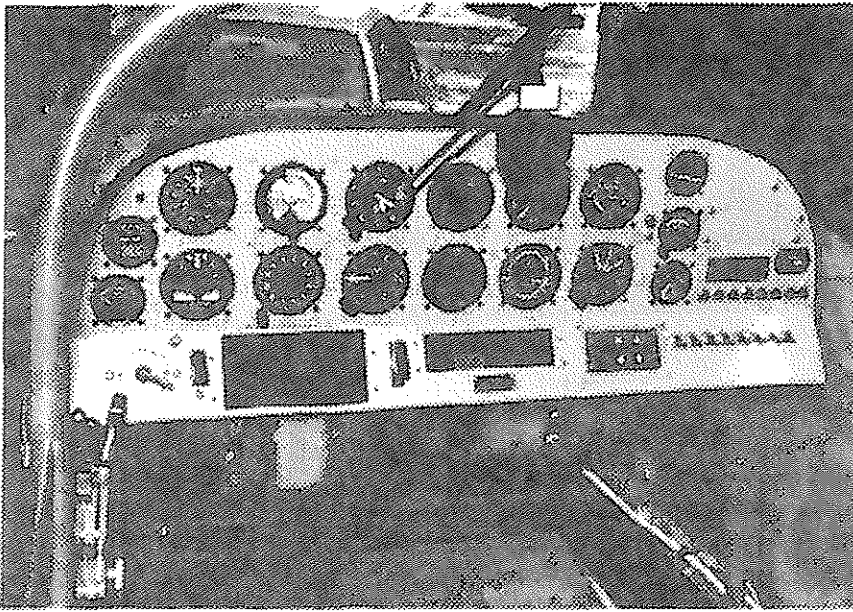
Now for an update. I retired last Jan. and I can't understand why I ever had time to go to work. Anyway, I had some retirement incentive coming and I decided to do something with my mouse motor (0290 D), so I went to work on it.

I really started in earnest when the FAA mentioned the fact that I may have a bad crank, and since my crank had been sitting around since 1960, I had it checked with a good shop in Salt Lake and they saved it. I went from there and did everything. The only original parts were the case, cylinders, rods, some gears, push rods and rocker arms. Everything else is new. I chickened out putting it all together myself and turned it over to the engine shop. They yellow tagged the crank and rods, but not the rest since I had piston skirts, valves, valve springs coated with special thermal barrier coatings by HPC High Performance Coatings used on Indy cars and elsewhere around the country. I'll send some info on this company with some pics I am just finishing up.

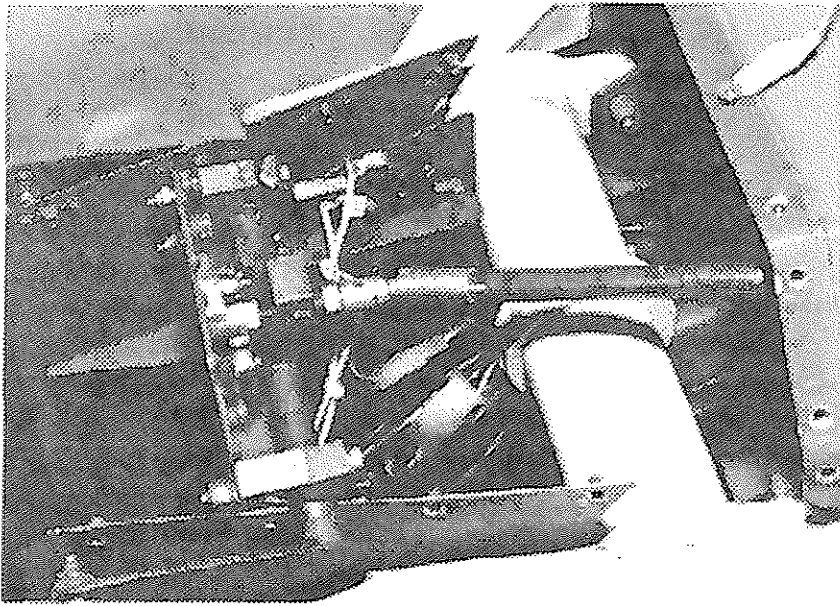
Well, my mouse motor is on the mount and partially hooked up. I think I resolved my trim system ok, especially after receiving the correction in the newsletter, which made a big difference. I installed the limit switches per the drawing in the newsletter (that was a cute little process to get it right) - pics to also follow showing my installation. My tail section is finished. With a bad back, I don't ever want to crawl back there again, especially with the push pull tube in place. Battery installed with wiring. No starter yet. Ran out of money for a while (Honey do projects took over for a while this summer).

About 75% of the wiring done. Instrument panel in and almost wired. Have installed a SkySports fuel probe in my tank (not cheap, but simple). Misc. other things accomplished and right now I am starting the cowling (now there is a fun little project!). Several Oshkosh's back I saw Gary Cotner's cowling and I decided that was for me, so that is what I am working on. My last trip to





*My 3rd panel- I would like to make another one but you have to stop sometime and live with it. A 9 mag on left, RST Navcom over my knees, master switch left, start right--Transponder center, ACK ELT test center, RST Intercom panel mounted, RST omni top center, Heathkit clock below - nice because it displays local and GMT together. I do have a clear view of the tach when I'm seated. Gary Cotner's throttle quad on the left.*

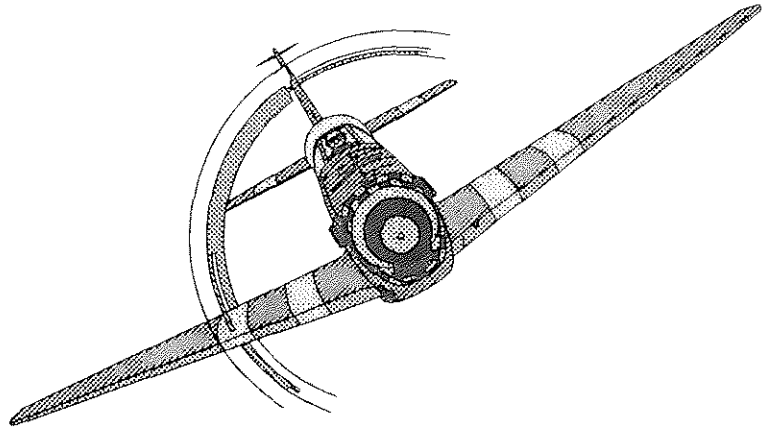


*Trim limit switches according to newsletter article. I had almost 3 turns from center on the jack screw when I started and after installing switches I'm down to 2 1/2 turns. Adjustment of the switches needs wiggle room. I guess if you put in the most expensive Army/Navy switches you could narrow down the adjustment.*

Osh was three years ago and I took a few pics (should have taken more and also taken some measurments), so I am sending (today, infact) some pics of my progress and my method of securing the nose bowl. Well that is about it for now. I have a lot of questions to ask but will work on them later. I can't believe I have been at this since 1973. Fortunately, I am in pretty good health and there is light at the end of the runway. I'm not giving up! Regards to all, Robert Clayton

# "BOGEY!" "BOGEY!" "BOGEY!"

by:  
Marion A. Smallwood



As many of you know, I bought the Dawson Thorp T-18SP, a single place retract, shown in the 1994 winter bulletin with the V-6 T-18 and several other attention-grabbing T18's at Kentucky Dam.

I was initially suspicious of the O-320 in the airplane. But beyond suspicion I wanted climb power and effortless cruise with smooth safe performance, knowing for sure what was inside the engine of such a high wing loaded airplane. So, I acquired a VO-360 A1B vertical Brantly helicopter engine for certified rebuild to replace the O-320. Since it had been flying for several hundred hours I thought it was safe enough for checkout. But, that 200 mph low pass at Kentucky Dam came back to haunt me. The O-320 turned out to have three unrepairable cylinders. Although it appeared excellent to the eye, the crankshaft had cracks on the-main bearing surface and small cracks on the side of the first journal. There was end play wear which allowed pressure on the front seal from any possible reverse thrust. Five lifters and gears were bad as well. The cam and rods made it, but the case, while cleaned, was not checked since the other main parts failed. Recently from log book compression data and first compression data I estimate the O-320 was putting out 125 hp instead of 150 hp.

There was a lot of research involving the O-320 from the T-18SP to see if it could be rebuilt worth the money for resale. No matter how I figured it, after I found four O-320 cylinders already machined for \$1000, the O-320 only made sense for an individual to build it up for himself, certified, at a cost of about \$8500. With no financial room for re-sale it would be trading dollars. I was offered a salvage price of about \$1700 which I will probably take after O-360 installation. Traded back for new parts, it will be crushed at Lycoming.

Some of the research was necessary just to go through part numbers that had been superseded several times in order to get a current part number, such as for rings which turned out to be standard for the O-360 and the Lycoming O-540 six cylinder. The pistons are, however, four ring with the fourth ring, a compression ring, acting as an oil scraper. I balanced the pistons and crankshaft and when two rods didn't have enough material for the AD bolt mod, I acquired a set of closely matched rods.

The engine came with an altitude adjusting carburetor and retard breaker shower of sparks mags, designated by the A1B in the VO-360-A1B. But after the Kentucky Dam conversation on mags and the engine builder's opinion, I will use the Bendix impulse mags from the O-320. I will keep the altitude carburetor which is now yellow tagged. I like the idea of a simple carburetor leaning itself as the pseudo P51 rapidly gains altitude. Unlike a pressure carburetor, it simply leans the engine according to barometric pressure.

The prop has been disassembled and inspected and verified to be in excellent shape. The variable pitch 71" prop has a narrow blade. Following a prop discussion in Texas at Pecan Plantation I came away believing that was very appropriate for the installation and dropped my fantasy about a three-blade prop.

As if there were not enough frustration in the engine buildup delay because of a spare time deal out of hand, I became committed to getting a Defiant to replace my 195. A real nice one from an estate was sold out from under me at the last minute after I went to look at it just before the Texas fly-in. It was like a factory made aircraft, but I learned from the FBO line chief it had a prop strike. The prop had been mysteriously repaired and put back on the aircraft without a log book entry. (Lycoming says an engine MUST come down for inspection after any prop strike.) The widow wanted to check it out before accepting a deposit and lower offer. As a result, the A & P who was to annual the airplane bought it out from under me. He was alleged to have been a friend of the builder.

Last year after Kentucky Dam I had flown a Defiant which belonged to a gentleman who has built three Thorps and owned two Defiants. He was going to take my 195 on his Defiant, but sold it for cash and told me afterwards. So, after a year of this I have decided to reject the Defiants as part of a learning experience, especially since I realized in the process I was actually going to give up the 195 after 21 years, a roomy cabin "Businessliner" with cockpit room like the DC3.

I have learned there is no end to the "rest of the story" on Lycoming engines. There are many important details not covered in the service manuals and always "something else." There may be some late AD or late Service Bulletin just out that may affect a lot of variables in the overall picture. For example, the recent Service Bulletin on rust in a hollow crank has not only cost individuals a lot, but has driven up prices overall. It is motivating some greedy individuals to falsify yellow tags on red tagged crankshafts, according to an FAA repair station manager.

It would be very difficult for a homebuilder to know he is keeping up with all of this. An A&P of our own suggests the best thing to do is have your engine built by or in cooperation with a quality FAA repair station engine shop. Perhaps you can follow the engine closely as they build or help you build your engine. Yes, more money, but it may be excellent insurance money. I trust you would make your deal so it doesn't take as long as did mine!

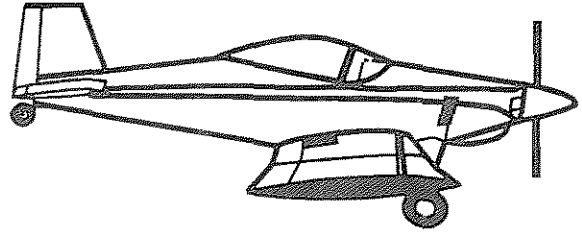
But, unless a homebuilder of an engine has been intensively involved in engine building, and is therefore humble, he may not be aware of all the nuances necessary for safe engine building for himself, "a loved one"...or, of course, his family and friends for that matter. *'I Mean, I Mean,'* after all those building hours the bird is a "loved one"...even to the family who too made sacrifices to its construction.

Even though I'm not a builder, Mr. Dawson proudly built a one-of-a-kind bird that fit my fantasies for which he gave; much credit and appreciation to John Thorp in a letter in 1972.

If I'm relatively safe with the big Jake in the 195 with a feel like a B-17 ... well, Beech 18 anyway, then I choose to build an O-360 certified airworthy engine rather than a certified for experimental for a feeling of safety as I fly the Thorp pseudo P-51 looking for another 195 to escort, or a squadron of Thorps to join ... if they don't scatter for safety, announcing "Bogey" on the radio.

Marion S. Smallwood, ED. D. R2 B327, Lowell, AR 72745 Phone, 501/756-6565

## Classic Sport Aircraft Update



Date: October 28, 1996

Hi again from Classic Sport Aircraft (CSA). We just returned from the EAA Copperstate Fly-In and had a great time, met lots of builders and potential builders. There were 4 Thorps at Copperstate - 3 ea T-18's and 1 ea. S-18. It would be great if more Thorp owners could fly to more of the fly-in's so that Thorps are well represented.

We have been very busy building and shipping parts - perhaps not quite as fast as everyone would like, but we are making progress and are continuing to set up new suppliers.

1. We are now shipping the canopy frames in three pieces with pieces of tubing supplied for adjustment and connecting them together (no welding required). The best part is they can be shipped UPS which saves a great deal of cost over a truck delivery.
2. We are also working on kits. We are planning on being able to supply kits in time for Sun & Fun.
3. Working on a Logo so we can get some shirts, patches and hats made. We have had many requests for these items.
4. What do all of you think about having a 'special name' for the S-18—NOT Wide Body, but a good name like the T-18 is the Tiger, so let's hear from some of you with some suggestions. E-mail is [TI8Thorp@AOL.COM](mailto:TI8Thorp@AOL.COM) or drop us a line.

One of our goals is to update previous drawing changes or clarify items listed. We will start including these in the Newsletter for all to see. Anyone requiring information, please don't hesitate to call or drop a line.

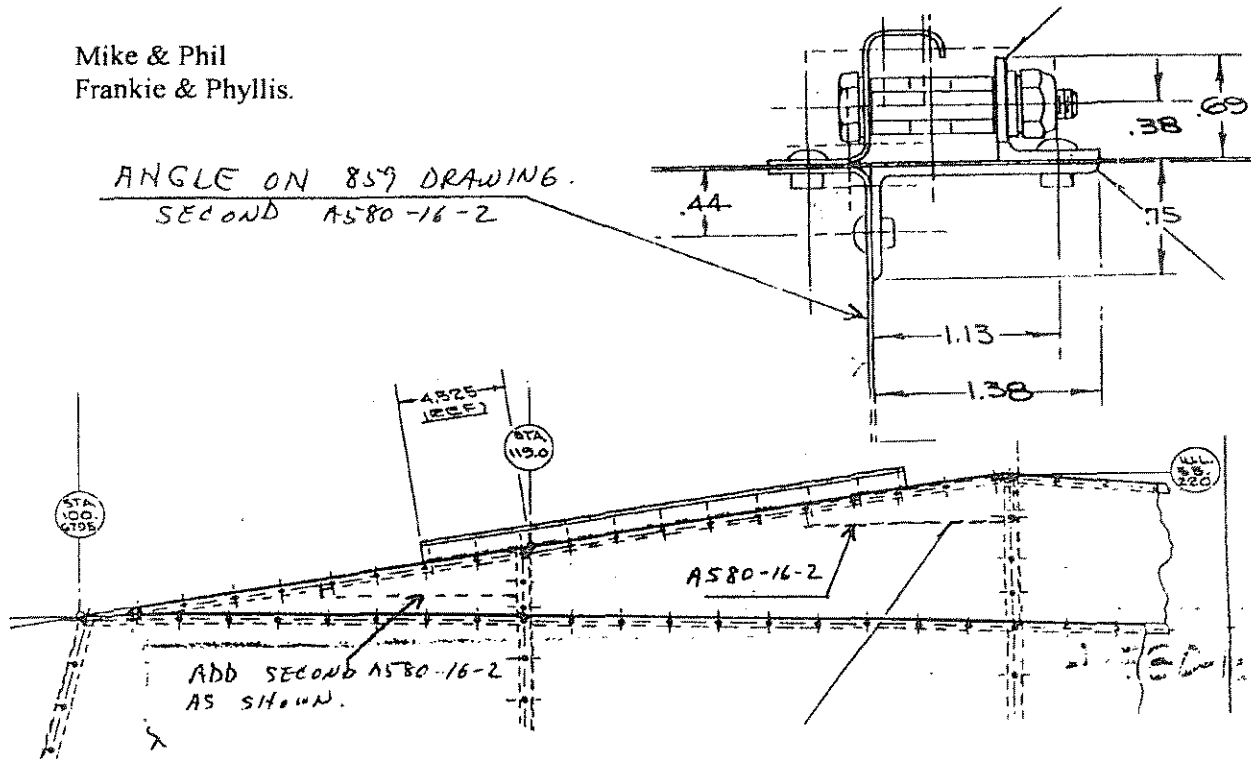
Drawing #859 has an angle not identified. It is P/N A580-16-2. A bracket riveted to the underside of 669 opposite the canopy rails. For added support add a second bracket A580-16-2 just forward of Station 119.0. See picture on the next page.

Also, we are negotiating for canopy prices. Anyone ready and needing a canopy, please call. A larger order at one time will help the cost for everyone. LET'S HEAR FROM YOU!!

Mike & Phil  
Frankie & Phyllis  
Phone: 209-539-2755

Mike & Phil  
Frankie & Phyllis.

ANGLE ON 859 DRAWING.  
SECOND AS 80-16-2



## FOR SALE

### T-18 Parts for Sale:

Walking Beam complete 550  
Sockets 552 (2)  
Plates 553 (4)  
Bushings 554 (2)  
Beam Assembly 551  
-2 Link  
Available: Main beam parts,  
522 Fittings (2)  
556 Control Mountings (2)  
-4 Spacers (2)  
-5 Fittings (2)  
537 Main beam inner wing, miss drilled holes in  
top  
of spar.  
All parts from damaged T-18, used \$150 all plus  
shipping

Elmer Hymen  
201-444-7432

### Parts for Sale:

Set of Plans, standard body  
set of ribs, fiberglass wing tips, Horiz tail spar &  
doubler, fiberglass horz tail tips, fuel tank, nose  
bowl, prop spinner, main wing spar ext. & web.  
S/S firewall, aileron counter weights & arms.  
main wing fittings for spar to outer wing, outer  
wing spar material, rudder peddals, control stick  
socket fittings, aileron bell cranks, main wing to  
fuselage attach brackets, aileron & flap ribs,  
some trailing edge tapered ext. material. various  
Alum. angles & piano hinge, windshield rollover  
bar and other stiffeners and fittings. Price for the  
lot is \$2500 or best offer.

### Other items not included above:

1 New Carb air box. \$145  
Set of 500x5 Goodyear wheels/brakes & axles  
\$225

Contact Jim Putney 1707 W. Lavender Ln.  
Arlington, TX 76013  
Phone: 817-469-9391



*Will The "REAL"*

***BILL ESSENBURG***

*Please standup*



*Will the real Bill Essenburg please standup? Here he is folks!  
Ok, so your editor and a couple of other folks made a mistake.*

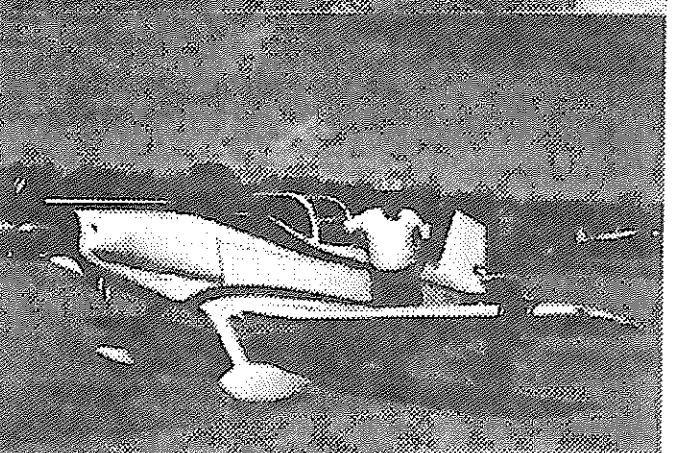
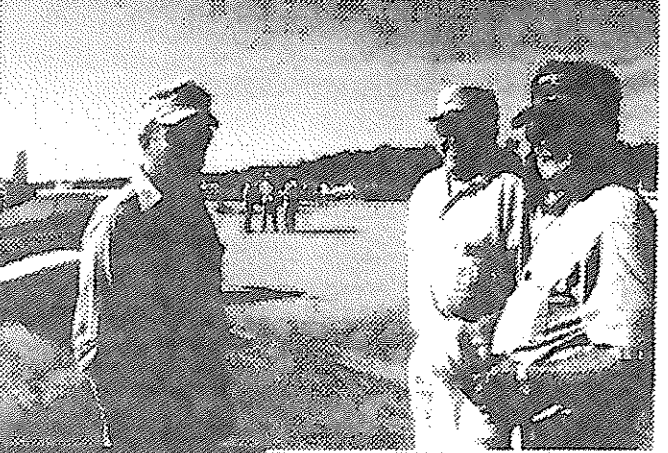
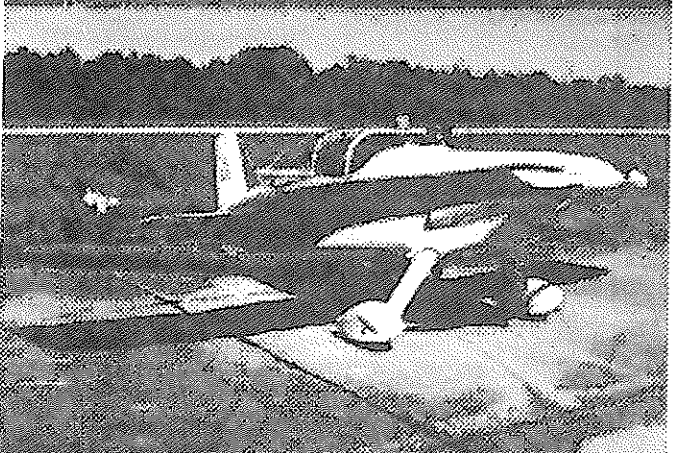
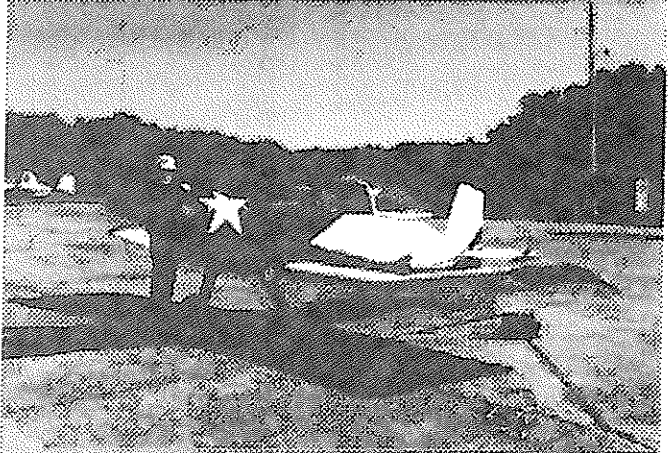
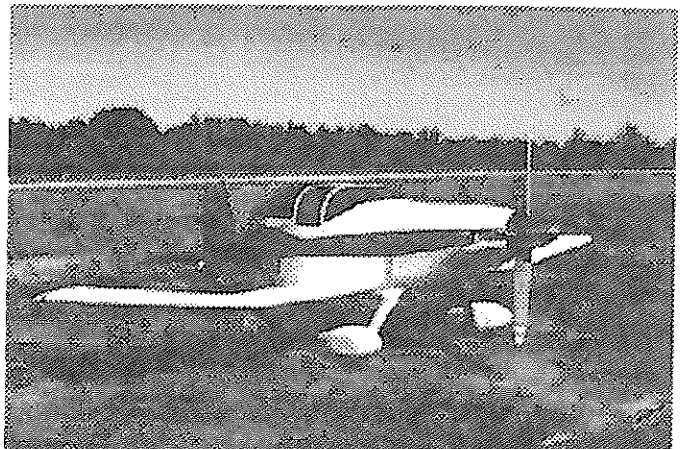
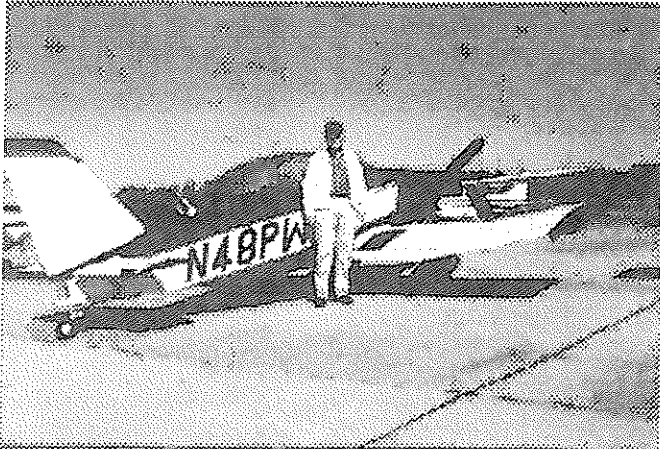
**A letter from the real Bill Essenburg.**

Dear Richard, As usual when I receive the T-18 Newsletter I read it from cover to cover, non stop. I was pleased to see a picture of me (receiving an award) and of my airplane! What a handsome guy and pretty airplane--except that's not me and that's not my plane!

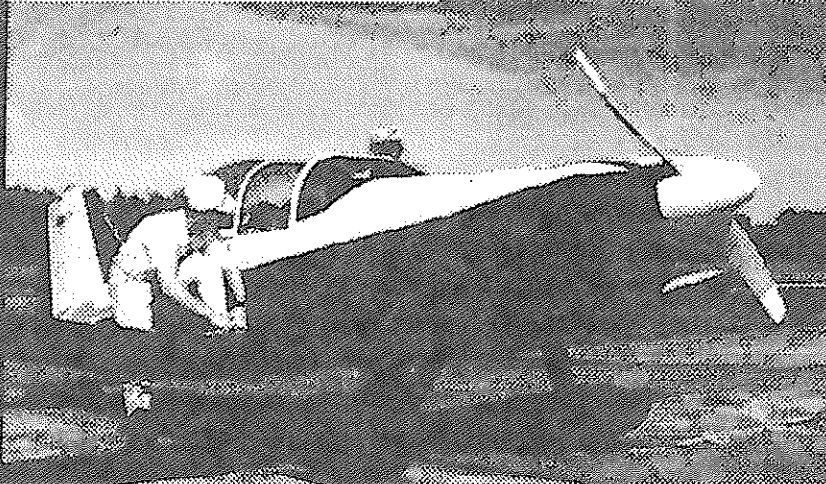
I was there with N77AJ but that good looking gentleman is someone else. No problem. My wife and I had a good chuckle.

You're doing a great job on the newsletter. I enjoyed Oshkosh and the forum a lot. It sure was fun to fly my T-18 there for the first of what will be many trips to Oshkosh.

I'd still be glad to discuss plans for a T-18 fly-in at Viroqua, WI (V-51). We have a nice airport friendly town, beautiful countryside and a Super 8 Motel with a pool. Enclosed is a crowded picture of me and N77AK at Oshkosh. Now find out who the other guy is! Sincerely, Bill Essenburg. **Who Was That Guy????**



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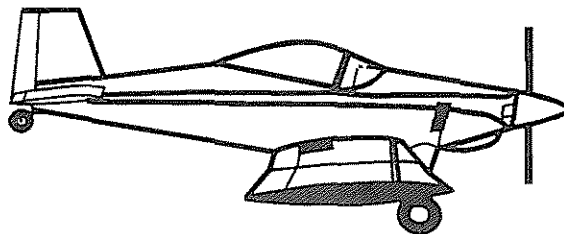


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T-18 NEWSLETTER  
ROUTE 3, BOX 295  
CLINTON, IL 61727  
1-217-936-4215  
Issue #101, Dec. 96



Newsletter No. 101



The folks at Sun'n Fun (April 6-12, 1997) plan to award the first ever "**John Thorp Trophy**". The winning Thorp will be selected from the flight line and the award made at a Thursday (April 10) evening John Thorp Award Dinner. The red carpet is out for T-18/S-18s folks so lets have a great turnout. The dinner is \$10 per person and please R.S.V.P. to Bill Williams c/o Sun N Fun, P.O. Box 6750, Lakeland, FL 33807-6750 by April 1, 1997.

### THORP T-18/S-18 MUTUAL AID SOCIETY 1997 DUES

Please continue your support of this valuable exchange of ideas, building tips and safety information covering John Thorp's great design. Make checks payable to Richard Snelson, Route 3 Box 295, Clinton, IL 61727 \$25.00 US, \$30.00 other.

Name: \_\_\_\_\_

Address \_\_\_\_\_

City: \_\_\_\_\_ State \_\_\_\_\_ Zip Code: \_\_\_\_\_

Phone: \_\_\_\_\_

Aircraft: \_\_\_\_\_ Hours on Aircraft: \_\_\_\_\_

Email address: \_\_\_\_\_

Notes: (Building?, Flying?, Thinking about it?etc.) \_\_\_\_\_

**Please help by sending your dues in now!**

# T-18 NEWSLETTER



*First flight was Christmas Day '96, about two weeks after N18WX was the River Valley Pilots Association float in the Russellville Christmas parade. The most common remark heard was parents telling children "It's not a real airplane."*

## IN THIS ISSUE:

SPRING FLY-IN at Coles (MTO) ILLINOIS, June 6-7-8

FIRST FLIGHT by Jack Waxenfelter (N18WX)

FLIGHT REPORT by Joe Gauthier

REPORT ON THORP KITS by Richard Ecklund

NEW OWNER OF N338Q by John E. Bridges

Master Index for the past 100 Thorp Newsletters  
by Jim Strickenberger

**NOTICE: (STANDARD DISCLAIMER)** As always , in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.



# THORP SPRING FLY-IN

## AT

### MATTOON-COLES COUNTY

### ILLINOIS

### (MTO)

### June 6-7-8, 1997

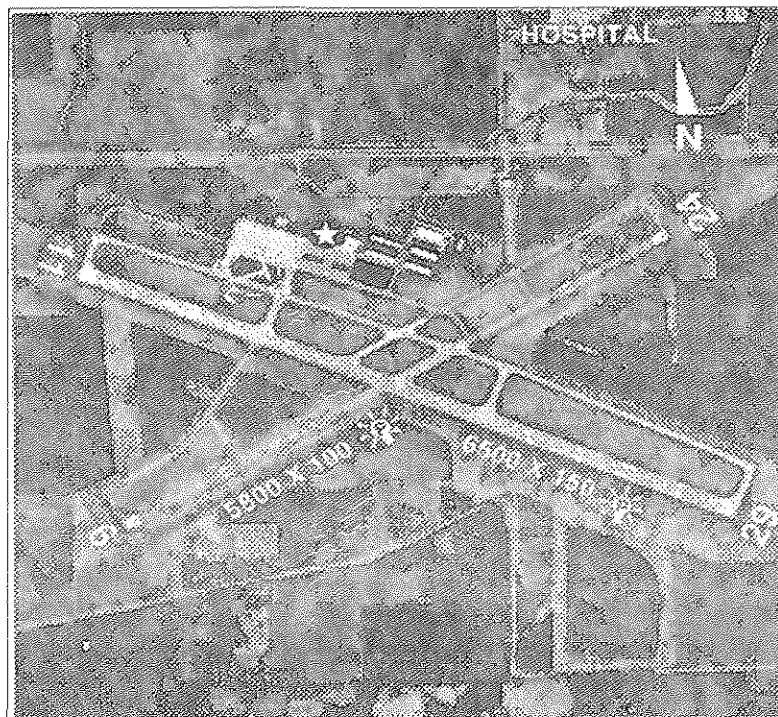
Make your reservations early at the Mattoon Ramada Inn. Ask for the Thorp Convention and you will get the \$49 rate. **Phone: (217) 235-0313.** For those arriving on Friday we will get together and go to dinner that evening. On Saturday evening we are planning a cookout at the large hangar. There will be lots of things to do, for those who do not care to eat, sleep, breathe and talk T-18s. Mattoon is very near the heart of Illinois' Amish community and we can arrange a side trip there for lunch on Saturday. The Amish have a lot of interesting shops to visit. For the rest of us:

- \* A lot of T-18/S-18 rides
- \* Thorp safety inspection, by EAA Technical Counselor (results private)
- \* Saturday afternoon hold a Thorp flying seminar - a group discussion with safety suggestions

The FBO is very good about Unicom calls and will give you the winds and active. The airport has extended a big welcome so come on out to Illinois and pay us a visit. You can camp on the field.

**Bring your own tie-downs.**

Coles is a busy airport with lots of folks stopping in for Saturday and Sunday restaurant visits, so keep a sharp eye out for traffic. Remember the right hand patterns. And please no aerobatics over the airport. We will have several shuttles running from the airport to the Ramada Inn. It's about 3 miles away. The Decatur EAA Chapter 274 is sponsoring this event and will help out.



Unicom -- 122.7  
 Elevation-- 721'  
 Lat: 39 28.68'  
 Lon: 88 16.81'  
 VOR -- 109.4 on field  
 Fuel: 100LL  
 FBO:  
 Central Illinois Air Corp  
 (217) 234-8146

Runways-  
 Right hand patterns for  
     runway 11  
     runway 6  
 Left hand for others, this is to eliminate  
 noise in the hospital area north-east of  
 the airport.

Excellent restaurant on the field

## **EDITOR'S TRIM TAB**

### **It's on to Sun-N-Fun:**

Thorp fans from all across the country will be gathering at Sun-N-Fun for the big Thursday evening cookout, at the President's Event Tent. The Sun-N-Fun folks will award a "John Thorp" trophy for the best Thorp at the fly-in. I understand Bill Williams has been working for weeks building a giant mobile B-B-Q grill for this event. So let's all join Bill and the other Florida folks for this great get-together. Mike Archer of Classic Sport Aircraft will be in booth #31 so pay him a visit. Mike will also conduct the T-18/S-18 forum on Tuesday.

### **Oshkosh 97 News:**

Currently no Friday evening banquet is planned! Butch's is no longer open. So we don't have a place to hold it. We are doing some checking and will let you know in the next newsletter. Any suggestions on banquet, please call me. Friday Noon: At the Nature Center we will again cook Brats and serve lunch followed by the T-18 forum. Please join us there.

### **Bad News Department.**

Our friend Bill Essenburg of Viroqua, WI was killed in the crash of an antique (rag-wing) aircraft. The crash occurred near Moriarty, New Mexico on February 3, 1997. Bill was a fine fellow and we will all miss him.

It saddens me to have to pass on the news that Ed Ludtke's wife Jeanette passed. Jeanette and Ed have attended most of the T-18 events for a number of years and we will truly miss this sweet lady. Ed's address is 2301 Dartmoor Sioux Falls, SD. Phone (605) 361-2301

Finally: Marvin Crane was killed in the crash of a T-18 at Brown Field, San Diego on Jan 25, 1997. I didn't know Marvin but still all of us in the T-18 community feel the loss of this individual. I have the following report from EAA Flight Advisor Jack Keyton Subject:

### **Fatal T-18 crash:**

Lost one at San Diego area's Brown Field on

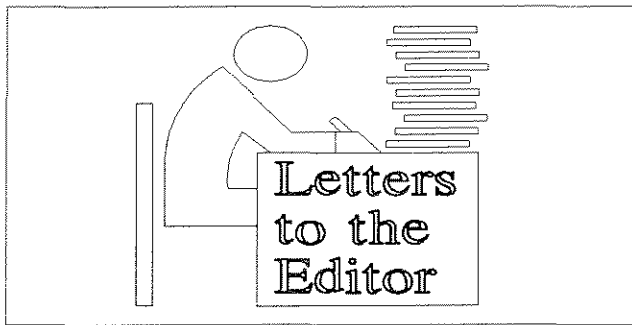
the 1/26 weekend (N40918). Info is that it had 2 on board and was in T & G pattern. On x-wind after t.o. an engine problem & emergency was declared. A/c crashed into an empty shed, 1/2 mi from the airport. Pilot fatal, pax serious. Preliminary indication is low-level stall & uncontrolled ground contact. It's a perennial problem with the pilot community. It may not be what happened, but pilots frequently try to save the machine (by stretching a glide) and losing their lives. We have to change the mentality. Perhaps do a bit more proficiency evaluation of the glide speed on our Thorps, check out altitude loss in a 180 turn. What angle we want to fly it, what airspeed. I once flew wing on a Porterfield doing about 75 mph. All was fine until I followed him into a 180 turn and the Thorp did a 1/4 turn stall/spin and lost 600' in 5 sec's. Jack Kenton, EAA Flight Advisor & CFI, inheritor of T18, N921JK [jfkenton@themall.net](mailto:jfkenton@themall.net)

### **Another report on the accident:**

#### **Crane Accident:**

It appears that it is important to repeat the information in the newsletter, that the fuel system must be properly configured and tested for adequate flow rates prior to first flights. Then there should be adequate diligence during operation to assure the vent system is functioning. The Crane T-18 had apparently been experiencing fuel flow problems during full power climbs since it first flew in december 1995. The aircraft was consumed by fire with the exception of the wing tips and empennage, making it impossible to positively pinpoint the fuel flow problem. The only evidence of a fuel filter strainer was some fresh solder in the vicinity of the fuel outlet. The recently added boost pump and position of the gascolator in the system was unconventional. Apparently there was a parallel path for fuel directly from the tank to the carburetor without the benefit of filtering. Lyle's article in NL#58 page 11 gives good guidance on flow testing. It should be pointed out that for gravity flow systems certificated aircraft must meet a flow rate of 150 percent of takeoff power fuel flow(part 23.955(b)).

Richard Eklund, Eklund Engineering, Inc.



Dear Richard,

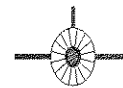
Just finished the annual "condition inspection" on my bird a couple of months ago. I think I'll do another in less than a year, to get it into warmer weather time from now on. I've now got about 500 hours in a little over 6 years, and decided to pull all the tail feathers this time, even though everything was still feeling good. I did something a little different to the horizontal tail pivot bushings. I machined some thin (.032") sleeves out of 'moly' filled nylon bearing material which I installed between the aluminum lugs and the steel bushings. This resulted in a very smooth and tight bearing which should require no further lubrication. Only time will tell how well it holds up. I had previously done the same to the rear bearing of the stabilator push-pull tube, and also the rudder bearings, over a year ago. I think the flap bearings would be excellent candidates for the same treatment. The material machines very nicely, but requires some practice and experimenting to get the proper clearances. I like the sleeve to push snugly into the aluminum, and rotate against the steel bushing.

I wonder if you could mention that I have more hats, and also visors, with the T-18 logo for sale. The caps in the color I have were very popular at the Placerville fly-in. They are a high quality golf style cap with leather adjusting strap (one size fits all), in tan with a blue denim bill. They are \$12.00 each. The unisex visors are available in 2 colors - navy blue, or white. \$11.00 each. Add \$4.00 for shipping and handling (priority mail) for up to 6 visors or 4 caps.

Some guys were asking about the rudder to tailwheel spring modification that I made. I have stainless steel "compression" type springs,

and wanted to get rid of the little 'teardrop' clips, after having one come loose once. As you know these springs consist of 3 parts - the spring and 2 removable "links" (for lack of a better term). I merely made a new one, of these (links) for each spring, elongated to the exact length I wanted, and eliminated the clips. The material I used, which I think is ideal, is 1/8" #308 S.S. welding rod. This can be bent and formed, and has sufficient strength and "springiness".

I'm still making & selling a lot of cabin heat boxes. You can buy them directly from me for \$50 + \$4 shipping & handling. They are light and have a stainless steel door and hinge assembly. Best Regards, (303) 420-2724  
JREVEN@AOL.COM



Dear Rich,

I've just finished making and installing a pair of static ports as described in newsletter 91. They're similar to those sold by Aircraft Spruce & Specialty for \$15.00 each but I have a few extra sets that I will sell for \$20.00 a pair and I'll pay the shipping. They are used with 1/4" Nylo-Seal airline and fittings and are easily installed with four 3/32" rivets.

I've also just finished making my canopy frame and would be glad to talk to any other builders that are contemplating doing so. I also machined two aluminum fittings that replace the front angled piece where the front bow and side rails meet and must be welded. The bottom part is identical in shape for mounting the bearings. I've reamed out a 3/4" hole for each tube so that when you mock up your frame the top bow and side rail are slid in place and you can either have them welded when done or held in place with a roll pin. It made it easy to hold everything in place and the only welding was on the cross brace for the rear bearings. If anyone would be interested in using the

The handling of the airplane on first flight was a non-event; it flies just like Bill's! I even got a smooth touchdown. The thrilling part was as the RPMs built on take-off roll, the engine started to smoke from both stacks and actually started to get rough before I got it leaned. It turned out that from a setting on the mixture where it didn't smoke to too lean was about one and one-half turns on the vernier! The local AI ensured me that his replacing of the acceleration pump shaft packing (little ring of leather) would fix this weirdness.

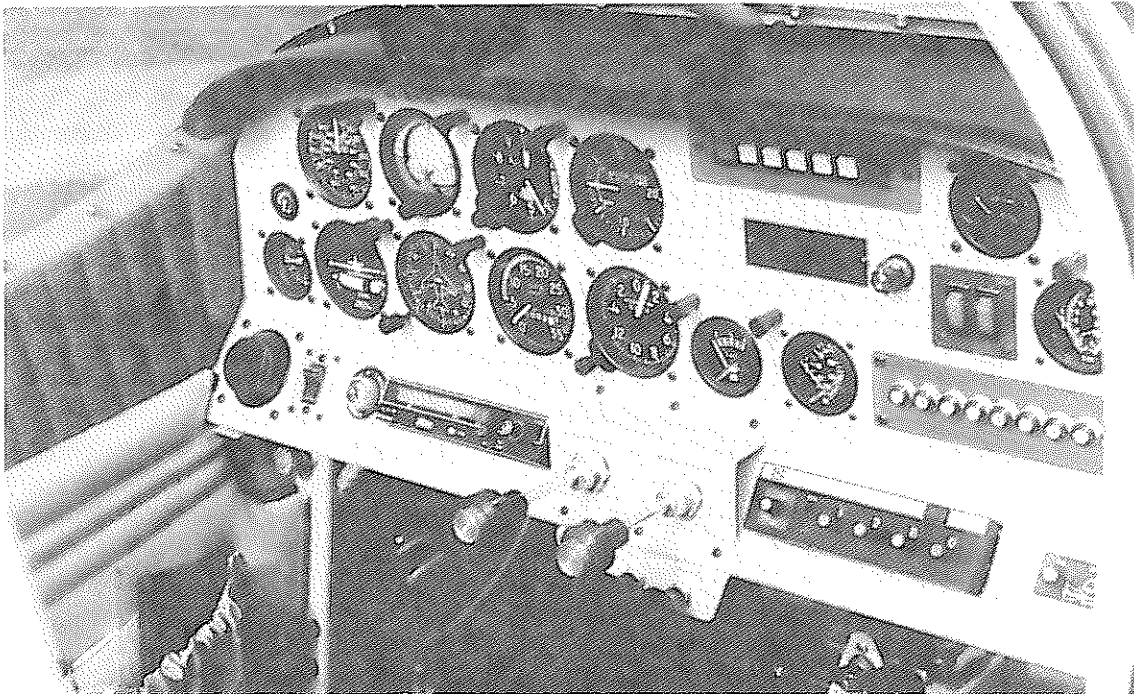
The second flight was just like the first (smoke), so it was ground this bird until we get to the bottom of this. The AI could find nothing wrong with the carb. I contacted the factory guru at Precision (as you suggested, Richard), and he was very helpful (a fellow named Allen). He says there are only three things that can cause rich mixture on an MA-4:

- 1) priming system leaking into cylinders.
- 2) acceleration pump shaft packing.
- 3) acceleration pump discharge check valve not holding.

With the above three items eliminated, we suspected air volume so we removed the C-150 air filter I had adapted to the front of the Ken Knowles supplied air box (real flat one). Well, that didn't do it, so we removed the air box entirely and voila!, no smoke. The suspect now switched from volume to some weird air flow pattern, turbulence, or resonance in the air box.

T-18ers, listen up! Bill suggested we try a simple flow vane below the carb. inlet. In about thirty minutes, we fabricated a flat plate that was riveted across the bottom of the air box and was curved upward (bent) smoothly 90 degrees and then mates with the rear box mounting flange. A clearance hole was provided for the carb. heat push-pull rod. Details on request! This was the fix, folks—no more smoke and picked up 100 RPM. Engine now leans normally. I believe that the square end of the air box can set up a "rotor" that will restrict smooth air flow into the carb. I have read many tales of 0320s in T-18s running rich and the owners resorting to all sorts of re-jetting and nozzle swaps—possibly, not necessary??

So—the adventure continues. I have flown off half of my 40 hours and love my T-18. Hope to be able to make several T-18 fly-ins this year! Keep up the good work on the newsletter,



*Builders take note of Jack's beautiful instrument panel. My wife will be on my back to add a couple of those cabin air vents. Nice job Jack.*



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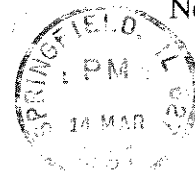
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### Email from members

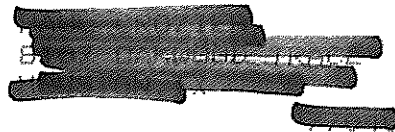
Rich, what flyin is happening on June 7,8. Guess haven't heard about that one. I am planning to make Fun/Sun if I can get some projects finished before time to go. J'nene and I spent the weekend with Evan/Virginia Roberts at Horseshoe Bay, down in LBJ hill country, He really has beautiful new home on 4500 ft runway. Evan bought two Sidewinder projects, I will build him a souped up 0290 for it. He is really flying his Thorp, makes lots of business trips and doesn't let wx shut him down. I have been trying to learn how to land mine again, my air time during the past year has been almost nonexistent. The T-18 proficiency is directly proportional to the time spent in the cockpit. Evan and I were discussing the cross wind characteristics, we have both landed in severe crosswinds up to about 25kts and almost 90deg across the runway. After a safe landing, and you are rolling out thinking "that was a walk in the park" you really give credit where it is deserved, the great design genius of John Thorp and the resulting T-18. Keep up the good work on the newsletter, we all appreciate your effort in that regard. Will send you a check for 97 dues, I believe you have my current address, if not is is: 1013 Melrose Dr., Waco, Tx 76710, 817/772-6188. Best Regards. Ken C. Morgan N118KM

T-18 NEWSLETTER  
ROUTE 3, BOX 295  
CLINTON, IL 61727  
1-217-935-4215  
Issue #102 March 97

Newsletter No. 102



Red Circle Not Paid



**Spring Fly-In at Coles Country Airport in Illinois on  
June 6-7-8, 1997 Details on page 2**

Thorp T-18 For Sale: 360 TTAF, 50 on Mattituck overhaul. 150 hp. Full Gyro Panel. King radios.  
Contact: Scott Keller Lincoln, MA. (617) 259-3153

T-18 embroidery on jackets or shirts. Too many variables to cover in the T-18 MAS. Contact Bill Mitchell, 526 Leona Dr. Denver, CO. 80221 (303) 427-4025

**For Sale: Lee Skillman's Thorp Widebody Project is for sale. This is a great buy, priced at the cost of parts. \$13,500 Lee does great work so if you are looking, check this one out. Lee also has an all metal Thorp cowling for sale at \$1500. Phone: 334-633-3535**

Only 1/2 of the dues are currently in. A red circle means I don't show you paid.

**THORP T-18/S-18 MUTUAL AID SOCIETY 1997 DUES**

Please continue your support of this valuable exchange of ideas, building tips and safety information covering John Thorp's great design. Make checks payable to Richard Snelson, Route 3 Box 295, Clinton, IL 61727 \$25.00 US, \$30.00 other.

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Phone: \_\_\_\_\_

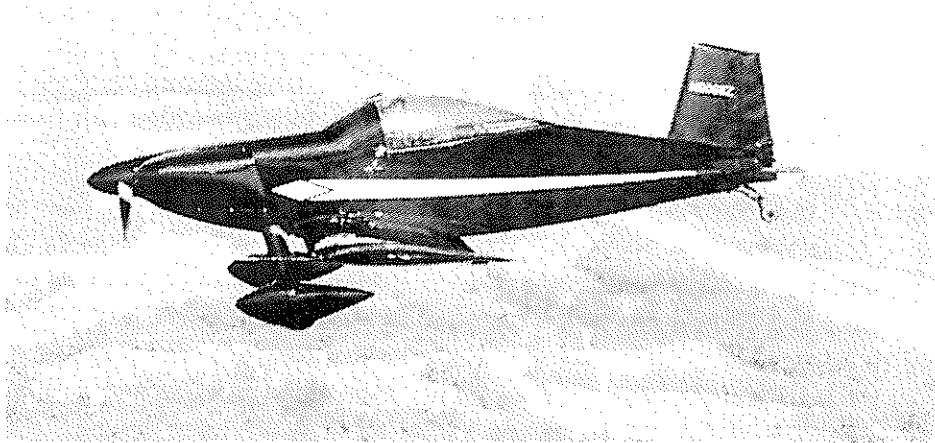
Aircraft: \_\_\_\_\_ Hours on Aircraft: \_\_\_\_\_

Email address: \_\_\_\_\_

Notes: (Building?, Flying?, Thinking about it?etc.) \_\_\_\_\_

**Please help by sending your dues in now!**

# T-18 NEWSLETTER

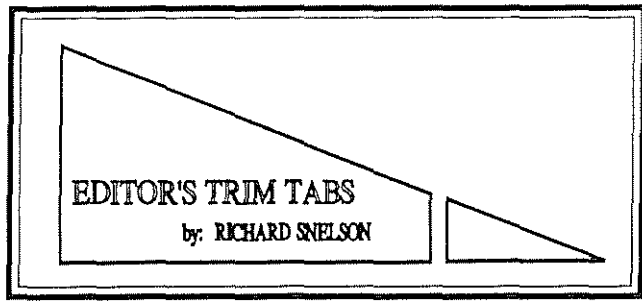


*Who is this invader? Wearing a Darth Vader paint job. Why it's, Steve Hawley, the man from Tucson and his beautiful new paintjob and restoration.*

## IN THIS ISSUE:

Safety Concerns in "Letters to the Editor"  
Coated Exhaust System Results by Lyle Trusty  
Paul H. Poberezny goes for the Grass Roots Movement  
More fine Drawings and ideas by Dick Penman

*NOTICE: (STANDARD DISCLAIMER) As always , in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.*



It was with much concern that I read your messages and contributions to the subject of stall/spin accidents. Much has been written on this subject in past newsletters and forums, but still this "pilot error" accident occurs. This month I received a touching letter from a grandson who had lost his 80 year old grandfather, Leland Floyd Reilly, to an approach to landing stall/spin. Mr. Reilly was flying with a gentleman who was about to purchase his aircraft. I don't have the full findings on this accident so I can't comment on exactly what happened in this case. I will and must comment however on what is and what is not a checkout in a new unfamiliar homebuilt.

Unfortunately owner checkouts are the rule rather than the exception. A couple of straight ahead stalls and back to the pattern? This is a bad choice for the new owner. Forget the macho crap about how well you can fly! Find a flight instructor with either type experience or experience in other homebuilts. Insist on slow flying the Thorp until you are extremely aware of approaching stalls. Pulling the power and gently raising the nose until it stalls is only a small part of stall practice. In fact flying the aircraft on the edge of stalling is much better practice. With or without stall strips my Thorp will let you know the stall is approaching. Could a pilot unfamiliar with the Thorp feel the approaching stall? Yes, of course, but it does take some practice. Either straight ahead, or in 30 degree bank turns the shudder on the controls is there. Practice taking the aircraft up to the shudder, in both departure and approach to landing attitudes and configurations, back-off, do it again and again. Learn the feeling so well that it becomes ingrained in your flying.

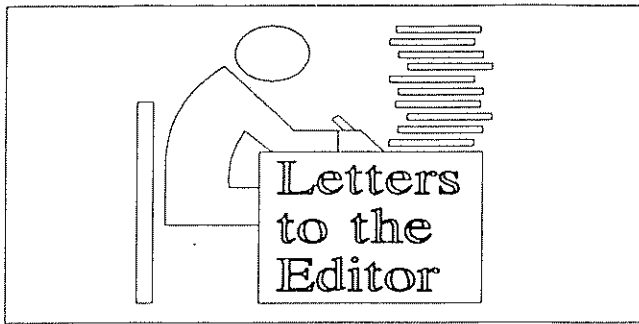
For the reading impaired I say one more time! A Thorp checkout is not: two straight ahead stalls, a couple of 60 degree bank turns and back to the pattern!!!!!! Pass this along, not everyone gets the T-18/S-18 Mutual Aid Newsletter.

We had what my son Rich Jr. calls a high level problem this issue. A lot more material that I could get in the 20 pages of the newsletter. Thanks to the many email messages and letters "Letters to the editor" is overflowing. Again Dick Penman has graced the newsletter with more of his fine detailed drawing and ideas. Only a part of them are in this newsletter, so you have them to look forward to in the December issue. Also in December you will find some great drawings from Gary Cotner on an electric flap drive using the same actuator as the RV. Bob and Susan Highley have sent photos of their trip from Florida to Placerville so look for those also in December. Don't stop sending email and letters, they are the heart of exchanging ideas and safety tips for flying and building the Thorp.

I would like to have photos and information on Placerville if someone could forward them. I did hear that a great number of T-18/S-18 were present at that great event. We had good weather for Ky Dam and got in a lot of great flying there. Photo's to follow.

For those of you that haven't heard, **Paul Poberezny** has started a "New" association. It called **Sport Aviation Association** and is for the grass roots flying folks. I've included the handwritten letter received from him. Membership is \$15 a year, count me in Paul. This is Paul's effort not an EAA add-on. His letter will let you in on what we talked about.

What do you think it would cost to build a basic Thorp T-18 from plans? Making the parts as in the old days. And keeping it very simple. Open cockpit, with a fiberglass turtle deck behind the seating. Let's say we use an O-290 G engine. I think you could have some very low cost flying. Send me your estimates for the next newsletter.



Dear Richard,

I always am happy to see the T-18 Newsletter in my mailbox. In the No. 103, just received, Tony Schischka's informative stall tests opens the subject and I agree The BT-15 also had the snap roll tendency using high rudder turning on final and some were fatal. This can happen to the T-18. It is good technique to always keep the ball centered. Also, there should be no need to make forty five degree banks turning onto final. Flying the 737, with passengers, a bank of 15 was desired for passenger comfort.

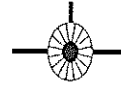
After reading Tony's article I took 54FS up for similar tests, using his bank angles. I had made these before on N54FS because some T-18's do fall off rapidly in a stall. Mine does not and I believe this stability is due to having stall strips in the narrow wing root section (folding wing) which gives early warning of wing stall (buffet). Additionally, I have the 10" fiberglass vertical fin extension for internal antenna which gives an 8" higher stabilizer extending into air undisturbed by airflow past the stabilizer at high angles of attack.

My T-18s approach to stall buffet comes in at 62 knots (Approx). I made 45 deg. banking turns clean, also with 1st, and 2nd notch flaps. Note: The 40 deg. notch was removed so that after manual use it would return to 2nd notch. In the 45 Deg. banks, with power at 15" I pulled it into deeper buffet in each configuration and could control turning to right and left with no drop off. The airplane was telling me it wanted to but it would not as I offered different rudder and aileron inputs. Although these stalls are for approach to landing practice, with 3 to 500'/min descent I tried to make them in level flight. The

sharpness of the wing leading edge will also have an effect on the stall but I don't know much about that. Perhaps this will open further input (discussion) regarding this dangerous characteristic present in ANY airplane.

The T-18 Newsletter is much appreciated Richard

Frank Snedeker - [snedeker@nwlinc.com](mailto:snedeker@nwlinc.com)



Dear Mr. Snelson:

Thank you for sending Newsletter #103. A pleasant surprise for me and timely too as I have been actively flying my airplane since nursing it through its condition inspection.

In the "Letters to the Editor" section I am motivated to add some thoughts to the article Mr. Schischka contributed to T-18 flight safety.

Remaining as coordinated as practical while flying the T-18 is excellent advice and we all need this refresher prod when flying a somewhat demanding airplane. I personally appreciate his observations and especially the descriptions of the high altitude probing of the resultant characteristics while being coordinated or uncoordinated and the obvious potential for a significant upset. We must not allow this airplane to fly us when close to the ground .... we must be a disciplined manager of this airplane and exercise our conservative judgement in order to prevent another T-18 from inadvertently demonstrating its stall characteristics with deadly *results*.

In the spirit of supplementing Mr. Schischka's article I would like to comment from my own experiences in general and specifically about my T-18 experiences and how I try to fly it.

Returning to basics we must never forget that stalls are a result of an angle of attack that exceeds the critical angle for that particular

airfoil cross-section. We can cause this angle to be exceeded by the relatively gentle 1 G stall or by imposing a greater than 1 G load on the wing and generating a "wing loading stall", often referred to as an accelerated stall. I feel this knowledge and understanding must be paramount and be crystal clear in its application in the mind of each pilot.

Other contributory factors are, or can be, very important and can determine the severity and the unique characteristics of what the airplane does immediately after the stall break .... but if while flying the traffic pattern you prohibit your T-18 from exceeding the stalling angle of attack by paying strict attention to your approach indicated airspeed, angle of bank (which loads the wing and increases your indicated stalling airspeed), and your airplane's attitude reference the natural horizon, you effectively remove the danger of less than perfect flying technique.

We must remember that if we observe the above precautions and use proper flying discipline and technique that the Thorp lends itself to sideslipping to a landing with reasonable safety. Obviously, my point here is that being uncoordinated or even aggressively cross-controlled will not cause the Thorp, in and of itself, to stall. And if it doesn't stall it won't exhibit any of the threatening characteristics Mr. Schischka so vividly describes.

My thoughts may seem boringly simplistic and insultingly obvious to most T-18 pilots..... but I have just finished going through the T-18 back issues which Mr. Snelson kindly sent to me..... it would appear that we, myself included, need to be reminded of the how's and why's of this airplane and to keep our performance priorities absolutely correct if we are to do our best to avoid another stall/spin/crash in the traffic pattern. To me, the priorities are to determine for your airplane the indicated airspeed of a typical landing configured 1 G stall, add a minimum (smooth air) of 30% to that indicated speed then using this speed as a firm indicated approach speed. Make an irrevocable rule not to exceed a 30 degree bank in order to "force" a traffic

pattern to lead to a runway (be a smart-ass and go-around), and pay close attention on each and every approach as to the typical nose attitudes you generate while doing this so that if you lose your airspeed indicator or you become preoccupied in the traffic pattern an "unusual attitude" will be noticed and cause you immediate alarm because you will know the ANGLE OF ATTACK is probably increasing. The above comments are mine and I am not an aeronautical engineer nor am I a test pilot.... they simply represent what I hope is a valid enough perspective to perhaps help keep myself and others from allowing our Thorps an unscheduled demonstration of its stall-break characteristics.

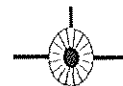
Larry J. Church  
1015 Parkview Dr.  
Los Lunas, N.M. 87031



Dear Rich,  
I am currently looking at several flying Thorp T-18 aircraft for sale and would be interested in receiving your newsletters as well as all past issues. Please tell me how to join the Thorp T-18/S-18 Mutual Aid Society, the cost for all past issues of your newsletter, and where to send the check. Thank you. I look forward to hearing from you.

email: 2rph@nemontel.net

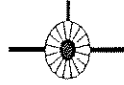
Bob Haugo  
PO Box 793  
Scobey, MT 59263  
Phone 406-487-2813



Richard - My T-18 is currently on hold, while I erect a building and finish what I have vowed is my last car project until the airplane flies. I expect to be working steadily on the T-18 sometime next year.  
email address is: ben.m.harrison@boeing.com  
Ben Harrison

Rich,

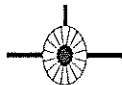
Do you know of any T-18 plans available?  
Thanks Ron Weiss.  
email backcourse@juno.com



Subject: How was Oshkosh?

Just a short note to make contact again. How was Oshkosh? Understand there were not too many T18's. Have a new T-18 builder here (well hope so) he will contact you if he hasn't already, (Wayne Mathews) to get all the news letters. It looks like he will opt for the complete kit. Will be most interested to look at kit to see quality. Maybe the kit will make the T-18 competitive with RV's! Got my T-18 at home doing 100/annual plus those things I've been promising to do for some time.

Regards,  
Tony & Viv Schischka <a.schischka@xtra.co.nz>



Subject: Fuel valve installation.  
From: "Paul-Ernest Lévesque"  
<pelevesq@globetrotter.qc.ca>  
Dear Richard

I know you are a very busy man but I have a question and do not know where to ask.

I remember reading some thought on not installing a fuel valve directly on the tank of a T-18, I do not know where I had that information. Tell me what you think: could the valve installed directly on the tank cause a crack later from vibration over the long run. Or should I install it

on a remote location. How about your aircraft fuel valve installation.

Thank for the help and have a good day

Paul-Ernest Levesque

*Editor's Note: My fuel valve is installed on the firewall in the center below the tank. I turn it off and on with a push/pull cable that terminates on the bulkhead below my left leg. I remember reading about cracks caused by mounting the valve on the tank itself. It does present a long lever arm and would stress the welded on boss over a long period of time as the valve is turned on and off. Most of the valves are a little hard to operate and this would make the stresses higher.*



Dear Dick;

Please accept my apologies for having not renewed my membership to the T-18 newsletter. I have enclosed a check to hopefully catch me up to date. If there have been issues missed and they are easily available, please send them.

All is well with good old N89ER. She has about 555 hours on her now and a significant portion is night and/or instrument. I don't remember if I told you that I have installed a Hartzell constant speed prop. It didn't help the top end or cruise speed at all (nor did I expect it to) but the take off and climb is great. I no longer sweat the hot/heavy/high departures. I don't recommend the CS prop for everyone but if you are flying at gross weight in hot/high conditions it is worthwhile. Evan A. Roberts P.O. Box 8288  
Horseshoe Bay, Texas 78657 (830) 598-6797

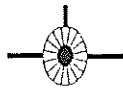


Subject: Kentucky Dam Fly-In  
From: SteveHawl@aol.com

Hello Rich!! I plan on coming to the Ky Fly In. My T-18 is all back together. Today I ran the engine for the first time in 9, months. The new paint job is spectacular!!! You won't recognize me anymore. Sure do hope the weather is good. The only thing I have left to do on it is get some N numbers put on the fin. Should fly it this next week without any problem.

Steve Hawley in Tucson

*Editor's Note: Steve pulled up along side me while we were over Ky Dam and I didn't recognize him! He has done a beautiful restoration on his bird. Great job, Steve.*



Rich-

Suz and I are in Cheyenne, WY on our way back from Placerville Fly-in. We had about 35 or so T-18's, many I'd only heard about in the MAS Newsletter. About 60 T-18ers flew in and out at various times. Lyle Flemming was there. He has the distinction of giving the first T-18 ride to Ken Brock in 1968. Lyle is now "over 85" but still an active T-18er although he doesn't fly himself any more. The hosts really put on the dog for all of the visitors.

That would be Hal and Nancy Stevens, Jim and Lil Crichfield, and Mac and Rena Booth. The Hangtown Chapter was out in force to make it a great event. I'll let the principles fill you in properly.

Get it flyin'

Bob and Suz Highley

N711SH

email: N711SH@aol.com

*Editor's note: I'm saving an article and pictures Bob and Suz sent for the December newsletter. Sounds like a trip I would like to make.*

Subject: Stab Rigging Report  
Hi Richard:

I told you I had been talking to Bill Mnich back in Maryland about stabilizer anti-servo tab rigging and had asked him to summarize his work for the benefit of the guys coming to the Placerville Fly-In. Bill sent me this Email which is of great interest.

The original problem was that he was experiencing buffet on final as if he was at an extreme forward CG condition, when he was not.

He did a weight and balance check, first thing, and found that to be within the normal range. Following that he did the rigging check as outlined by Dave Neustel.

Lyle Trusty

### Bill Mnich's Report

Lyle -

I finished everything in time to get off one flight last weekend, and there's no doubt in my mind the problem is solved. Although I wasn't able to do a thorough evaluation, I determined that I have PLENTY of Nose-Down trim. Here's some info I hope will be useful during your rigging forum this weekend at Placerville. Wanted to send it sooner but I've been drowning in work-related stuff this week.

Again, I've only got one hop and four landings on the airplane since I put everything back together after the trim fix, but so far I'm elated with the improvement.

Conditions at takeoff were 1540# GW, with a cg of 64.9 in. (this based on an assumed weight for my passenger because I didn't want to ask her for an exact number!). Previously, this set of conditions would have put me at full ND trim after burning off about an hour of fuel at cruise, which in my airplane would migrate the cg to about 65.3 in. Obviously, that was totally unsat and the reason I went to all this trouble in the first place.

Now, qualitatively, I seems to be roughly in the middle of the trim range with a 65 in. cg location, which is a HUGE improvement and should be right on the money. No offense to the original builders of my airplane, but I discovered that the 513 tab arms were done wrong from the beginning. In fact, compared to the new ones I received from Mike at Classic Sport A/C, which appeared to conform exactly to the plans, the old ones were fully a quarter inch too long. They were also asymmetric, which caused a mismatch in servo tab position of about 3/8 in at all trim settings. In addition, I probably made the problem worse several years ago by failing to verify the exact hole distances on the 521-1 links I installed to replace the originals (John sez 3.07 inches!). It was a challenge to install the new 513 arms to my airplane because once everything was in the proper rigging position, I needed to bend them laterally and drill them to match the mounting holes already in my tabs. But eventually it all went together quite well and fit like a glove.

In any case, I followed Dave Neustel's rigging procedure from Newsletter No. 93 religiously and found it to be an excellent reference. Here are a couple lessons learned:

- Don't bother with the traditional "spirit level". It certainly works, but I'd invest in a nice digital one (which have the bubble references too). With this instrument, I was able to measure everything to a tenth of a degree, which is much better than can be accomplished with the standard level. Either way, once you get your template exactly lined up and place accurate reference marks on the aircraft for leading edge stab position and 521-1 link angles, there was no need to keep the tail jacked up in the air to maintain level wrt WL 42. An interesting discovery from using the digital level was that I had a 0.2 degree difference between the L and R WL 42 references, and the exact measurement is dependant on WHERE you place the level. I just picked a spot and tried to stay consistent.

- Once you establish the stab in the trim position (5 deg Leading Edge Down), I found it easy to keep it there with a carefully sized block of wood placed behind the walking beam in the cockpit and held in place against the aft bulkhead with a bungee wrapped around the control stick. Worked great for me. However, if you remove the wood to move the stab, always double-check it against the template when you put it back to the rigging position. The template should be taped firmly in place on the fuselage and not disturbed throughout the rigging process. This is your "truth data" once it's properly located!

- Step 6 can be a little confusing, but once you read it a couple times and look at the hardware it will make sense. This is a very tedious step but once you get it exactly right, simply place a reference line of masking tape on the fuselage just inboard of the -1 to use as a "sight" for the -1 leading edge from that point on. The human eye is very good at matching straight lines, but of course, this procedure is contingent on having straight leading edges on your -1's! Where the procedure in Step 6 calls for a .080" feeler gauge, I found it easier to simply use a Champion spark plug gasket; they seem to be very consistent at exactly .080" in thickness.

- Step 7 contains an error that was corrected in Newsletter No.99 (thanks Lyle!). The control stick should actually be about vertical, not 7.5 deg forward as described in No. 93.

- In Step 8, I had a hard time trying to clamp the wood to the trailing edges, so I made some very thin wooden wedges and slid them into the gap between the tab and the stab. This held each tab in place quite nicely once the wedges were forced gently into a snug friction fit.

That's all I can remember for the time being, and I gotta go. Hope the above comments reach you before you leave for Placerville and are of some benefit to your audience. Have a great time! Wish I were there. Best Regards, Bill

From: "Harold Smith" <hmssws@hotmail.com>  
Rich,

Thanks for all the back issues of the newsletter. I wish I had them BEFORE I bought the T-18. Not that it would have stopped me from buying a great airplane, but it would have made me a more intelligent buyer. As it is, I lucked out and bought a fine example of the T-18. It flies great and nearly all the modifications I have been reading about have been incorporated into the airplane.

The one bad experience in buying the airplane was that the previous owner (not the builder) said he had lost everything on the airplane, including the Airworthiness Cert., limitations, drawing, builders log, etc. Everything. Well, I bought it anyway.

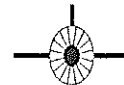
I contacted the FAA and they helped me get all the documentation in order. They were really helpful. That's right, I used the FAA and helpful in the same breath. The only thing they did wrong was to issue me a Std. category Airworthiness Cert. instead of a special. I did not know the difference as I am new to this sort of thing and exp. a/c., even though I used to own a Varieze. It caused me to make an extra trip from Houston back to San Antonio to get it right.

I used a friends, Steve Holbert, T-18 to learn to fly tail draggers. We flew for about 10 hours and then he turned me loose in my T-18. He has the 160 HP and I have the 180 HP. I put a new Aymar-Demuth 68/80 prop on it and I leave Steve in the dust. So far I have found no nasty habits of the aircraft. I have flown it in every configurations possible and it is stable even with forward CG and full flaps it flies very nice, no tuck or anything. I have not mastered the tail dragger but am starting to feel a little better in it. My wife fell in love with it on her first flight (of course she loved my Varieze to). The plane and I are still in the stage of forming a relationship

where we each feel comfortable with the other. I still have some things to fix on the airplane but all will come with time and money. Oh, the builder was Cecil Williams from Florida and the side number is 856CW. Does anyone know this gentleman? I would like to talk to him. I look forward to the coming newsletter and any future T-18 gatherings.

### **FOR SALE:**

Also, would you advertise the prop I took off the T-18. It is a Hartzell 70" prop. I have already sold the governor. The prop is in good shape. There are no logbooks for it though, as I said above, the previous owner lost everything. I am asking \$1,000 plus shipping (I'll crate it free). Thanks for all your help. I look forward to meeting you and all the other T-18 er's.  
Hal Smith



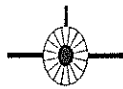
From: "J.E. (Ted) Strange" <strange@silk.net>  
Dear Richard:

The summer has come and gone and I am not flying yet. I bought a T-18 from an estate sale after it had been sitting outside for nine years with a hole in the canopy. It was quite a mess. (Why didn't some of the pilots that passed the plane put some duct tape over the hole) I trucked it home thinking I would be flying in 60days!!!! I am somewhat familiar with the T-18 as I spent 7 years building one only to give up after running out of steam. Some thoughts:  
When you are building your brake pedals, I would recommend you rivet nut plates to the rear of the mast (Drawing #491) so that in the future if you ever have to service the brake cylinder it will be a lot easier to get at. Keep fiberglass parts away from the exhaust system-FG burns fiercely once it has ignited. Use your wife's card table to arrange your tools on when you are working at the airport. I have a fuel injected IO-320 and the sniffle valve was missing from the oil pan. This is

a one way valve that allows extra fuel to drain onto the tarmac but closes when the engine starts so that it doesn't affect the mixture. I obtained a PVC valve from an automotive house and it seems to work well.

I found it was hard cutting FG cloth straight with scissors, so I solved the problem by using a paper shear. I imagine the cutting wheel your wife uses to cut cloth with would also do a good job.

Richard, I am indebted to you and those that have gone on before and broken the trail, it has made it a lot easier. You Americans have given so much to the world, I think there is a certain place in heaven for your kind. Best wishes from Ted Strange<strange@silk.net>



Subject: Rivets & sheets  
From: ljkrumel@sandia.gov  
Hey Rich!

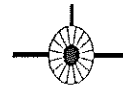
I'm about to start the wing on my T-18C... one of those performance boosters, right? In assembling the center spar it's become apparent that the need for dimpling rather than countersinking the web is mandatory. I'd like to warn others not to cheat in such critical structures. I'll mail the copy of a page from "Analysis & Design of Flight Vehicle Structures" by E. F. Bruhn, 1965. It should be helpful for people making such decisions with regard to rivet size and sheet thickness. These were compiled by various manufacturers as recommended values based on actual tests, rather than analysis which becomes too complicated. Table "B" indicates that the minimum sheet thickness for 1/8" rivets in a countersunk hole is .051". I've seen people cut countersinks in .040" sheet to their own jeopardy. One illustration shows a cutting action under the head when there's little or no bearing surface against the shank of the rivet. Table "C" also shows that flush rivets through a dimpled sheet may be stronger than a countersunk sheet. Some utility exists in that the sheets themselves have an interlocking effect against shear.

Clearly, these considerations apply to most joints on the T-18. I hope others will see the implications, and that these charts will be useful to promote thoughtfulness in their work.

Best regards to you, our editor, and all you builders,

Les Krumel  
(505) 281-5386  
ljkrumel@sandia.gov

*Editor's Note: Sorry we didn't have space for the tables in this newsletter. I do think they are available in several of the aircraft sheetmetal books sold by the EAA. Good point Les.*



Subject:

New owner for N8613A serial number 48  
From: RnT082338@aol.com

Rich,

Just to let others know the fact that I have purchased old 613A from Harry Paine. On the 3rd of July Harry said a fond farewell at the Santa Maria Airport in California and I departed for my home in Washington State. After an overnight at Redding, California I arrived at my home on Crest Airport in Kent. What a wonderful little airplane she is. No dishonest characteristics, lots of fun to fly.

With luck, my wife and I will be at the Placerville flyin in early September. We have already been to two fly-ins with 613A where many times I am the only T-18 there.

I have the great majority of newsletters that came from Harry but none since 1993. What is the current fee for the nl and what info can I get.

Roger Thompson  
17649 S.E. 293rd Pl  
Kent, WA 98042  
rnt082338@aol.com

Subject: Oshkosh  
 From: "RICHARD C. EKLUND"  
 <ThorpT18@compuserve.com>

I don't have my pictures back yet so can't provide a T-18 count. We had a small group at the Nature Center and I discussed the following: The myth that I heard recently, ie: "If the spar center section mods that John Thorp recommended are done, the aerobatic gross weight goes to 1500 lbs." THIS IS WRONG, OF COURSE. The entire airplane was designed to 1250 lbs, +6 and -3 g aerobatic category limit loads. This may explain why people are bending (rather than breaking, thanks to metal airplane allowables) the wings at the outer panel to main spar join with two persons aboard while doing aerobatics. I also endorsed the use of stall strips per Tom Kern's instructions and agreed to review John Even's more inboard location centered on the second rib. I discussed the two bulletins I have issued due to errors in the drawings. I mentioned the coated exhaust experiments Lyle Trusty is doing. The new laser cut rudder kit was shown at the aircraft and we had a lot of favorable comment. We announced that the empennage kit would be developed next, since it is common to the T18/S18. Both Dave Neustel and I talked with a number of builders and prospective builders through Sunday the 3rd. It was good to see a number of new young builders and owners. Bill Mnich was at the forum talking with Dave Neustel. His full page (pg 93) in the August Sport Aviation with his T-18 should give us a boost in recognition.

I am attaching a file with the current parts and subassembly kit offerings. I will follow up when I get the pictures back.

Richard Eklund  
 Eklund Engineering, Inc.

Eklund Engineering, Inc. PO BOX  
 1510 LOCKEFORD, CA 95237 209-727-0318  
 For the Thorp T-18 builder, the following components are offered:

Thorp #506 6061-T4 Tip - Horizontal Tail - \$90 per set (4) plus shipping These stretch formed aluminum skins have flanges for rivet joining the halves, or they can be trimmed and welded per the drawing.

Thorp #517-1 Horizontal. Tail Tab Skin, 517-2 Trailing Edge Strip and 517-4 /Rib- \$55.50 plus shipping ... Laser cut skin, Strip and Rib with all holes cut to accurate size and formed as needed. Requires light deburring and dimpling prior to closing and riveting.

Thorp #531R Aileron Kit - \$220.66 plus shipping... All sheet parts are laser cut with accurate holes and are formed and primed as required.

The builder need only deburr and dimple as required prior to riveting the assembly. Thorp #569 Rudder Kit - \$375.00 plus shipping...

All sheet parts have laser cut accurate holes and are formed as necessary. Require only light deburr and dimpling (if desired) prior to riveting.

Thorp #537-2 Upper Main Beam Channel Extrusion - \$125 plus freight Custom extruded 2014-T6 aluminum, 133 inch length by 2 x 1.25 inches to reduce waste and trimming time.

Thorp #537-3 Lower Main Beam Angle Extrusion - \$105 plus freight

Thorp #1072, 4" Prop Extension, Clear Anodize with #905 Driving Lugs for the Lycoming O-360 engine - \$235 includes UPS standard delivery in USA. International delivery quoted promptly. NOTE: Additional sub-assembly kits are under development with the goal of making a complete airframe kit available in the near future

Hello Richard:

Two weeks ago N77KK touched down at its new home in Palm Springs, California. This T-18 was built by Ken Knowles, and was the prototype for the folding wing as designed and built by Lou Sunderland. (See July Newsletter, and "Jane's Pocketbook #14, Home-Built Aircraft", p 237) The plane was last owned by Norman Justus, and was represented and sold by his lifelong friend Harry Arnold. Really nice guys these! I felt some sadness that they were selling their plane, but then I realized they were pleased knowing that their fine aircraft has landed in the hands of a real aviation buff.

What an airplane! I have many hours in a Bonanza, and it is not a stretch to say the Thorp flies in the same class. Smooth as silk, yet quick and responsive, and easily as stable as Marv Albert. And I want to tell you about the landing gear.. Kilo Kilo has some real legs under her. Titanium maybe? To show my appreciation for surviving such a hearty pounding, I'm spiffing her up a bit. I've wired in a monster GPS, a digital OAT, a graphic artist adding some nose art and of course no IFR ship could be certified without a CD player. Also, there must be a law against black leatherette in Palm Springs. Pizza chefs were cueing up to try a new flash bake technique. Media coverage of the pizza guys was limited .... they encountered Polaroid melt down and forgot their IR film.. Plush velour is being installed today at least my butt won't be zapped to the seat and my back epoxied in place.

Many thanks to all the EAA guys at Lincoln Airport CA especially Keith Peterson ... it took a brave man to check me out in the T-18.

Hope to meet many of you all in the future.  
Sincerely, Joe Lukins 2214 Yosemite Dr. / Palm Springs, CA 92264 / Ph & Fax 760.325.2552

## FOR SALE

### FOR SALE:

T-18 Plans  
S-18 Fuselage round deck with a swept fin  
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WOODWARD PROPELLER GOVERNOR  
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SUPPORT ASSY. WITH STARTER RING  
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589 hrs. KX 170 B with 201C head  
Wing tanks, 7 gals each plus 29 gal header tank.  
Flies 170 mph with fuel burn of 7.2 gph.  
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Thorp T-18, N9379 180 hp Lyc. All metal  
cowling. Polished Prop & Spinner. Gyros, 4 Cyl  
EGT & CHT. True Airspeed, King Audio Panel.  
3 light mkr. KX170, KX 170B, Elec Ignition. 7  
gal aux fuel. Paint is original yellow with black  
trim and very nice looking. Interior is 2 years old.  
A very nice airplane. Price is \$33,000 Contact  
Bob Park 4640 Aberfeldy Rd. Reno, NV 89509  
phone: 702-828-0718, office 858-2041

For sale:

1-walking beam complete 550 used-with 552  
sockets, 553 plates and link. \$100  
1-Pacesetter 200 by Cassidy wood prop 68-66  
for 150hp T-18 Excellent condition \$375  
2- aileron bell crank ass'y with 499 hubs and  
bearings pair \$40.  
Wanted: Prob Spinner T-18 and back plates.  
Prop is Sencenich 5 3/8 hub thickness  
Wanted: Wide body canopy glass  
Elmer Hymen 36 Center St. Midland Park, NF  
07432 Phone :201 444-7432

For Sale: Lee Skillman's Thorp Widebody  
Project is for sale. This is a great buy, and Lee  
would like an offer for the project. Lee does  
great work so if you are looking, check this one  
out. Lee also has an all metal Thorp cowling for  
sale. Phone: 334-633-3535

For Sale:

Slightly used Dynofocal engine mount for T-18  
Lots of 1/8" Clecos  
Call: 217-935-4215

FOR SALE: HARTZELL CONSTANT SPEED  
PROPELLER FOR 0-290, 0-320, 0-340 LYCOM-  
ING (No RPM restrictions) HC 82VL-1C 71" Dia.  
260 SMOH O-SPOH Inspection Return to Service  
Tag. (Matching governor exchange at Aircraft  
Accessories)  
Marion Smallwood  
501/756-6565

For Sale: Beautiful Thorp T-18 Caps  
Call or write, John Evens, 6855 Allison St.,  
Arvada, CO 80004 Phone 303-420-2724

Classic Sport Aircraft S-18 Plans and parts for both  
the T-18/S-18 Phone: 209-539-2755

Ecklund Engineering T-18 Plans and various Thorp  
parts and subassembly kits are now available. Call  
Dick Ecklund at 209-727-0318

Ken Brock Inc. Thorp machined parts and welded  
assemblies. 714-898-4366

Beautiful T-18 shirts. Call Marie McKinley at 704-  
628-0908 for more information.

Canopy Covers. Call Ed Ludtke at 605-361-2301

Subject: T-18 N851LT Egt/Cht report From: DadTrusty@aol.com

I promised that I would send you the results of testing my new exhaust system after I got it coated with ceramic. Well, I got it coated, at considerable expense, and finished modifying my one-of-a-kind-cowl to accomodate it. The results are different than I expected, in that the egt's are the same as I had with the mild steel pipes, however, the new pipes have improved performance over the old ones. I think they are much smoother flowing than my originals because the engine turns 50 RPM more in the climb and 20 to 40 RPM more at cruise. It's still too early to tell what the final changes will be, and I won't find that out until I fly it awhile at different altitudes, at various gross weights, and in different weather conditions. Meanwhile, the airplane apparently performs a little better and the engine runs nice and smooth.

I'm attaching a copy of the test summary. The file is "egt/cht". I'm looking forward to hearing about Oshkosh, since I couldn't be there. Talk to you later, Lyle Trusty

T-18 N851LT EGT/CHT survey, 7/27/97, Wt/Balance: 1,479 lbs, station 65.0" cg at T.O.

INSTRUMENTATION: Vision Micro-Systems, Inc, with 4 cyl cht/egt peak detector & Fuel Computer systems.

ENGINE: Lycoming O-360-A1A, 180 HP, MA4-5 Carb, Light Speed Engineering Electronic Ignition, cooling plenum chamber separated into individual right and left compartments, egg-crate type flow straightener under carburetor inlet. Dean Cochran Stainless Steel cross-over exhaust system with 1-3/4" ID pipes and .003" ceramic coating inside and outside.

PROPELLER: Sensenich Fixed Pitch, Model # 76EM8-86, S/N 19706K, Restricted operating range per Specialized Testing Service 2725 - 2840 RPM.

#### CRUISE CONDITIONS\*

| % pwr | cyl # 2<br>cht/egt | cyl # 1<br>cht/egt | KTAS(mph)     | Fuel Flow<br>(gph) | RPM / MP    | Press | Alt    |
|-------|--------------------|--------------------|---------------|--------------------|-------------|-------|--------|
| 70    | 350/1,510          | 350/1,470          | 170 (195.6)   | 8.2                | 2,600/21"   |       | 8,500' |
| 71.5  | 340/1,520          | 350/1,490          | 173 (199.1)   | 8.1-8.7            | 2,620/21.2" |       | 8,500' |
| 75    | 370/1,510          | 370/1,450          | 177 (203.7)   | 9.0                | 2,660/21.5" |       | 8,500' |
| 76.3  | 320/1,520          | 340/1,490          | 179 (206.0)   | 9.7-10             | 2,700/21.7  |       | 8,100' |
|       | cyl#4              | cyl # 3            |               |                    |             |       |        |
| 70    | 370/1,500          | 360/1,500          | Same as above |                    |             |       |        |
| 71.5  | 360/1,510          | 360/1,500          |               |                    |             |       |        |
| 75    | 370/1,500          | 370/1,540          |               |                    |             |       |        |
| 76.3  | 340/1,500          | 330/1,500          |               |                    |             |       |        |

#### CLIMB CONDITIONS\*\*

|    | Cyl # 2   | Cyl # 1   |                 |
|----|-----------|-----------|-----------------|
| FT | 350/1,210 | 340/1,230 | 2,787' - 5,000' |
| FT | 330/1,180 | 330/1,190 | 5,000' - 8,500' |
|    | Cyl # 4   | Cyl # 3   |                 |
| FT | 360/1,290 | 360/1,310 | Same as above   |
| FT | 360/1,270 | 360/1,290 |                 |

\* Mixture leaned until the first cylinder (#2) peaked, then enriched 20 - 30 degrees.

\*\* Full Throttle, Mixture full rich, 120-115 KIAS, > 2,400 rpm, ROC 1,400 FPM - 900 FPM.

|    |           |               |
|----|-----------|---------------|
| 90 | 360/1,310 | Same as above |
| FT | 360/1,270 | 360           |





Oct. 23. 1997

Dear Richard

It was very nice talking to you this afternoon. Yes I agree with you that the 1st built airplanes and costs are out of reach of so very many that would love to fly and build airplanes for the education and pleasure received. We don't see many plans for simple airplanes that are affordable to build. Out of the Ultra Group and available engine there can be some good possibilities for light plane design and flying at lower costs - This can be one of the challenges for SAA.

Keep in touch - My home phone is 920-233-8014. I still get alot of EAA mail at my EAA office over at the EAA Camp ground

Saul.

Dear Richard and Fellow T-18 Enthusiasts:

Here are several ideas I used on my T- 18 and thought they might be of value to our new builders or re-builders.

I consider myself a rather privileged builder/pilot because I knew many of the early builders, such as, B.C. Roemer, builder of the world's fastest T- 18, John Shinn, Lu Sunderland and many of the California T-18 folks. I also had the opportunity to spend many hours with a renowned builder in this region, Bob Dial. Bob gave me many building ideas when I was creating my "Dream Machine" and was a very patient flight instructor when it came time for me to pilot my own T-18.

I spent many fascinating hours next to Bob in my ship, running the T-18 through all sorts of flight conditions. High altitude, aileron rolls, and short field landings were routine afternoon flights. During those flights, Bob would relate many stories of his military combat and GM Corporate flying career and, of course, his many experiences in his own T-18, N 11 BD, which he completed in 1970.

We T-18ers were lucky to have a large number of innovative trail blazers. Incidentally, Bob was one of the first to install a fuel injected engine in a T-18 and his ship was the test bed for all the Sensenich propeller test runs in the early '70's.

In the early 1980's, as new aircraft concepts came on line, such as the Glasair, Long-EZ, and Lancair, many of us thought the T-18 was long past its prime and domed. However, we are finding out that you don't get something for nothing. All these advanced designs make some compromises to achieve performance. If you new folks are thinking about choosing a project, you should look closely at the true performance figures. You will see the T-18 is still near the top. Consider maintenance, take-off and landing distance, visibility, comfort, control balance, crash worthiness and longevity. All have to be part of the equation. The T-18 is a well balanced compromise having all of these attributes. Think about how many aircraft can cruise at 170 MPH, at 10,000 feet on 8.6gals. per hour and be safely flown in and out of a 2000 foot grass strip.

I've been involved with the T- 18 and associated people for 20+ years now and still find it exciting every time I push in the throttle for take-off or just getting together for lunch with the local T-18 group.

For those who are still thinking about building your T-18, get with it!! Every day you procrastinate, is that much time added to the other end of the project. You can do it!! We all had to take that first step. If you are about to start a new project, I recommend starting with the fuselage. Order the pre-marked skins and get off on the right foot. Some have recommended starting with a smaller part, however, small components can be frustrating and time consuming to build for the beginner. Remember, it's better to make the components fit the fuselage then it is to try and make a fuselage fit a bunch of components. Besides, building the fuselage gives the builder something to show his friends and neighbors, not to mention, something to sit in!!! You need to self motivate, so build in an order of construction that gives you visual motivation. Good Flying!!

Dick Penman

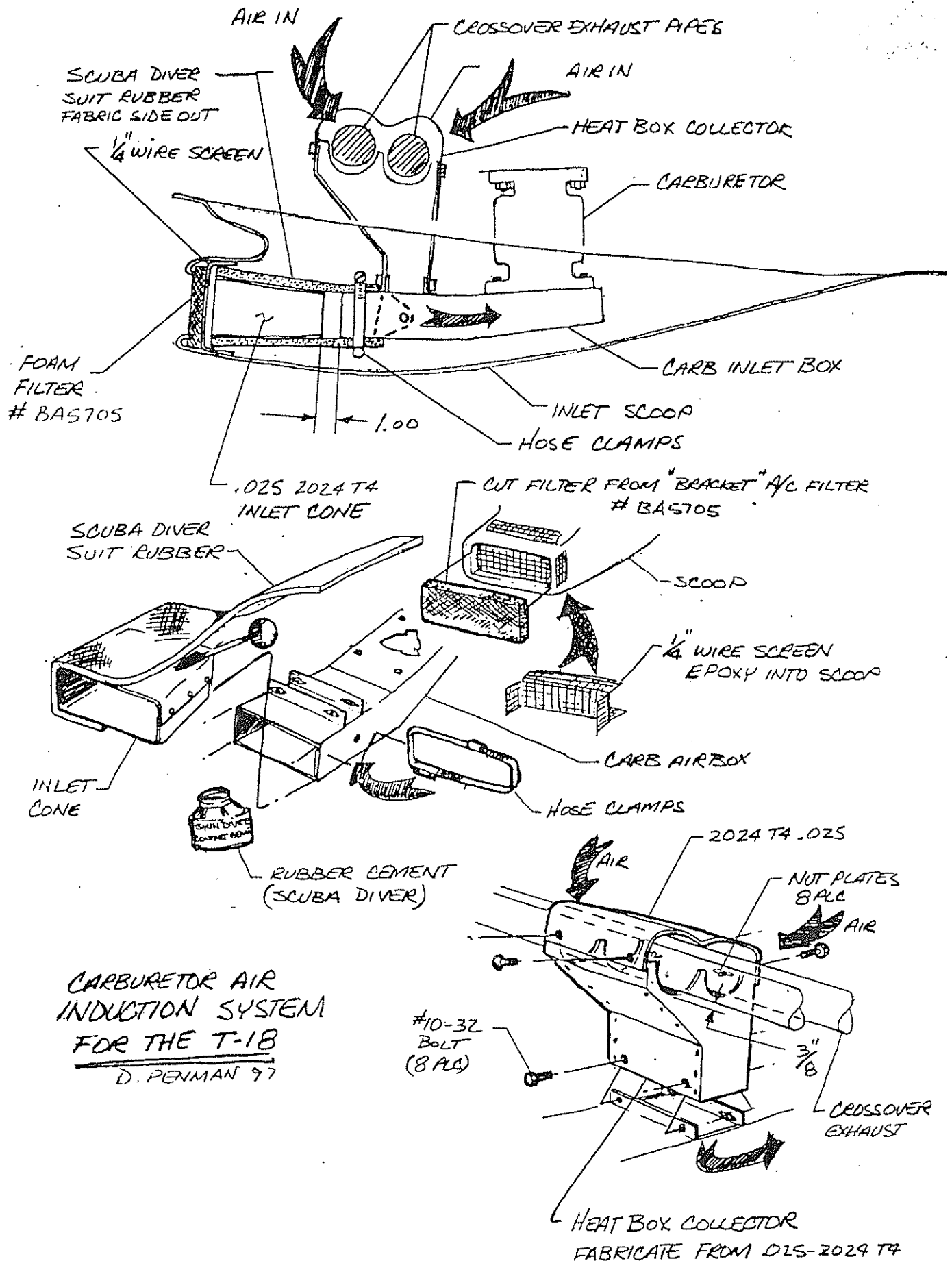
5918 Bordman Rd.

Dryden, MI 48428

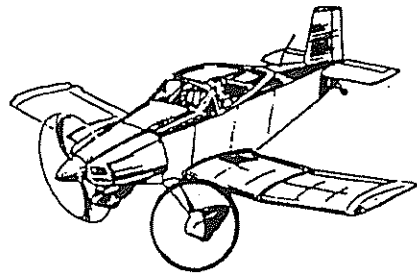
(248)628-5075

N199DP

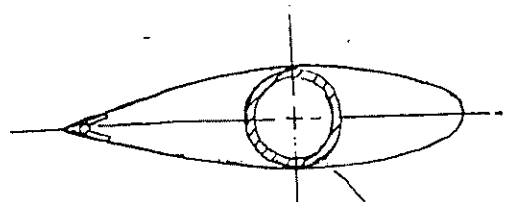
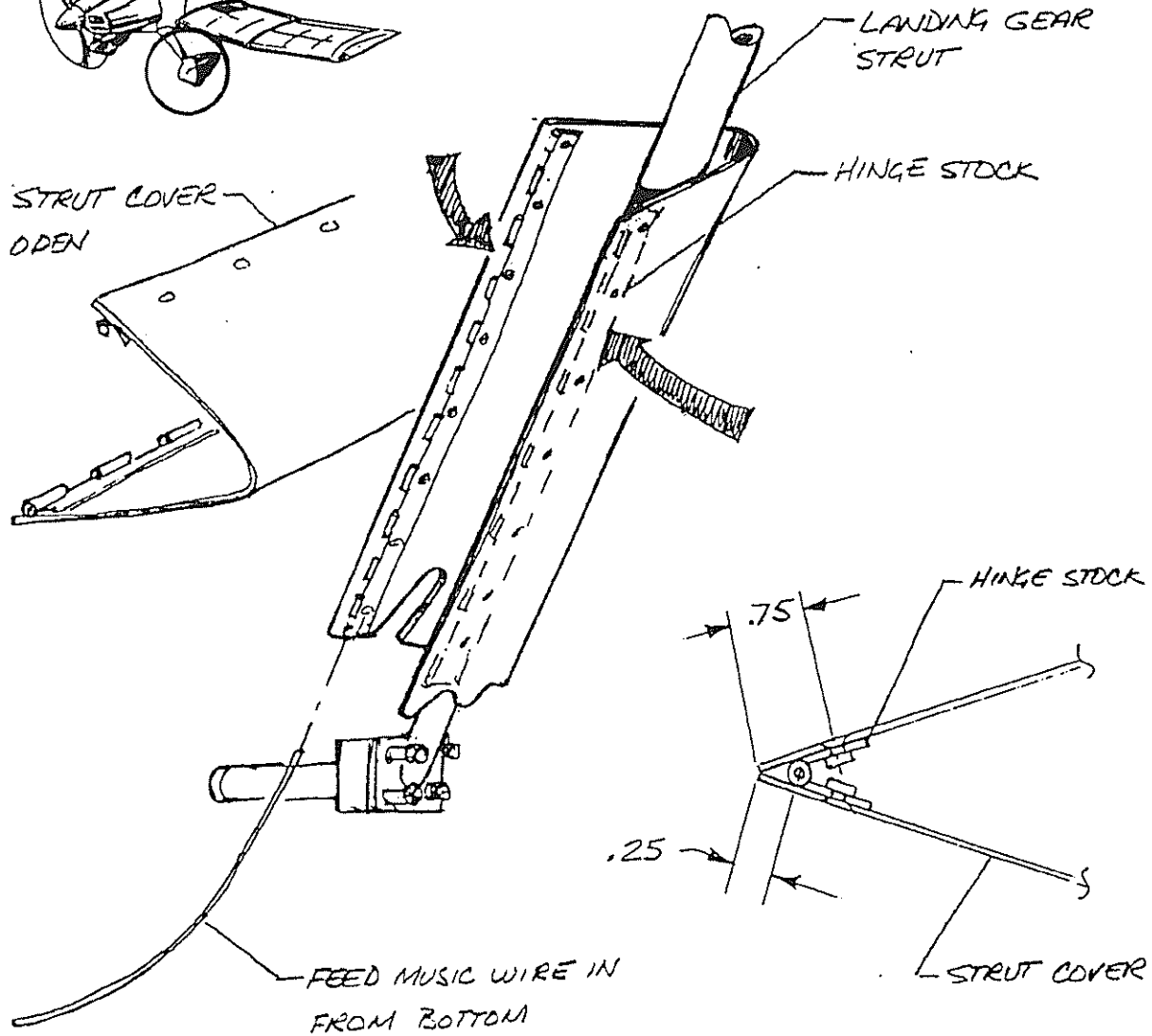
EAA 60368



LANDING GEAR STRUT COVER  
INSTALLATION D. PENMAN '97



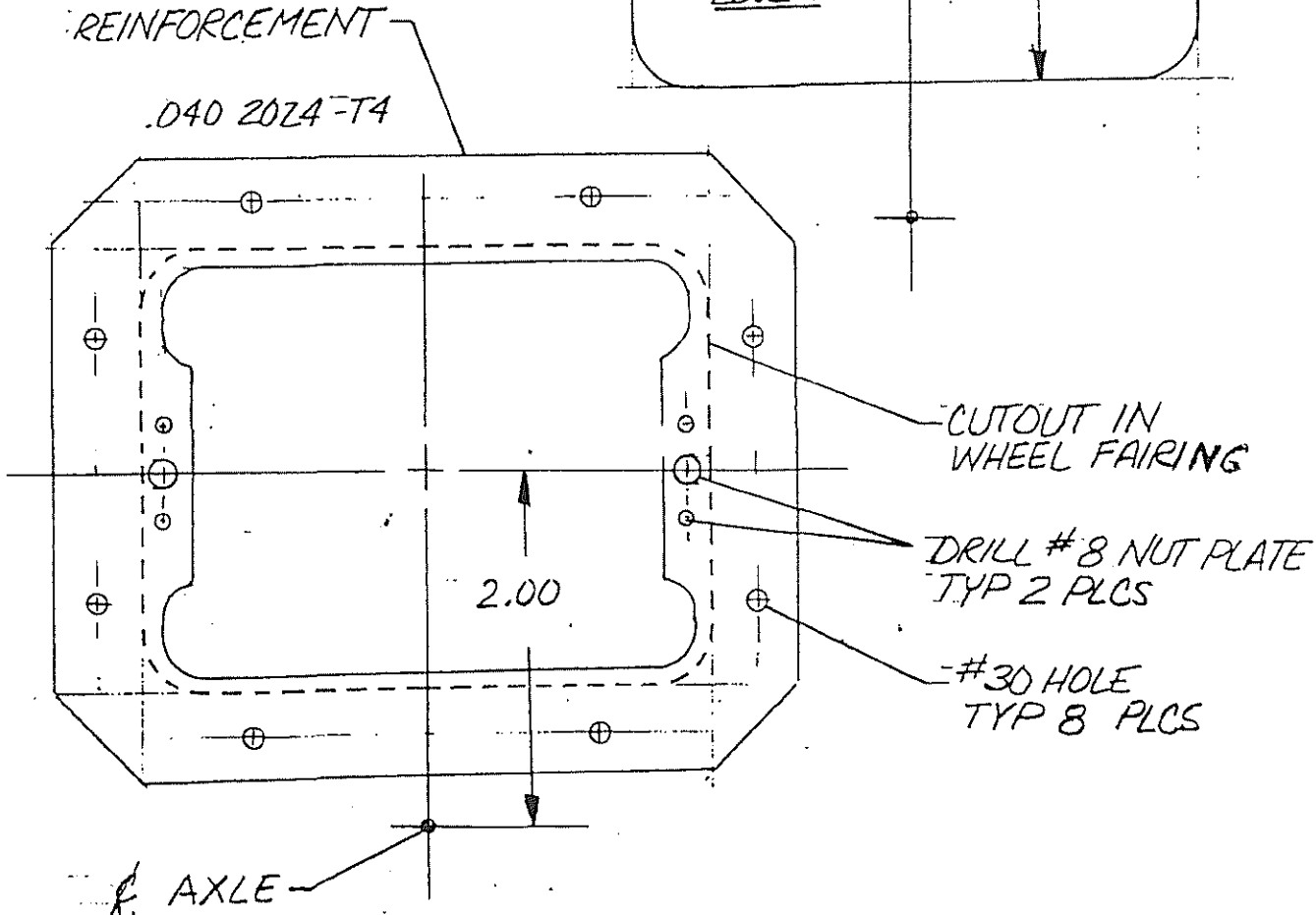
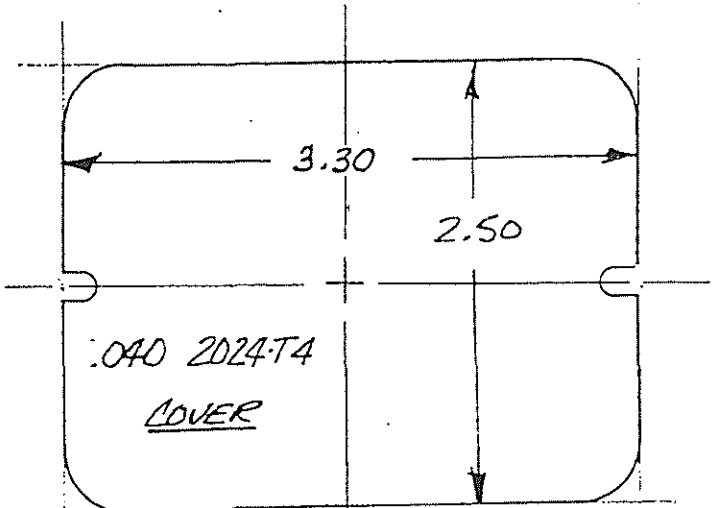
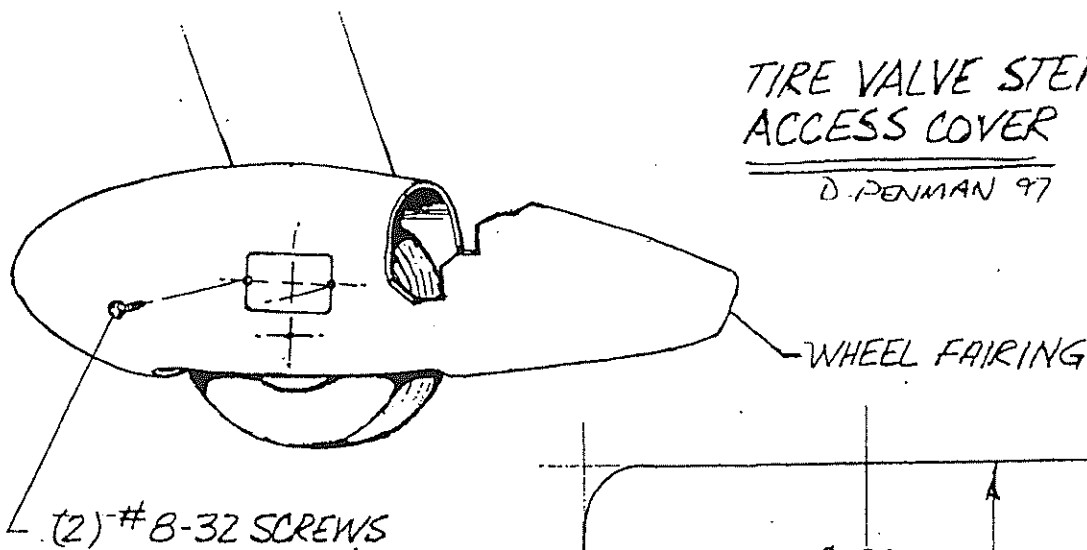
STRUT COVER  
OPEN

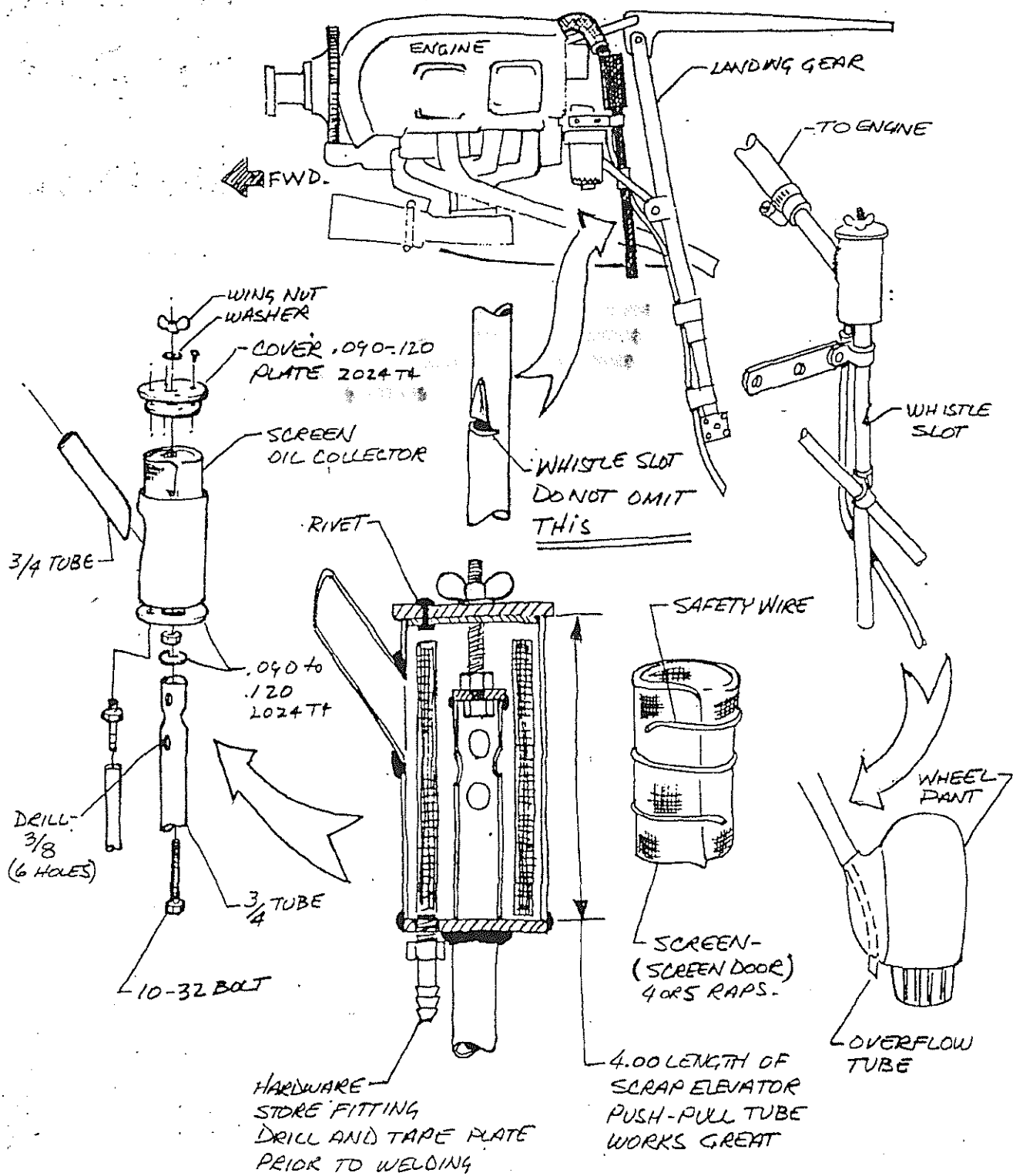


SIDE COMPRESSION WILL  
HOLD STRUT IN PLACE  
(NO OTHER BRACKETS REQUIRED)

TIRE VALVE STEM  
ACCESS COVER

D. PENMAN 97





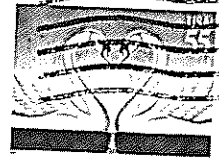
CRANKCASE OIL BREATHER  
SYSTEM - T-18 O320  
D. PENMAN 97

T-18 NEWSLETTER  
ROUTE 3, BOX 295  
CLINTON, IL 61727  
1-217-935-4215

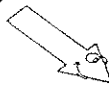
Issue #104 Oct 97



Newsletter No. 104



Red Circle Not Paid



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[REDACTED]  
[REDACTED]  
[REDACTED]

25

Last call for 1997 Dues! If you have a red circle on the label I'm not showing that you have paid for this year. If this is incorrect please let me know. Otherwise fill out the form below and send a check. It will help with postage and printing cost.

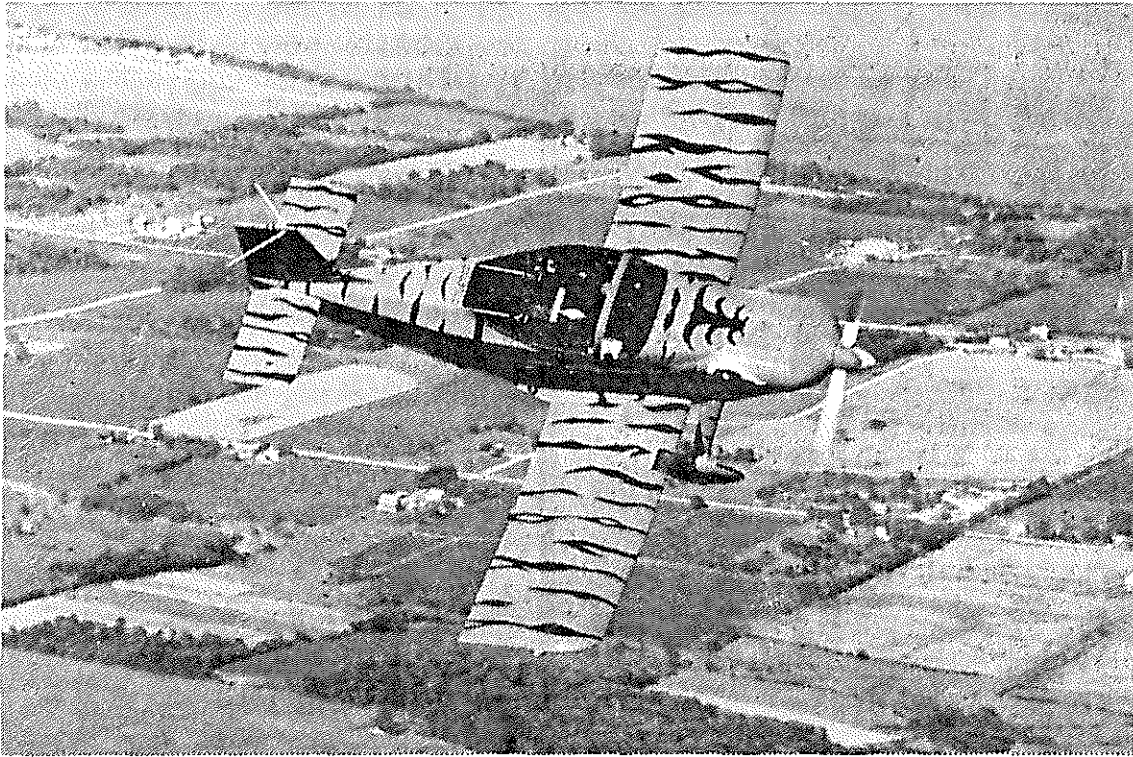
## THORP T-18/S-18 MUTUAL AID SOCIETY 1997 DUES

Please continue your support of this valuable exchange of ideas, building tips and safety information covering John Thorp's great design. Make checks payable to Richard Snelson, Route 3 Box 295, Clinton, IL 61727 \$25.00 US, \$30.00 other.

Name: \_\_\_\_\_  
Address \_\_\_\_\_  
City: \_\_\_\_\_ State \_\_\_\_\_ Zip Code: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Aircraft: \_\_\_\_\_ Hours on Aircraft: \_\_\_\_\_  
Email address: \_\_\_\_\_  
Notes: (Building?, Flying?, Thinking about it?etc.) \_\_\_\_\_

Only the folks with red circles on their labels!

# T-18 NEWSLETTER



*Harvey Mickelsen's "Fat Cat" Thorp*

## IN THIS ISSUE:

FLAP ACTUATOR by Gary Cotner

REBUILD OF N9008Z by Steve Hawley

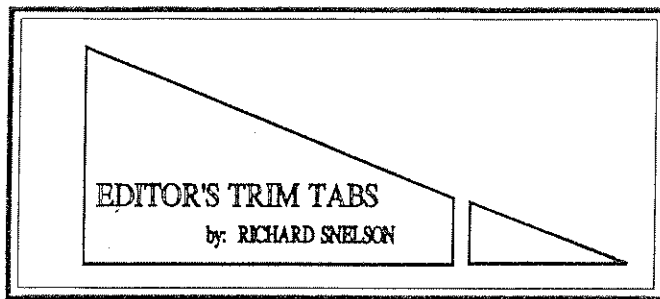
IVOPROP FAILURE by Harvey Mickelsen

Sun N Fun to Placerville by Susan Highley

FLASH! FLASH! THORP KITS!

*NOTICE: (STANDARD DISCLAIMER) As always, in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.*





## **1998 EVENTS!**

Sun' N Fun

### **2nd Annual Thorp Award Dinner**

\* Trophy for the outstanding Thorp presented at  
Sun N Fun

\* Sirloin Strip Steak & trimmings

Wed, April 22, 1998

6:30 at the Sun N Fun Special

Event Tent

\* Price \$10.00 per person. R.S.V.P. to Bill  
Williams c/o Sun N Fun

P.O. Box 6750, Lakeland, FL 33807 by April 10,  
1998

Spring Fly-In at Coles (MTO)

Matoon, Illinois

June 5-6-7

Oshkosh 1998

Picnic and Forum at the Nature Center on  
Friday, starting at 11:30 AM

Thorp Fly-In Placerville, California  
to be announced

Fall Thorp Fly-In at Kentucky Dam  
Oct 9-10-11, 1998

Memo from Ken & Marie Brock

It's good news! We have Thorp spinners back  
in stock. This is the only spinner that fits the  
Thorp cowling correctly.

To The Members of our T-18/S-18 Mutual Aid  
Society

Here's another issue folks and it's packed with  
excellent contributions from our members. Gary  
Cotner sent us some fine drawing of a flap  
actuator he designed using the flap actuator  
motor from the RV aircraft. Steve Hawley  
reports on the rebuild of N9008Z and Harvey  
Mickelsen has word on the failure of his  
IVOPROP. The traveling Highley's tell about  
their trip from Florida to Placerville, California.  
I've included a report from each of our suppliers.  
Both Ecklund Engineering and Classic Sport  
Aircraft are working on getting a Thorp kit on  
the market. Classic plans to ship their first kit  
early in 1998. Read the reports that follow.

Those of you planning to go to Sun N Fun be  
sure and attend the Thorp Steak Cookout. The  
Red Carpet has been rolled out for the T-18  
bunch. So come on down and joins us for the 2nd  
Annual Thorp Award Dinner.

Let's hope the weather is better this year for the  
Illinois Fly-In. It would be great to have all you  
distance folks flyin and joins us at the Coles  
County Airport.

We will do our best with the help of some other  
volunteers to put on the lunch at Oshkosh again  
this year. It will be followed by the T-18 forum  
also in the Nature Center.

You folks in California let me know when Placer-  
ville will be held. I'd like to get the date on our  
homepage.

Here's a good one for you. How would you like  
to spend the night in John Thorp's old home-  
stead. "The Locke House and the Inn at Locke  
House." Richard and Lani Ecklund with Kay  
Thorp, John's widow are continuing the preserva-  
tion and restoration of the famous homestead. It's  
now a bed and breakfast! See displays of John  
Thorp's works and accomplishments in the barn  
where he and his friends worked on building their  
own T-18s. For reservations call (209) 727-5715.

## Report from Classic Sport Aircraft

Greetings from Classic Sport Aircraft. You have probably wondered why you have not seen a lot of advertising, etc. Well, we have been working very hard to achieve our goal of making the S-18 available in kit form. We have another S-18 under construction for show at the various fly-ins and more proofing of our templates and drawings.

THE GOOD NEWS is we are happy to announce that we are working very hard on our first complete kit for shipment to New Zealand. Delivery is scheduled for early 1998. We are currently working to increase our inventory and coordinating with suppliers. We also anticipate shipment of a couple of wing kits.

This kit includes every part for the complete airframe. All welded machined and formed parts are complete. This will really enhance the time it takes to build an S-18. We are supplying canopy, windshield, spinner, engine mount, landing gear, cowling, etc.

We now have in stock, horizontal spars with the 509/510 and both 502-3,-7 tubes completely riveted ready for rib and skin installation. Some time in January 1998 we will have completed main spars for both the inner and outer wing.

We have received many inquiries for alternate engines for the Thorp, so in our spare time (ha, ha!!) we went to work and are developing a 180HP, V4 engine. It is our goal to develop a package that fits within the existing cowling. Anyone with interest, please drop us a line.

Our Fly-In schedule for 1998 is:

|                        |                                   |
|------------------------|-----------------------------------|
| Sun N' Fun             | April 19-24 (Booth 31)            |
| Arlington, WA          | July                              |
| Golden West EAA Fly-In | September (1st Annual) Castle AFB |
| Placerville, CA        | September                         |
| Copperstate (Arizona)  | October                           |

We hope to see you AND YOUR THORP at some of these fly-ins. We have some recently completed S-18's (the ones we are aware of). Jeff Taylor - Washington (Jeff was kind enough to let us put his beautiful plane in our booth at Arlington and it drew an awful lot of OOOHH's and AAAHHH's. (our aircraft, due to bad weather was stuck in Redmond, Oregon and we had to drive from there to Arlington.) Byron Janzen of Redlands, California and Doug Perkins of BC, Canada. These are real beauties, plus there are more soon to be completed.

That is all for now and thanks for the patience of all of you. LET'S SEE SOME S-18's and T-18's at these fly-ins.

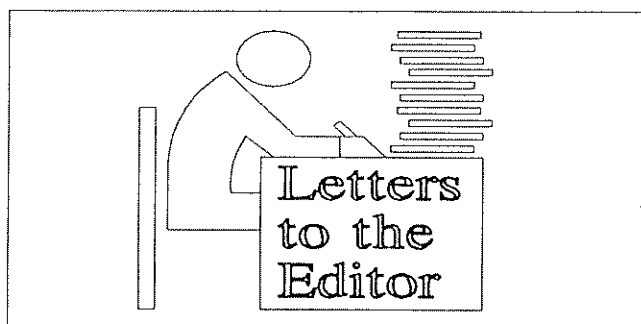
FOR THE LADIES. (From Frankie Archer)

We have had inquiries from some of you ladies about jewelry. I have made contact with a jeweler that will make us some earrings, necklaces, etc. He will make a mold and away we go. Do not know cost as yet, but depending on which gold used determines the price. NEED TO KNOW HOW MUCH INTEREST BEFORE we can do anything so let me know PRONTO of your interest. Would like to have some ready for Sun N' Fun. He can also do belt buckles. CALL ME EVENINGS preferably and let me know what your interest is (209)539-2755 phone/fax or E-mail T18THORP@AOL.COM. Thanks - Frankie Archer

## Memo from Ecklund Engineering:

There is an error in the price I listed for the #517-1 Horizontal tail tab kit. The price for one tab skin (517-1), one Trailing edge strip (517-2) and one Rib (517-4) should be: \$39.00 plus shipping.

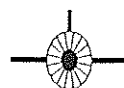
We are currently pricing the remaining parts for the Horizontal Tail Kit. Next will come the Vertical Tail to complete the empennage kit. We are also trying some methods of production forming the Flap skins in preparation for developing the Wing kit.



### CAUTION MAIN SPAR WEB RIVET DETAILS

A word of caution on the proposed changes recommended by Les Krudel for the main spar web rivet details on either the T-18 standard or S-18 folding wings. While the details he included from E. F. Bruhn's "Analysis & Design of Flight Vehicle Structures" are accurate, he did not include "The rest of the Story". While I have not checked the exact numbers for the rivet spacing used by John Thorp, I suspect he has included many more rivets than required for the allowable rivet loads in either Bruhn (Table D1.7) or the defense industry bible MIL-HDBK-5E (Table 8.1.2.2(d)). Each indicates a yield strength for 1/8" AD(2117-T3) rivets in countersunk 0.040 clad 2024-T3 aluminum to be 231 pounds. Yes, the 0.042 head thickness of that rivet makes this a knife edge joint, and MIL-HDBK-5E states this to be undesirable but approvable by the procuring agency. To my knowledge, there have been no cases of main spar web rivets loosening in service when installed per John Thorp's design. If there were loads equal to or greater than the allowable rivet yield strength, we would see working of these rivets. The fact that this is a 30+ year old design with lots of experience, reinforces the soundness of the aircraft as designed. The bottom line is again "BUILD IT TO CURRENT PRINTS" in the case of all loaded structures unless you are willing to fully evaluate the effects and accept responsibility for your changes.

Richard Eklund  
Eklund Engineering, Inc.

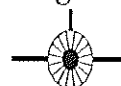


Richard,

I have been dragging around and (sometimes) working on my T-18 project for more than a decade. I am glad that it's on the last stretch to completion (minus paint). I think I could tinker with it for another month or two to assure that all is done and done right but I need to get some instruction before flying it. I am an A&P with a Pilot's license and I have 400 + hours in a Super Cub but haven't flown much in the past 10 years. I need to find a good instructor that can check me out in a Thorp. I live in Anchorage but plan to go to Boston and Detroit this Dec. and Jan.

As far as I know, I have the only T-18 in Alaska so I haven't seen too many. I would also like to see some Thorps and talk to some experienced builders on my trip. I want to make the flight time in this aircraft as safe as possible. Can you point me in the right direction? Thank you,  
Richard Marson

*Editor's Note: I got to fly with Richard Marson this week in my Thorp. Enjoyed the experience of meeting the very nice gentleman.*



From:

"Sun 'n Fun EAA Fly-In, Inc." <fly-info@sun-n-fun.org>  
Rich,

Danny Cummins of Tennessee informed me that the phone number for Applewood Shirts has been changed since Susan gave it to you for the MAS Newsletter. I checked it out and found that the correct number is: (704)654-9711. Perhaps you could run it on the Web Site.  
Cheers,

Bob Highley  
Sun 'n Fun EAA Fly-In, Inc.  
PO Box 6750  
Lakeland, FL 33807

*Editor's Note: I have it on my homepage, Thanks*

Hi again, Rich,

Just got the newsletter today. I sure do enjoy it. When they come, I have to read them before I do anything else. I truly love hearing about, reading about, talking about, looking at, and flying 'T-18's!

There were some very good letters. My friend Dick Penman's drawings were great, and I really enjoyed his letter. I too remember many of the "old guys". I got my first T-18 ride from B.C. Roemer, the "feather merchant". It was at Oshkosh in 1977, and I was already building mine, never having even flown in one until then. He took me out over the lake and rolled it! What a thrill! But I didn't need that, to know that this was one good airplane. Most of those guys were there... Lu Sunderland, Bob Dial, Don Taylor and his "Victoria '76", Ken Knowles, Dick Cavin, etc., etc., etc. They wouldn't know me from Adam, but I was in "Hog Heaven". Those were "heady" days for the T-18.

A quick comment regarding Dick's statement about "...how many aircraft can cruise at 170 MPH, at 10,000 feet on 8.6 gals. per hour..." .....How about 180 MPH at 7500 feet on 7.5 gph? This is what I and Dean Cochran (N11DC) both do consistently. Sometimes we even do better than this on the fuel burn. We've done long cross countries together (for instance, from Denver to Placerville, twice), and that's the performance we're getting. And we don't have a lot of fancy fairings (there is room for improvement). We both have 160 HP, and both aircraft are straight, and pretty light. I think this is one of the keys...keep 'em light. That's all the rambling for now.

Best Regards,  
John Evens, N71JE  
JREvens@aol.com



Rich,

Now, I think it is going to work!

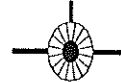
Still need info on an alternate static source and a source for the little Mode C box - I have a Narco transponder. Also, what about vapor lock with a gravity feed system? I have air going to the

gascolator, but that's about all I can do other than the usual fire sleeves. I couldn't find the Scott filter material for the oil separator than John Evans referred to, so I put a sheet of gray Scotch-bright in instead. Oil won't attack it and it seems like a pretty good filter. If this gives anyone heartburn, it is easy to change. I'll send a couple of pics later on my progress.

A few people here think I'm nuts for taking off the fuel pumps, but the gravity feed sure looks simple. Right now I have the plane propped up about 10 inches at the mains and the tail up on a sawhorse to keep things level. This is to help my bad back. I can actually stand up inside while working around the panel and firewall, which I'm almost ready to cover up. Your feelings on a firewall cover? There are a lot of different materials out there. Well, the weather is turning a little cold, my garage heater is working well and I'm on a roll.

Regards,

"Robert F. Clayton" <rclayton@utah.uswest.net>

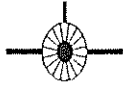


Dear Rich,

I just installed the latest version of Netscape and I always get in trouble whenever I try to update anything, so I'm not sure you can get back to me, yet. I know this is going out, so let's see what happens.

I finally got my B&C alternator and starter installed and hooked up. In fact I have my panel all finished except leads to my Skysports fuel probe. I have gone by Tony B.'s recommendations - one wire at a time. I have a new overhauled MA3-SPA carb all up to date and a new set of Slick mags. I have Gary C.'s throttle control installed and ready for the cable controls, (as soon as I can contact Cablecraft). I had an oil separator from John Evans plans made and it is installed. I had to move my oil cooler for the 3rd time to give me more space between it and the gear leg. That's done. Now I can get back to

finishing the baffles (a baffling job at best), and then back to working on Gary C.'s cowling. I have a few questions, but I'll see if this gets to you and comes back. Bob Clayton



Hi Rich,

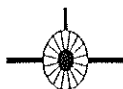
Thanks for responding to my inquiry. My Dad, Stewart Schureman built his plane back in the late 60's. He completed it ready for the first flight in 1969. The test flight and most of the flying was in Southern California. Most of the plane was hand fabricated. The prefab parts were not as common then. He worked in the aircraft industry for "Areoquip", Burbank, CA. He was also fortunate to be friends with John Thorp. The T-18 was originally polished aluminum, and later painted red. It was a fine example.

A stroke forced the sale of the plane in the mid 70's. Someone got it for a "song". I can remember finishing up the new exhaust system for it so it would pass the inspection. I was lucky as a kid to have a garage full of tools, and a Dad to teach me to use them.

My Dad passed away this year. Locating the old T-18 became important to me. I still have the original plans and correspondence from John Thorpe. If you hear of any contacts please let me know.

We just got "on-line". The information that's out there is amazing. I have made some great contacts for Vintage Motorcycles as well.

Take care, John Schureman  
email to: Jwskurman@aol.com



Hi Rich,

Haven't heard from you for a while. How are you? I had a great trip to the Kerrville fly-in the weekend of October 17th. I counted 5 Thorps

there. The weather was absolutely beautiful. What a nice weekend. Then to top it off, they gave me the "Plans Built Custom Grand Champion" award! I was really surprised. I haven't had my airplane judged at any of the fly-ins for several years now. Just did it on a whim this time. Not too bad for a 7 year old ship with 600 hours on it, huh? Figure it's just another tribute to a wonderful design.

Here's something that might interest some of the guys. I have a single cylinder head temperature probe, and have always wondered if I guessed right about being on the hottest one. So....I built 4 homemade thermocouple bayonet probes, and used my digital test thermometer and a rotary switch, and went up for a test flight this weekend. Climbing out of my home airport (elevation 5670 msl), the O.A.T. was 40 deg. F. The hottest cylinder turned out to be #2 (left front), followed closely (only 1 to 3 deg. difference) by #4 (left rear). #3 (right rear) was the coolest. As you know, I have the original Thorp style cowl, and I have my oil cooler in front of the #2 cylinder. I saw a maximum difference between the hottest & coldest of only 12 deg. F. (in climb, 1000 fpm, 7500 to 9500 msl). In cruise, the difference was just 8 deg. (7500 msl, 2550 rpm, 20" manifold pressure). The maximum temperature I saw was 338 deg. (in the climb). I believe that these are excellent numbers, and I attribute them to the excellent design of the cowl and baffling. I can see no need for the "dam" across the top of the engine that some of the guys have been installing, at least not on my installation. My baffling is tight, and I'm using a thin (1/16") silicone rubber sheet as the seal material. It has held up very well for 7 years now, with no cracks.

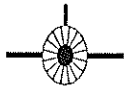
Something else that may be of interest...I recently replaced my rubber engine mounts. They were about 22 years old, since I had bought them early in the project, and were getting a lot of cracks in the rubber, although the sagging wasn't that bad. I bought the Barry brand units this time. Anyway, a word of advice...it's obvious, but don't torque or introduce any twist in the rubber

between the steel plates on these mounts. The rubber can start to crack or tear right away if you do. It's easy to do with the dynafocal mount, even with a washer under the bolt head. I think a little lubricant between the bolt head and washer when you're torquing them might be a good idea.

One final comment.. I've got quite a few friends flying RV's now (who hasn't? As Dean Cochran says "They're a growing menace!"). I remember a comment from a gentleman at the T-18 forum at Oshkosh several years ago. He said words to the effect that one of the bad design features on the T-18 was the landing gear. With all due respect to this fellow, that really "stuck in my craw", and I spoke up right away, but I feel it bears repeating once in awhile. The T-18 gear may be a little stiff on the ground, but it is an elegantly simple, strong design, with "real" axles and axle pads, which can be shimmed to get your wheel alignment just right anytime. It's a wonderful gear when you're coming in slipping, in a strong crosswind, and touching down on one wheel first, and I'll take it anytime over the "other brand's" design. Also, I seem to be getting at least 4 times the tire life of the RV's! Enough said.

As always, thanks for the good job, Rich. By the way, we miss you on AOL.

Best Regards,  
John Evens, N71JE



Dear Richard:

Timpken wheel bearings for Cleveland wheels can be obtained at a NAPA store half price of aircraft suppliers. Ordinary 12 volt auto tailight bulb with one indexing pin filed off will substitute for Grimes. I have been taxiing but would like to get some dual time in a T-18, can you suggest someone in Washington state who might teach me to fly the T-18?

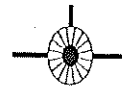
Best wishes from Ted Strange  
email address: strange@silk.net

Hi again, Rich,

For those guys who may balk at the price of cutting up a Bracket filter to fit in the style of air-inlet shown in Dick Penman's drawing in the last newsletter, or who don't have access to filter material locally, I have a pretty good supply of 1" thick "Scottfoam", dark grey color. This is material manufactured for air filters. I like to saturate it with a good quality foam filter oil (such as Belray brand), available at most motorcycle shops. This repels water, and makes the filter more efficient for fine dust. I even carry a pre-oiled spare in a sealed baggy in the airplane. I can furnish a 7" x 12" piece (more than enough for 4 filters) for \$8.00 plus postage.

John Evens 6855 Allison St. Arvada, CO 80004  
JREvens@aol.com

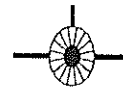
*Editor's Note: Another great tip from John.*



Rich,

The landing gear strut fairing modification in the November issue should probably have a wear strip stuck to its inside, ie some Polyethylene flashing tape or similar to stop fretting and intermetallic corrosion and perhaps a false rib, hose clamped to the leg, to stop any rotation. You will have to forgive me but I just spent \$14,000 getting my Cherokee back in the air due to Piper's poor anti-corrosion treatments so I am a little sensitive about it.

Gibson Allan  
email address: Allan.Gibson@wmc.com.au

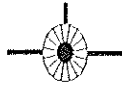


Rich, Jim & Judy Paine are in the process of moving to Hendersonville, NC and they must vacate their house no later than 24 Dec. Not a pleasant way to spend Christmas, but I know they are happy to have the house sale complete. The four of us, with our two Thorps, are hoping to make it to Sun N Fun this spring and are planning on spending the whole week. Will you be going to FL this year? Hope so! If not, we probably won't see you folks until the June fly-in. Dan & Janey Wolf.

## FOR SALE

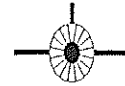
Will you please include the following items for sale in the next newsletter?

- Starter Ring Gear Assembly 122 teeth, .625 driving lug holes, \$100
  - Starter Ring Gear Assembly 122 teeth, .75 driving lug holes, \$200
  - Lycoming Direct Drive Starter Delco Remy #1109657, 10/12 pitch \$100
  - Generator 12 volt/12 amp, #1101875, including bracket and pulley  
reconditioned and never used. \$150
  - Lyc. 0-290 pistons + .020 oversize \$200
- Thanks, Jim Hockenbrock, Fawn Road  
Reedsville, PA 17084 Phone: 717-667-2790  
e-mail: jcorbin@acsworld.net



Hi Richard,

Just a short note to let you know that you have another interested T-18 builder to be. I purchased my plans from John T. about 16 years ago. (Possibly the last set that he sold) and also the wide body and conv. wing drawings from Sunderland. Unfortunately my job decided that I should relocate and so I have been in 4 different locations over these years and started a new family, so I haven't done much but think about flying. But, if nothing else, I'm pretty close to you now. Just 16 miles N. into Michigan, Bridgman to be exact. But in the recent issue of EAA I saw another T-18 and decided to go looking on-line for other interested people and came across the T-18 Forum and thought that I'd let you know that I'm here. There's always been questions in my mind on how to start and maybe that's kept me from beginning. Maybe my finding you will be just what I need to get going. I hope that this gets to you and you have time to respond. I really enjoyed your web page with all the nice T-18's. Take care. Dennis Richardson  
email: DK4rich@aol.com



Dear Rich,

Slowly but surely I'm putting 118JC back together with many improvements. I've added a hinged floor panel to make access to the rear of the instrument panel easier, and a cutout over the baggage compartment for access during flight. I'm trying to incorporate every neat idea I've seen that is affordable. I would like some feedback on some ideas I've seen in the newsletters:

- 3/32" wing rivets instead of 1/8" on the wing ribs at 1/2" spacing? (Easier to drive).
- single piece aileron & flap skins with folded trailing edges? (lighter stick forces?)
- 5 ribs per wing section instead of 4? (This brings the ribs spacing closer to what you see on the RV's ).

Please, anyone call or write me with comments.

Also I have some odds & ends for sale: - Main center wing spar, - main gear with damaged right leg (short gear). - standard wing ribs .025" (2 sets) - Narco ELT 910 ( Top of the line!) - prop extension.

Lastly, I am building the outer wings with wet leading edges. I'm looking for 10 nose ribs for a standard wing made from .032. If anyone wants to contact me I can be found at: Jimmy Cash  
9003 Green Leaves Dr. Grandbury, TX 76049  
Phone (817)573-7766

Thanks for the great work. Keep it up and fly safe. Jim.

*Editor's Note: Stay with John's design for rivets and the number of wing ribs. Keep it light, without unnecessary ribs, etc. As to the single piece aileron skins: If you don't shape the rear of the aileron correctly the stick forces can be heavier not lighter. Several of us talked about this at Ky Dam and I think the general consensus was that the rear edge needed to be flattened to break up the flow across the rear of the aileron.*

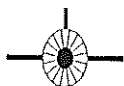
Dear Richard:

Please find enclosed \$ 25 for the 1998 MAS Newsletters. I always read them from one end to the other as soon as I pick them from my mail box. My T/S-18 project is still under slow construction, right now I have most of the inner-wing clecoed and soon will be ready for anti-corrosion treatment and final assembly. I ran into many dimensioning discrepancies in Lu's drawings and I am sorry to say that there were some in material received from Phil Tucker, maybe both ran into battle fatigue in these instances of work.

Other; some time ago I bought a canopy frame (obtained from Phil Tucker, he said) for the S-18 from the same Alabama gent that now is trying to sell his entire project as the last newsletters indicate, I noticed the rear rollers' brackets on the frame's cross-bar are welded aft on the bar and the drawings show them to be welded fwd on the bar. Photos that I took of several T-18s and S-18s show the detail as per the drawings, that is fwd on the cross-bar, I believe one exception is Jim Paine's from OH; comment?

Thorp pitot: I cannot find any comments in the newsletters as to why, it seems, the original over-the-fin pitot concept is not used. I asked comments from several builders that do have them and all I could get was "it works fine for me", the others would say generally "oh no, don't mount the fin pitot, not practical, not accurate, not good for hangar hazards, too far, the Piper way is better, etc. but not one could give me a good understandable reason one way or the other. Comment? Well I guess I am getting too winded and taking your valuable time. The newsletters are always super, thanks for your dedication. If you want, you may use my E-Mail:

pereOO9@ibm.net. Wishing good health and good times for you and your wife, I send you my regards. Sincerely, Al Pereira



For Sale:

Dynofocal engine mount for T-18

Lots of 1/8" Clecos

Call: 217-935-4215

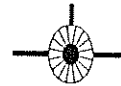
Hello Rich:

Thanks for forwarding the latest copy 104 of the newsletter. As I had to cut my visit to Oshkosh short this year I missed seeing you.

I received from Ron Davis Racing Products in Phoenix Arizona in August, the aluminum radiator, that with their help I custom designed "to fit into the inner wing of the S-18". Due to business pressures I haven't had any time to get at the installation to date. December should be less hectic. I'll send you a writeup and photos when I've completed this task. Keep up the excellent job your doing with the newsletter it's a treasure of data for all of us involved in the type.

Best regards,

W.T.Forsythe 8766 Marcel Cadieux Montreal, Quebec, H2M 2L1, Canada Tel: 514 388 7633



Hi Richard:

Well I got in two hours of touch and go's before the weather closed in. I have done a lot of work since then and she is now ready for flight come spring.

There are a few more jobs to do but I will be able to fly without them.

Is there a flat pattern available for LG fairings as mine are getting kind of ratty?

Best wishes to you and your wife for 98.

Ted Strange<strange@silk.net>

FOR SALE: HARTZELL CONSTANT SPEED PROPELLER FOR 0-290, 0-320, 0-340 LYCOMING (No RPM restrictions) HC 82VL-IC 71" Dia. 260 SMOH O-SPOH Inspection Return to Service Tag. (Matching governor exchange at Aircraft Accessories)

Marion Smallwood

501/756-6565



## Steve Hawley's N9008Z Rebuild

Sure did have a good time at the Kentucky Dam Fly In. The weather was beautiful and the company was great. Thank you for your efforts in furthering the T-18 movement and the newsletter. Your dedication is appreciated by everyone. Here is the account of the rebuild of my 18 year old airplane.

My wife bought the set of plans for my T-18 for a Christmas present back in 1971. The serial number was 810. I started work on the plane in early 1972 and finally flew it in 1979. I worked in heavy construction and a job usually lasted about 2 years. During the seven years of construction we moved seven times in four states. I guess it slowed me down a little but I never lost my enthusiasm. I finally flew it at Skiatook, Oklahoma. It was painted in 1980 with Sterling Lacquer Co. urethane paint. I chose a basic tan with orange trim with dark brown pin stripe. I thought it looked good but my wife never liked it.

The plane finally got 1000 hours on it and I decided that I would do an extensive annual. You know how one thing leads to another and before I knew it the plane was scattered all over the hanger. I then decided that I was tired of the paint and I would start all over. I started stripping the paint using a Turco product (No.6776 LO) and it sure was a tough job. Once I got started I couldn't very well quit so I stuck with it but with lots of second thoughts and sometimes regrets. The brown paint really wasn't all that bad!! I would guess it took about three months to strip the paint working four days a week, eight hours a day. I then steamed every part using a commercial grade detergent taking special care at every joint. I would guess that about 12 hours of

steaming was done to be sure no stripper would weep out of the joints and ruin the paint job. I then acid washed everything using scotch bright and lots of elbow grease. I then steamed it again but this time not using the detergent but again concentrating on the joints. Everything was then alodined. She sure looked good all gold but it was kind of 'splotchy' so I continued on. I chose to use PPG paint and was very pleased with the way it went on. I did everything myself and I am not a professional by any means so PPG must be user friendly. I am very pleased with the results. I chose gloss black with a metallic gold diamond and flash and a Tucson cream pin stripe one quarter inch away from the gold. I think it is spectacular but it sure is tough to keep the dust off. I can't see any difference in the temperature inside the plane because of the black color.

I also did a lot of rebuilding during the refurbishing. New instrument panel, new upholstery, new avionics, and new windshield. I removed the outside main wing rib for access to the aileron bell crank that hadn't been lubricated in 17 years. This time I installed a grease zerk so it can be greased by removing the wing joint gap strip. I removed the pitot static airspeed indicator source from the vertical fin and plumbed the left wing with a 30" bayonet type pitot tube. The static is simply some 100 mesh screen safety wired over the fittings on the back of the effected instruments. Not very elegant but very simple. About 50 rivets were replaced and a lot more were "tightened". There was about 3/8" of 'slop' in the stabilator so I made new bushings. This turned out to be a rather difficult project. I discovered that the holes in the aluminum attach plates that the bushings rotate in were slightly cone shaped. I turned a grade 8 bolt down and made a 'stepped' reamer. The smaller end acted as a pilot and in the larger end I cut longitudinal slots with a 1/16" cutoff wheel mounted in my Dremmel. These slots acted as both cutters and receptacles for the material removed. I used the bolt head to turn the reamer using lots of cutting oil. It was a slow process but worked very well. I then made new bushings from a grade 8 bolt.

There is now no play at all in the stabulator. I also made new ailerons and anti-servo tabs using the "folded skin" technique. They look great but the forces on the ailerons are now unacceptable. I would guess that I increased the force necessary to move the ailerons by a factor of four. I will eventually make new ailerons using some advice I received from Bob Highley when we met at Kentucky Dam. I also rebuilt the wheel pants. They are of fiberglass and were in pretty sorry shape. Someday I hope to improve my metal forming skills to where I can make them out of aluminum.

There is no doubt in my mind that the plane is now a little faster than before the rebuild. This is due to two factors; drag reduction and weight reduction. I have flown it about 30 hours since the rebuild and am confident that the following performance figures are correct. I cruise at 166 knots at 2500 rpm at 7,500 feet. By myself but with full fuel (29 gal.), I can climb to 7,500 feet and average 1,500 fpm. I have a Lycoming O-360-A3A turning a Warnke 72" diameter by 84" pitch wooden prop. I also have the harmonic damper installed. This doesn't make it any smoother but it allows me to idle the engine slow enough that I don't either drag the brakes or else taxi 50 mph! The empty weight is 953 pounds.

Even with the heavy ailerons the plane is a never ending joy to fly. It is comfortable to sit in on long trips. I installed temper foam cushions in the seats when new upholstery was installed.

## IVOPROP FAILURE

by  
*Harvey Mickelsen*

Here are a couple of items for the newsletter. Hope you saw Fat Cat in the October Sport Aviation. The photo people at OSH were great. They even sent me an album with 8 pictures mounted and the negatives.

### IVOPROP FAILURE

While testing my new cockpit adjustable 3 bladed 72" dia. Ivoprop, I experienced an in-flight failure. The cam that controls the pitch of one of the blades failed due to a poor weld. The weld had good penetration of the torque tube, but very little penetration of the cam. The failure resulted in two blades being controllable and one "doing it's own thing" pitch wise. The resulting shift of the center of thrust from the center of rotation resulted in an attention getting vibration. I didn't know what had happened, of course, but throttled back and returned to Half Moon Bay airport. On disassembly of the prop the cam fell out!

Ivo was called and he sent a new set of blades with a note saying they had good welds. Testing has been completed and the results are good. Compared to my 68" wooden Prince prop I have gained 500 fpm climb and 10 mph at the top end. The added speed was a surprise, but is due to a thinner airfoil (graphite vs. wood), larger diameter, and the fact that I could not use full throttle with the wood prop without over revving.

### SIDE BY SIDE FLIGHT TEST COMPARISON

You all know that I made quite a few changes to Fat Cat from the standard design. When Steve

Chial, a fellow Half Moon Bay airport resident bought a T- 1 8 that is very close to John's original design we had a chance to compare them in the air. This standard Thorp is a beautiful example in polished out aluminum and an award winner. The following table highlights the differences:

|                             | Item | N118HM, Fat Cat            | N18CH   |
|-----------------------------|------|----------------------------|---|
| Builder, date               |      | Harvey Mckelsen, 1996      | Carl Hoots, 1974  |
| Engine                      |      | Lyc IO 360, 180 hp         | Lyc O 360, 180 hp   |
| Body                        |      | Wide                       | Standard  |
| Gear                        |      | 2" longer                  | Standard  |
| Cowl                        |      | Graphite/aluminum original | All aluminum Thorp  |
| Prop                        |      | 72" 3 blade Ivoprop        | 72" 2 blade Hartzel electric cockpit control hydraulic constant speed |
| Wing Airfoil                |      | Riblett 35U-A412           | NACA 63-412 Standard  |
| Flap Airfoil                |      | Clark Y                    | Standard blunt nose   |
| Empty weight                |      | 1103 lbs.                  | 1041 lbs.   |
| Top Speed, true             |      | 200 mph                    | 200 mph   |
| Rate of Climb               |      | 1,800 fpm                  | 2000 fpm  |
| Stall Speed $\alpha=10$ deg |      | 68 mph                     | 65 mph  |

The major difference was the character of the stall. Steve does not have stall strips (yet). My stall is sharp with a left wing drop off. My stall is gentle and straight ahead with a good pre-stall buffet (no stall strips). I have aileron control through the stall. It reminds me of a J-3 Cub stall.

I would highly recommend the Riblett airfoil for new builders. It involves a change to the nose rib only, and no structural changes. I have the permanent tooling for these ribs, and would be willing to supply the ribs. The Clark Y flap airfoil is an optional change and requires a .032 flap spar. I have the tooling for those ribs also. Fly Safe, Harvey Mickelsen 657 Terrace Ave. Half Moon Bay, CA 94019 650 712 1438 harvey@best.com

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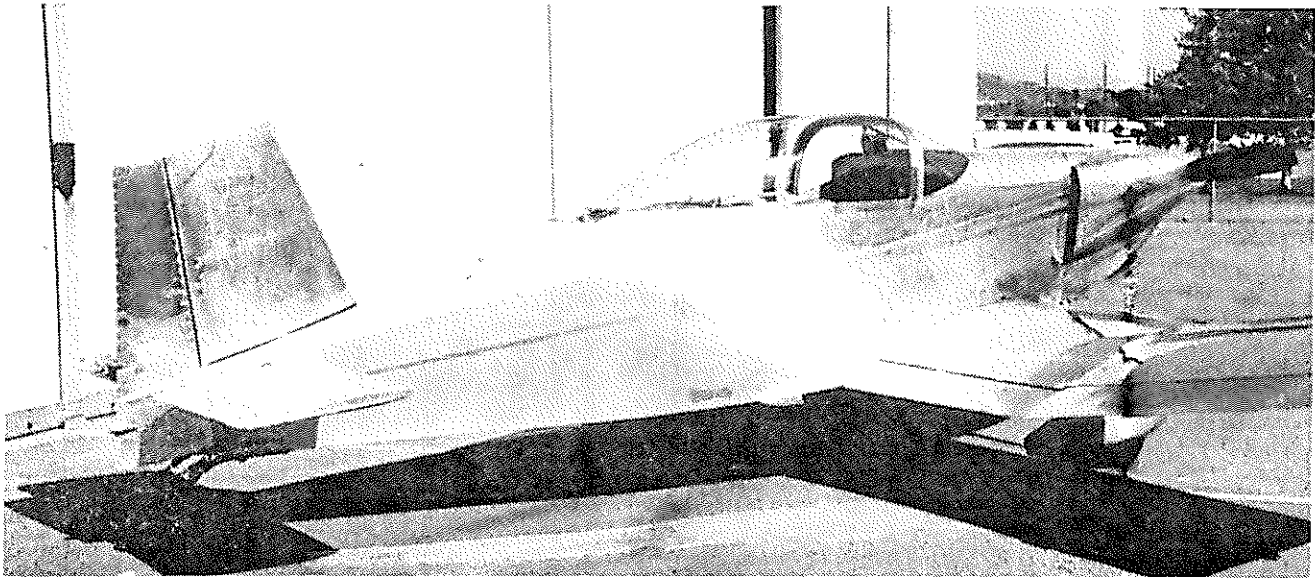
Hi Rich, Wanted to send you my new e-mail address [enigma@itexas.net](mailto:enigma@itexas.net), also have new mailing address, P O Box 5066, Granbury, Texas 76049. We have finally parked the motor coach and started building our home across from the runway at Pecan Plantation, Granbury. I sold my T-18, N118KM last summer. Guess I had not given it much attention during the two years of travel. The good news is I have another T-18 in my future, its a basket case but I enjoy the renovation projects, probably better than building a full blown. I will have more news on this project after I get this house built (late May completion). Most of the southwest T-18 gang will remember Pecan Plantation and the great fly-in we had at Gary and Maxine Green's.

My new home will be just across the street from Gary and Maxine. I cannot legally build a hanger on my property as I am on the golf course, however, I can build a large garage (with 22 ft garage doors) and lawn tractor my Thorp across the street where I have access to the 3600 ft runway. We also have two other well know Thorp Drivers at Pecan, Rick and Louann Jones, and Jim Cash. Couldn't ask for better neighbors than that. I would like to hear from some of the old gang, give me an e-mail post. Was good to hear that Steve Hawley finished his T-18 renovation and is back in the air. Regards and keep up the good work. Ken Morgan

*- A HEART FELT MESSAGE -*

DEAR DAN,

YOUR INPUT IN N. L. # 103 BROUGHT TO MIND, SOME OF MY MOST CHERISHED MEMORIES OF THE MANY HOURS SPENT IN JOHN'S SHOP ALONG WITH YOU AND OTHER FELLOW T- 18 BUILDERS. I AGREE WITH YOU 100% ON JOHN'S ENGINEERING ABILITY AND FAR REACHING KNOWLEDGE OF AERODYNAMICS. AS A FRIEND THERE WAS NO EQUAL. WHAT A TRAGIC LOSS. TO FURTHER STATE HIS ABILITY; AS YOU WILL RECALL USING HIS *FLAT LAY - OUT TEMPLATES & MATCH-HOLE TOOLING TECHNIQUE*, I WAS ABLE TO ASSEMBLE S/N 879 WITH 3/32" CLECOES AND NO ELONGATED OR OVERSIZED HOLES. THE MORE THAN 25,000 MILES DRIVEN BETWEEN EL CAJON, BURBANK AND LOCKEFORD, WAS WORTH MORE TO ME THAN ALL THE GOLD IN FORT KNOX. THANKS MY FRIEND, AND MAY YOU HAVE THE BEST. GEORGE TRUVER 727 BLACKTHORNE AVE. EL CAJON, CA 92020



*George Truver's beautiful all aluminum T-18*

## ELECTRIC FLAP ACTUATOR DRAWING

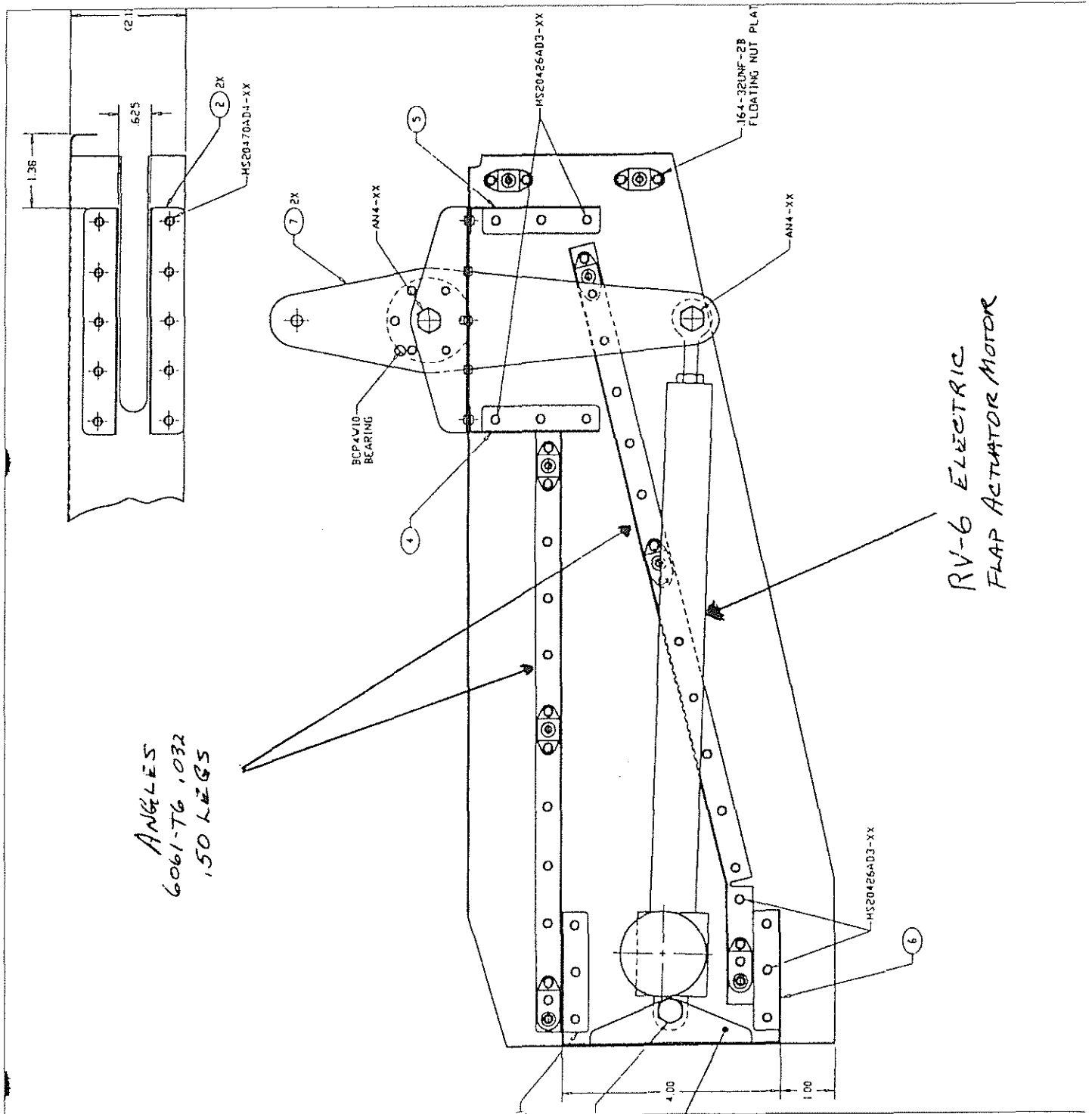
Submitted by Gary Cotner

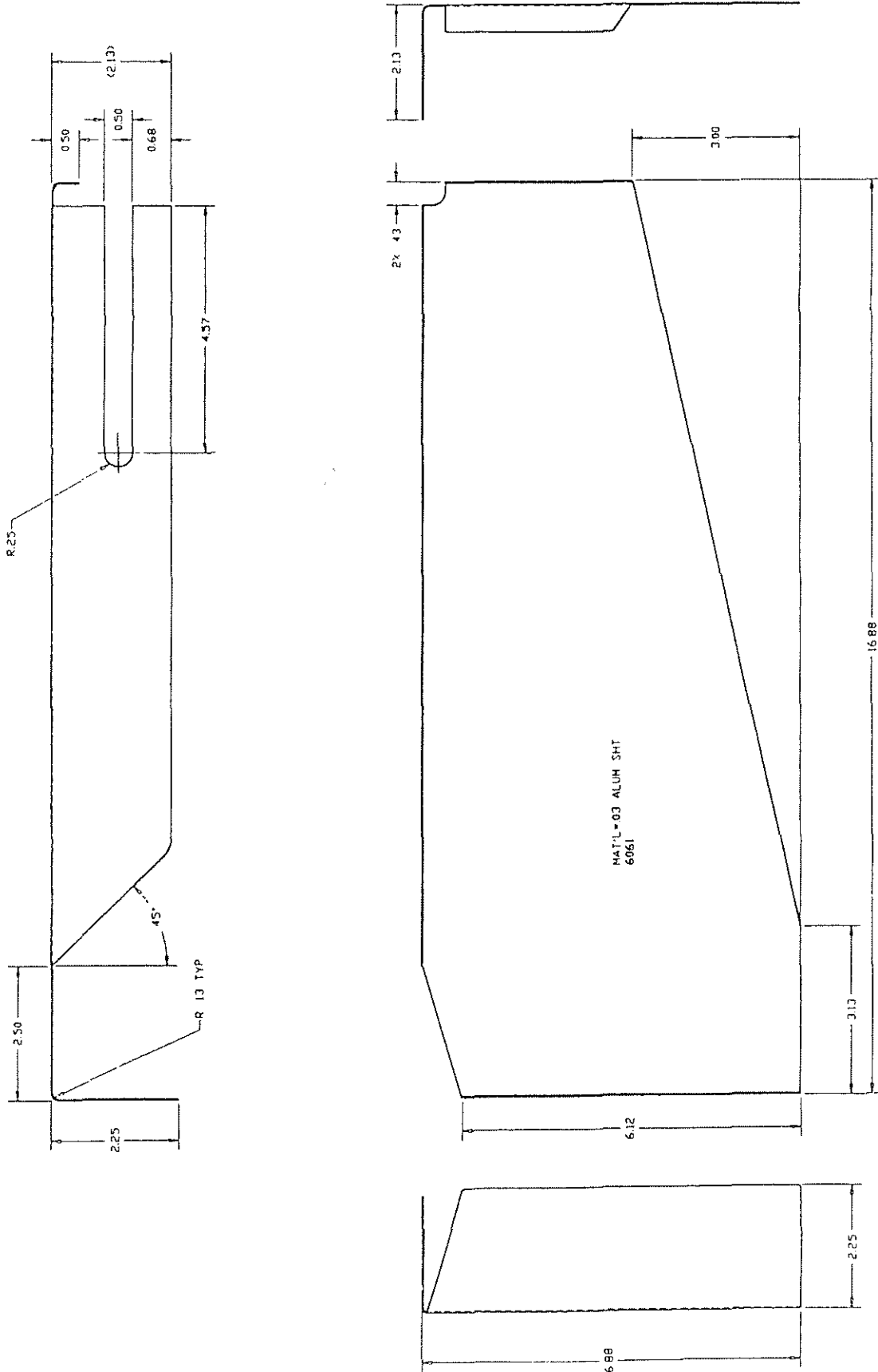
I have made some notes on the drawing that the drafter did not include, that I feel are needed. The actuator motor is the same as used on the RV-6. Anybody who is interested in building the unit for their Thorp can get the prints from me for a \$5.00 printing and mailing fee. I will supply mounting location for the unit and the modification for the pulley bracket on Thorp print A-740.

I can be contacted at the following.

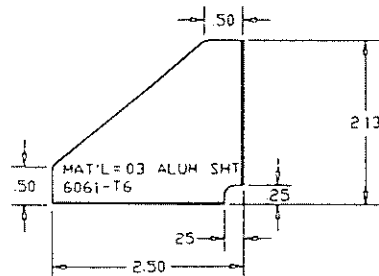
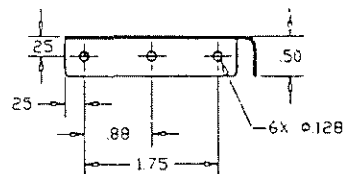
Gary Cotner  
13715 N. 150th E. Ave.  
Collinsville, OK 74021  
(918) 371-4739  
T18cotner@AOL.com

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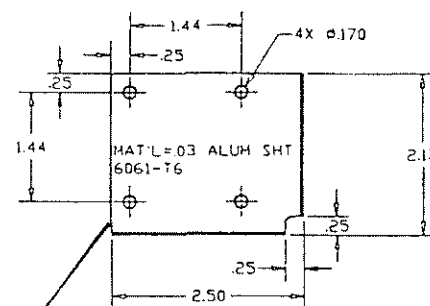
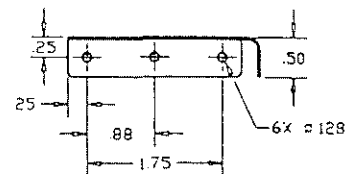
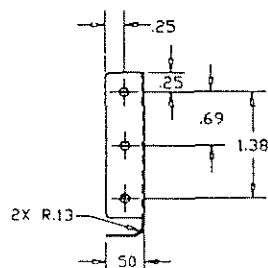




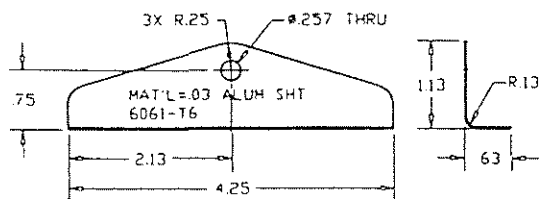
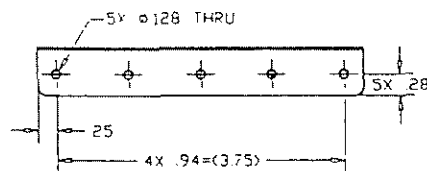
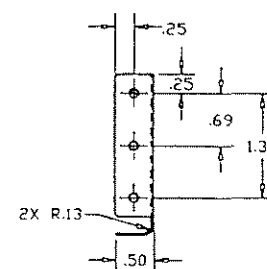
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DETAIL -004 SHOWN  
DETAIL -005 OPPOSITE

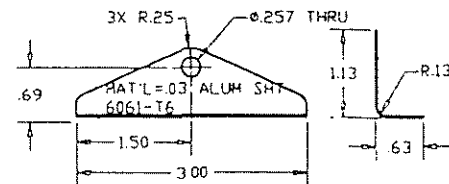
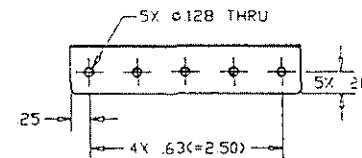


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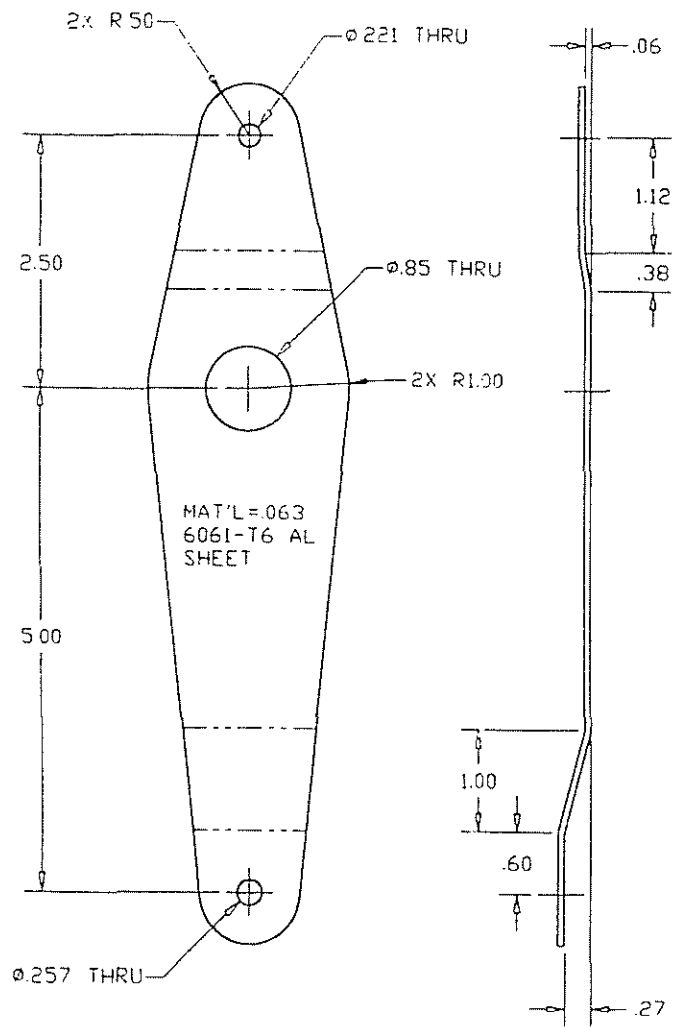


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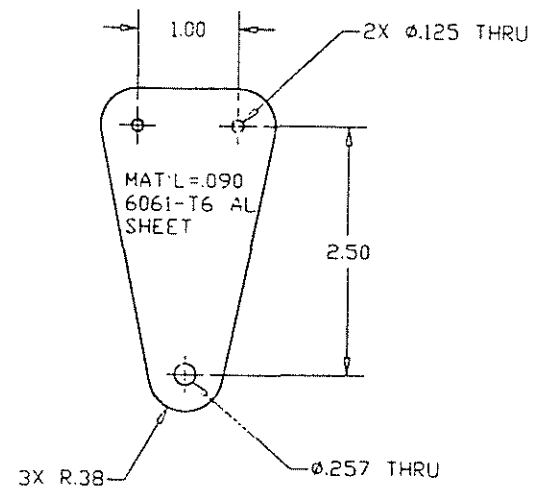
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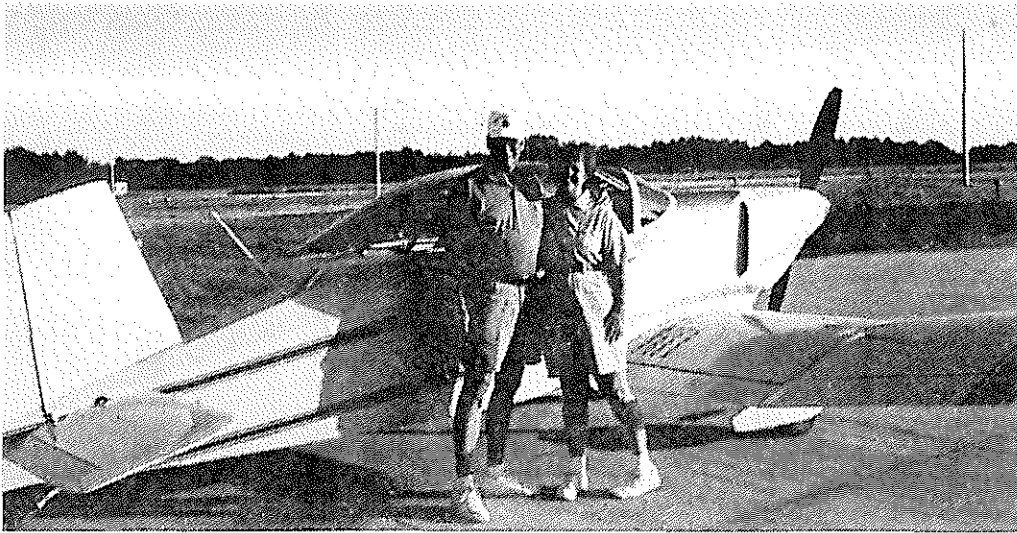


DETAIL -007



DETAIL -008





## SUN 'N FUN

TO

by Susan Highley

## PLACERVILLE

Our T-18 has taken us many delightful places over the years. In September, it took us from Lakeland, FL, to Placerville (Hangtown), California, for a west coast T-18 fly-in. We left home early one morning just after Labor Day and flew to Branson, Missouri, arriving in the early afternoon. The flight was a good one, but the reception at Branson was even better. The FBO there is run by the University of the Ozarks, Hard Work U., a private Presbyterian school nearby. The kids run the whole operation from pumping gas to renting cars ... you name it, they do it. They also keep the terminal building clean. Many students at the school are able to earn their way through 4 years of education, without paying a cent. There's lots of outside labor involved, but it's possible. There is a supervisor on the scene, but he's support staff only. It's been a long time since we've had someone sprint out to the plane to help us with our luggage. We rented a car and toured the area ... very pretty with lots of things to see and do. We chose to spend only one afternoon there, as we had other places to go.

The second day we flew across the plains, arriving in Cheyenne, Wyoming, early in the afternoon. Our son, daughter-in-law, and grand-

son are stationed at F.E. Warren AFB there.

After a pleasant evening with them, we were off again, this time heading for California.

The scenery changed dramatically as we headed west, with airports becoming fewer and farther between, we were forced to make more stops so that we'd have fuel at the right time. Fueling possibilities were fewer too, because sometime the attendant just wasn't there...maybe home eating lunch or whatever. We headed to Rock Springs, Wyoming, first, it having been recommended to us. We were advised to go to the terminal building for fuel, because the facilities there were better. Unfortunately, our informant forgot to tell us that the fuel truck had to come to the terminal from another area and couldn't do so when there was an airliner taxiing to the gate. We went into the terminal building to be sure the fuel truck was indeed coming over and became "trapped" inside, also due to the arrival of the airliner. Nevertheless, we got our fuel and slipped out before we were once again stuck.

Our second stop of the day was at Ogden, Utah, where the CAF B-29, "Fifi", was on display. She was on her way to the Reno Air Races with the scheduled stop-over in Ogden. The approach to

Ogden was most interesting, with a choice of either the North Ogden Canyon or the Weber Canyon. Since we had lived in the area at one time, we were familiar with the choices. The trip through North Ogden Canyon gave us a breathtaking view. (When we moved to the Ogden area in 1976, our house-hunting experience was a little tougher, as Bob was a few years into the T-18 building process and we now had to incorporate an airplane workshop into our house requirements. Gone were the days when we only had to consider number of bedrooms and baths. To complicate things even more, we had cold weather to deal with, so the garage workshop wasn't necessarily a viable opportunity. We finally found a house with a basement workshop that had a wide entry from the outside directly into the basement. Many times the fuselage was clecoed together for a dry run up the outdoor stairs. If it would go up the steps with the clecoes sticking out, it would surely fit when it was riveted. As luck would have it, the project didn't get to that point in Utah, but we were prepared.) It was a beautiful day in Ogden and we enjoyed watching the folks coming to see Fifi while we ate lunch.

From Ogden, we flew across the Great Salt Lake and then over the Salt Flats. This is an amazing sight, unlike any we'd experienced on other trips. The weather was clear, so we could see for miles.

After one more stop in Elko, Nevada, we headed for Reno and Lake Tahoe and on to Placerville. Coming from the east in the afternoon, Reno looked very different, hiding in the shadows of the mountains. Lake Tahoe is beautiful and huge. It seems to go on for miles.

We arrived at the Placerville Airport mid-afternoon in time to help a bit with the preparations. We were delivered to our motel and then Bob went off to locate a rental car and investigate the area a little more and meet some more of the folks. Dinner that night was at the local Elk's Club and was fun. It was a very informal setting with a lot of opportunity to talk and get to know one another. Lots of stories were being shared and appreciated. It was a great time.

The next morning, Saturday, we took a brief tour of the town. It's quite quaint with an interesting old hardware store with wooden

floors and lots of nuts, bolts, and gadgets. We had breakfast at an outdoor cafe that was great.

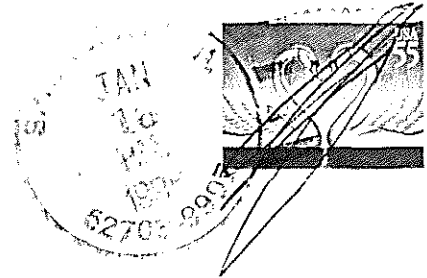
It was another beautiful day at the airport with Thorps coming and going almost constantly. Unlike our east coast group, these folks were likely to come for an hour or so and then go back home. I guess that many of them live relatively close and could do that. There were over 30 planes there, with everybody having a good time. The setting there is perfect for such events, as there is a small parklike area next to the hangar with trees and picnic tables...great for sitting and visiting and sharing stories. Lunch was at a Mexican restaurant "in town" followed by an afternoon of flying and forums. A group got together and flew out to a nearby airport that was hosting a Cessna 120/140 group. Dinner was a steak affair in the "park". We met lots of very nice people, some that travel to Oshkosh and Sun 'n Fun yearly, so we'll see them again. Bob received the award for the most rides given... something that he loves to do.

Our trip back to Cheyenne on Sunday was a reverse of the trip out, encountering people on their way to Reno for the races. Again, the visibility was great and the trip a good one.

After spending five days in Wyoming, we headed for home, once again stopping in Branson, but this time only for fuel. Wanting to get a little farther, we got down into Alabama by late afternoon, not knowing exactly where we wanted to stay for the night. We stopped in the far north-western corner of Alabama at a small airport that professed to have fuel. And they did, but, unfortunately, they didn't have power to the pump. After about 30 minutes of trying, Bob gave our apologies and we looked for another airport. I called the FBO at Jasper, Alabama, to inquire about their hours of operation and the owner said they would stay open until we arrived. When we got there, they offered a car to get something to eat, but ultimately let us take the car for the night and even suggested a nice motel and a restaurant for dinner. They were most helpful and these tired travelers surely appreciated the extra courtesy.

After a good night's rest, we flew back home to Lakeland, weary but satisfied. Our Thorp had taken us to yet another part of our country and brought us home safely.

T-18/S-18 Newsletter  
Route 3, Box 295  
Clinton, IL 61727  
Phone: (217) 935-4214



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# 1998 DUES

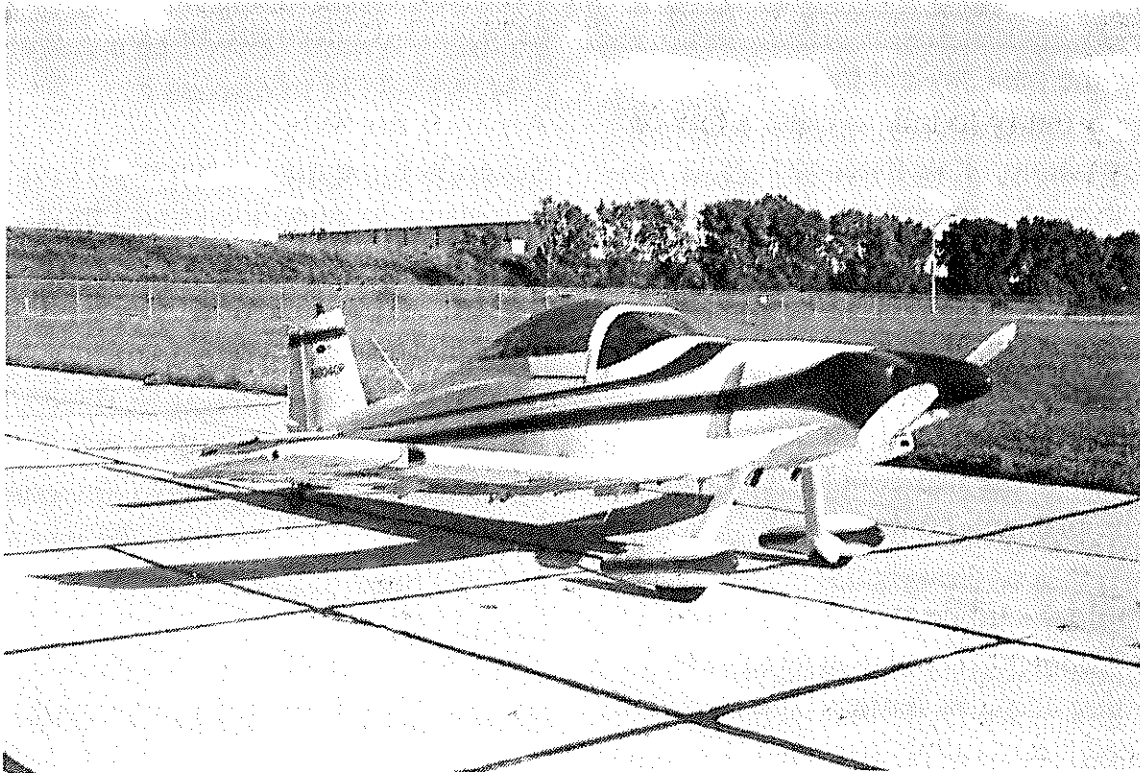
**Please send them now while you are thinking about it. Need to have them in this month.**

## THORP T-18/S-18 MUTUAL AID SOCIETY 1998 DUES

Please continue your support of this valuable exchange of ideas, building tips and safety information covering John Thorp's great design. Make checks payable to Richard Snelson, Route 3 Box 295, Clinton, IL 61727 \$25.00 US, \$30.00 other.

Name: \_\_\_\_\_  
Address \_\_\_\_\_  
City: \_\_\_\_\_ State \_\_\_\_\_ Zip Code: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Aircraft: \_\_\_\_\_ Hours on Aircraft: \_\_\_\_\_  
Email address: \_\_\_\_\_  
Notes: (Building?, Flying?, Thinking about it?etc.) \_\_\_\_\_

# T-18 NEWSLETTER



*Harlo McKinty's Red over White S-18 (N9040P)*

## IN THIS ISSUE:

*Letters to the Editor*

*Over - G by Kim Nack*

*For Sale/Wanted*

*Electrical Workshop by Charley Wagner*

*Cutting and Stripping*

*Crimping*

*Molex Connectors*

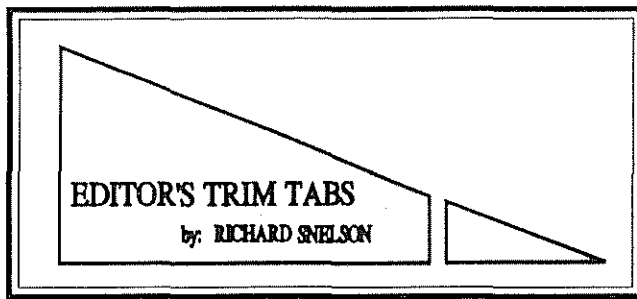
*Soldering*

*Shrink Tubing*

*Splicing and Power Signal Distribution*

*Bundling Wires*

**NOTICE: (STANDARD DISCLAIMER)** As always, in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.



During the past several months I've had the opportunity to talk to quite a few of you, by phone. I've listened to your suggestions for improving the newsletters and will incorporate those suggestions in future newsletters. A lot of you would like to see more articles on building and flying the S-18/T-18. "Me too." We have been getting what most think are great articles over the last couple of years and all hope that will continue.

One builder said he was tired of reading about Kentucky Dam. Not as tired as I am of writing about it. Notice, that coverage has been minimal the last several years!

## CANOPIES

I still get a lot of calls about where to get windshields and canopies. So I would like to ask for your inputs to tell us what your experience has been with the couple of vendors that are still making them. Please send "price", "quality" and "delivery time." A lot of the older Thorps need replacement canopies and windshields.

## Lee's Project

I had a call from Lee Skillman last week and he still has his Thorp S-18 project for sale. He's got it priced at \$10k and it's all the parts and accessories that are supplied by Classic Sport Aircraft in their catalog.

Fuselage is on the gear. He has canopy, windshield, dual brakes, and on and on. Someone is going to get a real deal when Lee sells this project. By the way Lee's work is outstanding, his first Thorp won a lot of awards including the Wright Brother's Award. Give Lee a call at (334) 633-3535 to discuss it.

## Aircraft for Sale

Several of you that watch my Thorp homepage have noticed that I have N295RS for sale. This is the second Thorp that I have built. It was completed in 1992 and won the Wright Brother's Award in 1995. I have flown it 450 fun filled hours. Don't jump to any conclusions I'm going to continue the newsletter. In fact I hope to have more time to put into writing.

## SPRING FLY-IN IN ILLINOIS

June 5 is just around the corner so it's time to get your reservations in for the Thorp Fly-In at the Coles County Airport (MTO) here in central Illinois. They are holding a block of room up until 2 weeks before the event. The phone number for the Ramada Inn is (217) 235-0313. Be sure and ask for the Thorp Fly-In group rate. We will have several shuttle cars to run you back and forth the short distance to the motel. We are planning to do the cookout again Saturday night and the airport authority said we can have the monster hangar again, to get the airplanes in side at night. Let's hope the weather is better this year and we can fill it up.

RoxAnne promises another tour of Amish

country for all that want to take a chance on her directions....

## OSHKOSH LUNCH/FORUM

We have the Nature Center again for the Oshkosh Friday get-together lunch with the forum to follow. Ben Scola and Roy Farris are planning a sandwich fixin type lunch. I'm sure it will be a bargain compared to the "Oshkosh Deals." so join us there. I'll bring the mike and PA so we can all hear the speakers at the 1:00 PM forum.

## Placerville 1998

7th Annual Placerville Fly-in.

Placerville, CA at the Hangtown VOR (40 miles east of Sacramento)

Placerville is scheduled again this year for Sept 4, 5, 6th. 1998

### Contacts are:

Hal and Nancy Stephens 530/295-1867  
Jim & Lillian Critchfield 530/621-1584  
Mac & Rena Booth 408/363-8720

**Accommodations:** Camp out under the stars at the airport or stay at:

Placerville Inn 800/854-9100

Day Inn/Best Western 530/622-3124

### Meals:

Friday night: Dinner at the Elks Lodge

Saturday noon: We'll go downtown

Saturday night: Steak & Wine Dinner (\$15 per)

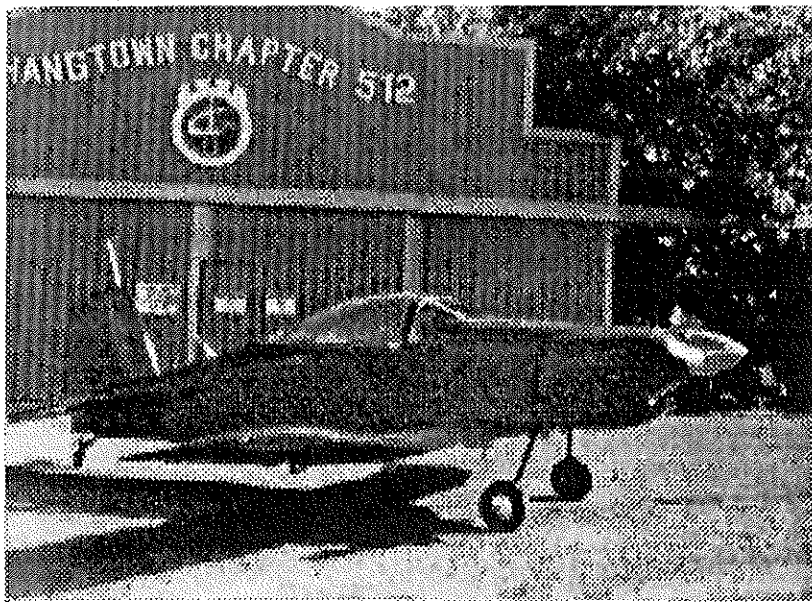
If you fly a T-18 or a Sky Scooter, plan to make this fly-in. Please! a RSVP call is required so parking places can be made available and a steak dinner reserved for you.

### \*\*\*EAA Chapter 512 Sanctioned Event \*\*\*\*

*This is an informal and friendly get together. If anything unfortunate should happen to you or damage occur to your airplane, it shall not be the responsibility or liability of the above named persons, EAA Chapter 512 or the Placerville, CA airport.*

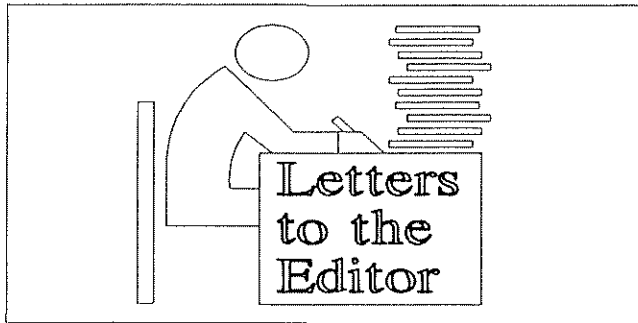
Editor's Note: Jim Critchfield is home from the hospital after undergoing 9 hours of surgery on his heart. We all are pulling for you Jim. Hurry and get well.

Send Jim a card or letter at: 1579 Sean Drive  
Placerville, CA 95667  
Phone is 530/621-1584



N8TT, Thorp Tiger. 31 years to complete. Moved 13 times during construction. Has 60 hrs on it. Have not made one change. Fly's with one person, hands off. 150 mph with 150 hp. Pacersetter Prop. 2700 flat out 170 mph. What a Jewel! Everything standard John Thorp.

Regards, Jim Critchfield  
Placerville, CA



Richard,

I'd like to say thank you to all the folks who helped me in my search for a T-18. I recently bought Evan Roberts' lovely rebuild N89ER. It now resides just North of Ft. Worth, Tx..

I'm indebted to a number of people whose help was invaluable. Rick Jones and Gary Green spent a lot of time preparing me to find a solid airplane. Rick flew me down and looked the airplane over prior to the sale. Gary weighed her, did a new W&B and has offered a number of bits of advice. Lyle Trusty was also a wonderful source of info and advice. He burned up a lot of internetrons helping me look and advising me on what to look for. There were others around the country who contacted me with helping hands as well. My Dad and I are taking the airplane to SnF and Oshkosh and I hope to be able to put faces to the voices I've heard on the phone and on the screen.

Thank you all again,

Damon Berry

FAMBER123@AOL.COM



Richard,

I can't thank you enough for your time and patience as well as your commitment to share information on the T-18, with the newsletters as well as in person. Since our flight together, I flew again for a couple of hours with Cecil Hendricks in Seattle and completed my bi-annual in a Citabria here in Anchorage.

My Thorp project has been built over a long period of time. It's Plan no. 1050 started in 1974,

and I was the third person to own it by 1986. The hardest part to the project is finding the time and space to work on it. It would sit for years then I would work on it for 3 or 4 months or so full time + then it would sit again due to my other commitments. I had time to finish it this winter and with the help I have gotten from you and others like Cecil, I think my first flight will be some time this month.

I'm a month or so past my estimated first flight date but I'm not one to rush into anything of this magnitude. The building part of my Thorp is all but done and I just received the new prop I ordered from Aymar-Demuth. I am working on my neglected paperwork now and could get the FAA's blessing soon. It seems I would have to fly an extra 15 hrs. to get certified if I fly with the new prop. The McCauly prop is certified & within manufacturer's limits. The Aymar-Demuth, although probably safer, is not FAA certified and the inspectors I have talked to want paper proof. I would like to compare the flight characteristics of the two and I would hate to throw out a good propeller. I was thinking of flying the first 25 hrs. with the metal prop then switch after certification.

I had my T-18 C weighed with the McCauly prop with a beefy extension, folding wings with tanks, and 8 qts. of oil in a O-320 and came up with an empty weight of 963 lbs. at CG of 62.6. I'm sure I'll lose a few lbs. when I switch the prop and extension but I worry about the CG moving back even further. I know I sound like the average aircraft builder, worried about their aircraft's weight but what it gained I lost in missed meals and long working days. It's good to be almost done.

Thanks,

Richard Marson

6620 East 8th Ave.

Anchorage, Alaska

Hi Richard,

I hope this letter finds Roxanne and yourself in good health with clear blue skies ending a short winter. With the warm Florida days and Sun & Fun just around the corner I'm seriously tempted but it's been an El Nino winter out here. What started out to be a two-week annual on my schedule is now going on its fourth month. It seems like it's going to rain forever and we have so much water on the floor of the hanger I'm afraid to stay too long with no lifeguard on duty.

The big news out west is the date for the Placerville T-18 Fly In - Sept. 4,5,6. We're looking for another outstanding turn out this year. We had more than 30 T-18s last year (as well as some strange looking RV something or others).

Jim Critchfield and the Hangtown EAA chapter 512 will open its doors for everyone with camping, picnicking and parking areas available for all guests. Shuttle service will be provided to lodging destinations and our scheduled lunch on Saturday. It won't take much arm-twisting to get Hal Stevens to take up his bugle as master of ceremonies again this year and open his hanger to the forum on Saturday. With Hal's direction and the aid of his sidekick (yours truly), we hope everyone finds the fly-in both educational and enjoyable. As is custom, the steak dinner is on for Saturday night.

I'd like to thank you for all your great work on the newsletter. It's a treasure trove of information for those of us involved with T-18s. Thanks also for being that link to help us better help each other.

Like free tickets left at the stage door for Elvis, we have two prime ribeye steaks and a bottle of California's finest waiting should you and Roxanne find your GPS programmed for our wild west. By the way, we've also got the cheese.

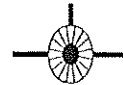
Best regards,  
Mac E. Booth, Jr.

Hi Richard,

Add me to the T-18 list if you don't mind. I have N4588, ser #671. It was finished in about 1976--- it's going through a repaint/reupholster rebuild right now. No electrical, GPU for power, weighs 817#. Will probably reach 825# or so when finished.

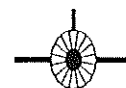
Do I understand that you have stall strips for sale? If so, I'll take a pair. See you at SUN and FUN. DAVID ALDEN

*(Editor's Note: Sorry, I don't have stall strips for sale.)*



Rich,

Enclosed find my check for 1998 dues. Sorry, but I absolutely REFUSE to cut up any more of my Newsletters in order to fill out personal info I KNOW you already have. Besides, if Susan found out that I chopped up her article, I'd never hear the end of it. In case I haven't told you, I bought a "T" hangar at the Landings condominium (private) airport last October. Heated, lots of lights, insulated, forty-four foot electrically operated bi-fold door and large enough to build in as well as house the Skylane. The airport is about six miles west of Elgin Illinois. Point of possible interest, in the spring of 1980 I went flying with the late, Bill Gilleon in his T-18. He rented space at the Landings in a hangar identical to mine. He was in the hangar with a Skylane!! It was tight but very doable. Like I said, "Point of possible interest" especially if anyone is heading this way before mine is finished. ( Can't blame a guy for dreaming.) Hi to RoxAnne for us. Best Regards, Ben Scola

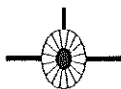




Rich,

Enclosed, please find my dues for the current year. Your letter is a great asset to my flying. I plan to attend a few fly-ins during the year & hope to meet some of the people who build and fly T-18's.

I have purchased the stall strips for my bird, but have not found the technical info on installation. If you could assist I would appreciate it. I would be glad to share the parts with another T-18 owner, because I have enough material for two airplanes. Sincerely, Bob Carman Phone: 607-754-7757 or email pnamrac@aol.com



Hi Rich

Just ordered a set of T-18 plans (my second, actually) and got your web site in the receipt of order notice from Eklund Engineering. Can you tell me what the annual sub cost for the Newsletter is? I got the cost for the back issues, but couldn't find the one year cost. From faulty memory, my first plan set was #279 from John Thorp. The project reached wings and tail stage before a career change made me sell it - which I regretted later. That was in Australia, 1977. I'm now living in Portland, Oregon and the bug is biting again.

Cheers! Ron Chernich

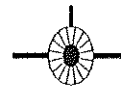


Dear Rich & RoxAnne,  
Have been very busy - eyeballs deep in airplanes! Flew out to Georgia in October and bought a 1953 Cessna 170B. In 2 1/2 months I've put 80 hours on her. The Thorp is a little jealous but I still fly her enough. I let my girl friend and friends fly the 170 and I take the Thorp. The Pitts is coming along very slowly now but hope to start recovering the wings next week. I'd get a lot more done if work didn't get in the way!

Will be at Oshkosh with the T-18 and the C-170B this year. My brother and his kids will take the 170 out there. Hope to see you there! or

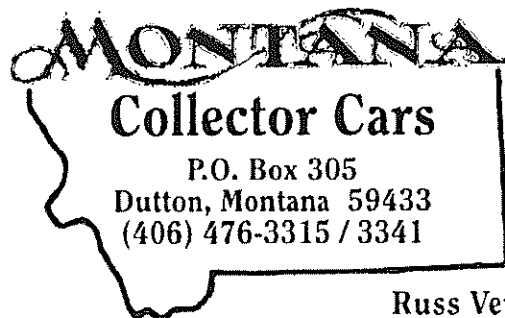
Placerville! or some other fly-in!

N28TG sure likes her 180HP engine I installed, (65 hours on it now since Aug 97). Can you help me find a prop shop that will twist my Sensenich to the pitch I need? Email me at aginn@ladc.lockheed.com. Thanks and fly safe! Tony Ginn 805/256-4829

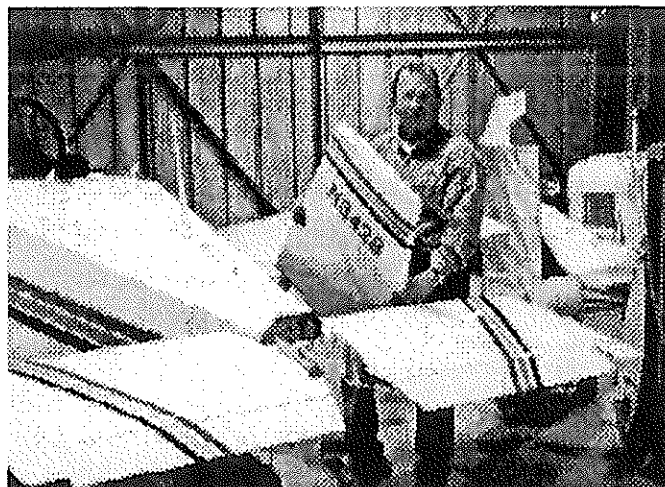


Rich: I purchase N8428 from Alvin Postin and flew it home to Montana from South Carolina last fall. During the ferry trip home the electric trim system failed (sheared pin at drive motor) and am now repairing and installing limit switches per T-18 newsletter articles and instructions. I find the newsletters very helpful and informative.

Please print my name/address and telephone number to assist any T-18 pilots in finding a Montana contact for cross country help or assistance I may be able to offer. Thanks for your efforts. Russ Verbael P.O. Box 305 Dutton, Montana 59433 Phone: (406) 476-3315



Russ Verbael



Dear Rich,

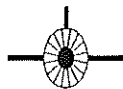
My wife and I sold our "Sweet Dreams" T-18 in October, 97 to a new owner. (4th for this airplane now). We owned N1014Z for 7-yr's and have many wonderful stories to tell, but to many to list in this short note. "Great Airplane" though. I've now owned six airplanes now and the Thorp T-18 will always be right up there with the best of them for me.

I sold the T-18 to a Mr. Sam H. McDaniel 3265 Flora St., San Luis Obispo, CA. 93401. He might like to continue the news letters? I gave him most of my copies when I sold him the airplane. Oh yes, he is 78 yr's old with two plastic knees. How about that! A real "Tiger."

So Long, "Keep-EM-Flying' Rich" Dave and Carol Tennant.

P.S. All the people who fly and own T-18's which we have known or met in 7 yr's were the best troops I've ever known.

*(Editor's Note: Thanks Dave and Carol, Safe flying to you both.)*



Hi Rich,

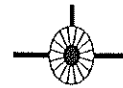
Here's a photo of Harlo McKinty's S-18, that he lets me fly. It's too bad I can't take it to the fly ins, but we are stuck with driving because of all of the booth supplies we need for our Temperfoam exhibit.

By the time Janice & I exhibit at Oshkosh, Sun N Fun, & Copperstate we've used up all of her vacation time not to mention the catch up work waiting when we return home.

Maybe someday we can make it to one of the T-18 Fly-Ins. Sincerely, Jim Fix

*(Editor's Note: Harlo's S-18 is our Cover Photo for this issue.)*

Dear Rich,



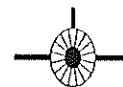
Please add my name to your T-18 newsletter subscription list. I've just purchased a structurally complete T-18CW from Jim Renniker of Minneapolis. The S/N is 866.

Please place a want add in the newsletter that I am in need of a conical engine mount and have a 180 hp dynofocal for trade. Also I want to purchase a used/unused "Garrison" updraft cowling that was sold through Air Craft Spruce for some time. I am aware of the cowling problems associated with these and believe I know the fix.

I have yet to inventory Jim's newsletters so I was glad to hear you have the back issues available.

I am 40 yrs old, married, one son. A&P, A.I., Pvt. Plt. I work for Northwest A/L's in DTW and have been here for 14 yrs.

I helped finish a T-18 in 1976 with Dr. Richard Burlingame, N62RB. Several yrs latter it was destroyed by a prop failure by its third owner. Thank you, Matt Null 3300 Goat Fell, Ann Arbor, MI 48108



Richard,

Sent you an email but with a new computer I don't know if I got thru. We had a problem deciding to have the 7th Fly-In. The EAA Chapter hungry for money put a \$2.00 a head charge on fly-in people, plus \$50.00 a day for a porta potty, didn't know whether we could swing it, so we said go for it. Sept 4, 5, 6th are the dates for Placerville No. 7. It's close to Labor Day but we've been successful on that date so far. More Later, Jim Critchfield 1579 Sean Drive. Placerville, CA 95667. (916) 621-1584 email [critch@inforum.net](mailto:critch@inforum.net)

January 20/98

Dear Rich:

Many thanks for the back issues of newsletters that you forwarded some weeks ago. I have perused all of them and found owners with problem similar to my own so they already have paid for themselves. I finally got my permanent C of A from Transport Canada a few weeks ago and now have 43 hours on C-FLDP. It is certainly a nice aeroplane to fly and I am more than pleased with it (photo enclosed). The plane stalls straight ahead at something less than 55 m.p.h.. The ASI scale starts at that speed and the needle at full stall with full flaps is just under the first mark. I have the "new" folding wing design (S-18) and it seems to be performing as advertised. One problem that I am working on (with a lot of help from Mike Archer of Classic Sport Aircraft) is the lack of forward trim at higher speeds. We have tried lengthening the 521-1 link in the tab system (by 3/16ths) with some noticeable improvement. However at speeds over 150 m.p.h. there is still a need for slight forward pressure on the stick even with full forward trim. After reading Bill Mnich's report in Newsletter 104 I feel there may be something in Newsletter 93 that may be of same help. I also have an intermittent problem with rough running engine which I am attributing to over rich mixture. The interim solution is to slightly lean out the mixture but I shall be trying out Jack Waxenfelter's design as a

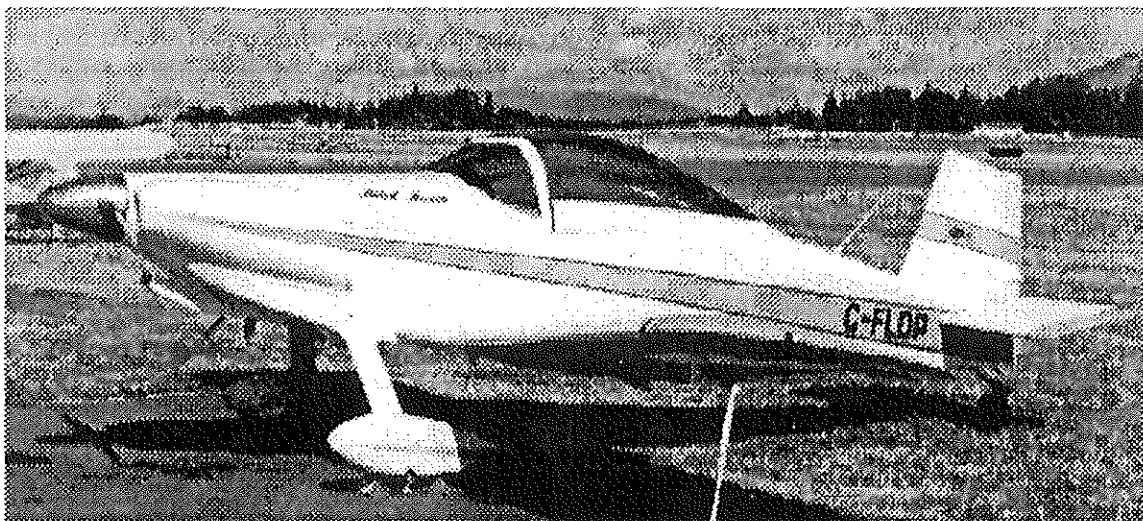
more permanent cure. I am very impressed with the new layout and clarity of your newsletter. I still have many of the old ones and there is no comparison for legibility.

Yours truly,  
L. D. Perkins

#### More from L.D.:

Following the advice of Mike Archer I lengthened the 521-1 link in the horizontal tail assembly 1/16th inch at a time and ran flight tests on it each time. Finally at 3.45 inches the trim responded properly and I can now fly it at high speed without having to hold forward pressure on the stick, where as previously it was necessary to reduce the airspeed to about 130 mph to compensate. The down side is that I have six sets of links left over not counting the original. The problem of a (sometimes) rough running engine was caused by my carb heat box control arm being too close to the side of the carb air scoop and getting gradually bumped out during flight by engine vibration thereby creating a too rich mixture. The plane has all the in-service acrobatic mods built into it and I plan on aerobating it after I have a few more hours on it. I would appreciate any experience (recent or otherwise) which some of your readers may have acquired in that field.

L. D. Perkins



*L. D. calls his Thorp (C-FLDP) Bated Breath*

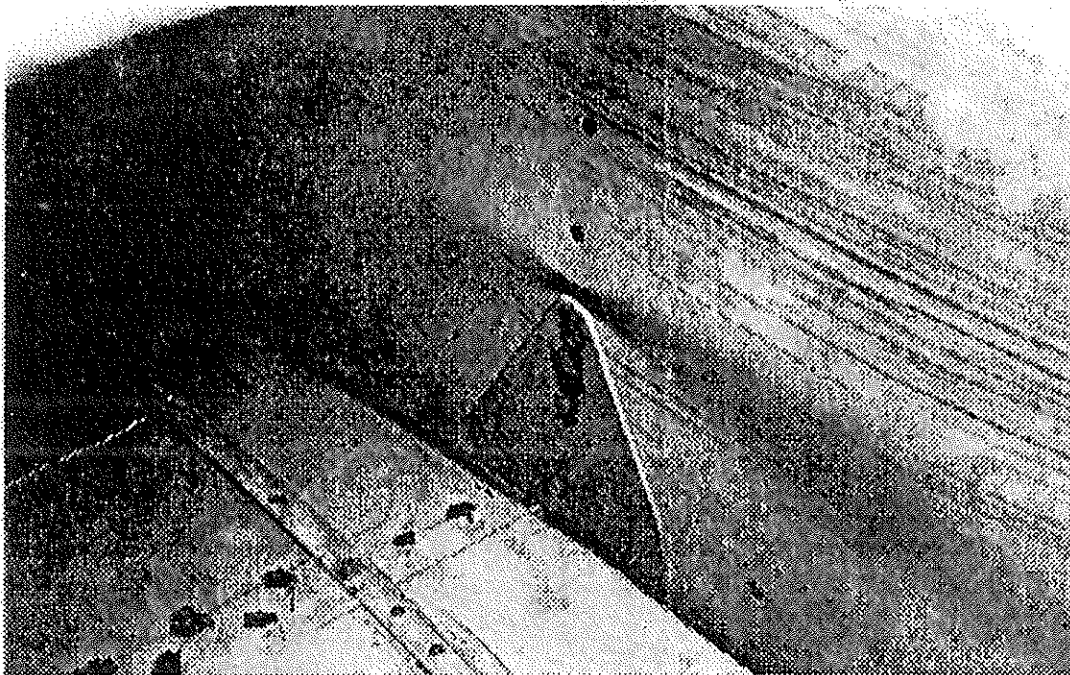
# Results of an Over-G Event

Kim Nack

My aircraft was involved in an over-G flight and suffered some wrinkling that I would like to share with the T-18 community. Immediately after an early post Flight Test period flight with passenger, (26 hrs) I noticed some wrinkling of the outer wing panel skin at the upper main spar. I have pictures of this flight as it taxied out and as it taxied in. This shows that the wrinkle occurred during that flight. This wrinkle was greatest at the intersection of the nose ribs and the spar in the upper skin of the outer wing panels. Another wrinkle developed in the fuselage side skin (RH) just above the C-580-17 doubler. also, the dash frame (603) collapsed with and at the skin wrinkle.

The aircraft weighed 1400 lbs (gross weight) and the recording G-meter in the dash, read 5.8 Gs. The wing skin was 2024-T4 of .025 thickness. The fuselage side skin was the same. My inboard wing was built with .032 thk 2024T3 material. The dash was 2024T3 .032 thk. Both failures were due to compressive loading. The pilot noticed no difference in aircraft handling. He and the passenger, who were wearing parachutes, were surprised to hear of the wrinkles after landing. I am repairing the wrinkled areas with doublers. The fuselage has doublers on the dash frame inside the fuselage and the wing has external straps at each rib.

The flight maneuver during which the wrinkles occurred is not easy to pin down but a loop is most likely the one.

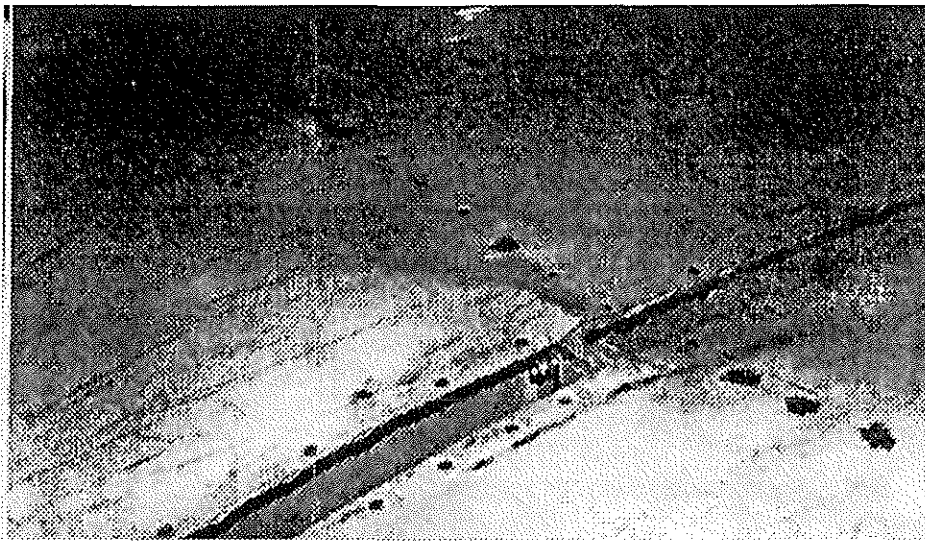


Right hand fuselage side

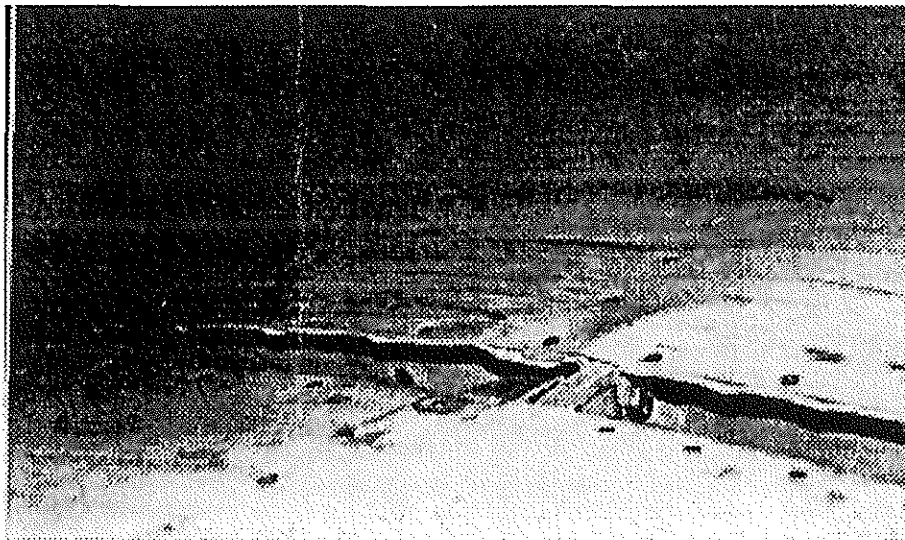
I hope this report is helpful. The aircraft is up to its intended structural capabilities and signs of distress occurred at the appropriate time and place.

My test pilot, who has 6000 hrs with 4000 hrs in light tailwheel type, is very pleased with the way the T-18 flies, especially the stall with the stall strips.

*Editors Note: Before someone out there writes to say: No reason for pulling 5.8g's to do a loop in a Thorp. I'll say it for them! I had the opportunity to check out this test pilot in my Thorp. Although very experienced, he has a hearing problem!!! He doesn't listen! I discussed G loading and the limits on the Thorp with him. While flying my airplane he started to enter his own spin test program when I took the plane from him!!! What a cowboy! Thank you Kim for the willingness to share this problem and bad experience with us. Kim lives at 2940 Devonshir Dr. Florissant, MO. 63033*



Right hand outer wing panel



Left hand outer wing panel

**FOR SALE:**

T-18C Airframe basically completed. Most everything from spinner to tailwheel. Has LDS airfoil. No radios. Engine is O-320 150 HP, conical mount. Has yellow tagged std. solid flanged crankshaft, yellow tagged cam shaft, all new rod and main bearings, new pistons and rings, cylinders 47 hours since chromed (per log book), wet vacuum pump, metal float and one piece venturi in carb. All fiberglass. Maybe 2 or 3 months to 1st flight. \$14,000 FIRM

I have for sale a complete set of S-18 drawings with builders manual by LDS. I bought these drawings from LDS and was issued S-18 serial number 18. The drawings are very clean and are completely unused in any way. \$180.

Barrett M. Kemp  
(501)968 7318

**FOR SALE:**

For Sale: T-18 damaged on landing. Damage to left wing, hor. stabilator, aft fuselage and minor damage to landing gear. Will sell decertified. Prefer selling as whole assembly but will consider parting out. Jack Waxenfelter (501)967-3100

**FOR SALE:**

T-18 C with O-320 150 hp Lyc. Aircraft and engine has 450 hr. Aircraft won the Wright Brother's Award in 1995. IFR equipped. Price is \$44,000 For details and equipment list contact: Richard Snelson at 217/939-4215

*(Editor's Note: As of 5/2/98 a sale is pending)*

**FOR SALE:**

T-18 N252F

Built by Lyle Fleming, Lancaster, California, finished construction 1990

S-18 folding wing, Trailer, 237 hours total time, airframe and engine, No damage history, Lycoming O-360, fixed pitch metal prop, Ellison Throttle Body, 200 MPH at 75% power, Professional electrical wiring, Electric pitch and roll trim, IFR Panel, Two Radios, Loran, Transponder, White over blue paint, June Annual \$27000 or best offer

Contact: Paul Reukauf 43740 N. Lively Avenue  
Lancaster, CA 93536 805-258-3076 day 805-948-2478 evening paul.reukauf@dfrc.nasa.gov

**FOR SALE:**

Lee Skillman's Thorp S-18 project is for sale. He's got it priced at \$10k and it's all the parts and accessories that are supplied by Classic Sport Aircraft in their catalog. Fuselage is on the gear. He has canopy, windshield, dual brakes, and on and on. Someone is going to get a real deal when Lee sells this project. By the way Lee's work is outstanding, his first Thorp won a lot of awards including the Wright Brother's Award. Give Lee a call at (334) 633-3535 to discuss it.

**Wanted**

A conical engine mount for a T-18. I have a dynafocal to trade. Also: New/ or used single inlet Garrison fiberglass cowl. Contact: Matt Null 3330 Goat Fell, Ann Arbor, MI 48108

## Electrical Workshop

The following electrical wiring information is from Charles A. Wagner from EAA Chapter 1000. Thank you very much Charles for letting us use it in the Thorp Newsletter.

## CUTTING AND STRIPPING

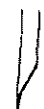
- Note: Prices indicated generally represent the lowest price I know of for a tool of reasonable quality. Cheap tools will not produce good quality results.
- Cutting: Wire-cutting dikes, flush or semi-flush cut \$12 - Use for small wire up to about 14 gauge.
- Shearing type wire cutter \$20 - Use for large wire and coax cable.
- Caution: Never use wire cutters for anything other than soft copper or aluminum wire.
- Stripping: Pocket knife - Do not use!

Guillotine type stripper - This is the most popular type and is widely sold. Relatively inexpensive. I do not recommend them because of the high risk of nicking the wire.

Ideal Custom Stripmaster for Teflon \$120 - **Obscenely expensive!** This is my personal favorite. Easy to use and virtually impossible to nick wire. Although intended for Teflon, it works extremely well on all types of plastic insulation. To save money, I purchased a regular Stripmaster with guillotine blades (much cheaper) and a set of Custom Stripmaster replacement blades (they fit). The combination was about half the cost of a Custom Stripmaster. One blade set fits wires from 26 to 16 gauge, and the other blade set fits wires from 14 to 10 gauge. Both sets are extremely useful.

Round Cable Stripper \$41 - This works for coax cable and wire that is too large for the Custom Stripmaster. Requires much more care in its use. Must experiment to set blade depth.

- Strip Length: Other than not nicking the wire, this is the other critical part of stripping. The correct strip length must be carefully determined for each type of terminal you are using. In general, too little strip length will weaken the electrical connection, while too much strip length will reduce the strain relief needed to avoid fatigue failures.



GUILLOTINE  
BLADES



SHOULDER SITS ON INSULATION O.D.,  
CUTTER BLADE NEVER TOUCHES WIRE

CUSTOM STRIPMASTER BLADES

## CRIMPING

### Insulated

Barrels: AMP Super Champ and similar tools \$10 - The best of these tools can make barely acceptable crimps if you use them properly. Some of these cheap tools have crimp cavities that are completely unacceptable.

Ideal CrimpMaster frame and die set \$60 - This is the least expensive good quality insulated barrel crimper I know of. AMP makes good tools also. The AMP ProCrimper is probably a very excellent tool, but is more expensive.

### Open

Barrels: Molex pins and various other terminals use open barrels. Each barrel type has its own specific crimping tool. Use only open barrels that have both a conductor crimp and an insulation crimp for strain relief.

### Battery Cables

Del City crimping tool \$142 (1989 price) - This is the least expensive big wire tool I know of, and it crimps many sizes and types of very large wire terminals.

### Hints

Make a sample crimp of each type of crimp you plan to do, and pull test it to destruction. See what fails. A good crimp will deform the wire inside the barrel, demonstrating the extreme pressure present. If the wire cleanly pulls out at only a modest force, the crimp is inadequate. If some strands break off and stay inside the barrel, you have a good crimp.

It is imperative that every crimp provide both an electrical crimp and an insulation crimp. The insulation crimp prevents vibration-induced fatigue failures. Do not use terminals that have an all-plastic "funnel entry" barrel. These barrels are not meant to crimp the insulation. If you do crimp the plastic barrel, there is no assurance that it will remain crimped for life. I recommend the AMP PIDG series of terminals. These have a copper sleeve inside the barrel that is meant to permanently grip the insulation. In my opinion, these are the best terminals available, and they do not cost much more than the cheap ones.

Battery cable lugs do not have anything to crimp the insulation. I recommend using shrink tubing overlapping the crimped barrel and the wire insulation, but this provides only minimal fatigue protection. For best results, support the cable to prevent excessive bending at the terminal.



## MOLEX CONNECTORS

**Comment:** Molex connectors are about the cheapest connectors around. They are light in weight, reliable, and fairly easy to work with. Considering the major advantages in building in electrical disconnect points in your project, Molex connectors offer an unbeatable set of features.

The small .062 pins take wire from 18 to 24 AWG, and can carry 5 amps each. The large .093 pins take wire from 14 to 20 AWG (large wire version) or 18 to 22 AWG (small wire version). Large pins can carry up to 12 amps each, but you must derate the total capacity for larger connectors. You can carry 12 amps on two or three pins while carrying much less on the others.

**Strip**

**Length:** About .125" for small pins and about .165" for large pins.

**Crimping:** Molex 11-01-0008 \$154 for small pins and 11-01-0084 \$128 for large pins. These are the tools I use and recommend. Molex also offers low cost tools 11-01-0015 \$13 for small pins and 11-01-0014 \$13 for large pins. I have not used these tools, and cannot comment on their crimp quality. However, they are not ratcheting tools and the user must make sure a full crimp is completed each time. Also, two separate crimps must be done, one on the conductor and a second one on the insulation.

**Insertion:** Molex pins are simply pushed into the back end of the connector body. If the wire is stiff enough, you can push the pins in using the wire itself. For small wire, a small screwdriver can be used to push the pins in. Make sure the pins are in all the way so that their tangs engage the notches in the body.

**Extraction:** Molex 11-03-0002 \$10 for small pins and 11-03-0006 \$10 for large pins. A sleeve on the tool compresses the tangs and a spring-loaded pin inside pushes the pin out of the body. After a pin has been extracted, **very slightly** expand the tangs if it is going to be inserted again.

**Hints:** In your documentation, make sure you identify each circuit with the pin number in each connector. The connector bodies have pin numbers molded in. Also identify each connector. I use J-numbers (i.e. connectors J1, J2, etc.) for both the male and female halves, so J2 mates with J2, etc.

Remember, female is the hot sex. When a connector pair is disconnected, the female pins (which are normally used in the "receptacle" bodies) should be on the hot, or electrically live side. They are less likely to short out.

## SOLDERING

- Where? Certain electrical connectors (radio, instrument, etc.)  
 Printed circuit boards (if you have any)  
 Certain switches, mostly small ones  
 Potentiometers  
 The center pin on BNC connectors  
 Certain wire splices
- Wire: Do not solder PVC wire. The insulation melts. Automotive wire type GPT, irradiated PVC, Tefzel, and Teflon can all be readily soldered.
- Tools: Soldering iron. The best type is thermostatically controlled, but, as usual, is the most expensive. I have taken a low cost iron that gets too hot and mated it to a lamp dimmer to make a poor man's controlled temperature iron.  
 Make sure the tips are iron plated. Unplated tips don't last long.
- Wet sponge, or at least a wire brush. This is used to clean the tip, which needs cleaning very frequently.
- A soldering gun or very large iron is needed for heavier jobs, such as soldering a tray mount RF antenna connector. The whole body has to be heated to solder on the shield and to seal the cover.
- Solder: Use only electrical grade solder, with rosin core. I like to use .031 diameter solder made of 63% tin and 37% lead (known as 63/37). This formulation solidifies instantly when cooling. However, 60/40 is also quite common and works well.
- Tinning: Always tin the wire after stripping and before mating it to the device it will be soldered to.
- Solder cups: Connectors with solder cups should have their cups partially filled with solder before the wire is inserted. Then by simply heating the cup, you can plug the tinned wire in without adding any more solder.
- Hints: Always make sure that whatever you are about to solder is very clean. Use a mild abrasive such as ultra-fine Scotchbrite to clean oxidized surfaces.
- Always wet the soldering iron tip with a small blob of solder before attempting to heat anything. This provides a heat transfer path.
- Carefully inspect all work for proper wetting. Cold solder joints are bad.

## SHRINK TUBING

**Types:** The most common types of shrink tubing are PVC and irradiation crosslinked polyolefin. While PVC is cheaper, it shrinks about 20% longitudinally (that's a lot!), and has a lower operating temperature, 105°C. The much better polyolefin shrink tubing shrinks only about 5% longitudinally, and has a 135°C operating temperature.

There are many specialized types of shrink tubing also available, such as high temperature Teflon, extra heavy wall, extra high shrink ratio up to 4:1 shrink tubing with a meltable adhesive inside for sealing, etc. etc. I use shrink tubing with a meltable adhesive for sealing battery cable crimp connections. The adhesive seal keeps corrosion out of the crimp joint.

**Sizes:** Shrink tubing is available in a wide range of diameters ranging from 3/64" 2" inside diameter, unshrunk. When heated, it will shrink to 50% of its unshrunk diameter unless restrained by whatever is inside it.

**Uses:**

1. Insulating otherwise uninsulated electrical terminals.
2. Insulating solder connections on connectors.
3. Insulating inline splices.
4. Encapsulating isolated electrical devices such as resistors and diodes that may be installed in wire bundles.
5. Protective wrap around wire bundles.
6. Used as identification sleeve on wire.

**Tool:** Heat gun \$58 - produces the hot air required to shrink the tubing. Polyolefin tubing shrinks at 121°C (250°F), and these heat guns provide air over 500°F to quickly heat it to shrink temperature. Hair dryers won't work.

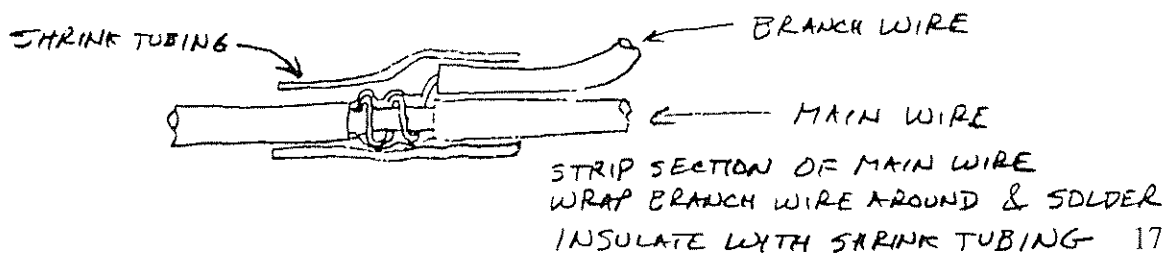
**Hints:** Don't forget to slide your shrink tubing onto your wire before soldering it on, if you plan to insulate the joint.

The heat gun can seriously damage many things with the high temperature air it delivers. Use caution, and heat just enough to shrink the tubing.

Do not use heat shrink tubing on PVC wire. The insulation melts easily.

## SPlicing AND POWER SIGNAL DISTRIBUTION

- Intro: In any wiring system, it is necessary to distribute certain signals, power leads, and ground leads to multiple devices. Thus there is a need for a way to connect multiple wires together. Some possibilities are:
- T-strips I do not use terminal strips because they are bulky, uninsulated, heavy, and a royal pain to work with. Besides having to bolt them down, I also have to deal with loose hardware during installation and maintenance.
- Splices Crimp splices can be used to add wires by crimping more than one wire into each end. I do not use them because they add unnecessary bulk to my wire bundles.
- Bus bars I use these only in specialized circumstances for power distribution. When needed, I fabricate one to fit the application.
- Solder In-bundle connections can be made by soldering on one or more branch wires to a main line and insulating the joints with shrink tubing. I use these a lot, because the resulting connection is extremely compact and lightweight, measuring and weighing little more than the basic wire itself. *SEE SKETCH BELOW.*
- Crimp Crimping multiple wires into a single crimp barrel is acceptable, provided that the total of all wires is equivalent to an acceptable gauge for the barrel. It is also very necessary to make sure that all wires are fully inserted into the barrel before crimping. Common examples are two #22 wires into a red (22-18) barrel, and two #18 wires into a blue (16-14) barrel. This type of termination is particularly useful for forming daisy chains, such as supplying power to a group of circuit breakers or instrument lights. I recommend this type of distribution.
- High Current When the current required in a circuit exceeds the rating of a conducting element, say a connector pin, the simple solution is to double up and use two wires or two pins in parallel to carry the current. If both halves of the circuit are built up identically, with the same wire gauge, same length, same pin type, etc., the resistance of each half is the same, forcing the current to divide itself equally between the two halves. This is a time-honored way to get a lot of current from one place to another.



## BUNDLING WIRES

- Intro** When multiple conductors follow the same path, it is desirable to bundle them together for neatness, compactness, and to add stiffness. A bundle of wires vibrates much less than individual wires, and is more reliable. An external wrap also adds abrasion resistance to the wire bundle. This discussion covers several ways to do this.
- Cable** Factory manufactured multiple-conductor round cable with a jacket is perhaps the very best way to handle multiple conductors. Unfortunately, this approach is not often practical, because there are many different numbers of conductors in the various cables, mixtures of various wire gauges, combinations of configurations (shielded, twisted pairs, etc.), and other problems making this solution usable in only a limited number of cases.
- Sleeving** Vinyl sleeving is available in a variety of diameters, and makes an excellent jacket for wire bundles. I use it wherever I can. The only problem is that sleeving with an inside diameter over .263" can only be purchased in 100 ft spools. Cost is typically about \$30 per spool, so I cannot afford to stock too many sizes.
- Shrink** Shrink tubing can be used as a jacket for wire bundles, but it has certain disadvantages. One, the bundle becomes very stiff, perhaps too stiff. Two, shrink tubing is expensive on a per-foot basis, say 75¢ to \$1.00 per foot for 4-foot lengths at 3/8" to 1 1/2" diameter. Three, continuous lengths over 4 feet require purchasing extremely large spools at very high prices. Four, shrinking the tubing could damage the wire inside if it is PVC.
- On the other hand, in tough environments like under a cowling, shrink tubing works very well. Stiffness is a plus. If you only use Tefzel or Teflon wire (I think you should), shrinking the tubing cannot possibly hurt the wire. The safe operating temperature of polyolefin shrink tubing is 135°C (275°F) which is probably high enough for most locations under the cowling. The 4 foot length limit should cover almost any under-the-cowling run.
- Tape** Vinyl electrical tape works well as a bundling device behind the panel. It permits breakouts of branch cables, adapts to any size or shape of cable, and is low in cost. But it takes a lot of time to wrap long bundles with it. And it does not provide much in the way of abrasion resistance. I use tape in selected locations.

Others I do not use lacing tape because it provides no additional protection for the wire bundle. Besides, I don't know how to tie it and see no need to learn how.

I do not use expandable braid because it has to be clamped at the ends to keep it from sliding around and bunching up. Besides, it is hard to pull it thru a grommet.

I do not use spiral wrap because it does not fully cover the cable, adds bulk, cannot easily be fed thru grommets, and does not please my aesthetic senses.

I do not use split loom tubing because it is too stiff, too bulky, and never stays together well enough to suit me. Also, it is not available in very small sizes.

**The above electrical wiring information is from Charles A. Wagner from EAA Chapter 1000. Thank you very much Charles for letting us use it in the Thorp Newsletter.**

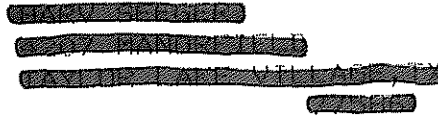
Hi Rich:

I went to an electrical workshop last Saturday that was expertly hosted by Charley Wagner from EAA Chapter 1,000. Charley is a retired NASA Electrical Technician, presently building a RV-6A. Charley is a very practical homebuilder electrician and uses materials and techniques in keeping with our kind of airplanes. He uses Molex plugs and receptacles in those places requiring a "cannon" plug, for example. He has summarized several subjects and provided many good pages of advice and data for presentation in the workshop. I feel sure you will want to use a lot of it. He gave me permission to use the material in our T-18 Mutual Aid Society Newsletter. Please give him credit for whatever you publish. By the way you can get an excellent electrical catalogue by calling Mouser Electronics at (800)346-6873 or going to [www.mouser.com](http://www.mouser.com) on the internet.

Sincerely,  
Lyle Trusty



T-18/S-18 Newsletter  
 Richard Snelson  
 Route 3, Box 295  
 Clinton, IL 61727  
 Phone: (217) 935-4215  
 email: rsnelson@dave-world.net



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## 1998 DUES

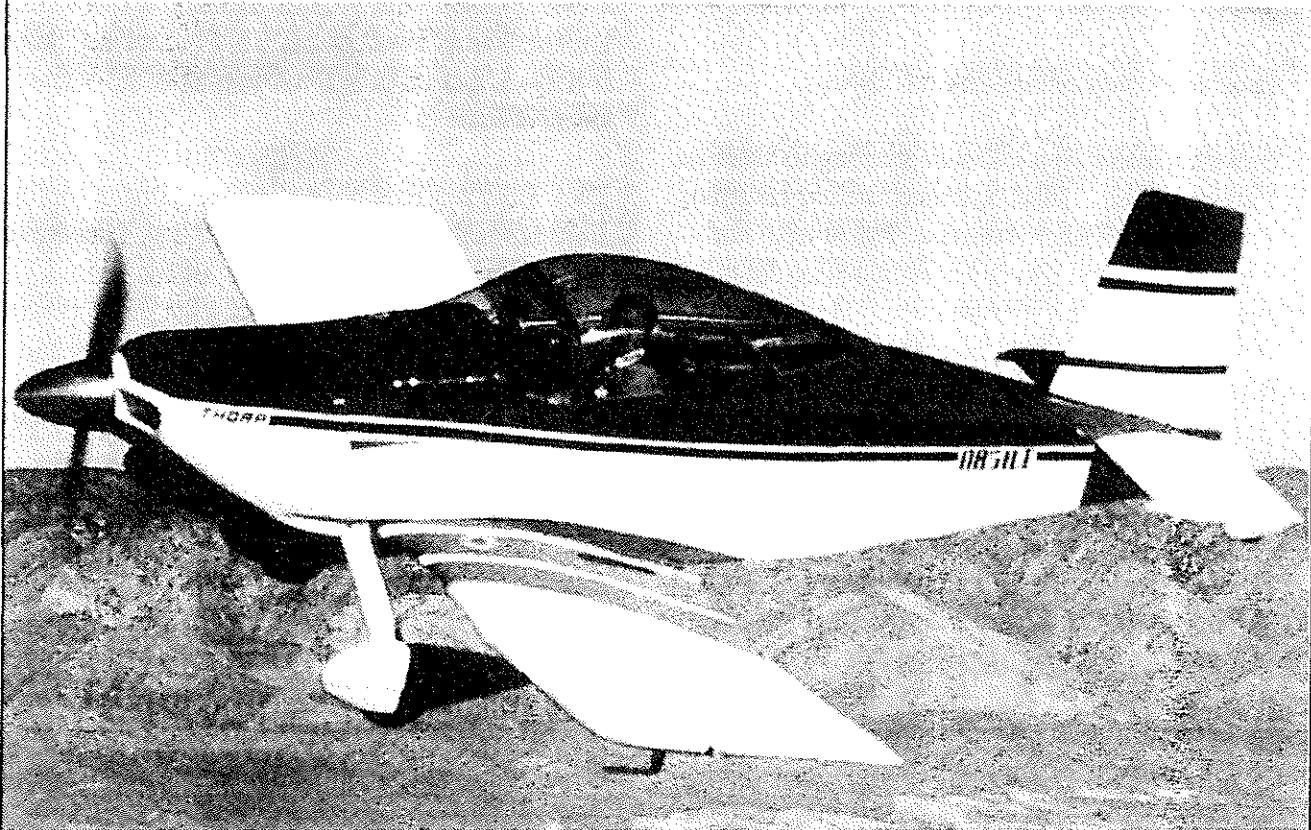
Red Circle means I have not received you dues for this year. Please help out and get them in now.

### THORP T-18/S-18 MUTUAL AID SOCIETY 1998 DUES

Please continue your support of this valuable exchange of ideas, building tips and safety information covering John Thorp's great design. Make checks payable to Richard Snelson, Route 3 Box 295, Clinton, IL 61727 \$25.00 US, \$30.00 other.

Name: \_\_\_\_\_  
 Address \_\_\_\_\_  
 City: \_\_\_\_\_ State \_\_\_\_\_ Zip Code: \_\_\_\_\_  
 Phone: \_\_\_\_\_  
 Aircraft: \_\_\_\_\_ Hours on Aircraft: \_\_\_\_\_  
 Email address: \_\_\_\_\_  
 Notes: (Building?, Flying?, Thinking about it?etc.) \_\_\_\_\_

# T-18 NEWSLETTER



*Lyle Trusty's N851LT*

## IN THIS ISSUE:

**S-18 Aileron Binding Alert!** by Denell Zander

**Letter to the Editor...LOTS of them!**

**Electrical Tips** by Lyle Trusty

**Scott Master Cylinder Problem** by Walt Giffin

**For Sale Items: Some good buys here!**

**Oshkosh 98** by Roy Farris

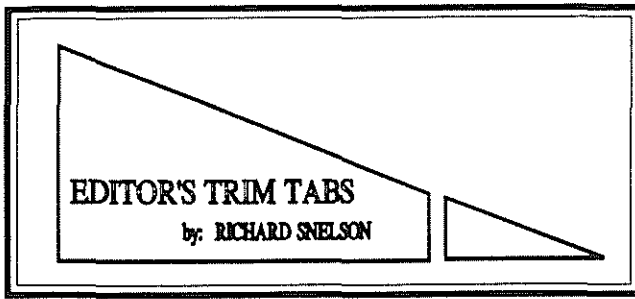
**Kentucky Dam Fly-In is Oct 9, 10 , 1998**

**Call for reservations 1-800-325-0146**

**See Page 19 for contacts and details**

**NOTICE: (STANDARD DISCLAIMER)** As always , in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.





Dear Members of our Thorp Family,

Fall temperatures are finally starting to bless us here in Illinois. With it comes the expectations for the great Thorp events at Placerville, and Kentucky Dam. Don't know how you folks are feeling, but it's my thinking that I'll take the Kentucky Dam Fly-In over Oshkosh anytime. These small get-togethers are twice as much fun and if you get on the ramp and discuss your project or airplane with the Thorp owners you can learn just as much as sitting in the crowded forums at Oshkosh. Unfortunately we still have hundreds of Thorp owners that don't come out for these events. Let's tell them what they are missing!

The second Thorp I had built now has a new home in Oregon. Sure, it was sad to see it go. But the new owner, Pat Rokus is a fine fellow and will give it tender loving care. Heard from him this week and he has more that 75 hours in the airplane now. He's put landing lights in the wings and the pictures show nice workmanship.

Some of you have asked what my plans are as far as another Thorp are concerned. There are a lot of good projects coming up for sale and I might go for one of those. I plan on keeping the newsletter going and making it to most of the Thorp events. I belong to the Decatur Aero club and have 5 airplanes available, so I have plenty of flying opportunities.

RoxAnne and I made it to the lunch/forum at Oshkosh this year, but left right after it was over. We had our horses and horsetrailer camper over in a wilderness area on the Wisconsin River.

More than 20,000 acres of woods and riding trails. Had a great time there.

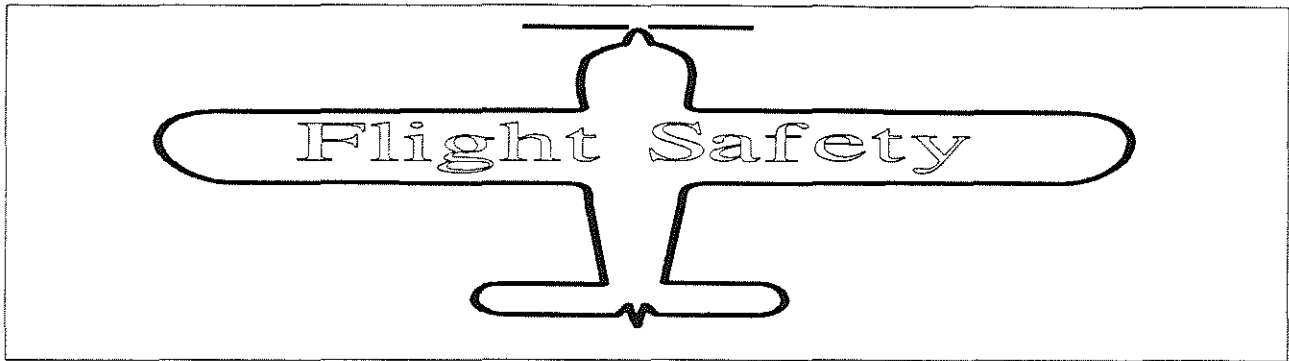
We had a good crowd at the lunch/forum and Bill Williams called afterward to say they had a surplus from the lunch collection. Bill thought it would be a good idea to send the funds to the folks at Placerville to help with some of their cost for the Thorp event there. So Placerville, hope it helped. Let us hear from you as to how the event went.

Dick Ecklund sent photos of the Thorps on the field at Oshkosh 98. He counted 22. I wish we had more space in this newsletter for more photos but it turned out I had a lot more material than I could get in. Thank you to Dick for the pictures and to the folks that continue to send letters and email articles for the newsletter. Roy Farris has promised an article on building the flaps for the next newsletter. We need other folks to jump in here and send me articles and information on their projects and trips. Please help! I would really like to hear from Classic Sport Aircraft with the details on their new S-18 Kit. The world wants to know Mike and Phil. Send us more info.

Visit my home page for event information.  
<http://homepage.dave-world.net/~rsnelson/thorp.html>

## Newsletter Dues

Please help me out fellows! There are still way too many of you that have not sent your 98 dues! This is really late in the year and makes it difficult for me to handle printing and postage cost. A couple of folks waited till December last year to tell me "Oh! by the way Rich, I didn't want the newsletter." That was after I had sent it to them all year! They didn't pay either. @#\*\*\*##...Thank goodness there were only a couple of people that pulled that stunt. So you late guys check the label for a red circle and then send your dues. Please do it today!



## S-18 Aileron Binding Alert

Subject: Aileron Alert!  
From: delzander@juno.com  
To: rsnelson@dave-world.net

While rigging my ailerons for first flight, I noticed binding at the aileron push-pull tube rod ends at the walking beam. I checked my plans and found everything built to specs. I checked another flying T-18 (Folding Wing) and found the situation even worse.

The problem is that the mast plates at the end of the stick socket and the AN960-10 washers at the control horn at the outer wing juncture do not provide enough clearance for freedom of the push-pull tube rod ends at both ends of the stick forward and aft excursion. On my airplane the twisting force had loosened the lock nut on the rod end and was working the threads about 1/16 turn at each full excursion of the stick. On the other airplane the lock nuts held and the last 6" +/- movement of the stick aft was torsionally loading the push-pull tubes. I suspect that every plans-built T-18 out there has a good chance of having binding in the aileron push-pull tube or working of the threads on the rod end. My solution was to shim out the mast plates at the end of the stick socket with a .032 aluminum shim on each side and then put a .032x1/4 dia. bushing on each side of the control tube rod end. I used standard AN960-10L (.032) washer and turned them down to 1/4" O.D.. That provided plenty of rod end freedom at both ends of the stick excursion. At the risk of being too paranoid I think this should be checked before the next flight on high time aircraft and on all T-18s at the first opportunity. Denell D. Zander 503-620-1335 DelZander@juno.com

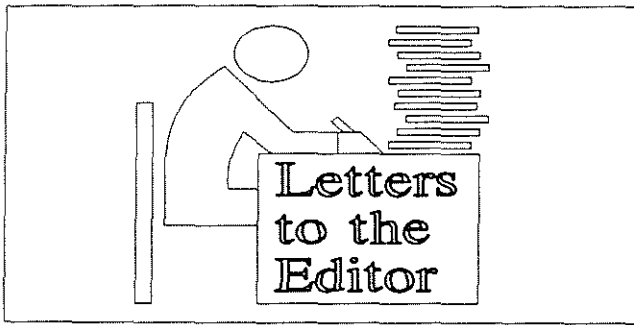
### Response from Classic Sport Aircraft

Subject: Binding Ailerons

I have an inner wing set up and tried to repeat your problem. Using the Hiem F34-14, I was able to get the rod end to move. You could see when the torsional load would start. I then tried to repeat using a Fafner REB3N and I could not see any movement. The Fafner is wider at the ball (approx. .500) and allows the full movement. The Hiem is narrower (aprox .460).

Adding spacers as you did fixed the interference with the Hiem. I will look into a possible change in the S-18 drawings. The movement does not appear to be anything critical, but should be looked at during annuals.

Sincerely, Mike Archer  
Classic Sport Aircraft



Editor's email: [rsnelson@dave-world.net](mailto:rsnelson@dave-world.net)

Hi Richard,

The home project should be completed by mid July. Building a T-18 is easy compared to building home. Thank goodness its almost over and I can get back to a normal life including airplanes.

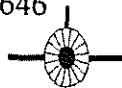
Regards, Ken Morgan

New address:

9110 Bellechase Rd.

Grandbury, TX 76049

Phone: 817-578-3646



Rick:

Building your own windshield is essentially child's play, as outlined in a previous newsletter. It cost me \$40 for the acrylic - about 35 for the form, which cost could be reduced-so that \$75 is pocket change compared to the price asked by vendors. Sure, it takes time and one learns from doing - but is that what it is -all- about-?

Two attempts were made to form the canopy and both failed. The method attempted was to rough form the acrylic sheet over a rough male mold, then blow it to the desired shape. Unfortunately, the required compound curves could not be approximated; severe wrinkles developed during initial forming and could not be removed.

After checking all sources of which I knew, I bought one from Classic Sports, and I suggest that one in need of a canopy check with Mike Archer. Sincerely, Floyd Myers

5170 Sunset Drive  
Ogden, UT 84403

Hello Rich & RoxAnne,

Hope all is well with you and your family as well as the T-18 family. Still enjoy very much receiving the newsletter and hope you continue to have the time and ENERGY required for such an undertaking.

A lot has changed in my life as well as Mike Hernden's. As for Mike, he has a C- 170 which he has been improving gradually over the last 4-5 years. About 4 years ago he bought a C-195 requiring a total restoration. He has had it disassembled about as far as you can go and still have anything that resembles an airplane. It is now going back together. Still a long way to go and a lot of work but at least all in a "positive" direction. Consequently, his T-18 project has been in storage for the last 4-5 years.

My life has changed as well. Sundstrand offered a "by-out" package to all over age 55 in 1996. I decided after 29 1/2 years to accept the offer and retired November 1, 1996. We all thought (HOPED) that that would mean the T-18 would finally get to the front burner and get finished. In January, I bought a hangar at Cottonwood Airport on the NW side of Rockford. In April, I bought a Fly Baby locally (really nice one) for a low cost tail dragger time builder. In May I was persuaded to come back to work via Kelly Services. Sales here were up 50% over 1996! \$635m to over \$1 billion for the aerospace division. So, I am now officially a Kelly Girl! Not sure how long I will be on the job here but the Director says he believes there will be work available for 4-5 years. Not sure I will stay that long but who knows. It is nice to be able to set your own hours and days however.

During the summer, I followed some "chatter" on the AOL bulletin board for the T- 18 and became concerned about something I have known for years but had forgotten when I bought my hangar. That is that the T-18 needs (for most/many pilots) 2000 ft minimum to land. Cottonwood is 2600 with a 400 ft displaced threshold on one

end. It seemed that I needed a new airport or a different project. After being emotionally involved as well as physically involved with the T-18 since the 60's, it became a rather depressing summer and OSHKOSH was somewhat of a "bummer" for me. Cottonwood is the home of EAA Chapter 22 and is nearly 100% owned by chapter members, consequently, I wasn't too eager to leave there.

Early September, I got a ride in an RV4 that belongs to a friend here in Rockford. After that, several things happened very quickly. I happened to see a RV4 project for sale on the internet with an 815 area code. Turns out it was only about 20 miles west of Rockford, was the second ship being built by an American Airlines Captain and was for sale due to lack of time since he bought a small farm for his family to live on. Just moved there. He has a lot of work to do to the house, like a complete rebuild! The following week end was the flyin at Whiteside airport so I went to the RV forum. To make a very long story short, I now have a RV4 airframe that is 90% complete. Have to install the canopy, instruments, engine and cowl. I had an inquiry about my T-18 project but it isn't for sale.

Current thought is that it will be my "retirement-retirement" project. I have a terrific shop, heated and well lighted in my hangar (hangar 42x42) so have a good place to build. Not as handy as the garage but nice to have both vehicles inside in the winter again. Also, with 4 or 5 projects being built or restored, there is a lot of activity there for encouragement. By the time it is completed I should have a lot more taildragger time and may feel competent to operate the T-18 from there also or will have to hangar it else where.

While I'm still at what was to be a short note transmitting a couple of checks, I would like to express my concern about the T-18 and OSHKOSH. I would like to see the T-18 continue to be popular with additional builders. With the forum "off-site" I wonder how many "wannabees" are getting the T-18 message.

Unless they come there and seek out the T-18, they would never learn anything about it. I know I haven't been to a forum since it left the field due to the time commitment to get there and back. I realize that it wasn't your wishes to move off the field either. Just wonder what others are thinking and whether or not it is hurting the future of the T-18.

Well, I've taken enough of your time with this. Would enjoy seeing you and RoxAnne again. Haven't been to KY LAKE for several years now. The last time I did, you folks didn't make it. By the way, we have a great fly-in breakfast the first Sunday in May, every year at Greater Rockford Airport. That would be a nice T-18 flight on a nice Sunday morning. HAPPY FLYING, SAFELY Wally Hunt 1658 Plaza Drive, Rockford, IL 61108 Phone: 815/332-4708

*Editors Note: It was great to hear from you, and what's happening in the Rockford area. We have missed seeing you at the T-18 events. I do agree with you that the "T-18/S-18" is not getting proper exposure at Oshkosh. With that said, I must tell you that you are missing the best bargain lunch at Oshkosh, plus a forum that can last most of the afternoon if one cares to sit in the big tent, drink free soda, and talk. Besides, Wally it ain't that far to the nature center. Looks like if the field keeps expanding west it will be at the doorstep to the nature center soon. As you know we had been pushed into late afternoon--evenings times for our forum, which most thought was really stupid. That's why we went to the Nature Center. Plus the fact that it's a better place! We missed the ball this year because I failed to get anything in the program about the forum. That's my fault and we can change that next year. What's really missing at Oshkosh is someone to bite the expensive bullet and have a T-18/S-18 display. Until that happens the T-18/S-18 will remain a well kept secret. (Best flying homebuilt in the world.) Just ask and we will tell you! Hope to see you at Kentucky Dam in October, Rich Snelson*

Dear Richard,  
 Sorry to read you sold your T-18. When I first heard this I was quite surprised and figured you would no longer edit the T-18 Newsletter. So I thought if you didn't do it I would no longer pay my dues. My biggest benefit is to read the letters sent in. However after reading the last issue and noting I'm behind I'm enclosing my check for at least another year.

I try to get my Cessna up at least once a week. Going to miss your flyovers. Ernest Thorp

*Editors note: Thanks for the comments Ernest. I plan to stick with the T-18 Mutual Aid Society. Lots of good T-18s and T-18 projects out there so you never know what might end up in my shop.*

*Ernest lives about 3 miles north east of Clinton Illinois and a great grass airport with east/west and north/south strips. Lots of flying history behind this gentleman going back to getting shot down in WWII. This year he was Illinois' flying farmer of the year. Great family, fine man! With a name like Thorp, how could he miss. Rich Snelson.*



Hi Rich,  
 Enclosed is some info on my T-18 and a picture. Heart problems is the only reason I'm selling. Mary and I had a lot more trips planned.

I just can not imagine going by car!! The Thorp sure went places in a hurry.

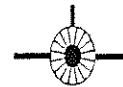
Thanks for carrying on with the newsletters, they are great! Truly yours, Dick Amsden

*Editors Note: Sorry you are having to sell your beautiful Thorp. Details later in this newsletter. Rich Snelson*



Dear Richard,  
 Leave this AM for a month in the deep interior of Venezuela so won't make it to Coles Co. T-18 Thorp Fly-In.. Was planning to but this opportu-

nity came up. I might go to Oshkosh but over the years have determined that the small T-18 fly-ins are a lot more fun than Oshkosh. Will be sure to make Placerville, Ky Dam other local ones though. T-18, 9008Z is running fine-as usual! Thanks for the N.L. Steve Hawley.

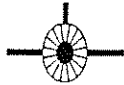


Dear Rich,  
 Enclosed is my check for this year's dues. I am embarrassed about my tardiness. The least that I could do is to get in on time or early as a way of thanking you for the excellent job that you are doing. Our business is coming along slowly but, it does cause me to work long hours and sucks up all of the money. We have recently signed an agreement with another company to market our products world wide. This is very exciting as we should see an increase in sales and I will have more time to design and develop new products. Fortunately, I love, what I am doing and it sure beats working for someone else in spite of the long hours. I am sure you heard about the misfortune that befell John Bridges and his buddy on the way to Sun n Fun. They were in the other guy's Glassair and they crashed in Louisiana shortly after takeoff from a refuel stop. The loss of both of them is enormous but I would like to tell you how John touched my life. I met John here in the Airpark at a hangar where he was building a Glassair for another buddy of his. John & I started talking back and forth and he was able to "drag" me to an EAA chapter meeting near the Deer Valley airport. After the meeting, we went to John's hangar to look over his Thorp, which was pictured in the newsletter last year. Then John started "pushing" me to have him come to my place and go over my project. We did get together and since John was a Tech Counselor for the chapter, he really went over my T-18. He had a lot of good tips for me and he wrote up the report and submitted it to Oshkosh. Then, he wanted me to visit his hangar so he could show me how to glass things in and to go fly with him. Unfortunately that did not happen

and I was shocked when I heard the bad news. We had a memorial service for the two of them at the hangar where he had been building the Glassair. We all will miss both of them and I will miss John and will remember his willingness to help anyone that he felt that he could help. You didn't need to ask as he readily volunteered his services. He was truly a typical EAA volunteer who was very skilled at building airplanes. Keep up the good work and I hope that next time we communicate that I will be able to report some progress on the Thorp.

Sincerely, Don Ruffner

*Editor's Note: I was very sorry and sad to learn about the loss of one of our T-18 friends and builders. Rich*



Subject: Flaps Fittings

Date: Tue, 15 Sep 1998 21:34:15 EDT

From: DDdouble357@aol.com

To: rsnelson@dave-world.net

Hi Dick:

I get so frustrated with this darn machine(computer) some times I can't even find my self in it. Hope everything is well with you and your. Some how I stumbled over some T-18 stuff on AOL where there appeared to be a chat board with some of the builders asking some questions. I put in a question but haven't gotten an answer yet; so I thought I would direct it to you. I came across some Flap assembly parts from a friend who had decided not to build another Thorp. The parts all looked new: however, he had drilled some of the assemblies and one of them has a skin already clecoed on it but not riveted. The problem that I encountered was that he had reversed the locations of the -4 and -6 fittings on the ribs for the inner and outer flaps ribs.

Before I go on with the plugging and riveting doublers on the ribs and relocating the fitting IAW drawings, I thought I would shoot the question to you in the hope of saving me some extra work. What would happen if I decide to leave them as they are and going ahead with the assembly?.

Would the flaps still operate as advertised?

Some time when I have a little more time I will send you a progress report on my project. I've been working 12 hours days and have had time to work on my project. And too the weather around here had been in the 100+ degree for the past two months which Zaps your want to do anything much less out in the garage.

Hello to all out there in the Thorp world.

P.S. Will be going to the Southwest regional in Abilene, Tx which is only 150 mi from here. Don Doubleday

*Editor's Note: It has always been my finding that when it comes to Thorp primary controls and assemblies we should build them to John Thorp's drawings.*



Rich,

I recently purchased a set of plans from Classic Sport Aircraft, SN 241. Is there any listing of names and addresses T-18 and S-18 builders. I live in the Dallas Fort (Texas) Worth Metroplex, and would like to visit as many projects as I could before actually beginning the construction myself. Surely there has to be some in the DFW metroplex.

Also, is there any kind of material takeoff that has been done for the T-18. I plan on scratch building everything. I don't want to order the whole plane at once, but I don't want to piece-meal the orders either. I asked this of Mike Archer of Classic Sport Aircraft, and he did not know of anything. For some other aircraft designs, I have seen tabulations of how much material you needed for a particular sub assembly, or a drawing showing full size sheets of material, and what was supposed to be cut from each.

Does something like this exist, possibly in the newsletter.

Thanks, Robert Mardis

<Robert.Mardis@halliburton.com>

*Editor's Note: See the details in this newsletter as to a Excel file that will be very helpful. Ron Chernich has it available. I also have it now and can email it to members.*

Hello,  
I thought you might be interested to know that my father, Bob Dial, passed away on August 14, 1998 at his home in Bloomfield Township, Michigan. My Dad had been suffering from heart disease for several years. He was 76 years of age. He built 2 T-18's.

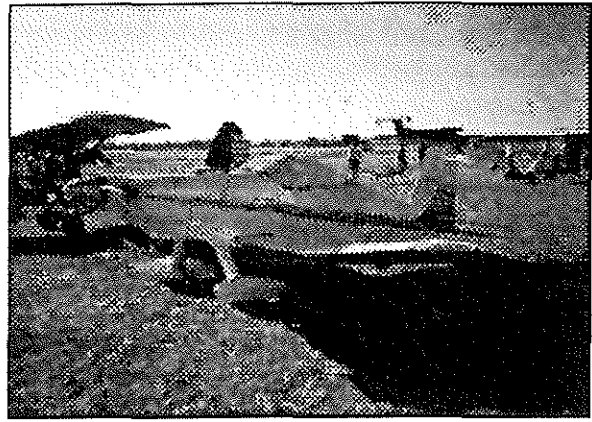
The first was built from scratch and flown by my Dad for many years. After he lost his medical, Dad sold his first T-18, and the new owner destroyed the plane and lost his life in an accident.

The second T-18 was bought by my Dad as a partially completed project, which my Dad finished. This plane was subsequently sold and I believe is currently owned by 2 gentlemen near Atlanta.

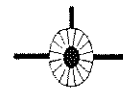
Dad served in the Air Force in North Africa and China during WWII and received an honorable discharge at the rank of Major. He retired from General Motors Corporation as a corporate pilot in 1978 flying G-2's.  
Please acknowledge your receipt of this email.

Thanks  
Kenneth M. Dial  
Geisinger & Dial, P.L.C.  
201 W. Big Beaver Road  
Suite 1120  
Troy, MI 48084  
Voice 248-524-0202  
Voice Mail 248-524-6164 X 3009  
FAX 248-524-0231  
kendial@dialcpa.com

*Editor's Note: Many of the T-18 folks are familiar with your dad's name. Bob Dial with his participation in the Thorp Mutual Aid Society added a lot to the great T-18's history. He was a fine builder and will be missed. I've included a photo of Bob's T-18 at Oshkosh 98. It's current owners are Barry Hall and Jud Carter*



*Bob Dial's Thorp N31BD*



Hi Everyone:

I just got out of the hospital today the 24th, feel weak as a kitten, but am doing fine. I'm home, under the able supervision of Anny the First. We have already done a bunch of things, prescriptions, groceries, etc. but I'm winding down, and about to call it "atsanuff" for today. I've got two extra belly buttons, a 10 inch scar on my chest, and an eighteen inch scar on the inside of my left leg. I also have numerous black and blue splotches where the nurses missed the vein with their darts. They did four by pass grafts without stopping my heart, a fairly new procedure pioneered by the Dr ( Dr A. Gheissari) that did the operation. I spent two days in the Intensive Care Unit (ICU) after the operation on the 20th, and then two more in the primary care unit (PCU) before getting discharged today the 24th, at noon. Thanks for your thoughts and prayers.  
Lyle and Anne Trusty

*Editor's Note: Glad things went well. You're back just in time to read the newsletters and the great article you sent on diodes. Not a bad picture on the cover either! Rich*

From: James "Jim" Borg <James.Borg@gte.net>  
To: rsnelson <rsnelson@dave-world.net>

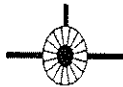
Hi Rich

I just got on the internet and having lots of fun just crashing around with this new computer. The T-18 is all in pieces right now. The wing is off for inspection and to correct some minor areas that I was never very happy with from the start. All is O.K. with the wing spar which is what I really wanted to inspect most of all.

The engine is disassembled and most of the parts are at the engine shop for inspection. I'm really happy with the results so far. The crankshaft, case, and cylinders were inspected and found to be within limits. All other parts are also checking out good. Not bad for a engine with 2800 hrs. (0320 E2A 150 h.p.)

As long as the airplane is down I plan on removing the tail group and inspecting that also. I'm also going to move the pitot from the vertical fin to under the wing. I also think a paint job is in the plans. I'm really getting tired of polishing aluminum. Jim Borg (N180RG)

*Editor's Note: I have always removed the rudder, and vertical fin each year. It's a good idea to check for cracks through out the area. Also check the steel landing gear attach points for rust and cracks.*



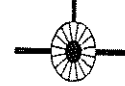
Rich,

I need to talk to someone who knows props. I have a 0-320 that has a c/s Hartzell designed for a 0-360 (F76 66 blades) . According to the factory there has never been any vibration testing done on the engine/blade combination that I have. Therefore they say there's no telling what kind of things are going on up there. To buy new blades is prohibitive and used ones are not to be found. I'm trying to find out what risks I may be running and also what kind of testing has been done on all the other non-certified props. Have they had this kind of testing, is it necessary, would I be in the same dark using one of them, etc.

Any help you can give I'd appreciate.

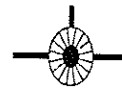
Thanks,  
Damon Berry  
FAMBER123@aol.com

*Editor's Note: I didn't have the answer for this on so passed it along to Bob Highley and Bill Williams. Anyone care to comment for the next newsletter?*



Hi Richard,  
I'm home again after another wonderful time in your country, especially at Oshkosh. I really appreciated the get together on Friday when I was able to meet so many other T-18ers. As I arranged with you could you please send me the following 4 back numbers of the Newsletter: 82,84,85,88.

Regards, Brian Olney  
<s.olney@student.murdoch.edu.au>



From: "WARWICK W. LLEWELLYN"  
<wllewellyn@compuserve.com>

I am in the process of re-assembling a Thorp T-18 that was built in 1976 by a friend who passed away two years ago. When his health was declining he took the wings off to take the airplane home to do some fix-up work prior to putting the plane on the market. I have a question concerning the wing center section to fuselage attach. The Thorp drawings show an Avdel ball detent pin for the main spar attach. I find no such pin in the assortment of hardware with this plane. Would AN6 bolts with AN365 nuts be suitable ?

Do later T-18 plans call for the Avdel pins? Your help would be appreciated. Warwick Llewellyn, 2500 Perdido Drive, Midlothian, VA 23112  
email: wllewellyn@compuseve.com  
phone: (804) 744-1895

*Editor's Note: Most people use bolts instead of the pins. Rich*



G'day Rich

All the back newsletter issues arrived and it's been great to catch up on what's been happening in the T18 world during the last 20 years that I've been away. The current group are certainly a great group. Greg Halverson and Brad Chapman saw my name in the last newsletter, noticed I was "local" to them in the Portland area and took the trouble to contact me. Greg took me for a ride in his T18 (with folding wing) - which was my first ride in the type. Even though I'd had one a third complete way back, I'd never even sat in one before. Greg was brave (or foolish) enough to let me shoot some landings at Scapoose which I enjoyed immensely. Especially as my last taildrager experience was 30 years ago in a Tiger Moth. Brad had his T-18 down for maintenance when I visited, but we had a great time talking and with the cowl off, he was able to show me a lot about his 0-290 GPU installation. All this is helping to light the building fire under my tail again.

As an observation, the newsletters show the group has evolved from primarily builders to a more of a owners/social structure. Perhaps the efforts of Classic Av and Eckland Engineering to produce full kits will change that back a little - and perhaps I can do a little as well. I've started looking into material sources and costs and alas, the scene is not as good as it was years ago. When I started last time, I was able to order a materials pack containing all extrusions, tube, hardware, odd-size plate and other hard to source items. Not so today. Surprisingly, the newsletters were not able to give me a complete materials list - although there are at least three partial lists that I've found. So I set out to rediscover what other early builders must have found and would like to share it out through the newsletter and yourself to help others who would like to scratch-build. My first surprise was that a sheet 4x12 sheet of .025 Alclad that cost less than \$20 in the 1970's now costs more than \$120. That's a lot more than what could be accounted for by inflation.. Why is this?

I've gone through the current "Deluxe" plan set, making an Excel spreadsheet of every part and hardware item called out, with the exception of engine installation items like prop diving lugs, extensions and carby air box stuff. In the process, I found 3 more extremely minor drawing errors and two possible "missing" parts. These appear in the drawings, but are never actually dimensioned and given dash numbers - although I'll bet every builder has managed to notice and include them regardless. If anyone would like a copy of the spreadsheet, they can email me, or find someone that can email me and I'll send them an electronic copy. I don't want to get into the

"floppy by snail-mail" business, so emails only please.

However, since my email address will change in the near future, I thought it best to send you a copy so we have a central repository, as it were. Some of the stuff may also serve as newsletter filler material, from time to time.

Regarding the plan anomalies, I've emailed Richard Eckland who will validate my findings and update his plan correction sheet as appropriate.

Here is what I found:

A-650 "Assembly Canopy": two different parts both called out as -12, a Spacer and a Seal. No big deal.

A-740 "Flap Pulley Installation Inboard": drawing in the top left misidentifies -1 as -3. Again, this can't cause a problem.

550 "Control System" shows the 556-1 Walking Beam mounting brackets attached to the main spar with the wrong kind of Hi-shears, driven the wrong way around. This error could result in a mainspar that can't be mated with the fuselage - if the builder has not studied the plans carefully enough to know the spar web must be flat in this area. I'm sure this was a "known" plan error 20 years ago, but I can't find a newsletter reference to it.

The two part omissions are very obvious to a builder. Again, I stress that I may have missed where these are called out, but I don't think so:

1. The 3/4 x 3/4 x 1/16 angle extrusions that run either side of the 526 fitting down the middle of the 604 Firewall (back) are shown, but not actually identified. This could cause a builder to miscalculate the amount of angle stock required to build.
2. There is a Clip mounted to the 580-5 Long-erons just aft of the main spar (with Hi-shears) to carry bolts that bear against the rear of the top spar cap. These clips appear to be made of lower main spar cap material, but are not detailed anywhere, nor are the 4 Hi-shears that mount them. I don't think that a 133" length of lower spar cap material would supply enough excess to make these.
- 2a. The 599 Ref that shows the clips also suggests there are small plates riveted to the rear of the main spar upper cap against which the bolts through the "missing" clips bear. These would probably need to be something harder than 2024 - maybe stainless. I wonder what other builders have done here?

So, that's it. I've still not definitely decided to start the project - especially as I will soon return to Australia, where "rules Rule" and making a homebuilt requires as much bureaucratic compliance effort (read that how you will) as building effort. Anyone who completes an aircraft there, in my opinion, can justifiably feel a major sense of achievement.

If US readers want to see what I mean, review the requirements chiseled in stone on :

<http://www.saaa.com/building/guidance.htm> and prepare to be amazed (and thankful for living in a society that encourages individual achievement in general and aviation development in particular). That said, I must point out that an initiative exists down-under to implement an Experimental category. One can only hope.

A word or two on the spreadsheet. It's in Microsoft Excel, which is quite common. It's in a version compatible with MS Office 95 and uses "workbooks", but does not contain any macros. The sheets are:

\* Drawings - all sheets in the Deluxe set, as recently published in the newsletter. You can do your own sorts by, number, name etc.

\* All Parts - all components and hardware as called out in the drawings, along with the material type, stock, blank size and quantity. This sheet uses "groups", so it looks like the drawing list with little buttons in the left margin. Click on a button to explode out a drawing and see all its parts (due to a quirk, you actually click the button on the next line).

\* Materials - derived from "All Parts" this sheet is used to build a complete "materials required" list by sorting on Type and Stock, then adding up the blank sizes.

\* Hardware - again derived from "All Parts", this lets you total up all identical items from all the drawings.

Another sheet contains hardware prices from Aircraft Spruce. I have a macro that produces prices from this on the hardware list, but this requires more work.

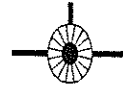
Here's some statistical data: There are 826 different bits of metal to be cut, trimmed and shaped in the airframe of a T-18. Putting these together will require 1557 different hardware items. This includes long rivets, the ones you will only need a few of, but not short ones which you would buy by the pound. Finally, the list does not contain anything forward of the firewall except the undercarriage - where you can

expect to add more parts and hardware.

Cheers for now,

"Ron Chernich" <Ron\_Chernich@clmt.com>

*Editor's Note: I have Ron's Excel and can email it to anyone wanting it. Contact me at: [rsnelson@dave-world.net](mailto:rsnelson@dave-world.net)*



Subject: first flight

From: Bob Pernic

<pernic@yerkes.uchicago.edu>

Richard,

N966RP flew for the first time on July 4th. It flies beyond my expectations which were based on two other T-18s I had flown. It stalls gently at 58 MPH clean. No sudden pitch down or wing drop off, only a gentle shutter at about 60. Ground handling is positive with no tendency to do anything unpredictable. I had an engine roughness that only I could detect while running the engine on the ground with the airplane as a test stand. In the air under power when I tried to lean it out it would back fire. I remembered reading someplace if this occurs that to look for loose or cracked fuel injection lines. When I inspected them I found all four only finger tight where they attach to the fuel distribution spider on top the engine. This also explains a slight gasoline smell and the roughness I mentioned. On the second flight on Sunday morning I made a nice three point landing with out using brakes until I went to turn onto the taxiway way. I did a left brake to make the left turn and then corrected with a right to straighten out. To my amazement both brakes were locked up solid! Mind you it was good upon landing and didn't lock up until applying brakes. First thing I thought of was the parking brake but that seemed to be fine. I examined the brake peddle and that seem peculiar because the master

cylinder piston rods were tight ( solid ) in the up position with out any play ( down travel ) in the rod. First thing I did was loosen the vent screw on the top of the cylinder. ( These are the Cleveland cylinders with the built in reservoir ) Loosening the vent didn't do anything. Next I loosened the hose connection at the bottom of the cylinder, with the release of a few drops of fluid the brakes released. This eliminated the parking brake as a possible cause and confined the problem to the master cylinders. I can not believe that it happened to both cylinders at the same time, but it did!

I've spent hours now trying to find the cause or to duplicate the problem and can not.

I remember in one of the past news letters you saying something like this happened to you, but as I recall it was a problem with the wheel cylinder, which I'm positive this was not. Any comments?

Now that I'm done with the project there is a lot that I can contribute to the newsletter and certainly will do so. Sincerely, Bob Pernic

*Editor's Note: We have had a lot of discussion of this in past newsletter, so look there. Also see Walt Giffon's article in this letter. Cleveland has said to always replace the rubber o'rings in any brake set that has been sitting around a few years.*

More from Bob.....

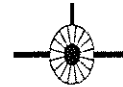
Subject: a winner!

Richard, it was good seeing and talking to you last Friday at the forum. I offer the following for the next newsletter: My T-18 won EAA award for outstanding workmanship in the Plans Built category. I guess this means it won best plans built airplane award. I was notified by receiving a rather heavy plaque last night when returned from a business trip. It is my understanding that these awards were presented on Monday evening in the theater in the woods, but I didn't know about any of this because I had to leave around noon on Sunday for the trip I just mentioned. At that time I did know that nine judges had judged

the plane so figured that something might be up. I will contribute a story to the next newsletter about the 20 year project, but could use a few words from you as to how long and what you think it should cover in order to make it interesting. Sincerely, Bob Pernic

Bob Pernic <pernic@yerkes.uchicago.edu>

*Editor's Note: Congratulations Bob. We are looking forward to an article on the project for the next newsletter. I thought I had a picture of your airplane from Oshkosh 98, but Dick Ecklund who took the pictures missed your plane. He did get the other Pernic Thorp, but must have thought he was seeing double. I think your plane was just behind his. Right? Rich*



From: Robert Mardis  
<Robert.Mardis@halliburton.com>  
Mr. Snelson

I am fixing to buy a set of Sunderland S-18 plans, and wonder if you could give me a little information. Let me explain my situation.

I was introduced to the Sunderland S-18 last year at Copperstate, and liked it. It was a tough choice, but I chose to build a new design called a Vision, a 2 place side by side compsite aircraft with similar dimensions to the S-18.

Having just barely gotten started on it, I have discovered that I am allergic to the epoxy that is used in the construction. I have sought the advice of many, including folks at Oshkosh this year, and after weighing all of the advice, have decided that the best thing for me to do is stop building this airplane.

Therefore, I am trying to divest myself of construcion manuals, building materials etc., which brings me to my question.

I would like to know what the dimensions (overall width and height) of the firewall is. I have aquired a piece of stainless steel for my Vision firewall, and am trying to determine if it is big enough to become a firewall for the S-18, or whether I should sell it along with the other stuff. I would appreciate any guidance you might be able to give me. Thanks, Robert Mardis

## Electrical Tips

By: Lyle Trusty, N851LT



The high tech electronic equipment in your airplane, in many cases, cost you as much as your engine. The last thing you want to do is inadvertently damage it by turning on the master switch or actuating the starter with your prized electronics, radios, and navigation equipment turned on. One of the first fixes implemented to avoid this problem was the practice of installing a radio master switch, however, with the introduction of all this new, miniature electronic equipment you need more than that. There's a way to overcome this problem. It's cheap and it's good insurance.

Here's what happens when the starter switch is released, or the master switch is turned off. The energizing coil of the solenoid creates a reverse current flow due to the collapsing field of magnetism. This current can have a very high negative voltage, as much as minus 400 volts, that will be opposite the normal polarity of

the system. If your electronic equipment is in the "on" position, this spike can burn out components of your system that are not protected. The diodes "short" this spike out, saving your valuable gear.

### CAUTION

If you don't have diodes in your system you should have all your electronic equipment turned off before you turn the master switch on or off, and while you start the engine. This also goes for electronic instruments and displays that have circuit boards and microprocessors in them.

**Ref. Fig. 1:** You can get 1N5408, or 1N4007 (or equivalent) diodes that are rated at 1,000 Volts and up to 3 Amps, at most any computer electronics store. They look like a resistor with a lead coming out each end. They have a colored band painted around one end. That is the **Cathode** end, which indicates the physical orientation of the diode required for it to perform its function

A diode is essentially an electrical check valve, passing current of a particular polarity

freely in one direction while acting as a high resistance in the other direction. Installing one of these diodes across each your master and starter solenoid will protect your electronics.

**Ref. Fig. 2:** The commonly used Cessna type master solenoid, rated for continuous duty, has three terminals on it, two large and one small. The large terminal marked "BAT" connects to the lead from the positive battery post. The other large terminal connects to the lead that goes to the terminal on the starter relay. The small terminal connects to the master switch. When the master switch is turned on it completes a ground circuit to the relay coil, **Connect the diode between the "BAT" terminal and the small terminal, with the cathode end of the diode connected to the "BAT" terminal.**

**Ref. Fig. 3:** The Starter Relay, rated for intermittent duty only, is wired in a similar fashion if it has three lugs. The large lead from the master relay connects to the "BAT" lead on the starter relay and the other large terminal connects to the starter. The small terminal is connected to the

start switch, which provides a ground to energize the relay. **The diode should be connected between the "BAT" terminal and the small terminal, with the cathode end connected to the "BAT" terminal.**

**Ref. Fig. 4** If you have relays, such as Cutler Hammer's, that have two large and two small terminals, an external lead from the battery terminal to the nearest small terminal will be required. Then, connecting another lead to the other small terminal, and through a switch to ground will enable you to energize the relay.

**In this case, connect the diode between the two small terminals with the cathode end on the "BAT" side.**

The reason you only have three posts on the newer solenoids is that one side of the energizing coil is connected internally to the battery post. When you hit the switch, all you are doing is grounding the other side of the solenoid, causing it to activate. Some builders, with master relays that have four posts, prefer to hook up their solenoids so they are supplying power to the solenoid when they throw the switch. However, this requires that the

circuit be protected with a circuit breaker, and the circuit is not "fail-safe". A short to ground will pop the circuit breaker and open the relay. I prefer the other method, because if you get a short to ground in your switch wire, it doesn't short anything out and get hot. All it does is continue to activate the solenoid. You don't have a circuit breaker in the circuit that can fail, and you won't know the wire is grounding until you go to shut off the master switch. I'll take that any day, compared to sudden loss of all electrical power while airborne.

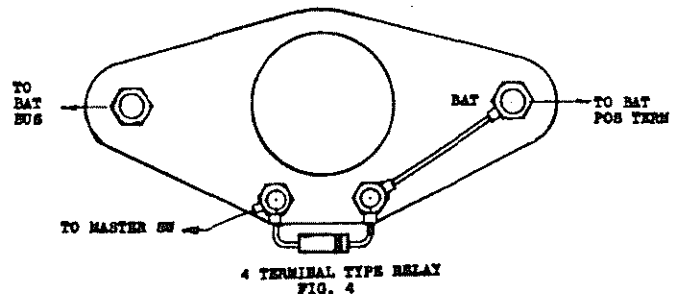
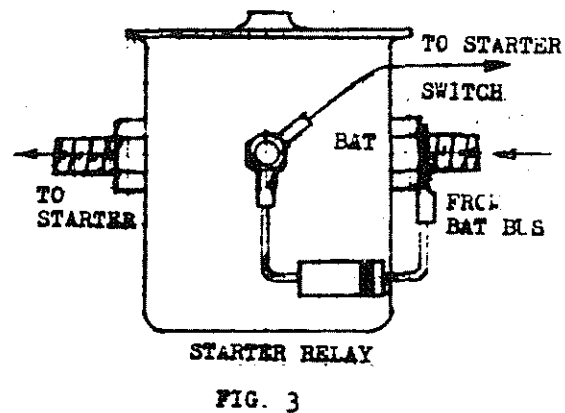
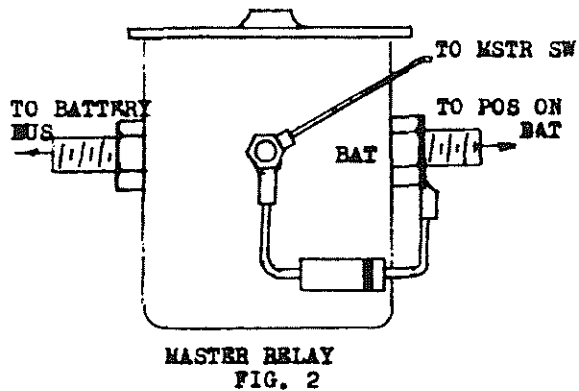
If you hook the diodes up backwards, all that happens is that they will get hot and burn out, almost instantly. Just go buy new ones, put them in the right way, and you won't have any more problems.



IN5408 or IN4007 DIODE

1000 PRV. 1 to 3 Amps

Fig. 1



# SCOTT MASTER CYLINDER PROBLEM

## T-18 MUTUAL AID SOCIETY

I have some information which may be of interest to those of you who have experienced brake lock-up on your birds.

I have read several reports of brake lock-up usually attributed to the guide pins on Cleveland brakes. I believed that to be true until our recent (second) such incident on our T-18. After the first failure I installed long guide pins, swore to keep them clean, etc. all to no avail. The second failure (some 200 hour later) lead to complete disassembly and testing of the Scott master cylinder for the offending wheel. What finally came to light was an intermittent movement of the small nylon (or teflon?) bushing located in the cup at the base of the actuating rod. Apparently that bushing is pressed into the cup but if it loosens enough to slip up on the shaft it blocks the pressure relief hole at the base of the cylinder and prevents return of fluid from the wheel cylinder to master cylinder. When that occurs the brakes remain in a locked configuration until pressure is released by opening the line or moving the pressure plate by disassembling the wheel hardware. The insidious part of this process is that the nylon bushing may return to its proper place in the cup and not cause problem for many more braking cycles. My cure was to put the bushing back in the cup and center punch the edges of the cup enough to (hopefully) retain the troublesome part.

I would be interested in feedback from others who have experience locked brakes, particularly to know if they have installed Scot master cylinders of the same design as mine.

Walt Giffin T-18 N78WG *Thanks for the tip, Walt. Rich Snelson*



*Here she is folks, the 1998 John Thorp Trophy winner at Sun-n-Fun.  
Built and flown by Bill Williams of Lakeland, Florida*

**FOR SALE:** 1984 T-18 650 Hrs on A/C & Engine, 0-320 A2B, Culver Prop. Nav, Strobes, Landing & Panel lights. Cleveland toe brakes & Johnson bar. Scott 2000 T/W. Easy Access APU. FGP, KX155, glide slope, 3 lite M/B, KX 78 Xpdr, \$29,500 Contact Bill Mitchell, 526 Leona Dr. Denver, CO 80221 (303) 427- 4025

Subject: G.P.U.parts and T-18 material  
Date: Sun, 30 Aug 1998 13:06:29 EDT  
From: JKerr56051@aol.com  
To: rsnelson@dave-world.net

Dear Richard:

I have almost three Lycoming G.P.U.'s that are for sale. There is no paperwork on them and no known history. I am putting one together for my third Thorp project. Two cranks are standard, one cam is an approved part number. I have no oil pans. I have plenty of con. rods and pistons. One engine is assembled. I have spar caps. I need a canopy.

Please run in newsletter; \$375.00 for the assembled engine. \$200 ea. for the cranks.\$100 ea. for cylinders. \$25.00ea for con.rods.\$20ea.for pistons. Buyer pay shipping. Thanks; John Kerr 2441 Pence DR, El Cajon, CA 92019

Thanks,J.L.K.

**For Sale:** T-18 project -- fuselage on main gear and Scott tailwheel. Many subassemblies completed. Most parts and materials to finish, including preformed ribs, wing skins, bubble canopy, canopy frame, gas tank, Dynafocal mount, etc. Plans and all T-18 newsletters. Plus some metal-working tools. \$5,000, firm. Eugene, OR. (541) 687-8473.

From: Peter Wegerich  
<wegericp@cadvision.com>

For Sale S18 (kit?)

I have almost all the parts for an S-18. Firewall back. The only parts completed are some control surfaces and 1 wing spar. I am asking \$7,500 US. Complete with windshield and canopy, landing gear, wheels, tires, brakes, fuel tank, control stick assembly (inc. all push rods and offset sticks and rudder pedals and cables, Flap assembly and trim assembly), plans and all issues of the newsletters. I am located in Airdrie Alberta Canada (just outside of Calgary).

Peter Wegerich

403 948-5704 or 403 680-7300

wegericp@cadvision.com

For Sale: Thorp T-18 TTAF 980, TTE 1240  
LYC 0320 E2G 150 HP. 1983 S/N 1268  
IMRON Paint.

165 MPH (143k) @ 2400 rpm. Terra Radio w/ GS & intercom.. Terra Transponder, Fly Buddy Loran Price is \$29K Dick Amsden 810-463-6273

*Editor's Note: Sorry about the medical problem Dick. We will miss seeing you at the Thorp events. (Nice Thorp Folks, jump on this one)*  
Rich Snelson





*Here's Richard Ecklund's N181RE. Note the metal cowling and the metal wheel pants "John Thorp Style" Nice work Dick.*

## OSHKOSH

by Roy Farris

Our forum/lunch get together was on Friday at the nature center as it has been for the last three years or so. Bill Williams had the chef honors and cooked Brats for around seventy-five people. I would like to thank the following persons, who had a hand in the forum/lunch preparation, Bill Williams, Bob and Susan Highley, Ben and Teresa Scola, Margie Conwell, Comelia Aldridge, Lee Skillman, Richard and Roxanne Snelson, and myself. The meal was great, the camaraderie was excellent, and the forum interesting.

Several individuals spoke on brake lock-ups and how they have addressed the problem. (*See Walt Giffin's article in this newsletter*). The Thorp "G" loading was discussed with reference to the over G event that occurred and was shared with us by the owner in the last newsletter

The upcoming fly-in at Placerville and Kentucky Dam were mentioned and plans for next year's Thorp events were discussed. It was voted to

have a **get-together in Colorado**. Walt Giffin will be helping to put this together. The airport would be Fremont County (1V6) which is near Canyon City, Colorado. This could be a Fall Fly-in if the folks don't hold the Placerville Fly-In again next September. We will continue to hold the Kentucky Dam event since we don't want to loose our Fall slot there.

We discussed the task of somehow trying to get a list of all the T-18's worldwide. This is made difficult because many of the T-18s/S-18s in the FAA's list are under different names instead of Thorp.

The topic of a Thorp Oshkosh dinner was raised and the difficulty of finding a suitable location. Rich Snelson and Bob Pernic have been working on this but came across contractual requirement with the restaurant that would require advance paid reservations. The dinner idea would be nice and is still in the back of our minds as something we would like to do. A vote at the forum

showed that the majority of those present liked the forum/lunch combination better than the dinner.

There were several T-18's at Oshkosh this year, but it was hard to tell by looking. The EAA is hampering any attempt to park aircraft by type. Thorps were strung out all over the place with only about fifteen or so in one centralized area. We were not the only group to suffer such parking problems. I think about everyone except the warbirds and the RV's suffered the same wrath. It was decided at the forum that if we wanted to park together as a group next year, someone would have to stake off a parking area and guard it, although no one volunteered to take the job. I think we should consider this plan and decide how to implement it. I know that there was at least one new T-18 there this year, maybe more, but I cannot say who the owners were. Next year we plan to have a sign-in sheet at the forum so we can get a list of those present.

Oshkosh for me is always an exciting time. I love everything there since it is about flying. I must admit though, that I heard a lot of grumbling among the pilots, from the warbirds through the experimental, the antique, classic and all the way to the contemporary. Pilots are not happy with the EAA's new policy of admitting the general public to the flightline. I must admit that I saw many incidents of people sitting and leaning on airplanes, smoking, and one incident of a gentleman moving the prop to make room for his beach umbrella. I saw many lawn chair and umbrella strikes on parked aircraft by people moving through. The EAA eliminated several rows of parking this year and in an attempt to park as many airplanes as before, they spaced them closer together. This made matters worse as far as the movement of people was concerned. I heard rumors of a letter writing campaign to Tom Poberezny to list the concerns of the pilots. I believe this is a sound idea, but I am not sure how far it will go. Let me know what you think.

Oshkosh is still the biggest aviation get-together

in the world despite some rising problems. I think most everyone believes that it has gotten too big and maybe a little too commercial, and some believe that EAA has lost sight of its roots. Maybe it has, but we could help EAA leadership remember their roots by setting a good example. Let's work together to promote the T-18 and try to get one hundred of them there for Oshkosh 1999. We can do it, there are plenty of us out there....

I think many of us would like to see someone else join the great long-time support of Ken & Marie Brock representing the Thorp at the largest aviation event in the country. Rich Snelson tells me he gets constants questions on who/where represents the Thorp. The lack of promotion by the suppliers keeps the Thorp a secret.

One of the topics that was discussed at our forum was how to unite this ragged group of T-18'ers together. We have the best airplane, and the best people, but we lack manufacture/kit supplier leadership and information for those who want it. I would like to see the T-18 movement gain speed, and I believe that with some effort, this could be a reality. If you have any input, I would love to hear from you.

Roy Farris

rfarris@wworld.com

(618)723-2594

**Please join us at the Fall Fly-In at Kentucky Dam. The event is Oct 9, 10, 1998 for reservations call 1-800-325-0146. This is the Kentucky Dam Village Lodge. For details call Roy Farris at the above number. Our thanks to Roy for helping to get this event together.**

T-18/S-18 Thorp Newsletter  
Richard Snelson  
Route 3, Box 295  
Clinton, IL 61727  
Phone: (217) 935-4215  
email: rsnelson@dave-world.net



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25

## THIS YEAR 1998 LATE DUES ONLY

Red Circle means I have not received your dues for this year.  
Please help out and get them to me now. Remit today.

### THORP T-18/S-18 MUTUAL AID SOCIETY 1998 DUES

Please continue your support of this valuable exchange of ideas, building tips and safety information covering John Thorp's great design. Make checks payable to Richard Snelson, Route 3 Box 295, Clinton, IL 61727 \$25.00 US, \$30.00 other.

Name: \_\_\_\_\_  
Address \_\_\_\_\_  
City: \_\_\_\_\_ State \_\_\_\_\_ Zip Code: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Aircraft: \_\_\_\_\_ Hours on Aircraft: \_\_\_\_\_  
Email address: \_\_\_\_\_  
Notes: (Building?, Flying?, Thinking about it?etc.) \_\_\_\_\_

# T-18 NEWSLETTER



*Well, now folks! This is really what it's all about! Isn't it? Mike Thomas (left) Chuck Borden (right)*

## IN THIS ISSUE:

Editor's Trim Tabs: The "1999" Thorp T-18/S-18 Events

Letters to the Editor: Keep them coming folks!

First Flight by *Chuck Borden*

Building The Wing Flaps by *Roy Farris*

Placerville 1998

Colorado 1999 T-18 Fly-In by *Walt Giffin*

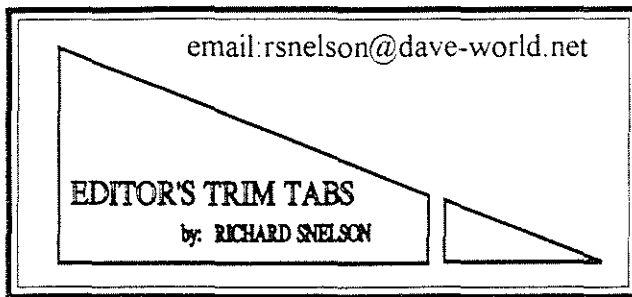
Paso Robes Thorp T-18 Fly-In by *Chuck Borden*

Visit my Webb Page for updates on events:

<http://homepage.dave-world.net/~rsnelson/thorp.html>

email address: [rsnelson@dave-world.net](mailto:rsnelson@dave-world.net)

**NOTICE: (STANDARD DISCLAIMER)** As always , in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.



Boy! Those West Coast guys sure have a lot of nerve! That Tony Ginn guy called here when we were sitting in a cold house with the power off for 10 hrs and the temperature approaching -100 degrees below zero and he tells us about the temperature in Calif. I wanted to shoot the son-of-a-gun. Oh well! he had some good news about Chuck Borden having his second Thorp Fly-In so I'll let him off the hook this time. I understand everyone in his family now have their own T-18. Talk about formation flying. "The Flying Ginn's"

RoxAnne and I had a crazy December. She had major surgery and I spent the next 5 weeks taking care of the horses and animals on the Snelson Ranch. Oh yes, she's doing really fine and no more PMS.. Come to think of it I'm doing fine too. I hope that explains why I didn't get the December issue #108 issue to you in 1998.

### Events for 1999

#### **Feb 20, Paso Robles Municipal Airport: Second Thorp T-18 Fly-In**

*(See flyer on page 19 this letter)*

#### **June 11-13, Fremont County Airport, Canyon City Colorado T-18/S-18**

*(See notice on page 18 this letter)*

#### **July 30, Oshkosh 99, Lunch and forum in the Nature Center at noon on Friday**

Sept ?? Placerville, California (No update on this event, stay tuned)

#### **Oct 8, 9, 10 Kentucky Dam Thorp Fly-In**

We have an update from Classic Sport Aircraft and it sounds like they have been pretty busy this last year. I've been bugging them to send more items and information for the newsletter. You know, Let us know what's going on guys. A lot of people are finding my web homepage and sending email, calling about the Thorp. I forward the messages to Classic and also to Ecklund Engineering for them to respond. Also getting calls to buy T-18s. So keep us informed if you know of someone wanting to sell or buy.

This newsletter is stuffed fun of good stuff so I'll wrap up here and save room for some of your inputs. **I will mention it's "Dues time." So please get them in before the end of Feb.** Still 25 folks that haven't paid for 1998.. I'm sure they know who they are.

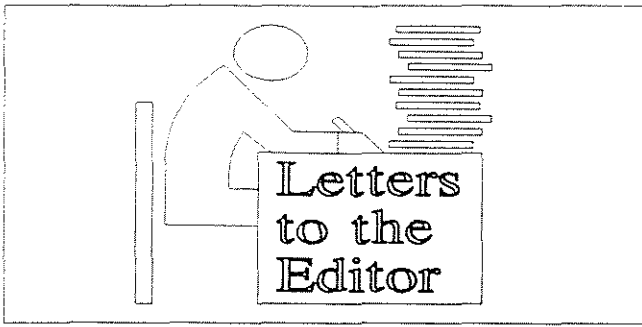
### **SEND 1999 DUES NOW!**

#### **Thorp for Sale!**

Built 1969, refurbished 1995. This is a well-built, beautiful Thorp that weighs 900 lbs empty (1,550 gross) and performs like a fighter on less than 8 gph. Two props: 1) Aymar-Demuth wood (1995) lets you cruise 145 kts at 2,400 rpm and climb at 1,500 fpm. 2) Flotorp metal (1969) climbs at 2,500 fpm and cruises at 120 kts at 2,400 rpm. Throttle back to 110 kts and sip 5 gph.

TT is 1570 hrs, 500 since top overhaul on 150 hp O-320-G-4 Lycoming. Narco 720 Nav/Com, Narco transponder w/ mode C. Intercom. Lightweight Hi-Torque starter, new stainless exhaust system. Temperfoam seat cushions. Nav lights and strobe. VFR instruments. New aluminum panel, vacuum pump, DG and horizon ready for installation.

This plane is a 10 outside, 8.5 inside. The panel and new upholstery will make it a 10/10. It has flown me to Alaska, Florida and many other spots and everywhere I land it draws a crowd. \$25,000 Call John Sullivan, 518-494-3292 or e-mail, [sullivan@netheaven.com](mailto:sullivan@netheaven.com)



Richard:

Hope you don't get a complex. We have not been ignoring you - just busy. This year is coming to an end fast. Will try to detail what has been accomplished. We attended 5 Fly-Ins this year (see Frankie's letter below). We will lay out a schedule for next year and advise. With comments and articles discussing fly-in attendance, I would like to let everyone know we are trying to cover as many as possible. The restrictions are Time and Money. While one person wants us to attend their fly-in, another is wishing we would stay home and cover orders. Guess I'll never win.

Items now available are:

1. Our new spinners \$245
  2. Our new landing gear \$ 875
- The mod we made to the gear was for shipping, cost, and we are able to retrofit to the long gear or repair damaged gear in the field. We have three kits that have been sent out.
3. We are stocking windshields and canopies (light gray tint only).
  4. Current stock levels now cover approximately 80% of the aircraft. On some parts, we have as many as 30 airplanes on the shelf. (Of course, it is never what someone thinks of to order.. so I guess we will always have backorders.
  5. Improved on fiberglass for better fit.
  6. We now have formed leading edge skins on the wings, flaps, vertical, horizontal and landing gear fairings.
  7. Horizontal Spar assembly, with 509 & 510-1 fittings riveted in place.
  8. Fuel tank assembly with new flush mounted cap (no leakage in the cockpit).
  9. STARTED CONSTRUCTION ON OUR OWN S-18....

Items In Work For 1999

1. Tri-gear (many, many, many requests for this).
2. Pre-assembled main spar assemblies.
3. New engine for the Thorp. 180HP all aluminum, V4. Allows use of existing Thorp cowling.
4. Cable actuated trim mechanism.
5. Flush mounted cowl cheeks.

As you can see, we have accomplished a lot and will continue. We have not satisfied everyone on everything, but will continue to improve.

We started 1998 with a kit delivery to Wayne Matthews in New Zealand and will finish with a complete kit to Bob Elliott from Helena, MT.

Mike Archer

#### LETTER FROM FRANKIE ARCHER

Update on Fly-In's that we attended this year.

Sun'nFun - We spent about a million hours driving across the country from California to Florida and it seemed like we were away for a month. I don't think I could have spent one more hour in the car riding. The Staff and Volunteers at Sun 'n Fun do a tremendous job. Everything runs smoothly. In fact, all the Fly-In's seem to be well organized. The weather was a little touchy off and on but the turnout was good. We had about 32 attendees for the Thorp Forum and was happy about that. With weather and our plane having an electrical problem, it had to leave late Friday. Without the plane in our booth we might as well have been invisible. No one was stopping or even looking at our display which is too bad, but we find that at all Fly-In's. We left Saturday and did not stay the last few hours of the Fly-In, so if we missed anyone, we apologize.

In July, we drove to Arlington, WA. to the Northwest EAA Fly-In. We had a Beautiful S-18 in our booth that belongs to Jeff and Amy Taylor of Snohomish, WA. He received a million compliments on his plane, as he should have. We really appreciated having such a beauty in our booth. Thanks Jeff & Amy..

Next was the Placerville Fly-In. Mother Nature wasn't too good there. We did not have the 32 Thorp's that attended last year. There were (3) NEWLY FINISHED planes that attended. The title of The Most Beautiful was owned by Jerry and April Denham of Mt. Shasta, CA. It was painted a beautiful red with lite gray trim. Also Jim Critchfield had his T-18 red beauty and Byron Janzen of Redlands, CA has his newly completed S-18 there. Not painted yet, but soon will be. I am sure he will surprise us. The Janzen's are a Thorp Family. They have 3 completed and another one under construction for their father. The boys are Brad, Bruce and Byron.

Everyone missed Lyle and Ann Trusty. Lyle always presents a good informative program. They are very well liked by everyone and we

hope Lyle is doing well since his surgery and up running around.

In September, we drove to Castle Airport in Atwater, CA (only about 160 miles from where we live). This was the brand new Golden West EAA Fly-In. They had a very good turnout for a first time fly-in with over 600 aircraft registered. Mother Nature was NOT cooperative on Saturday, as it was rainy, cold and windy, but a good time was had by all. We did get a full kit order from there and that made us very happy. Also a possibility of a second one.

Last Fly-In for us was the EAA Copperstate in Arizona, Oct 8 thru 11th. Phil Key had his beautiful red T-18 in our booth. His head gets so Big from all the compliments, that we have a hard time getting his head through the door at the restaurant in the evening. Hopefully, Mike & I will have our S-18 finished soon and we can fly to some of these fly-ins. **BOY DO I LOOK FORWARD TO THAT.** I am really sick of seeing all the RV's and VERY FEW Thorp's and I'll bet you are too.

We would love to hear from some of you who have started an S-18 as no one has any idea of how many have been started and not yet completed. Please let us know if you have finished one or getting close to completion. E-mail us at: [s18thorp@lightspeed.net](mailto:s18thorp@lightspeed.net). We would love to hear from you. If you have a problem, let us know also. We will certainly try to help you in anyway we can, because we want you to get flying and improve the attendance at all the fly-ins. Hope to hear from you soon and thanks to all of you for your support.

Frankie Archer

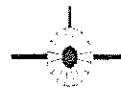
*Editor's Note: Good report Mike and Frankie. Everyone wishes you the very best in making your Thorp S-18 business a success. Rich*



Rich,

This is to let you know that the T-18 I sent you information on (serial # 18) has been sold to Scott Ginn in Colorado Springs, Colorado. His dad, Howard Ginn heard about it from the info I sent to you, or from you, when he was in California. Thanks for all the help in getting this sold. The Ginns are very nice people and it was the perfect situation for old #18. Howard and his wife each have one and another son has one, which you probably already know. I'm looking forward to seeing it fly.

It was sad to see it go, but the realization finally sunk in that I was never going to make the time to finish it in my present situation. Thanks again, Hal Aavang



Hi Richard.

Thought I'd drop you a note and let the readers know of a neat "fix" I found for a bent landing gear. Recently, on landing a local turf strip, I hit a gopher hole while taxiing and bent my gear leg. I searched around for another gear but the cost and shipping was too high. (A one-piece gear has to be shipped by truck, because its too big for UPS.) Then, I called Classic Sport Aircraft and discovered they have recently begun producing a retrofit kit for existing Thorp landing gear. It involves cutting off the gear legs just below the lower firewall crossbar and a section just below the top of the A-frame. You then hammer out the inner tube of the gear that's left, attach a special sleeve to the top fo the A-frame and reinsert the new heat-treated gear legs through the existing landing gear assembly. Each sleeve takes 6 bolts and you need a cobalt bit, slow speed, and alot of pressure of drill through the heat-treated metal.

The assembly took me about 6 hours. I found the gear to be a little softer than my old shorter landing gear but I'm very happy with the results, so far. By the way, this gear kit is easily shipped UPS, too. Greg Halverson.



Hello Rich & RoxAnne,

We are finally on line with our e-mail, the address is [jpaine@ioa.com](mailto:jpaine@ioa.com). We are so happy to see your great web page, and of course, we love the picture of Rich in his Dayton jacket. We read the Ky Dam synopsis, it was great, and 1999 is Oct. 8 and 9. Would you please add our e-mail address at the bottom of all references to this fly-in as Roy Ferris is returning it back to us. Do you have an e-mail for Walt Giffin? It looks like we will try to make the spring fly-in. Thanks again for a great Web Page! Judy & Jim



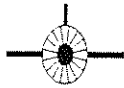
Dear Rich:

As you know, Pat Rokus bought my aux fuel tank just a day after I spoke with you on the phone. I started to build my replacement tank, but found that I had to buy more aluminum than I needed

for just one tank. So I now have 3 tanks in process, one for myself, and two for sale. If it is not too late to get an add in the next newsletter please include the following:

T-18 Auxillary Fuel Tanks (only 2 left)  
Welded aluminum construction.  
Mounts under deck behind seats.  
Useable Fuel: 8.5 GAL +  
\$350.00 Each

Contact John Kleber at 303-840-3648 or  
E:Mail address: 73761.230@compuserve.com  
Thanks Rich for doing a great job with the T18  
Newsletter! Sincerely, John Kleber



Dear Richard,  
Thank you for continuing with the Newsletter. I haven't written for a while so I thought I should bring you up to date on Fat Cat. After the initial problem with a broken weld and Ivo's great customer support (He says he has a new welder, and I have 3 new blades.), the propeller is working great. It is only a few pounds heavier than the wooden Prince it replaced, and it gives me 500 fpm increase in climb rate and 10 mph at the top end. (The old prop would over-rev.) I had to build a second brush holder bracket because my first design was not stiff enough. I'm using a 72 inch diameter 3 blade for my IO-360 Lyc., and it seems to be right. I think Ivo is working on a governor, but I don't find the control to be a burden using the toggle switch. It looks great, and for \$2000 offers a lot of performance.

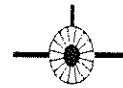
I tried that perforated tape from the article in January Sport Aviation on the prop hoping to get even more performance. It did quiet the prop a little, however I lost performance. Worse, even though I followed the application instructions to the letter, including applying Super Glue to the entire perimeter, the outer 6 inches of tape separated in flight! I pulled the rest off and spent the next 4 hours getting the Super Glue off the prop! The material he uses apparently will not stick to glue. After threatening to write Paul P. I got my money back.

Today I finally figured out how to land at my new mountain airstrip, Alta Sierra, near Grass Valley, CA. It is a one way strip...you land uphill (99% of the time with a tail wind), and take off downhill. I had been approaching at the same airspeed as I would to a level airstrip and would bounce it more than usual. The solution was to

add 5 mph to my approach airspeed to allow more time to flare to the uphill slope. Why didn't I figure that out before? I guess I was reluctant to add speed since it is only a 3000 foot strip, however since you are rolling out uphill you slow down rapidly even without brakes.

I made it to the Placerville Flyin again this year and as usual it was a great success. I do hope that they don't discontinue this event. If they do, maybe we could set up an event at Nevada County Airport. It is near here, and has a better airstrip as well as an EAA Chapter, gas and a restaurant.

Harvey and Stephanie Mickelsen  
harvey@nccn.net



Rich,

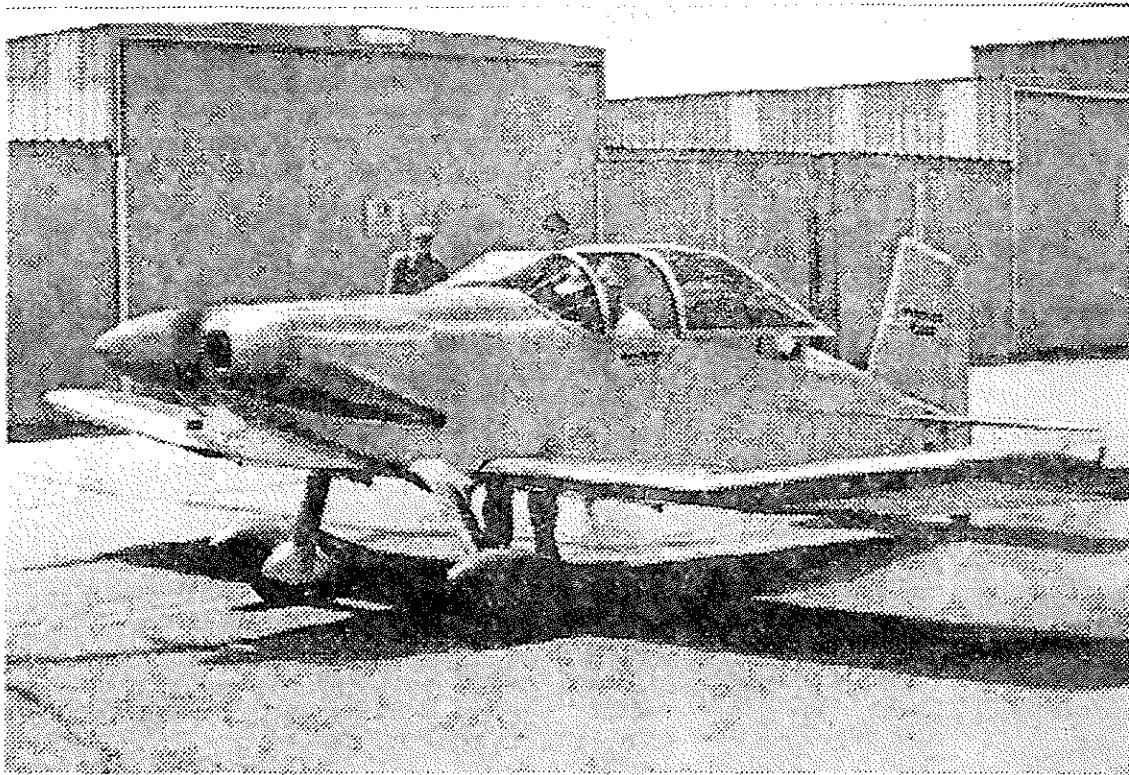
I recently purchased T-18 N2819L from Bob McWhorter here in Longmont CO. I am nearing 20 hours in the aircraft (in the last 2-1/2 weeks) and my instructor turned me loose after about 10 hours). The aircraft was completed in 1984 and has about 650 hours on the airframe and re-built O-320A2B. I built a Starduster II and a Pitts in my younger days, but I enjoy flying the T-18 the best of all. Demanding but very honest design. I have only three problems with the plane;

1. I have VERY chapped lips at the corner of my mouth from the ever present smile...
2. I have run off what few friends I once had by talking constantly about the little bird.
3. The dieting is hell. Very glad I lost 30 lbs this last summer, now I just need to keep them off so I will fit in the 'pit. Looking forward to fly-ins and meeting you all, Tom Melsheimer  
ttm@merlin.com P.O. Box 930 Berthoud CO  
80513 Phone:(970) 227-9487



*Editor's Note: Next issue a email from Bob Pernic while at the South Pole Antarctica.  
Pictures from Kentucky Dam 98  
and much more.. Send it, guys... Rich*





## FIRST FLIGHT

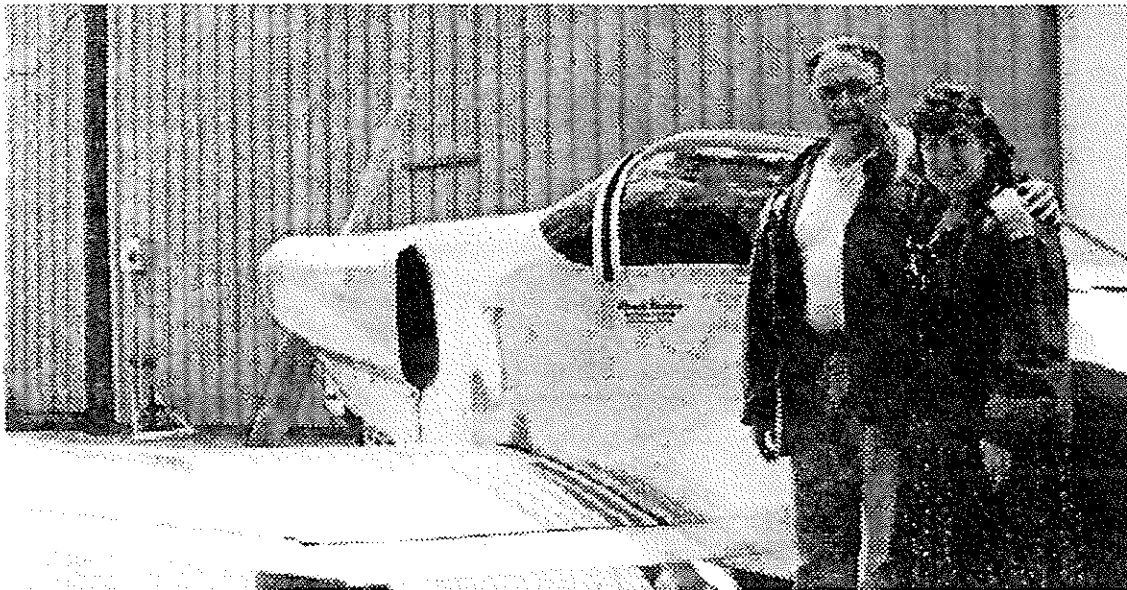
by Chuck Borden

Dear Richard I am writing this letter to inform you and readers of the T-18 Newsletter that my new Thorp T-18, flew for the first time on May 23rd of this year. It is the third T-18 I have built. Since I was not current and had not flown a T-18 in many years I had my good friend Mike Thomas of Pismo Beach Ca. do the honors. Many of you know Mike, he is a former T-18 owner and has won the "Sun 100" race the last two years with his Questar Venture, N77T. The flight went well with no problems except that the airplane is right wing heavy. This seems to be a reoccurring problem that I've had with my other Thorp T-18's. We got most of it out by massaging the trailing edge of the right aileron. But the problem has not completely gone away. I think that if I were to lower the rear spar, on the right wing 1/32 of an inch and ream the hole to .374 and use an AN6 bolt, the problem will be solved. For those that don't know about this problem, it is better to have the left wing heavy when flying solo so you can trim the airplane with the lateral trim. Then when you have a passenger the airplane will fly hands off with the trim backed off. I have been flying T-18s since 1972 when I flew my first one. It is still flying today and is based at Centennial Airport in Denver. Jerry Ferman of

Englewood now owns it. Jerry has owned it since 1977. I had the pleasure of knowing John Thorp and I once gave John a ride in my T-18. Much to my surprise John told everyone at the time, that I had the best flying T-18 he had flown in. I don't think this set well with the guys who were building and flying prize winning T-18s. So let me explain. First of all John Thorp was a purist. He didn't like fiberglass. He didn't like people changing his plans. If you could make it out of aluminum he thought that was what it should be made out of. That is why John had those not so glamorous aluminum wheel pants on his airplane and the all metal cowlings which is a piece of work. I am fortunate enough to have one of John's all metal cowlings on my new T-18. When John took the ride in my T-18, he liked that it was built exactly as he designed. Which was 97% to the prints and flew exactly like he wanted it to fly. It was powered by a GPU that John had built for me for the price of \$1100. Boy, how times have changed. During the years that I knew John we, the local T-18 builders and close friends, would meet on Saturday mornings at Mr. C's Coffee Shop. We were all guilty of asking John real stupid questions, to which John would give real intelligent answers. Once someone asked if a T-

18 could fly put together with clecos. That question John did not answer but instead gave that John Thorp look. The only thing I don't like about the T-18 is, it's too narrow for two people. It needs to be about 3 inches wider in the cockpit area, especially since I'm not that 155-pound young man I use to be. I build standard T-18s. I don't know what you guys are building, but I'm sure they do not fly like a standard T-18. Once a man told me his wide body folding wing T-18 weighed 1200 pounds empty and stalled at 80 mph. That airplane can not be any fun to fly. I would not even get in it. Now, about my third T-18, my new standard T-18 has a 0320 in it and stalls at 56knts. I fly over the fence at 65knts and it makes perfect three point landings. The serial number is 160 and it was an uncompleted project that was started back in the late 1960's by a friend named George Momberg, a Lockheed aerospace worker. It was never completed and nothing had been fitted together. The Project was sold to Joe Pengilley and later sold to an old friend that we all knew, Bill Warwick. After the unfortunate death of Bill I met up with Millie Warwick, who I hadn't seen for years, at a memorial that the locals at Torrance Airport were giving for Bill. After spending the day with friends I hadn't seen in years, I had a conversation with Millie. She said, "Chuck how would you like to have another T-18?" I was dumbfounded and without thinking bought it sight unseen. It took my wife, Linda, and I two months to get out to the Arizona desert to see the project, and another two and a

half years of constant work to complete what was going to be a six-month project. But I am pleased. In closing I would like to say that after reading this newsletter for the last two years I can see that nothing has changed. Everyone is still trying to change things that do not need to be changed and trying to second-guess John's design. As an example I once read in this newsletter that "everyone should be aware that countersinking the web on the main spar is dangerous and this should be dimpled." Please, there has never been a structural failure of the main spar on a T-18. Don't reinvent the wheel. Where does this stuff come from? I would like to say hello to all the great people I have met over the last 31 years involved with the T-18. A special thanks to George and Barbara Leader who gave me help and encouragement, Mike Thomas who has been trading favors with me for years, Tony Ginn who took the time to give me a good refresher course, Tom Hunter who helped me bring the project to Paso Robles, Joe Pengilley who always greets me with a smile and last of all Millie Warwick who sold me the project and a special remembrance for Bill Warwick who always offered his assistance and once let me fly his famous Tiger Plane. We are planning a Bar-B-Q at our hanger in Paso Robles, CA. on February 20th 1999. RSVP Phone #805-438-5478 You can e-mail me at cbbitt18@concentric.net or snail mail me at, 9031 Tassajara Creek Rd. Santa Margarita, CA. 93453 Check out our web page [www.concentric.net/~cbbitt18](http://www.concentric.net/~cbbitt18)



*Chuck & Linda Borden*

*Editor's Note: Chuck sells some aircraft tools that we could use in building Thorp's or other metal homebuilts. A Fan Rivet Spacer for laying out hole spacing, 20 holes-\$30, 10 holes-\$25 He also makes a set of five different thickness joggle forks for the corners of bulkheads. \$4.99 per set. Borden Industrial Tooling, 9031 Tassajara Creek Rd. Santa Margarita, Ca 93453*

# Building the Wing Flaps

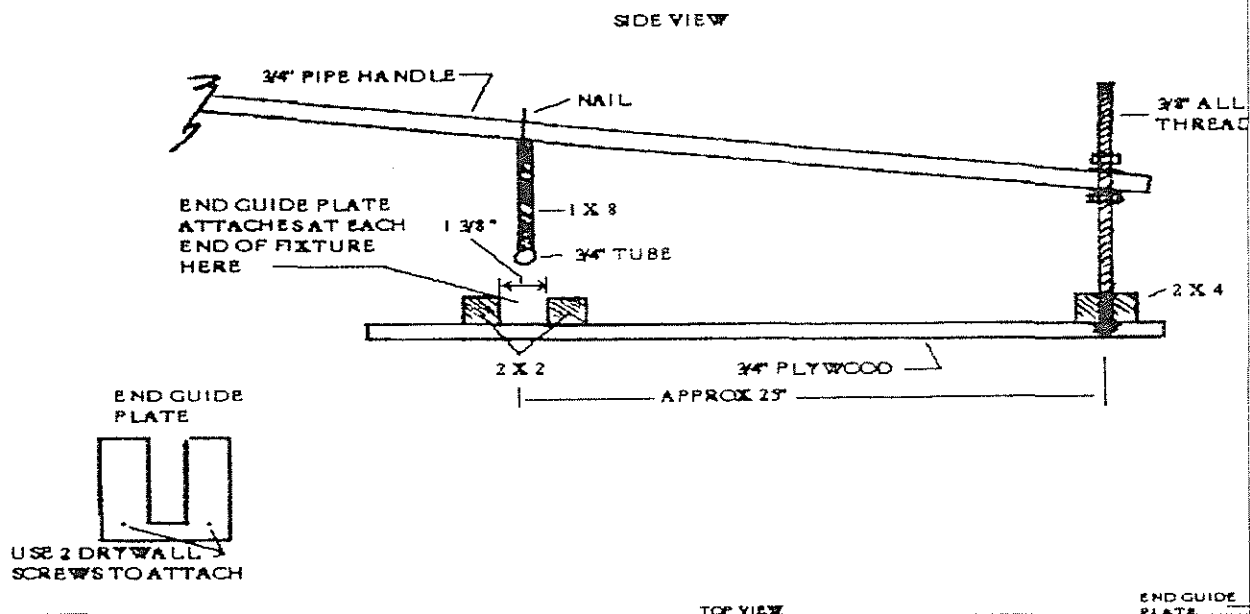
by Roy Farris

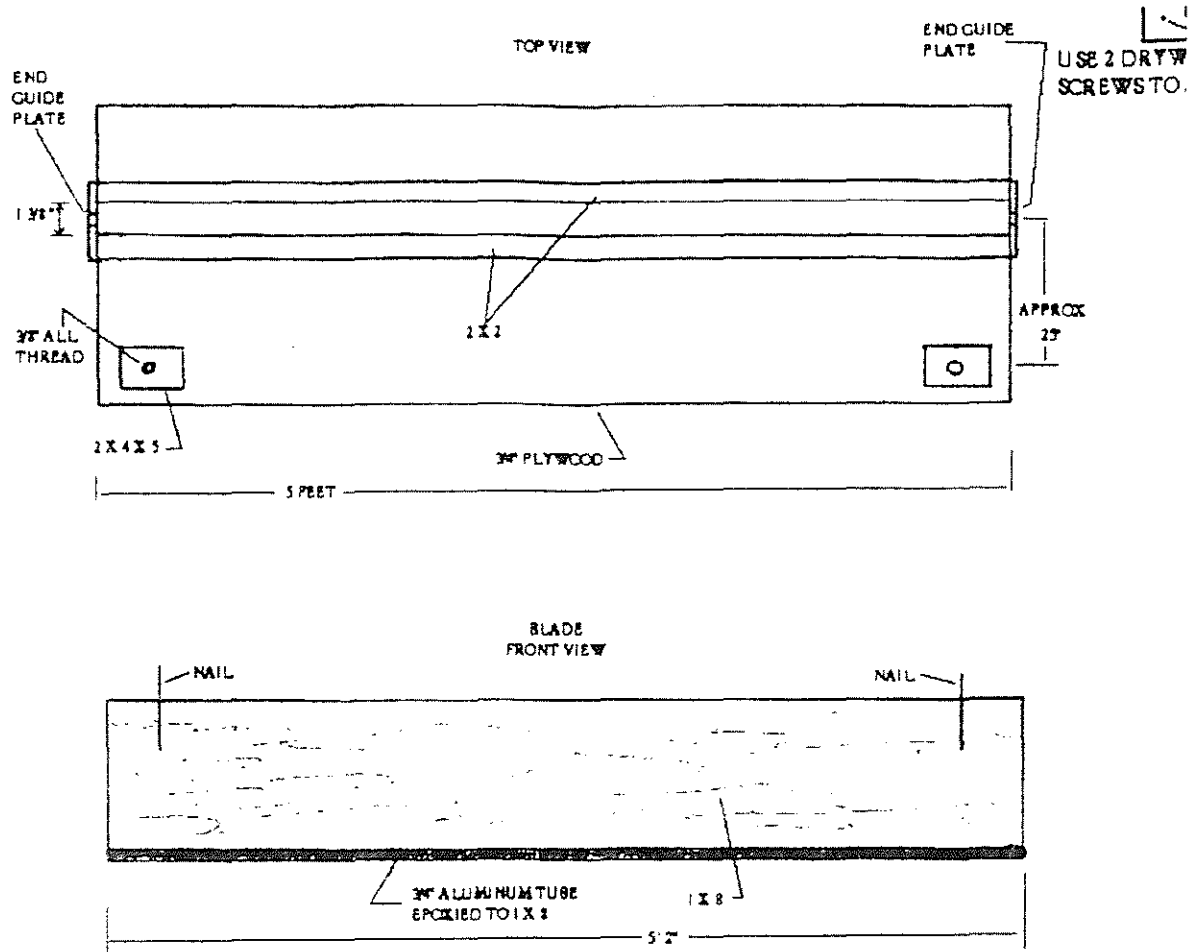
When it came time to build the flaps for my T-18 project, I approached it the same way that I had every other assembly. I dug out all the newsletters and went to the index, found all the articles on flaps, and proceeded to read them all. What I found was that there were no construction articles at all in the entire stack of one hundred or so newsletters. I found this hard to believe since every other assembly problem on the T-18 is covered somewhere in those newsletters. I began calling some builders to gain their input on flap construction. I didn't get much help, almost every builder that I spoke to said something like "you don't want to make them like I did... mine are warped". It seemed that most everyone had problems building those darn things. The couple of builders that had good looking flaps on their airplane just could not tell me a good way to do it. I even spoke to the legendary Jim Younkin at the Antique Fly-In in Bartlesville, Ok. Jim can bend anything for an airplane out of sheet metal. He said "well I just don't know how to tell you to bend that flap skin... but if I had it in my shop I'm sure it wouldn't be a problem." Well that was great but it didn't help me any. So I took all the input I had from Jim and all the T-18 builders and set down to figure out a good way to build the flaps. It took me six months of experimenting, but I figured it out. The problem has always been the .44 radius bend on the lower leading edge. Most builders have simply folded the skin over in polliwog fashion, and pressed it

together with a two by six as they had done for the wing, stab, and fin skins. I found that by doing it this way I could not get a perfectly straight bend and it was difficult to get the correct radius. That aluminum is really tough to bend that sharply. The following is what I came up with to do the job. All the dimensions on the accompanying drawings are for the T-18 flap skins. This method would work equally as well on the S-18 flaps, but the fixtures would not need to be as wide, being that the S-18 flaps are shorter. You will however need to bend four skins.

## The bending fixture

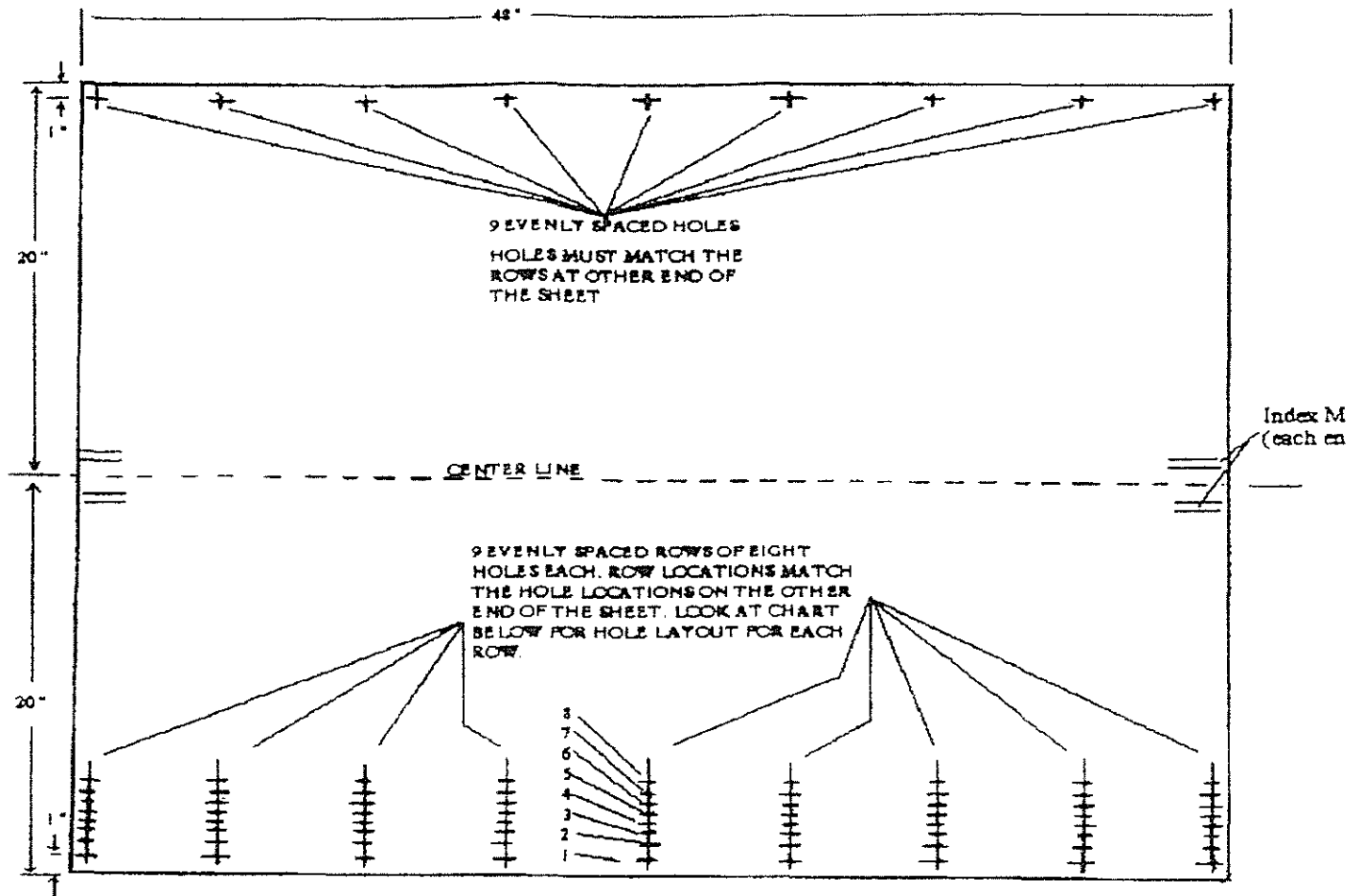
Basically what I call the bending fixture is nothing more than a press brake, or nose brake as I have heard it called. I started out with a piece of 3/4" plywood 5' long by 36" wide. Then I cut 2 pieces of 2 x 4 about 5" long. I glued them on the plywood at the back edge and about 1.5" from each end. I also ran 4 drywall screws up through the plywood from the bottom and into the 2 x 4's. Drill a 3/8" hole through the 2 x 4's somewhere about their center and go completely through the plywood. I then counter bore from the bottom through the plywood with about a 1" diameter wood bit. (NOTE: counter bore only through the plywood). Insert a 14" length of 3/8" all thread through these holes and secure with flat washers and nuts to hold them securely to the 2 x 4's.





The counter bore on the bottom will allow the nut and washer to recess and allow the plywood to set flat. Next you will need 2 nice and straight pieces of 2 x 2 that are 5' long. It is important that at least one side of these 2 x 2's be perfectly straight. I ran mine through a good table saw and trued them up. Draw a line across the top side of the 3/4" plywood 25" from the center of the two 3/8" all thread rods. This will be the "center of bend line". You want to position the 2 x 2's parallel to this line. You want them spaced 1 3/8" apart and centered on this line. I used drywall screws to attach the 2 x 2's to the plywood. Note: Because of the stiffness of the aluminum I found that I could not apply enough pressure to bend the skin with the 2 x 2's set at the 1 3/8" setting as described above. I first bent the skin with the 2 x 2's set at 2 1/2" and then moved them to 1 3/8" and repeated the process. This worked out really nice, but you do have to move the 2 x 2's. That's why I used drywall screws to attach them, it made it a cinch to move them around. You then need to make 2 End Guide Plates. I made the end guide plates from 3/4" plywood. Basically they need to be about 8" wide and 4" or so tall. Cut a 3/4" slot in it's center leaving 3/4" across the bottom to hold it together. The end guide plates then screw onto each end of the bending fixture using drywall screws, with the center of the 3/4" slot lined up with the "center of bend line". The Bending Blade

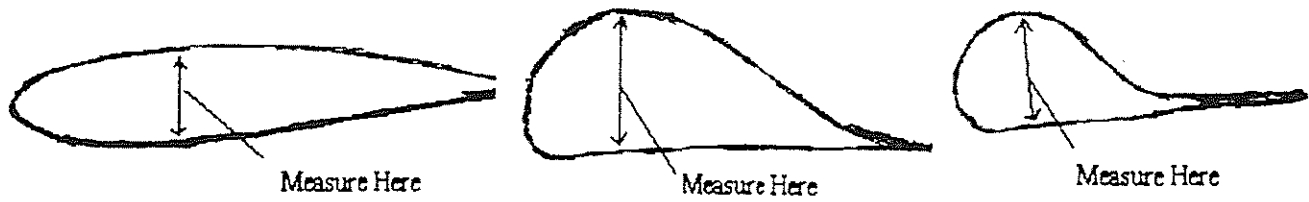
is now fashioned... I used a 5' length of 3/4" diameter aluminum tubing. I epoxied the tube to one side of a straight 5' long 1 x 8. Again I ran the 1 x 8 through a table saw and trued up the edge. Make sure you keep the bending blade straight while the epoxy is curing. After the epoxy is cured, apply Duct tape to the tube to keep it from scratching the flap skin. Now make 2 Handles. Make the handles out of 3/4" black pipe, or something of equal strength. You will be amazed at how much force is required to make the initial bend. They will need to be 5' or so long. I think mine are 6'. Drill a sloppy 3/8"+ hole near one end of each handle. Place a nut and flat washer on each all thread, then slip the handles on, and then place another flat washer and nut on the top. Place the bending blade into the end guide plates, it should move freely, but not have too much slop. The center of the aluminum tube should run down the "center of bend line". If it doesn't you need to reposition the end guide plates. Raise the bending blade and slip a scrap piece of aluminum sheet across the 2 x 2's and lower the bending blade so it rests on the sheet. Adjust the handles on the all threads until they rest on the top of the bending blade and are parallel to the plywood base. Drill a 1/4 hole through the handles so they hit the center of the top of the bending blade. Push a #8 nail through the handle and tap it into the top of the bending blade. Do not drive the nail all the way down,



HOLE LAYOUT FOR BOTTOM ROWS

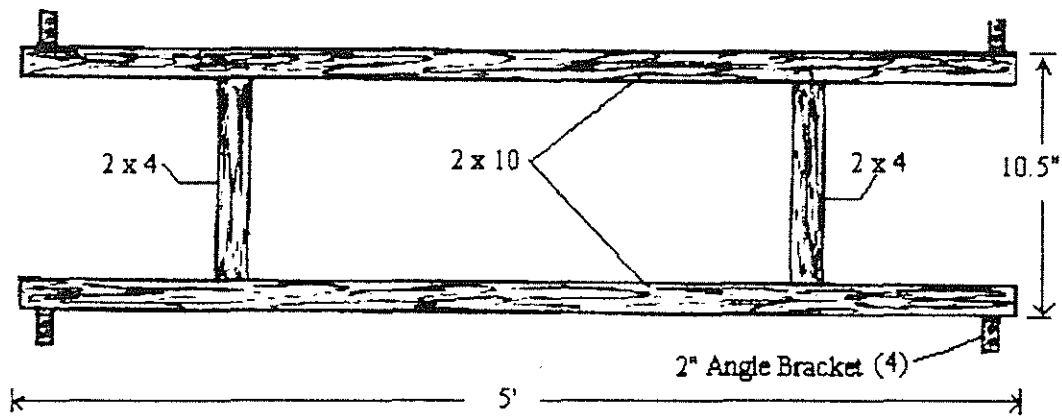
| HOLE# | DISTANCE FROM PREVIOUS HOLE | SQUISH TO: |
|-------|-----------------------------|------------|
| 1     | 1" FROM EDGE OF SHEET       | 3 1/2"     |
| 2     | 9/16"                       | 2 19/32"   |
| 3     | 11/16"                      | 2 9/16"    |
| 4     | 5/8"                        | 2 21/32"   |
| 5     | 1/2"                        | 3"         |
| 6     | 5/8"                        | 3 1/4"     |
| 7     | 1/2"                        | 3 1/2"     |
| 8     | 1/2"                        | 3 5/8"     |

Example #1  
Measurement point for Squish bends

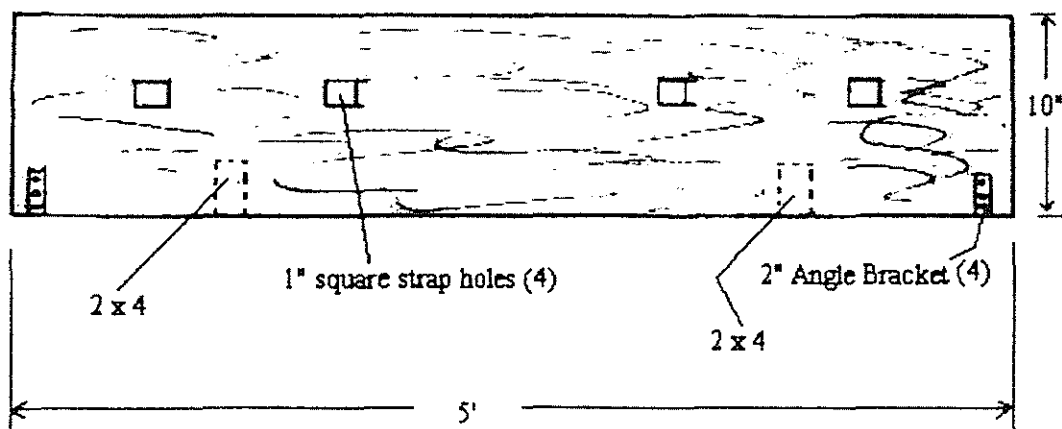


Assembly Jig

Top View



(Rear view is the same)



it needs to be a loose fit. Also be sure that the distance between the handles is wider than the flap skin. You now have a T-18 flap bending fixture.

### Flap Skin Layout

Start with a sheet of .025 2024T3 aluminum 48" wide by 40" long. Use care and make sure the trimmed sheet is square. If it is not square, the flap will likely be warped. Reference the Flap Skin Flat Layout drawing. Mark and draw a full length center line at 20". Mark one half as the bottom and the other half as the top. Start on the top half, measure in 1" from the sheet edge, layout and mark 9 evenly spaced holes. Now go to the bottom half, layout and mark 9 rows from the edge of the sheet towards the center, that are spaced exactly as the holes you laid out on the top half. (see the flap skin flat layout drawing) On each row you lay out on the bottom half, you will measure and mark 8 hole locations. (see the hole layout chart on the drawing) Measure in 1" from the edge of the sheet, on all 9 rows, and mark the first set of holes. These are labeled as hole #1. Using the dimensions given in the chart, measure in 9/16" from the first set of holes and mark this location on all 9 rows, label these as hole #2. Measure in 11/16" from #2, mark, and label this location as hole #3. Measure in 5/8" from hole #3, mark and label as hole #4. Measure in 1/2" from hole #4, mark and label as hole #5. Measure in 5/8" from hole #5, mark and label as hole #6. Measure in 1/2" from hole #6, mark and label as hole #7. And the final set of holes, measure in 1/2" from hole #7, mark and label as hole #8. Now you should have 9 evenly spaced rows of 8 holes marked on the bottom half. These 9 rows should match the 9 holes located on the top half. Later in the bending process you will fold the sheet over polliwog style, as we have done on the wing, etc., so the spacing of the top and bottom holes must match. I hope this didn't confuse anyone .. just look at the drawing .. I think it will explain. Do not layout any rivet hole locations at this time! Recheck all your measurements. When you are sure you got it right, drill all the hole locations to #40. Layout both flap skins ( 4 skins for S-18 ) before you begin the bending process. You are now ready to bend the flap skins .

### Bending The Skin

Step 1. After all this preparation, bending the skins is fairly simple. Start by placing the bending fixture on a flat work area. I placed mine on top of my 4' x 8' work bench. Fasten the fixture down solidly to your work table, or whatever you are using. I used several drywall screws and secured it to my wood work bench top, just make sure it is solid. As I said earlier, I made the first bend with the bending fixture 2 x 2's spaced 2 1/2" apart. I would recommend this, but you can try it at the final 1 3/8" spacing if you ate

your Wheaties. Ok now you have the bending fixture set up and ready .... now take one of your prepared flap skins, measure 11/16" and 3/4" from both sides of the center line and place a mark. These will be your index marks, with the bending blade down on the skin you cannot see the center line. Place the skin on top of the bending fixture 2 x 2's and under the bending blade. Align the index marks on each end of the skin with the insides of the 2 x 2, ( 3/4" index marks for 2 1/2" 2 x 2 spacing and 11/16" for the 1 3/8" 2 x 2 spacing ) this will place the bending blade directly on the skin center line. Check one more time that everything is straight and the index marks are aligned properly. When everything is correct, apply equal downward pressure on both handles until the skin folds and the bending blade bottoms out along the entire length of the bending fixture. This will take a lot of pressure. I Duct taped a piece of 1" pipe across the handles so I could hang on it. I actually had to get my girlfriend Comelia to jump up and down on top of the bending blade while I bounced on the handles. Remove the bent skin from the fixture, set it aside and do the next one the same way. ( do all four if you are building an S-18) If you managed to use the 1 3/8" 2 x 2 spacing then you are finished with the bending fixture. If you used the 2 1/2" spacing you now need to move one of the 2 x 2's to get the final 1 3/8" spacing. You will also need to reposition the end guide plates. Place the previously bent skins back in the fixture and repeat the process. When you remove them from the bending fixture this time they should have a nice tight radius, be perfectly straight, and have a bend angle of somewhere around 110 degrees.

Step 2. You have made the tough bend on the leading edge. Now we must form the larger radius sweeping bend over the top part of the leading edge. We will revert back to John Thorp's polliwog method to accomplish this task. Set the bent skin on your work bench with the bottom down. Pull the top half of the skin down on top of the bottom half and place cleco's in the 9 holes on the top and into the nine #1 holes on the bottom half. Place the folded skin on the floor on a large clean sheet of paper, or whatever you use to keep from scratching the skin. Using a 2 x 6 about 5' long, also wrapped in paper, starting from the back edge (cleco'ed edge), move the 2 x 6 toward the leading edge applying downward pressure. I call this Squishing. Be sure to keep the material behind the 2 x 6 flat. (the top half should be flat against the bottom half) Be careful here and do not apply too much pressure and overbend the skin. This part of the bending process doesn't require nearly as much pressure as Part 1. Apply some pressure, then remove the 2 x 6 and check to see what is happening. With the folded skin still on the floor and the 2 x 6 removed, measure the polliwog at its widest point. (example #1) Refer to the chart on the Flap Skin Flat Layout for the Squish To measurement. For the Hole #1 position the measurement is 3 1/2 ". So measure the polliwog

at this time, on both ends. You want it to be 3 1/2". By checking both sides you will keep the bend even across the skin. Repeat the "squish" until you get the 3 1/2" measurement on both ends. By angling the 2 x 6 you can work one end more than the other to keep things even. I found that plus or minus about 1/16" is sufficient. I used one of the flap ribs to check the radius after each squish, that way you can refine the process as you need to. Remove the cleco's and let the skin relax, then place the flap rib into the radius to check it. When you get 3 1/2", move the top half of the skin forward and install the cleco's into bottom hole #2. Refer to the chart to find the squish to measurement. We want 2 19/32" for the #2 hole position. Place the 2 x 2 along the back edge and again work it forward applying downward pressure. Keep the skin pressed flat behind the 2 x 6. Apply a little pressure, then remove the 2 x 6 and check the measurement for 2 19/32". Repeat the process at position #2 until you have the correct measurement. Now move the top half forward and install cleco's into hole #3 on the bottom half. Refer to the chart for the correct squish measurement and then squish the skin until you get it. Keep repeating this process for bottom hole #'s 4, 5, 6, 7 and 8. After making the squish bend at bottom hole location #8, use one of the flap ribs to check the progress on the leading edge bend. I found that the area close to the original tight bend became slightly deformed when making the last couple of squish bends. I needed to move the top half back to the bottom half hole location's 3, 4, and 5 and slightly resquish. This worked out really well. On these last three or so tweaking squish bends be careful not to over do it. Just use the flap rib as a guide and do what is necessary, it won't take much. My skins formed perfectly around the flap ribs with no pressure at all. Now do the remaining skin or skins.

### Flap Assembly

Start out by roughly trimming some of the excess material from the trailing edge of the skins. Don't do the final trim yet, just get it to within an inch or so. You now need to build the Assembly Jig. Refer to the Assembly Jig drawing. Take a couple of 2 x 10's about 5' long. Run both edges on a table saw to get them straight, and both 2 x 10's exactly the same height. Cut 4 square holes in each 2 x 10 as shown on the drawing. Set one edge of each 2 x 10 on your workbench so that they are parallel with each other and measure 10 1/2" between the outside edges. Cut 2 pieces of 2 x 4, 7 1/2" long, and fasten them between the 2x 10's as shown on the drawing. Using 4, 2" angle brackets, fasten the jig solidly to your workbench. Again I used drywall screws for this purpose. Use a level and make sure the tops of the 2 x 10's are level and parallel with each other. Use shims where needed to get them level. Double check that the outside measurement at each end remains at 10 1/2".

Layout the rivet holes on the flap ribs and the flap spar on both top and bottom. Make sure that they are correct, then go ahead and drill all the holes with a #40 drill. Assemble the inboard and outboard ribs to the spar with cleco's. Wrap the skin around the spar/rib assembly and place it on the assembly jig with the bottom side down. Start on one end rib, measure from the edge of the skin to the rib flange. Refer to the flap drawings here, but set the rib into the skin the amount needed, plus a little extra, you will trim it off later. Double check your measurements and be sure the rib is square with the sheet edge. Clamp the rib into this position with c-clamps or whatever you use. Now go to the opposite end and repeat this procedure. When finished you should have both end ribs positioned where you want them and they should be square. Using a reverse strap type hole locator, locate the rivet hole location from the ribs onto the top and bottom of the skin. Keep a slight downward pressure across the entire flap assembly to insure the flap remains flat against the jig. I used a 1 x 3 board laid across the flap to help. There may be a few holes that you cannot locate because the jig is in the way. Don't worry, you can locate them later. Center punch the hole locations and drill them to #40, and insert cleco's. Take the assembly off the jig, locate and drill the remaining holes that you couldn't get to. Remove the skin from the spar/rib assembly. Use a couple of small wood blocks cut squarely, and clamp at the spar/rib joints to hold the ribs square to the spar. Make a strip template of the top and bottom spar rivet hole locations. I used a 4" wide strip, as I found out that a narrow one would bow a little and cause inaccurate hole transfer. Cleco it to the spar, then on each end of the spar, pick up 2 or 3 rivet holes in the rib, they will be used to index the template when the skin is placed back on the spar/rib assembly. Mark which ribs holes you use. Once you have both templates made, replace the skin on the assembly, and place it back on the assembly jig with the bottom side down. Place the top strip template on the top skin and cleco it down on each end, using the previously marked rib holes. Make sure you hold the assembly down flat on the jig, and mark the spar hole locations across the skin. Remove the skin and drill the holes to #40. Replace the skin again on the spar/rib assembly and insert cleco's in some of the top spar and end rib holes. Place the skin back on the assembly jig, this time with the top side down. Cleco the bottom strip template to the bottom side of the skin, again using the previously marked end rib holes. Hold the assembly flat on the jig and mark all the bottom spar hole locations. Remove the skin and drill them to #40. Replace the skin on the spar/rib assembly, and place it on the assembly jig with the bottom side down. Use a board or something to keep the flap flat, then locate, mark and drill the rivet holes across the trailing edge to #40. Remember that at this time the skin is still oversize, I measured from the spar rivet line to get the



trailing edge rivet line. Once you have drilled the trailing edge rivet holes you can final trim the trailing edge. Remove the skin again. This time install the short nose rib on the spar, using one of the square wood blocks to hold it square. Make a strip template of the rib using a piece of .032 material. Wrap it from the top spar all the way around to the bottom. Leave it in place and then make another one over the top of it. The first one sets the skin thickness, this makes the second one more accurate. Throw the first one aside and use the second one. Pick up 3 spar rivet holes on both the top and bottom and mark the ones you use. remove the short nose rib and reassemble the skin to the spar/rib assembly. Place the nose rib template on the skin and insert cleco's into the previously marked spar holes on both top and bottom. Mark and drill the holes to #40. Disassemble the entire flap assembly. Refer to the flap drawings as needed, and assemble the flap hinge, and torque tube parts to the end, and short nose ribs. Once the hinge parts are installed on the ribs, make templates that will fit over the hinges and set on the rib flange. You need to make one for each end of each flap. With the template in place over the hinge, locate and drill 3 holes that correspond with 3 in the rib flange. Now place the correct template on the bottom of the flap skin and insert cleco's in the corresponding rivet holes. Make sure you use the correct holes. Double check, then mark the hinge cutout through the template, remove the template and cut the slot. Once all the slots are cut, you need to reassemble the flap assembly, and place it back on the assembly jig, bottom side down. Install the torque tube, it should slide right in, if not find out why and remedy the problem at this point. Now, take 4, 1" wide nylon ratchet straps, insert them through the 4 square holes in the assembly jig, up and over the top of the flap. Using the ratchet, snug each strap. The hinges will hit the assembly jig on the bottom and hold it square. I also c-clamped a small wood block at each end on the bottom up against the rear of the assemble jig. This keeps the flap from sliding rearward. The flap is now held flat against the jig, Remove all of the cleco's on both the top and bottom of the flap. This will allow the assembly to relax and will show any hole mismatch. If a hole shows much mismatch use a round jewelers file and file the holes to a better match. Begin drilling the holes to 1/8" and inserting cleco's as you go. Continue this process until all the top holes are drilled to 1/8". Remove the straps, and turn the flap over on the jig so the top side is down. You will need to remove a few cleco's to do this. Insert a few #40 cleco's in the bottom, reinstall the straps and wood blocks as needed. Remove all the cleco's on the bottom and repeat the hole drilling process until all the holes are drilled to 1/8" and cleco's inserted.

Deburr all of the holes and dimple. The flap is now ready to rivet together by whatever means you choose to use. You can use solid rivets or the pop variety. I built my flaps with a folded type trailing

edge, which made bucking the solid rivet nearly impossible, so I chose to use Cherry Max pop rivets. I strapped the flap assembly back on the assembly jig and used a pneumatic rivet puller. With the flap strapped flat on the jig, there was no way I could induce a twist in it while I riveted. The Cherry Max rivet is close to a solid flush driven rivet in appearance, and I wanted a straight flap. If you build the standard flap, you would probably want to use AN470AD rivets on the trailing edge, but you could pop rivet the rest of it. Once you have completed the riveting you need to trim the flap ends to the correct length. Your Finished !! I am really pleased with the way my flaps turned out.

I hope this article helps someone out there build a set of T-18 flaps. The article got quite lengthy, and I hope I didn't loose anyone. I will be more that happy to answer any questions, please feel free to give me a call at (618)723-2594.

Roy Farris

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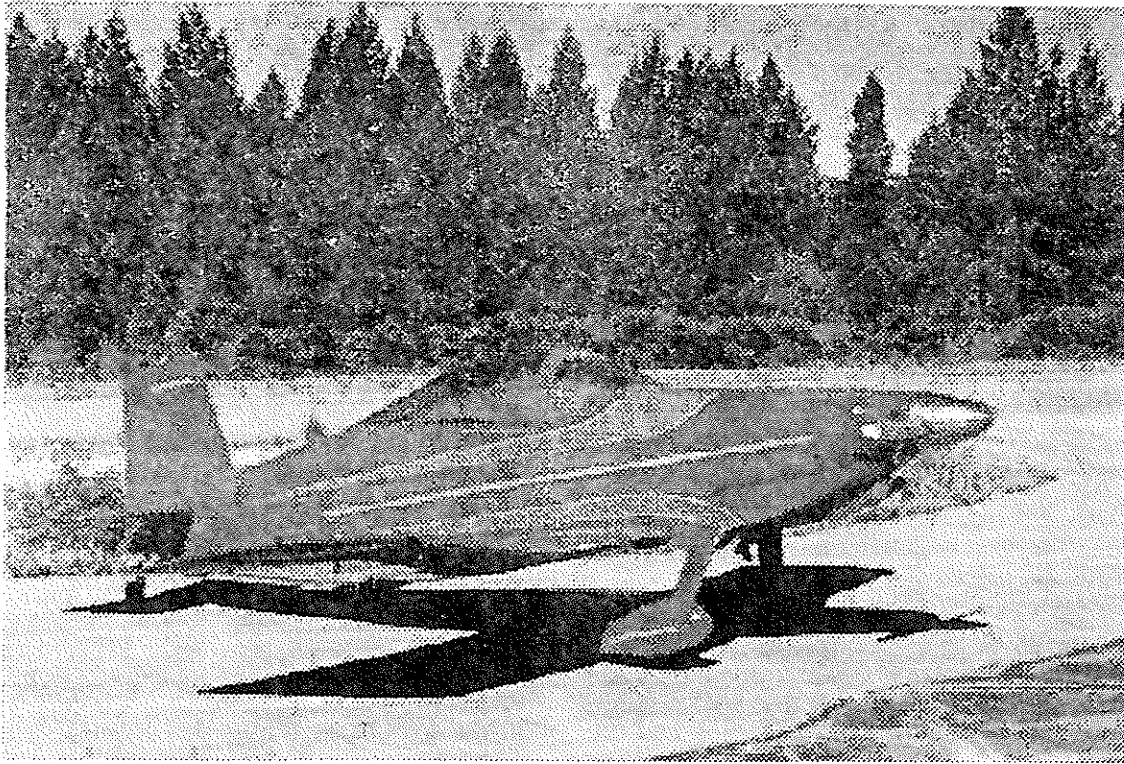
## FOR SALE ITEMS:

For Sale S-18 Project, structually complete, with all controls and fiberglass parts to finish, canopy mounted, fuel tank, aux tank, engine mount, Cleavelands. All Ken Knowles componets. \$9500 firm Matt Null 734-975-2317 before 9pm EDST

For Sale. Wright Brother's Award Winner T-18, 150 hp with IFR equipment. Pat Rokus 541-672-8575

For Sale Thorp T-18 Standard Body, Folding wing. Extra fuel in wing tanks. 0-360 engine 180hp. 164 hours since overhaul. O'berg oil filter, John Thorp design airbox, Prop Hendrickson Wood 68/80 Static and Dynamic Balanced. Cleveland wheels and Chrome brake rotors.

Stall strips, Whelen double flash strobe, 170 RST Comm. Garmin 55 GPS with mounting bracket. Antenna connection for handheld. Mode C. Transponder, ELT Price \$24,950 Frank Snedeker 425-392-0124 or email [snedeker@nwlinc.com](mailto:snedeker@nwlinc.com)



*Jerry Denham's red and gray trimmed in gold T-18! Voted "prettiest" Thorp at Placerville*

## **PLACERVILLE 1998**

Thorps Galore!!!!

From the hot 107 degree days to cool ones, the temperature dropped as did the number of Thorps. Weather closed out the opportunity for 10-20 Thorp designed planes from attending the 7th Placerville Thorp Fly-in even though 24 enjoyed the nice weather we had at the Fly-in. At the previous fly-ins we have had as many as 34 planes.

A hurricane in Baja California sent warm moist air Northern up the Sierra mountain range allowing for evening showers that came first as the raffle for prizes ended and the last bit of dessert was eaten. Southern California was much more severely impacted as well as the coastal range when fog set in there.

Many of the previously attending pilots and passengers enjoyed the camaraderie that has developed within the group. People have become great friends and Thorp planes have become better examples of the design due to the

sharing of information that has taken place over the years.

Jerry Denham and wife April of Mt. Shasta own N118DT which was voted as the "prettiest" Thorp by the ladies of the Fly-in. A carefully detailed new Thorp (less than 50 hours total time) with a bright red base color and gold trim that caught the artistic eye and drew the most votes. Placerville was the first fly-in for the plane and its owners were ecstatic to have been chosen the winners.

Joe Pengilley, after having been coached by Gus Gordon won the 1st prize for the Champagne Cork Flying Contest with the longest shot over 15 other contestants. A #1 pilot coffee mug will keep the memory of his achievement alive.

Jim Critchfield was master chef with the beef tri-tip. Those who preferred steak burned their own to their personal pleasure.

Harvey Mickelsen won the grand prize raffle drawing by presenting the matching ticket pulled from the can for the Critchfield Thorp T-18 clock which all participants wanted badly.

Planes for sale this year included Art Trask's continental powered T-18, Jim Critchfield's newly flown T-18, David Hamilton's O-290 powered older T-18, John Hendericken's project as well as Chuck Patton's ground looped T-18's remaining parts. Several people, who attended, expressed interest in becoming Thorp owners. ClassicSport Aircraft and Ekland Engineering discussed progress they have made this toward the support of the Thorp design. Even a tri-gear version is in the offering.

The Thorp T-18 Mutual Aid Society surprised the Placerville organizers with a check to cover the costs of using the Chapter 512 facility and the portable toilet required by the airport. With that, due to the lesser attendance than expanded the budget balanced.

John Evens and Dean Cochran of Denver Colorado announced a Thorp gathering in Colorado next summer, either in June or September - date to be firmed up later. The location may be in the Pueblo, Colorado area.

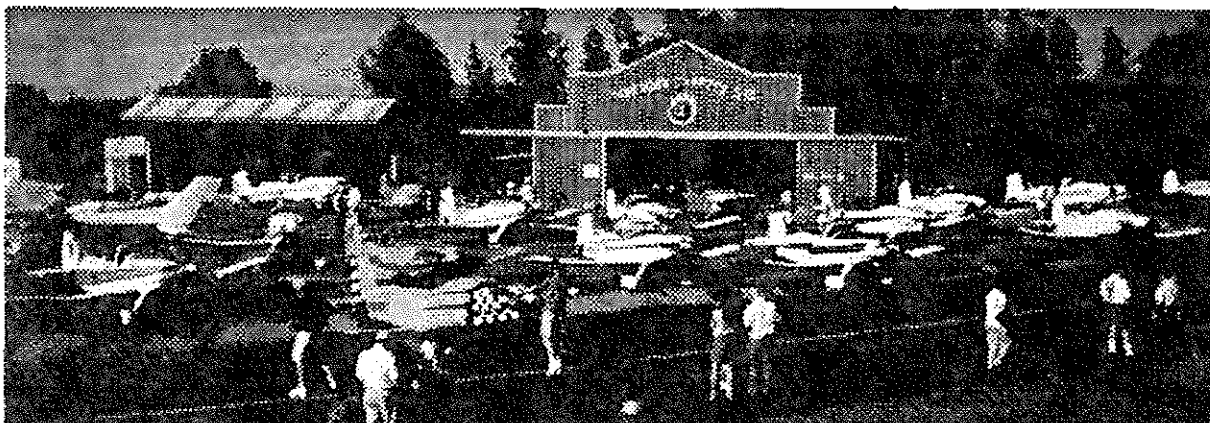
A sad note is that Lyle Trusty, of Lancaster, was unable to attend the fly-in due to a medical procedure done in late August. Lyle has con-

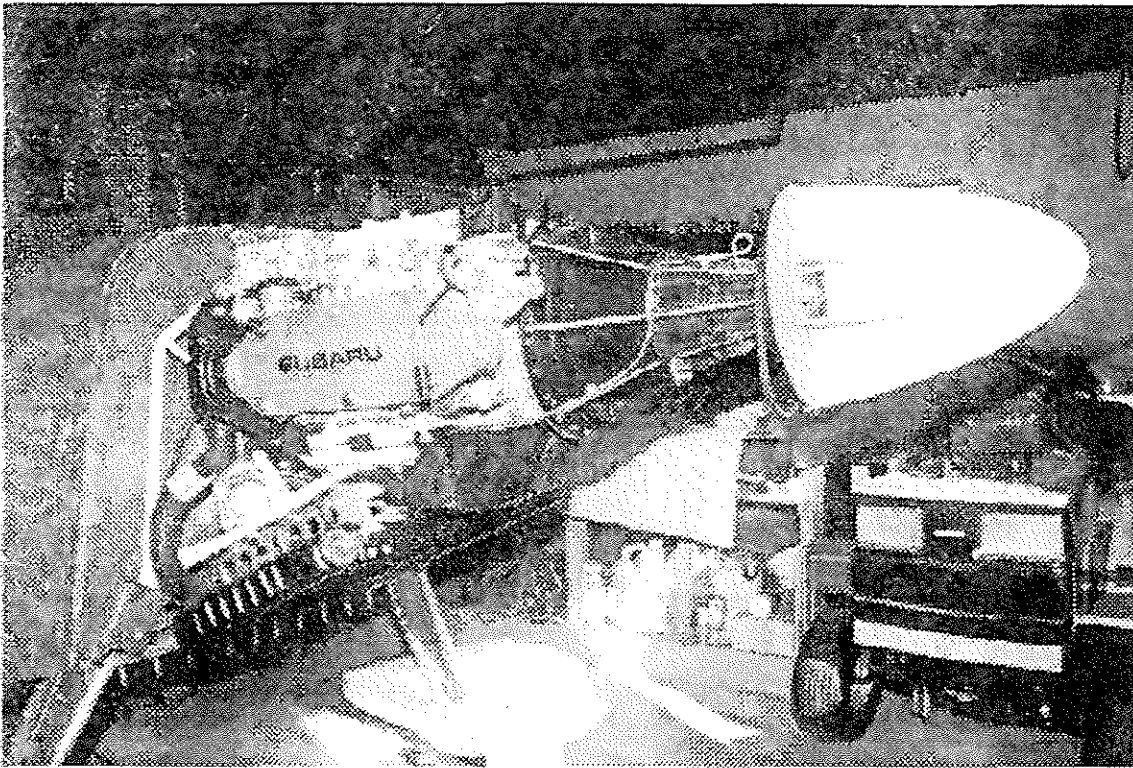
vened the Thorp Forum for the past several years and built up a strong following of Thorp owners, Anne, Lyle's wife, has helped with the food preparation. We missed them both. Hopefully he is doing well with the changes and soon regain his airman's medical certificate.

Mac and Rena Booth - now both pilots- own a beverage business and as in the past years donated cases upon cases of soft drinks and snack foods. It was appreciated by all as only a few diet sodas remained in the ice chest when the last of the Thorps flew out.

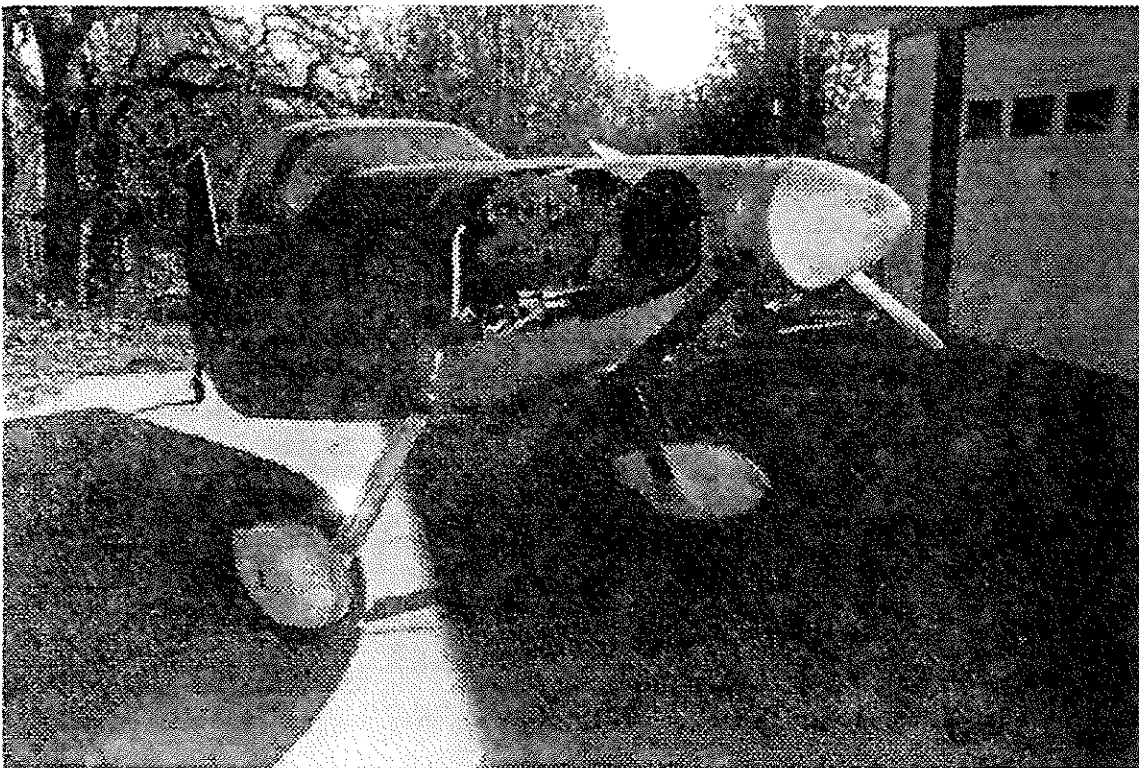
Some of the attendees were Brad and Sonya Chapman, David Hamilton, Dean Cochran, Jerry and April Denham, Norm Hibbard, Bill Cordoza, Frankie and Mike Archer, Phylis Ward, Phillip Key, David Neustel, John and Vicki Evens, Les and Merry Bunker, Harvey Mickelsen, Amos Ranck, Art Trask, Steve Dillard, Steve and Holly Irving, Tony and Starr Ginn, Gus Gordon, Chuck George, Joe Jr. and Sr. Pengilley, Larry, Roselynn, and Gina Cresse, Brian Haynes, Jack Haynes, Carl and Sue Daughters, Bob Taylor, Steve Taylor, John Mallon and Larry Mitchell, Mac and Rena Booth, Jim and Lil Critchfield and Hal and Nancy Stephens.

P. S. Hal purchased the parts of Charlie Patton's ground looped plane and hopefully with other T-18 parts will try to be in the air for Oshkosh '99 or '00.





My Subaru X T6 is now on my T-18 with a Warp Drive 3 blade propeller. Tied to our garage at Hidden Valley -NW of Dallas- The T-18 put a goodly amount of tension on the rope connected to the tail wheel. The Subaru engine is rated @145 HP with 5200 rpm. The 2.17 gear reduction by Ross Aero of course allows the power to be developed by the Sabaru. The initial aim of this aircraft is to quiet it down compared to other small planes. The insulation used on the Diesel Olds some years back is what I intend to try. The three blade prop is ground adjustable and will be set for 2300 rpm or so at full throttle. Best Regards Bob Yeakey



# COLORADO 1999 T-18 FLY-IN

Where: Fremont County Airport (IV6), Canon City Colorado

When: June 11-13, 1999

Accommodations: Canon City Inn 719-275-8676 (Fax 719-269-1033)  
Special rate \$60/night including tax.  
Cancellation 11:00am Friday June 11.  
Ask for the Giffin T-18 party.

Details: The Tigers will rendezvous at Walt and Bev Giffin's hangar 129. The Inn is located five miles from the airport so transportation is being planned. However, if you would like to rent a car, reasonable rates are available at Practical Car Rental (719-276-1425) in Canon City. Perhaps you would like to extend your Colorado trip with white water rafting on the nearby Arkansas River, Rocky Mountain sight seeing or gambling at the restored mining town of Cripple Creek. The airport also boasts a glider school and parachute school for those seeking more aviation adventures.

A banquet will be hold Saturday June 12 at the Canon City Inn with cocktails at 6:00pm and dinner at 7:00pm. The menu will feature a complete prime rib dinner for \$18.65 per person including tax and gratuity. We will be taking reservations and money up to Friday evening June 11.

During the day Saturday Vicki Evens and Bev will plan off-site sight-seeing or shopping excursions for anyone who is interested.

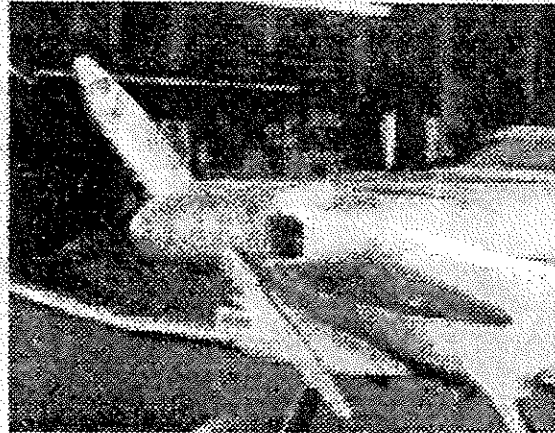
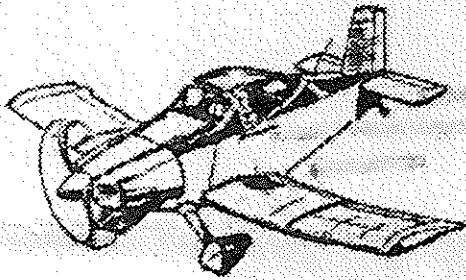
Dean Cochran and John and Vicki Evens will be helping to make this get-together enjoyable for everyone. Come join us in beautiful Colorado. Call any of those folks or Bev and Walt Giffin at 719-547-2906 if you have any questions.

## \*\*\*EAA Chapter 808 Sanctioned Event\*\*\*

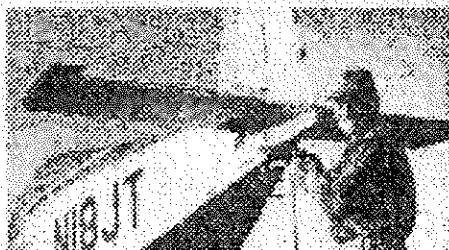
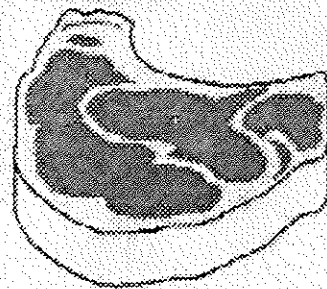
This is an informal get-together. If anything unfortunate should happen to you or your airplane., it shall not be the responsibility or liability of the above mentioned persons, EAA Chapter 808, or the Fremont County Colorado Airport.



Paso Robles Municipal Airport  
Second Thorp T18 Fly-In and Bar-B-Que  
Saturday February 20, 1999



- Fly-In Sponsored By Chuck Borden
- Our first Fly-In Bar-B-que was February 1996. Sorry it took so long to have #2.
- Aircraft Judging : Best T-18, Oldest T-18, Furthest Distance.
- No Charge for Bar-B-Que: Small Donations accepted.
- Arrive early for tour of local wineries and wine tasting.
- Spot Landing Contest on arrival.  
Look for line on runway



John W. Thorp  
(1912-1992)

RSVP Chuck Borden  
805-438-3478 or e-mail [cbt18@concentric.net](mailto:cbt18@concentric.net)  
snail mail 9031 Tsassajara Creek Rd.  
Santa Margarita, Ca. 93453  
Check our our web page  
[www.concentric.net/~cbt18](http://www.concentric.net/~cbt18)

T-18/S-18 Thorp Newsletter  
Richard Snelson  
Route 3, Box 295  
Clinton, IL 61727  
Phone: (217) 935-4215  
email: rsnelson@dave-world.net



[REDACTED]  
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25

FLASH! California Fly-In Feb 20 at  
Paso Robles Municipal Airport  
**1999 Dues by the end of Feb**

Help me out and get your dues in by the end of Feb. So I can plan my printing and mailing requirements. For those 25 guys that haven't paid for 98 what are you waiting for?

**THORP T-18/S-18 MUTUAL AID SOCIETY 1999 DUES**

Please continue your support of this valuable exchange of ideas, building tips and safety information covering John Thorp's great design. Make checks payable to Richard Snelson, Route 3 Box 295, Clinton, IL 61727 \$25.00 US, \$30.00 other.

Name: \_\_\_\_\_

Address \_\_\_\_\_

City: \_\_\_\_\_ State \_\_\_\_\_ Zip Code: \_\_\_\_\_

Phone: \_\_\_\_\_

Aircraft: \_\_\_\_\_ Hours on Aircraft: \_\_\_\_\_

Email address: \_\_\_\_\_

Notes: (Building?, Flying?, Thinking about it?etc.) \_\_\_\_\_

# T-18 NEWSLETTER



*One of the great Fly-Bys at Kentucky Dam 1998. See what you've been missing folks!*

## IN THIS ISSUE:

**Letters to the Editor... and lots of emails**

**Pernic Brother's Thorps** by Robert Pernic (from the bottom of the earth)

**First Flight** by Elmer Hymen

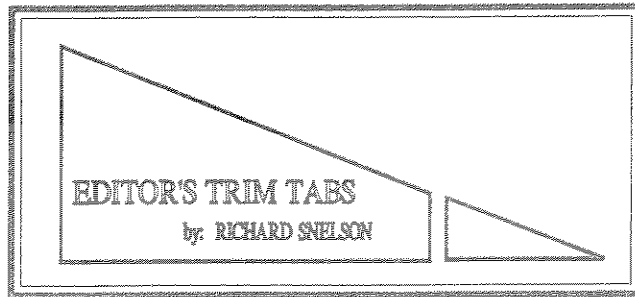
**Paso Robles Bar-B-Q** by Chuck Borden

**Flap Feedback Article** by Tom Hunter

**Colorado Fly-In**

*NOTICE: (STANDARD DISCLAIMER) As always , in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.*





I thought as you got closer to retirement your life was supposed to slow down. Well I'm getting closer, and it ain't getting no slower! In fact, I've started a new career so don't laugh guys. In the last few weeks I've been putting the finishing touches on a large scale conversion of my 1200 sqft shop to a piano showroom and a piano repair and restoration business. All this plus learning to tune, fix sticking key, repair soundboards etc. etc. The more my company talked about being bought up, the more I worked on the shop. So I'm about ready.. including around \$10k of remodeling plus another \$10k of special tools and equipment. I now have 7 pianos in various states of repair and moving them toward the sales floor. All this plus working full time at Illinois Power Co. Soon to be something else I'm sure. If you miss me at the T-18 events this year it's because I'm using all 25 of my vacation days traveling to piano guild seminars plus private training with one of the best piano tunner in the US, he lives in Tempe, AZ. RoxAnne and I will make it to Kentucky Dam in the Fall but will miss seeing you'all in Colorado and at Oshkosh. During Oshkosh I'll be at a week long class at the University of Minn.

I planned to have a membership list in this issue, but instead had tons of emails and letters that I felt were more important to get out to you. I do need additional articles for the next couple of issues so if you would like to submit a how to fix or how to build it, please rough something out for all of us T-18ers..

The fly-in in Colorado is up on us. You can read more about it on page 19 of this newsletter and I hope John Evans will write up an article for the

next newsletter. How about it John? Pictures too please!

**Colorado Fly-in** June 11-13, 1999 at the Fremont County Airport. Contact: Walt and Bev Giffing 719-547-2906

**Oshkosh Nature Center Event** July 30 at 12:00 noon We will have Brats and Chips and will follow lunch with the forum. Contact: Roy Farris 618-723-2594

**Porterville Fly-In: Sept 3, 4, 5**  
8'th ANNUAL P'VILLE FLYIN

Placerville is out, Porterville is in!! There is more than one P'ville on the West Coast.

September 3, 4, 5, 1999, the Thorp people will be gathering for the annual contests, forum, pictures and great food.

Classic Sport Aircraft owners Frankic and Mike Archer have agreed to assist the West Coast Team of Hal and Nancy Stephens, Jim and Lil Critchfield, and Mac and Rena Booth in putting on the gathering.

Friday is for early arrivals, Saturday for the main events including the famous BBQ dinner, cork flying contest forum photos, etc. with Sunday for good-byes.

All Thorp design enthusiasts T- 18's, S-18's, and 211 's are invited! We hope the move will improve the number of people/planes participating. We're looking forward to 50 or more Thorps. Contact Hal Stephens 530/295-1867

**Kentucky Dam Fall Fly-in:** Oct ...  
Contact Roy Farris 618-723-2594

We'll have a great summer and enjoy the great T-18/S-18 events that are planned for you. Keep those emails and letters coming this way.

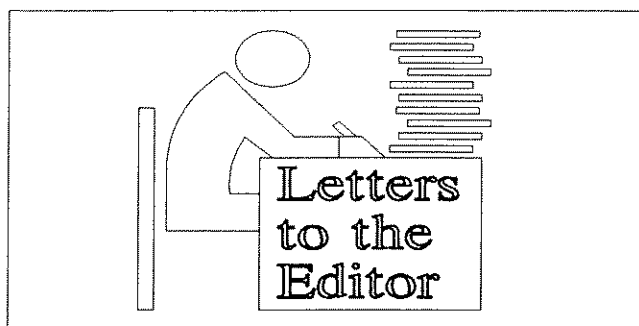
Richard Snelson

Route 3, Box 295

Clinton, IL 61727

email: [rsnelson@dave-world.net](mailto:rsnelson@dave-world.net)

web: <http://homepage.dave-world.net/~rsnelson/thorp.html>



Subject: Halverson T-18  
Date: Sat, 1 May 1999 23:30:46 EDT  
From: CANDO16@aol.com

Just a note to let you know that I sold my Thorp T-18C. Hopefully I'll beat the ad I placed with you a few weeks ago, so you won't include it in the upcoming newsletter. Thanks.... Greg Halverson 922GH

From:

"Barrett M. Kemp" <bkemp@cswnet.com>  
Hi Rich,

I have an unused dynafocal T-18 engine mount that I would let go for \$175.00 plus shipping. It is left over from the project I have sold. My phone number is 501-968-7318. Thank you, Barrett M. Kemp



Subject: T-18 POH  
Date: Sat, 8 May 1999 23:08:37 -0400  
From: "Robert S. Hartmaier"  
<70422.3151@compuserve.com>

Rich,

A few years ago I received a computer disk from John Cotten with a T-18 Operators Handbook on it. I promised to copy it and send it along. Well, it was mislaid, and I just recently found it again while doing some Spring cleaning! I have now copied it onto my computer. If anyone would like to copy the disk they may send me an e-mail at 70422.3151@compuseve.com, or snail mail at:

8 Holly Road  
Jamesburg, NJ  
08831-9670

Thanks, Bob Hartmaier



Subject: Hello!  
Date: Sat, 1 May 1999 19:52:38 EDT  
From: T18Man@aol.com  
Rich-

My name is Jim and I just got on the net. Your page looks great!! I am the owner of 428JS and was in your newsletter a couple of years ago. Let me know if you are ever in the Palm Springs area. I'll give you a ride. Jim Stuart



Subject: Thorpe T18  
Date: Thu, 29 Apr 1999 11:03:00 +1000  
From: Andrew <andrewf@maxwell.com.au>

Richard,

I am 27 years old and fly/live in the Sydney area, I've been flying since teens but as yet haven't taken to building or purchasing my own aeroplane (dad owns RV).

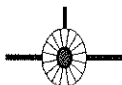
Richard Eklund has given me your email address. I'm really interested in either buying or building a Thorpe and at this stage am trying to gather as much info as possible. Can you help with info or websites? Really appreciate it.  
Regards, Andrew.

Subject: Thorp S-18 newsletter  
Date: Thu, 22 Apr 1999 21:24:09 +1200  
From: "Mike Boyles" <boylesm@wave.co.nz>  
Rich,

I live in Auckland New Zealand and I am considering building a Thorp S-18, I would like to purchase the back issues of the newsletter.

Will you please send me details of the price, how to order back issues and subscribe to future issues. Regards, Mike Boyles

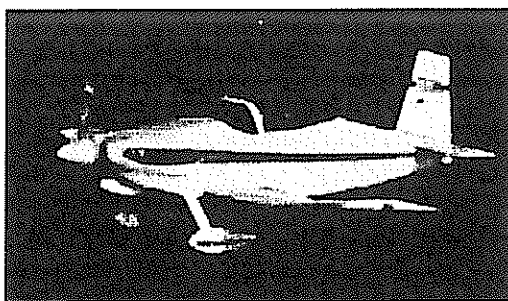
*Editor's Note: I've included these emails in case some of you fellows would like to contact these would be T-18/S-18 builder/owners..*



Subject: Address change  
Date: Wed, 21 Apr 1999 10:03:24 -0600  
From: "Robert F. Clayton"  
<bclayton@redrock.net>

Email address change: bclayton@redrock.net

Update: Bolt on prop, install spark plugs, put in some gas, start engine and test for operation and leaks. Shut down, breathe easy. Install canopy, attach wings, outer flaps and controls, paint. I think at this point, it is supposed to fly.  
Thanks, Bob



*Dan Wolfe over Kentucky Dam 1998*

Subject: Thorpe For-Sale  
From:  
Brent Schultz <Bschultz@anaheim.net>

My Brother (Chris Schultz) has a Thorp T-18 project for sale that is 90% complete. Aircraft is currently being stored in El Toro, California and is being sold to make way for a new A/C project. A/C was started by someone else in the late 60's and has had two owners and needs some work to complete. A/C comes with Lycoming O-360 (180hp), fixed pitch metal prop., spinner, metal cowl and has some flight and engine instruments. Based on our info to date, it appears that the engine may be new and never run (other than at Lycoming factory). If you have anyone interested in purchasing the project, please have them call my Brother Chris Schultz at (949) 951-6059, or me (Brent Schultz) at (714) 974-5835. Sale price is \$18,000.



Subject: T-18 For Sale

From: TWOGIRL1B@aol.com  
Richard,

It was a pleasure speaking with you yesterday and appreciate your thoughts. All things considered would you be so kind to run an ad for me in the newsletter which would read as follows:

For Sale T-18 Fuselage clecoed, wing & tail surfaces complete. Most everything to complete spinner to tailwheel including many instruments (noradio).

Standard fuselage & wing. Lyc. O-360 A1D, OSMOH stored 12 years. Includes correct fixed pitch alum prop but engine could except C.S. prop. \$13,500  
Chuck Meyer 708-534-2079

Wishing you all the best, Chuck

Subject: T-18  
From: Terry Henert <thenert@adams.net>  
Hi Rich

I live in Carthage, IL, about 30 miles north of Quincy. I have a very nice 1948 C140 but for some time I have been wanting to go faster and get there quicker, or go farther in a day. I just discovered a couple Thorp sites this week, including yours, and I have a lot of questions. But a good first question would be where on the net that I can find more info' to read.

A guy from Texas stopped in at Carthage last summer with his T-18 on his way to Oshkosh. That was my first closeup look at a Thorp. I remember reading about them back in the 60's when I started flying but I had never seen one. I have been thinking about that little bird ever since, along with the RV's and Mustang. I may be interested in buying a Thorpe, but not building one.

I flew over to Decatur for breakfast about 2 months ago. I am interested in going back over there and buying you some gas and breakfast for a little demo ride in your airplane. But at this time I just want to say hello and let you know I am interested in the Thorp. Right now it is past my bedtime. I hope to hear from you.

Terry Henert  
thenert@adams.net

*Editor's Note: I let Terry know that he should join us at Kentucky Dam this Fall. Hope to see him there. Rich*

Subject: T-18's and Young Eagles  
From: Tom Melsheimer <ttm@merlin.com>

Chapter 43 recently introduced flying to some Young Eagles. The day was a bit chilly and overcast, but the kids very much enjoyed their rides.

One youngster climbed out of a Piper and asked "Can I get a ride in one of the FAST ONES" (and of course we did!). 5 aircraft showed up to give rides and 3 of them were T-18's! Yours truly was introduced to the EAA Young Eagles program this day and Dean Cochran (spelling?) and Billie Mitchell flew several very appreciative kids around West Denver. Of course, Billie just "had" to comment about how slow my bird is (the orange and yellow one) over the tower frequency. Billie's has a 180 and a very good prop. Dean's has a 160 and a good metal prop and N19L has 150 HP turning a prop that hardly gets much over idle (that's my excuse and I am sticking with it!). Giving rides to kids in a T-18 is most rewarding and it's great that they are small enough that I can go too. still dieting, Tom Melsheimer



Subject: G.P.U. parts  
From: JKerr56051@aol.com

Rich,  
I have near enough parts for a complete 0-290 G.P.U. including a polished and inspected standard crank, a good cam and much more (no pan, carb or mags). I would like to sell as a package. Offers over \$1000 are sought.  
Thanks, John Kerr

Subject: N.L. 108  
Date: Wed, 27 Jan 1999 12:50:47 -0800  
From: Howard Ginn <ginner@KACHINA.NET>

Greetings Richard;

Just recieved N.L. No. 108, and as usual, is an excellent production! Lots of good info. Elaine and I were sorry to hear of RoxAnne's surgery, but it sounds as if she is doing just fine and her husband is expected to recover. I was starting to send the check for the M.A.S. dues, but saw your ad on AV Web for the A 610 flash tube. Let me know if it is still available and I will throw in the additional \$28 bucks. It takes a lot of spares to support the fleet.

Incidentally, Chuck Bordens new T-18 was started by my neighbor in Calif and for the first 20 years, I was the head rivet bucker. It was great to see the bird finished and flying. The original builder also bought a factory new O-360 from John Thorp for \$4000 ...AAAArgh. Anyway, thanks again for all your efforts.



Subject: Hi Richard  
From: "Joe Lowe" <jslowe@earthlink.net>

Just wanted to thank you for keeping the newsletters coming. Those letters keep the spirit smoldering and hopefully in the near future the desire will turn into action. I do have a bunch of reasons why my bird is not finished, but not one is really worth a hoot. The check will be in the mail tomorrow. Again, thanks and happy landings. Joe

Subject: T18 news  
From: Tony & Viv Schischka  
<a.schischka@xtra.co.nz>

Hi Richard,

Thought it was about time I brought you up to speed with things down in our part of the world. In a couple of weeks we will be holding our annual Sport Aircraft Assoc. Flyin at a very nice grass field in the South Island. Hopefully we will get 3, T18s there! 2 of the 4, T18s flying here have changed hands several times in the last year, not sure why.

Do you remember when we spoke at Oshkosh that the first T18 kit has come to NZ? Well have had a good look over the kit and I'm pleased to say it is very good quality and very comprehensive.

One or two small problems have arisen but these have been dealt with professionally by the kit supplier. Builder has completed flaps and ailerons and has the fuselage standing assembled with clecos. I must say the flaps and ailerons look better than mine did! Hopefully these kits can bring the T18 back to life and we will see more in the air once the word gets around! I will keep you posted as he proceeds.

I hear winter has been a bit tough up your way and I guess the flying is scarce.

Had my T18 out of the air for annuals over the xmas period (don't why I have it timed for then!) but managed to get a few hours in flying a Tiger Moth (DH82) taking my children for rides and doing an hour or so in a 90HP Cub. The last time I flew this particular cub was 35 years ago when earning my PPL! Great fun.

Well that's it for now. Regards Tony S

Subject: Help!  
 From: "Robert F. Clayton"  
 <rclayton@uswest.net>  
 Rich,

I was just getting started on my spinner installation and discovered the front bulkhead doesn't fit my Sensenich wood prop and Ken Brock doesn't make one for the thicker hub. There are a lot of wood props out there, so the others must have had the same problem. Do you have the solution or can you direct me to the solution? Just when I think I'm on a roll, another gremlin pops up. I can still use the spinner and rear bulkhead. I just recieved my bolt kit from Sensenich and I was hoping to run my engine and I wanted to finish the spinner before I crank it up. I also just finished the little inspection plate in the floor for the rudder turnbuckles (a very good idea). The weather here is mild so it is easier to keep my garage (hangar) heated and I'm getting things done, (including the spinner, hopefully).

I had a visit from Russ Verbael in Dutton Montana. He purchased a T-18 from someone back east and just when he started home, the torque tube on the electric trim sheared off and he flew it all the way to Montana with full down trim. He said he was a little tired when he got home. I gave him information on how I did mine, with some pics and he says it worked just fine. After flying it for a while, he told me he couldn't imagine ever having to use maximum trim. I don't remember who he bought it from, but it is the one with the little dorsal attachment on the fin. I think I have seen it at Oshkosh in the past. Anyway, it looks as if I will have a T-18 check out in the spring, before I fly mine. My youngest son is in the flight program at Utah State University and has just finished his instrument rating. Next year he will be my instructor. Don't you just love it! My son, instructing the old man. "I love airplane noise" Bob

Dear Richard,

Through the years John Thorp's T-18 design has had an enthusiastic following of owners, builders and suppliers.

Lou Southerland, Ken Knowles, Phil Tucker, Ken Brock, Richard Ekland and now Mike Archer continue to advance the design in ways not imagined by John.

Frankie and Mike Archer bought the rights to the Tiger from Phil Tucker of Lancaster, CA a couple of years back. Their dream was to move the design into the homebuilt kit arena by providing all parts for both the T- 18 and the S-18 (wide body, fold wing) variations and provide a complete kit for the S- 18, even a newly designed engine.

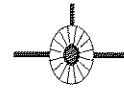
My experience is they are accomplishing their dream, I bought a destroyed T- 18, S/N 126, hauled its remains home, and began sorting. Today, every piece of metal or other component that was needed has been supplied to me. It's great!! Classic has the machinery necessary to manufacture the component or they have subcontractors that will supply them as needed. An example is the landing gears "N" frame. The collision with terra firma took out the gear at the fuselage on the left side. The right side, was torched off to trailer the wreckage home. A new "A" frame was needed! Classic Sport Aircraft supplied a new and improved (including longer) leg "A" frame, which didn't fit --- back to the drawings! Yes, one dimension was different between the "S" model and the "T" model. A new "T" model frame was constructed and delivered. It fit!

Spinner, backing plate, wing skins, ribs, brackets, spars, you name it they supplied the needed parts - I'm pleased they are there for us! Call them at 1-209/539-2755.

Incidentally, Lyle Trusty of Lancaster suggested new "long easy" Cleveland wheels and brakes for the plane which were supplied by Aircraft Spruce and Specialty. They are heavy duty and work just great. Hal Stephens, 1390 Broadway - B144 Placerville, CA 95667 Phone: 530/295-1867

Rich, Sending check for 99 newsletters. We are enjoying our new home in Pecan Plantation. Just getting workshop completed, will start on project in a few days. This project is SN 95 and has been around since the late sixties. In fact, the inner wings were built without provision for flaps. I will modify so that flaps can be added. Pitch triin has been installed per original plans, but will change to electric motor driven system with limit switches per my newsletter article. I have been reading about brake lockup in past newsletters. It was mentioned that short slider pins could be a problem as later versions of brakes had longer pins. Talked with others about the shorter pins and was told there is no problem with pins, just keep the pin/slider clean and inspect at regular intervals. I will rebuild the brake assy and install new "O" rings with a good inspection of the disc and disc body. That should give me a good base line to work from and will keep close watch to insure proper operation. I will reroute the rudder cables to the side and eliminate the forward tunnel. Also plan to round off the tunnel between seats as I will have electric flaps using Cessna 150 flap actuator. If anyone has used this flap mechanism please let me know as I would welcome your installation methods. I have my own ideas but other insight would be helpful. I am looking at an 0320 150hp engine. I would opt for that configuration so that I can burn auto fuel. However, there is a fuel consortium here at Pecan that makes 100LL very reasonable. The engine needs overhaul so will make decision on 150 Vs 160 when I rebuild. I have been associated with the T- 1 8 since early seventies. I can remember my first close look at the Thorp, was in CA at the Helicopter show, drove over to Torrance and visited with the George Lederer gang at Torrance Airport. At that time there were about 15 Thorp's flying or in construction stage at the Torrance Airport. I was hooked and spent the day visiting with those early enthusiasts. The wonder is that after all this time, and rebuilding/owning a Thorp for over eight years, I am still as excited about the airplane as I was twenty five years ago. That says something for John's design and the charisma

that surrounds the aircraft. I consider it a blessing that I once again have the opportunity to construct/build the best home built design that ever hit the drafting table. My new e-mail address is [kjmorgan@flash.net](mailto:kjmorgan@flash.net). Would love to hear from any of the gang. Best regards Rich and keep the NL coming. Ken C. Morgan  
Ken & JNene Morgan 9110 Bellechase Dr.  
Granbury, TX 76049



Dear Rich: Thanks for another interesting newsletter. Dues for 1999 are hereby enclosed. Since I last wrote I have put about another 85 hours in my bird C-FLDP. It is a delight to fly and performs pretty well according to specs as predicted by John Ronz's design program which I took the trouble to put onto my computer some time ago. It stalls straight ahead (no wing drop) with no flap at about 62 hvh, and with flap at about 55mph. I have not attempted spins yet but will, do so in the near future. I expect each aircraft is different but I would like to hear from same one who has had recent acrobatic experience in a Thorp as to entry speeds, recovery etc. Seen to me there was a newsletter (way back) which gave some information but I seem to have mislaid it. The last newsletter with its account of the "cow-boy" test pilot who put wrinkles in his friend's plane by overstressing it in the pullout I found quite incredible. Did he not offer to compensate the unfortunate owner? It might be interesting to hear the sequel to this incident. I finally got to meet Mike and Phil and Frankie at Arlington this year. They had a very nice booth set up and seemed to draw a goodly number of people. The number of Thorps were the fewest I have seen there contrasting with the great number of RV6'S which took up a very large portion of the field parking. To my mind the Thorp is a much more attractive design but then I am probably prejudiced. One thing I have noticed on mine is on the main spar some wing pop rivets on the stub wing (three each side) are starting to show same signs of lifting. If it continues I will replace

them with Cherry Max rivets which should have been used in the first place. Builders using pop rivets who have not reached this stage should take note. I trust you will continue with your excellent newsletter and that you will be successful collecting subscriptions from the 1998 foot draggers. Cheers for now Doug Perkins



Dear Richard:

Just received Newsletter 108, thank you for your dedicated work, I always look forward to receiving the next one and enjoy reading them, usually more than twice. I am enclosing check No. 3369 that covers the 1999 dues. Something new, Maureen and I moved from Austin, TX to Tucson, AZ, before and during the holidays. Since I we didn't trust the movers with my S-18 project, I moved the whole thing myself in a rented truck and it seems that there were no damages even though in some washboard like highways I felt every pebble that I rode over and made me cringe. Well, now we are almost out of the unpacking business in our new home and as you would guess, the project ranks low in priority behind the rest of the household details. In October we had the pleasure of meeting Frankie and Mike Archer at their hangar in Porterville, CA, they are a swell couple, gave us a detailed tour of their business and lots more. Mike has many splendid ideas about making the S-18 easier to assemble the otherwise time consuming details, he will be implementing his ideas as they build their own S-18. Richard, please change my address to: ALBERTO PEREIRA 11991 E SETTLERS TRAIL TUCSON, AZ 85749-7801 Our e-mail is working and is still the same: pere009@ibm.net That will be all for now, greetings to you and RoxAnn and many thanks again. Sincerely, Al Pereira.



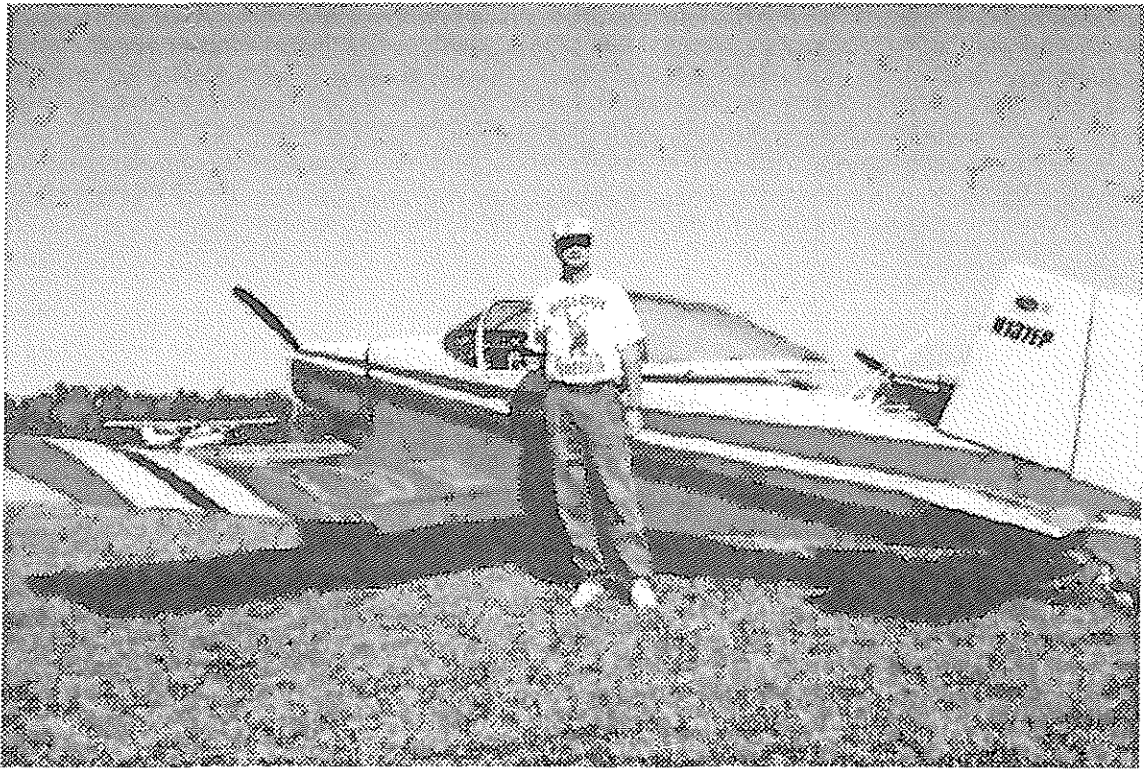
Dear Richard,

While looking thru some old magazines I found this article by Bill Warwick that I think may be of interest to our group. I just picked up some old magazines and I'll have to see if I have the Oct. 87 Kitplanes to see the original article. Also came across some old issues of Model Airplane Magazine and Air Trails from the 1930's & 40's. They are pretty neat reading. Sincerely, Robert Jaeger  
*"Here's the Letter"*

### Here Are Some Tips for Thorp T-18 Pilots

I always enjoy stories on the Thorp T-18 (October, 1987 KITPLANES) and agree it is indeed a "classic travelin' machine!" I still enjoy mine very much even though it's a mite tattered around the edges. Seeing pictures of shining examples like Karl and Mazie Lipscomb's gives me the urge to fix mine up a bit. One small correction should be noted in reference to the all-flying tail tab. This surface is most definitely not a servo. If it were, LeRoy Cook would have had a case of PIOs (pilot-induced oscillations) that would have been insurmountable. The tab's purpose is to resist stick inputs and attempt to return the main slab to its trimmed position. Therefore, the tab is more properly referred to as an anti-servo. Having given a fair amount of dual instruction in T-18s, I usually advise a takeoff with trim slightly nose down to avoid the whoop-se-dooos that Cook experienced. Making the climbout with a slight amount of back stick seems to smooth out the neophyte T-18 pilot. Here's another helpful hint for those finding it difficult to flare three-point with forward cg. (180 hp, constant-speed propeller, full fuel, pilot only, no baggage). Normal tendency is to trim nose-up to relieve stick pressure, but maximum tail power is achieved by trimming nose-down, which brings the anti-servo tab into play as an added aerodynamic surface. Naturally this requires more arm muscle to make the flare but doesn't pose a problem to anyone with average strength. Bill Warwick Aguila  
Arizona 17 JANUARY 1988



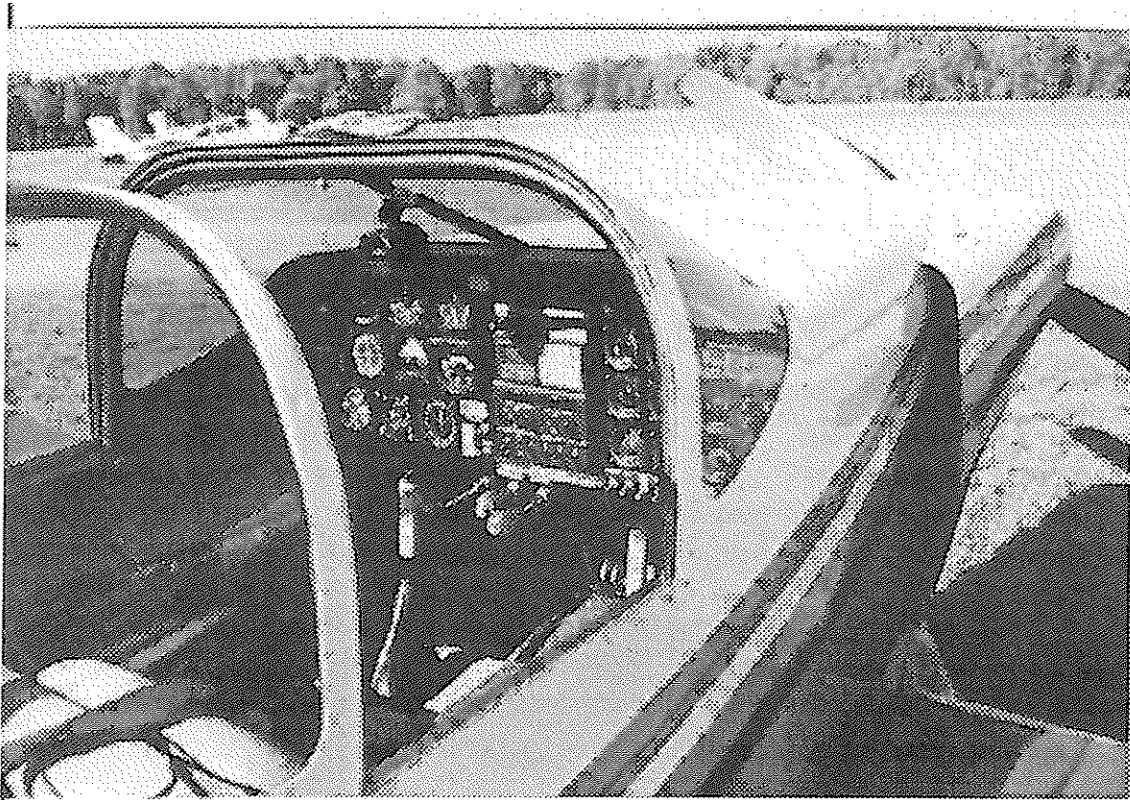


*Ed Pernic at Kentucky Dam with his "twin T-18" Lucky brothers I'd say.*

get a fuselage out of the basement and I was able to assemble everything there with always the proverbial two most-asked questions; " how are you going to get it out of the basement and what are those little copper bullet-like things sticking out everywhere?". There is nothing like having the project in the basement of ones' home. Many times I had only a few minutes to work, perhaps only to clean up the work space or to get a drawing out to look at something I'd been thinking about or to figure out what's next. Son Dave was still in grammar school and he helped me when necessary. We have a few pictures of each of us getting some hangar time, standing inside the cockpit with the fuselage on saw horses, kind of like a Flintstones Airplane. My wife Pat, bless her, hardly ever complained about the riveting noise even when it occurred at three AM! Time marches on, though, and Dave is now thirty four. This past year, Dave wintered over as a Mechanical Engineer here at the South Pole. Here he built the wing for his own T-18. Perhaps we best leave that story for another time! One thing about a T-18, there's plenty one can do if money isn't available, just keep working. Buy what you need only when you need it. Sure glad I

didn't purchase that slick Loran receiver back in the eighties!

Eventually it was time to take the T18CW apart and get it out of the basement. We were fortunate enough to be able to build a hangar on a beautiful grass strip near home, so on the way to the hangar it passed through the local auto body shop for paint and made to look exactly like N137EP's'. Overhaul and install the engine, reassemble, wire, upholstery, test run engine, these all take an inordinate amount of time. A year to be exact, but this project had dragged on long enough and it was time to fly and fly we must. The moment came on a beautiful evening this past 4th of July, 1998. With a small group of friends we made one quick aborted take off to test the ground handling characteristics. Taxied back to the runway, checked to make sure everything was in the green and took off. We were in the air very quickly, perhaps seven hundred feet or so, We have 2400 feet of runway and by the time we were at the end I was at 500ft and all trimmed up! Took it to altitude circling the airport all the while. I was particularly interested in its slow flight characteristics and stall.

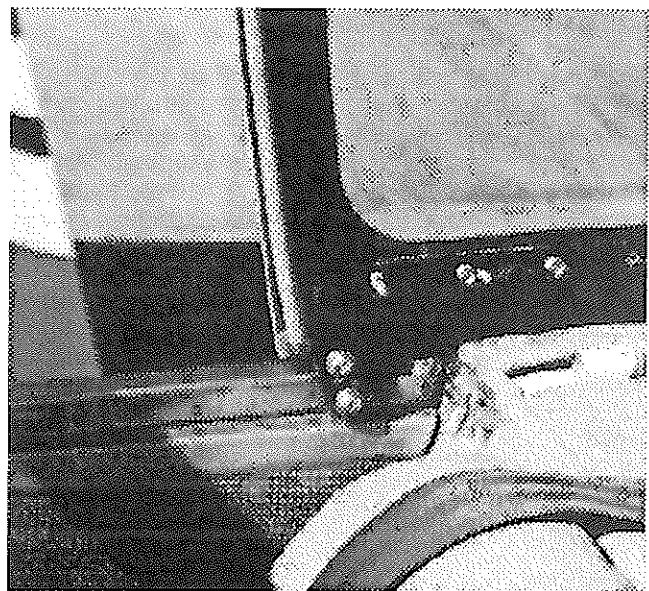


*Bob Pernic's well laid out panel! Lots of stuff there Bob!*

Nothing unusual, no wing drop off, a little shutter with a gentle break, as nice as can be! According to the flight plan I stayed in the air for a half hour. Came around and landed just a little tail heavy on the first attempt. I could not think of a single thing that I needed to do before the next flight with the exception of the usual preflight. Boy, was I mistaken!

Coming up, Part two: Boro, the airplane. Bob Pernic

*Editor's Note: Bob let me take the left seat on this great airplane. It's as stable and solid flying airplane. Lot's of power. Good controls. I've include a picture to the right of one of the neat ideas he has incorporated in his T-18. With a simple slot in the canopy track and a slide lock he has build the canopy so it can be taken off in a few seconds. Slide the lock over move the canopy back till the wheels are in the slot and lift the canopy off the aircraft. Nice feature.. Makes it easy to do clean-up and maintenance on the panel etc.. Thank for letting me fly your great bird! Richard Snelson*



**Canopy Quick Removal Latch**

# FIRST FLIGHT

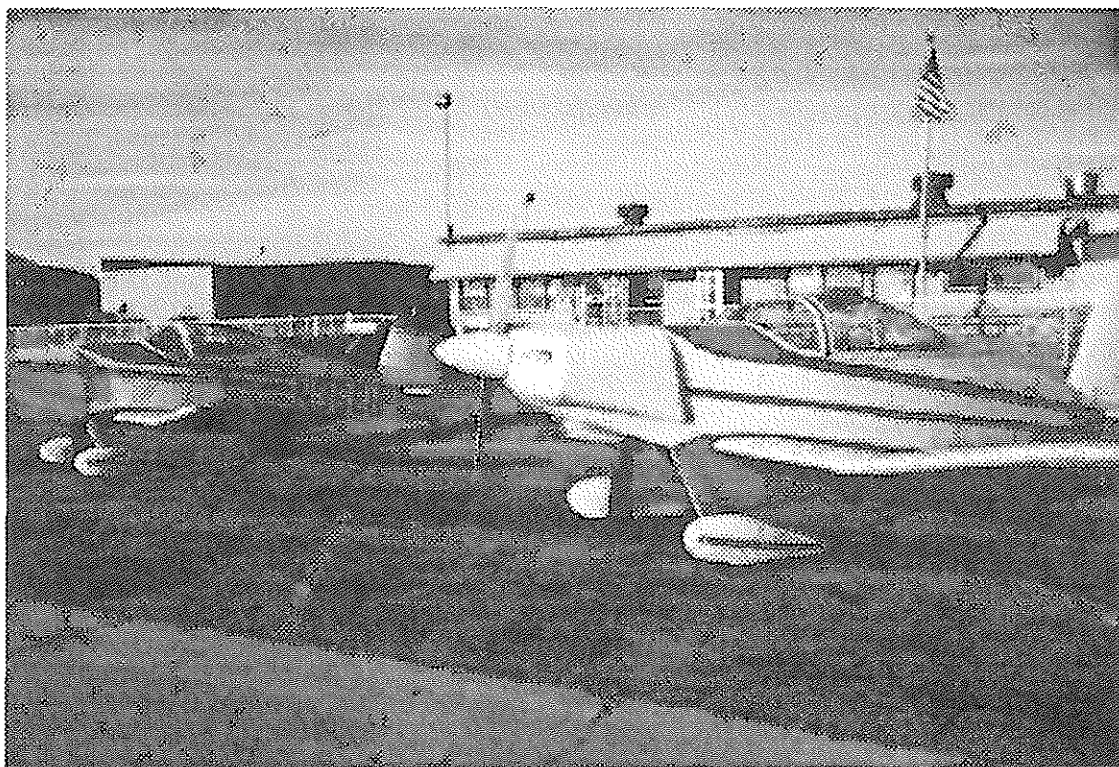
by Elmer Hymen

I am very happy to inform you about the first flight of T-18 529BH. This aircraft was basically built by me, with help from my son Bill Hymen.. The plane was built in 8 years, the same amount of time that it took me to build N36EH a standard plans built T-18 completed in 1977 and I have always flown the plane since then.

With all that flight time in T-18s I had no problem test flying the second T-18. The taxi test and engine runs were done at Greenwood Lake Airport in NJ. I purchased a LYC 0290D@ with only 1100 hrs and a new top overhaul, half inch valves all new top parts at a price I could not pass up.

The plane is mostly plans built using Sunderland wide body and leading edge wing ribs. I did not build the convertible wings because I had bought some parts from a wrecked T-18 from Long Island many years ago also bought parts from an unfinished plane here in N.J. The main wing spar was used in the new plane, also many of the small parts, extrusions etc. also the 2" longer gear was used.

Back to the first flight. It was very straight forward flight of about an hour or so. This plane has a left wing heavy condition that I will work on, also I found that the right flap retracted position was interfered with by the rear attach bolt at the fuselage. Grinding out the nose of the flap fixed this and helped the left wing heavy condition somewhat.



*Foreground Red Thorp 529BH just after 10 hrs of flight time. In rear 36EH 21 years old with 900 hr of fun on her!*

The plane has a VFR panel with xponder & encoder, a VAL com radio also a GPS with space for more equipment on the right side.

The 0290 D2 engine has a MA3SPA carb that has the venturi and float changes but I think the carb may need some changes as I'm not getting good static run up, anyone that has more info on this problem would be appreciated. Also in level flight does not get near red line. I enjoy the newsletters very much. Thanks Elmer Hyman

Bill Melly N6GN from Camarillo, Ca. (flying 32 years)

Farthest distance,  
Steve Hawley from Tucson, Arizona. (523km.)

First place spot landing-Richard Schaefer N41RS from Torrance, Ca.

Second place,  
Laffy Kruchten N7088 from Redondo Beach, Ca.  
Third place,  
Flying a Stanley Screamer, Dale Stanley  
N54ODD, Paso Robles, Ca.

## PASO ROBLES BAR-B-Q

by Chuck Borden

Thorp T- 18 Bar-B-Q at Paso Robles Municipal Airport Febru@ 20th, 1999 I know it's probably hard for people on the East Coast to understand Californians having Bar-B-Q Fly-Ins in February. But one of our closely guarded secrets is that the weather in late February is always pleasant in Paso Robles. March is a different story. If you want to move out here, remember the earth shakes once in awhile. The planned event turned out spectacular, we fed 100 people and 16 T-18's flew in from as far away as Tucson, Arizona. We started serving at 1 PM and a brief award ceremony followed while every one enjoyed Bar-B-Q Tri-Tip steak, prepared with Fran Newman's famous Texas Steak Merinade. Awards were given for the following: Best Standard T-18, Best Non/Standard T-18, Oldest T-18, Furthest Distance, Spot Landing on arrival.

Winners were:

Best Standard T-18

Jim Cooper N7618T Rancho Palos Verdes, Ca.

Second place

Vern Passmore N25VP from Wilmington, Ca.

Third place

Steve Hawley N90082 from Tucson, Arizona

Best Non/Standard T-18

Gus Gordon N633GG from Granada Hill, Ca.

Second place,

Byron Janson N3647C from Redlands Ca.

Third place,

Carl Daughters N647C from Arroyo Grande, Ca.

Oldest T-18,

Several people have told me, this was one great event. Maybe so, but not without the help of the of many especially the following people: 9 Hosts Bill and Joyce Carlson Cooks: Rex Awalt, Oscar Bayer, Linda Borden and Dion Holton, Registration and PR: Tony Ginn and Tom Hunter Spot Landing Judges : Darrel Radford and Neil Koellish, Aircraft Judges : Mike Laubach and Dale Stanley, Big Band Music and PA system: Marv Fenton

There was no charge for the Bar-B-Q for T-18 pilots, passengers and builders. However, donations were accepted to cover expenses. Our policy was to put on as good an event as possible and let everyone decide what it was worth to them. Too many times I have shown up at a Fly-In, put my airplane on display and had to pay for the privilege. That is why I will not take any more homebuilt aircraft to Oshkosh. With the paid gate that the EAA has at Oshkosh I would think that the people that risk their aircraft to put them on display at this event should be waived any fees. Without participants there would be no Oshkosh. Therefore I decided that this was not going to be a moneymaking event. So far the total for putting on this Bar-B-Que was \$325. The donations brought in a total of \$435.50. After all the bills were added up the remainder, \$110.50 will be donated to EAA chapter 170 for sanctioning the event and getting the insurance coverage. Next year the Bar-B-Que will be held one month later. Although the weather was great in Paso Robles we know it was not so great elsewhere. I had a lot of calls from T-18ers saying they would come if the weather cooperated. The date for the Next Bar-B-Que is Saturday March 18, 2000. Let me know if this interferes with anything. Sincerely Chuck Borden

# FLAP ARTICLE FEEDBACK

## by Tom Hunter

To Richard Snelson

From: Tom Hunter

Subject : Article in Newsletter 108 on building wing flaps

I would like to make a few comments. I did have the benefit of building my first set of wing flaps in John Thorp's shop many years ago. When I built my second set to match the new wet wing following Lyle

Trusty's configuration, I used the match hole tooling and an extra set of trailing edge holes to make the correct bend for the leading edge. It still works after all these years! The following is a brief description of the process.

If you look at the profile of the flaps, you will notice that there are 2 bend radius on the leading edge. The tooling that was produced in John Thorp's shop and used by hundreds of builders took into account the 2 bends that make up the leading edge and the template had an additional length of material with an extra set of trailing edge holes which were used only to get the correct radius and then cut off to make the final part.

It is easy to see how this works if you shear about a 2 inch by 40 in length of .025 sheet and then try to create the correct leading edge profile by holding the trailing edges together and applying pressure to the metal.

It is not hard by trial and error to find the correct location of the 2 points that you will need at the trailing edge to get the leading edge to come out properly. It might involve the use of several "test strips" but you will see the required location of the second hole location at the trailing edge. Once you are sure that your test strip can be bent correctly using the 2 trailing edge bend points

that you have found by trial and error you can transfer this to your template.

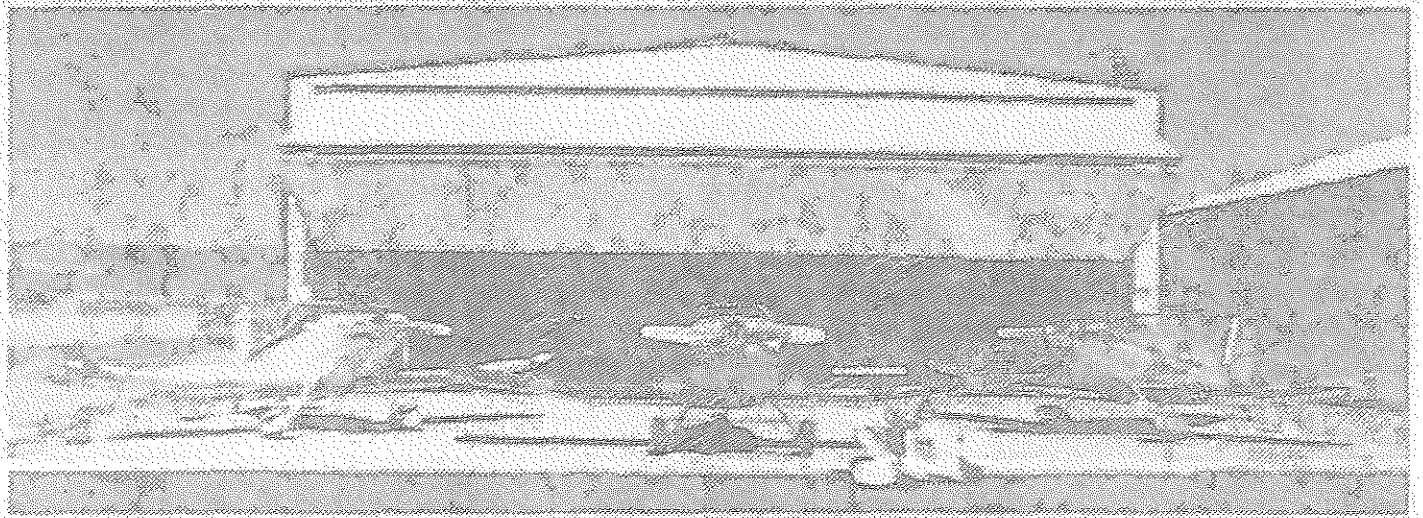
You will want to lay out all the rivet holes in your full sized template. I suggest you use a .040 sheet for your template. This is what was used in John's shop and it makes it easier to transfer the holes to the actual part. Please remember that you will want to make your lay out square and true since you are using match hole tooling, the rivet holes are your gig. If, for example, you do not get all the trailing edge holes laid out absolutely parallel, then the flap will be warped when you bend it and when you rivet it together.

Bending the full sized flap skin should take you at most 5 minutes. You cleco the first trailing edge together and lean into the skin with a two by four covered with a towel. Then you lean into the re-cleco'd skin and finish the bend to get the second radius. Then cleco the correct trailing edges together and check the profile with a flap rib. Remember the skin will bend more easily at the ends than in the center of the span. That is a minor problem however, since you only have end ribs and the one little leading edge rib.

One last thought. When you rivet the trailing edge together, put all the rivets in the trailing edge and clamp the inverted trailing edge to a flat bar stock 48 inches long and back rivet. It doesn't matter if the rivets on the top are flush or dome heads so don't worry about that. You will end up with a perfectly straight trailing edge.



# Colorado T-18 Fly-In



**WHEN:** June 11 -13, 1999

**Where:** Fremont County Airport (1V6), Cañon City, CO

**Accommodations:** Cañon City Inn 719-275-8676

**Special Rate:** \$60 per night including tax. Ask for the Giffin T-18 party

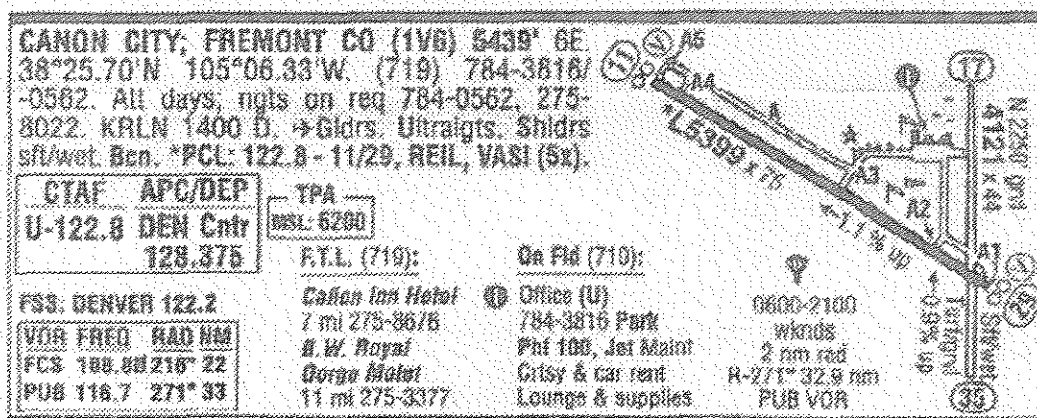
**Cancellation:** by 11:00 a.m. Friday, June 11<sup>th</sup>.

For details or to let us know if you plan to attend, call:

Walt and Bev Giffin 719-547-2906

John & Vicki Evens 303-420-2724

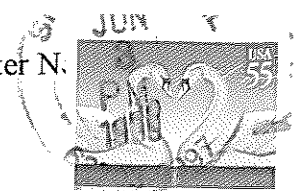
Dean Cochran 303-466-3472



(Airport Diagram Courtesy of "Flight Guide®")

## EAA Chapter 808 Sanctioned

This is an informal get together. If anything unfortunate should happen to you or your airplane, it shall not be the responsibility or liability of the above mentioned persons, EAA Chapter 808, or the Fremont County Colorado Airport.



T-18/S-18 Thorp Newsletter  
 Richard Snelson  
 Route 3, Box 295  
 Clinton, IL 61727  
 Phone: (217) 935-4215  
 email: rsnelson@dave-world.net

713 468 7372



## Colorado Fly-In is June 11-13

It's "Red Circle Time." Please check if you have a red circle on the label. It's means I have not received you 1999 dues.

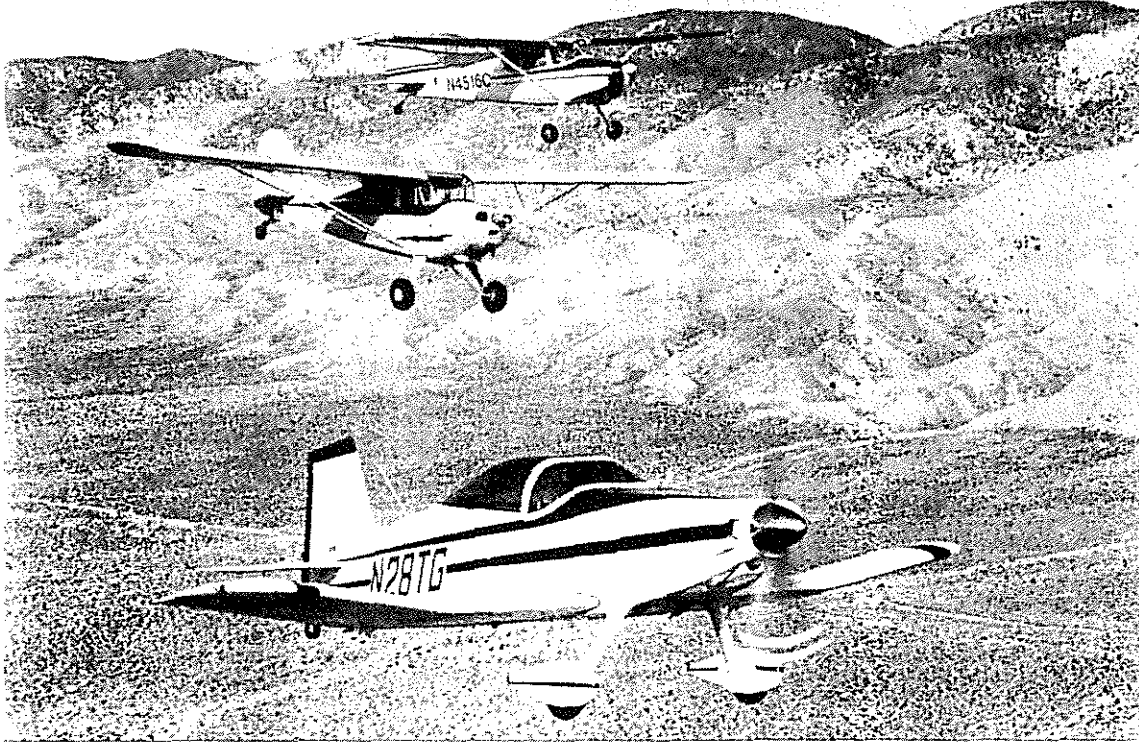
**Please!**

### THORP T-18/S-18 MUTUAL AID SOCIETY 1999 DUES

Please continue your support of this valuable exchange of ideas, building tips and safety information covering John Thorp's great design. Make checks payable to Richard Snelson, Route 3 Box 295, Clinton, IL 61727 \$25.00 US, \$30.00 other.

Name: \_\_\_\_\_  
 Address \_\_\_\_\_  
 City: \_\_\_\_\_ State \_\_\_\_\_ Zip Code: \_\_\_\_\_  
 Phone: \_\_\_\_\_  
 Aircraft: \_\_\_\_\_ Hours on Aircraft: \_\_\_\_\_  
 Email address: \_\_\_\_\_  
 Notes: (Building?, Flying?, Thinking about it?etc.) \_\_\_\_\_

# T-18 NEWSLETTER



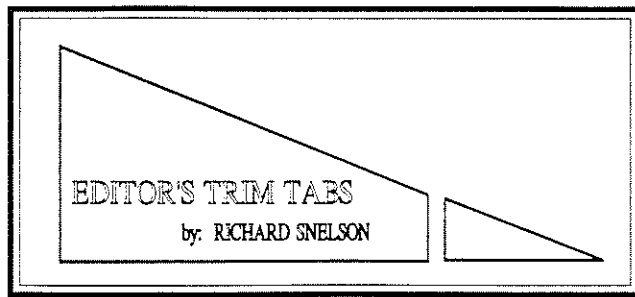
*Tony Ginn in the lead with the flying "Ginn's" in trail. Don't let them fool you, they all have Thorp T-18s hidden somewhere!*

## IN THIS ISSUE:

Become a Thorp Ambassador  
T-18/S-18s on the World Wide Web  
Letters to the editor  
Colorado Thorp Fly-In  
Oshkosh 99  
Ecklund Engineering Components  
For Sale Items

NOTICE: (STANDARD DISCLAIMER) As always, in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.





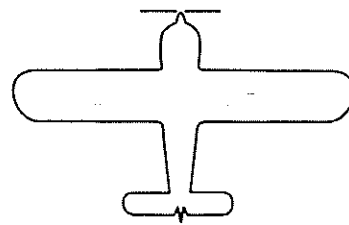
To The T-18/S-18 Mutual Aid Society.

New interest in our great Thorp aircraft continues. Not a week goes by without a new name coming in via email or a phone call after a visit to our Thorp Mutual Aid Web Page. Now it's my goal to update and modernize the homepage "Web Page." to attract even more folks to the Thorp Aircraft Family. I've purchased a new computer system and new software to publish to the web site. This new software will make it easier to update and maintain the site. The size of software packages has grown so much that disk drives are filling up quickly and it takes more and more computer memory to run the programs.

The next source of new T-18/S-18 builders and owners come directly from contact with you, the members of the Mutual Aid Society. Proud owners are telling the folks they meet about this great Thorp aircraft. Hundreds of rides are given to pilots unfamiliar with what a pilot's aircraft is really like. They come away from a ride or visit with a great big smile and ~~always want~~ to know more about either building or buying a Thorp. This is a great service all of you are doing and it pays a tribute to John Thorp and his family of aircraft. I have an idea that will make this exchange with the new folks even easier. That's to have Thorp owners that wish to be Thorp Ambassadors listed on our web site. One or two owners in specific states and countries that would be willing to discuss and show off their aircraft. Let me know, by email, mail or phone that you wish to be listed as the Thorp Ambassador of your area. I'll put this information on the web page for folks to find you.

Another gentleman has joined me and my effort to promote the Thorp aircraft. His name is Luis A. Hernandez, Jr. and his Thorp web site is located at: <http://www.t18.net>. He has put a lot of effort into the site so please visit it soon. He has excellent graphics and good links to other Thorp sites.

The Kentucky Dam Fly-in was last week, and I have to tell you that this one really got rained out! Lots of rain. We did have six Thorps on the field Saturday, but they were stuck on the ground for the day. Oh sure, one or two test hops to check the ceiling and visibility did launch. It's hard to keep Jim Paine on the ground! Jim did reserve the Kentucky Dam Resort for the next three years for the Fall Thorp event. This would have been a good one because all the Thorp rooms were booked ahead of time. Sorry you folks didn't make it. We missed seeing you.



### **This is a flight safety item!**

Two older T-18 aircraft has been observed, within the last few months, to be missing the stainless steel strap that folds around the leading edge of the servo tabs. Both owners of these aircraft have been made aware of this mandatory modification. How many other Thorps are out there without this strap? If you did not build your aircraft check it before the next flight! Install this modification. Now!

Two long time members of the Thorp Mutual Aid Society have passed away. We will miss them.

Nate Eastman--Kimball, NE  
Floyd Myers --Ogden, UT

# T-18/S-18s on the World Wide Web

## This will be a new feature in the Thorp Newsletter.

During the Thorp forum at Ky Dam, I asked how many individuals had computers and used them for email and to visit the world wide web. I didn't take an exact count, but over 90 % of those present said they did. So I think it's timely as we are about to get past Y2K and into the year 2000 to discuss some of the many ways we can exchange information, email, eMail Lists, homepages and finally world wide web sites. I'm sure it won't be long until we are sitting in front of our computer screens with tiny tv cameras connecting us all for an evening of talk and exchange of Thorp building information. Until that time, here's another great idea!

The first topic for this feature will be eMail List. An eMail list is a simple way for a group of individuals to exchange information, or ask question about a subject they have in common. In our case that would be the Thorp aircraft. To be a part of the eMail list you subscribe (join) it. There's no cost for being a part of this eMail list. After you join you will receive all the email that occurs for the Thorp eMail group. To ask a question, you use the eMail list address and submit (email) your question. It goes to all the members of the list. Anyone on the list is free to respond to your question or to add another question to it. Any time that you wish to leave the list you can, by sending an unsubscribe message to the list.

The Thorp Mail list is up and running and it's waiting for you to join for the great information exchange. I'll be there along with Bob Highley and several other members that will help answer your questions.

To join the list, using your web browser go to the following address

<< [<http://www.onelist.com/subscribe/thorplist>>](http://www.onelist.com/subscribe/thorplist)

Follow the instructions on the web site to sign up.

To send email to the list send a message addressed to <<[thorplist@onelist.com](mailto:thorplist@onelist.com)>>.

Members can check out the archives of past Thorp questions by going to the following web address.

<<[<http://www.onelist.com/arcindex.cgi?listname=thorplist>>](http://www.onelist.com/arcindex.cgi?listname=thorplist)

This email list currently has over 20 members and, although not extremely busy, it allows us to stay in touch, meet other Thorp drivers/builders, share building and flying tips, and more. Anyone with an interest in the T-18/S-18 is welcome to join us.

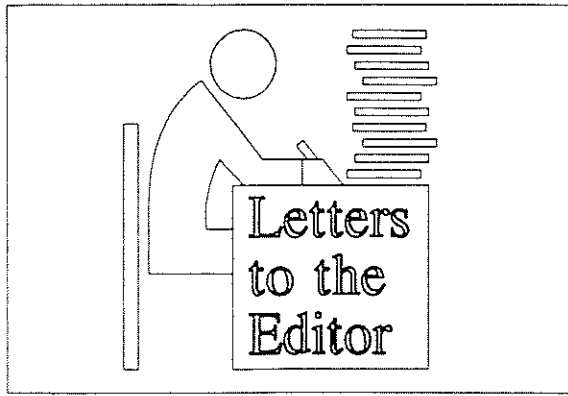
Thanks to Luis A. Hernandez, Jr. <[mshopper@iag.net](mailto:mshopper@iag.net)> for starting the Thorp eMail List.

### Visit the following Thorp Sites:

<<[<http://homepage.dave-world.net/~rsnelson/thorp.html>>](http://homepage.dave-world.net/~rsnelson/thorp.html) (My current Thorp Site)

or

<<[<http://www.t18.net>>](http://www.t18.net) (This is a new site that Luis just put on the web.)



Rich:

Update from Classic Sport Aircraft.

We recently returned from the Northwest EAA Fly-In at Arlington, Washington. Great week, the weather was wonderful--no rain--and the pilots from Canada really took advantage of the good weather as they were there in record numbers Thursday thru Saturday. I believe the count on Saturday was 74 from Canada.

As usual, the Taylor family, Jeff, Bob, Steve and Tyson were out in full force to support the S-18 T-18. The other Man- Of-The-Hour, Cecil Hendricks, chaired the Thorp Forum just to make sure everyone knew about Thorps. Congratulations are in order for Jeff Taylor, from Snohomish, WA. (Who allows us to put his plane in our booth each year at Arlington) and Jerry & Alice Denham both received awards for their beautiful Thorps.

We did not make Colorado, as planned, due to too many weather changes, but understand those who attended had a great time. Porterville, Golden West and Copperstate are ahead and we hope the weather is great for these Fly-Ins.

Another subject for builders ---Hal Underwood of Lancaster, Ca. had questions on the 30 deg. versus 40 deg. flap settings. The confusion was enhanced by the drawing. The S-18 drawing 631A had been updated, but he had an older copy. The other drawing that relates to this is the S-18 drawing # 743 which was correct. As indicated before, I am implementing a revision

system for all S-18 drawings. I hope to have this accomplished by early next year. I will send you a drawing revision list in the near future. In the interim, anyone wanting to know the latest drawing on the S-18 can e-mail or call and I will update them. E-mail: s18thorp@lightspeed.net or phone 7 - 8 am or 6 - 7 pm at (559) 539-2755.

I would like to let the new builders and those interested in the S-18 and T-18 that we produce a complete Kit for the S-18 and parts for the T-18.

Sincerely,  
Classic Sport Aircraft  
Mike Archer



*Editor's Note: The following is a note to Lyle Trusty, his response, followed by a response from Classic Sport Aircraft*

Subject: RE: Flap limit  
From: DadTrusty@aol.com  
To:halcarol@ca-connection.com

Hi Lyle- Haven't bugged you for a while so thought it was time. Frank and I were looking at the S-18 plans which call for 40 deg flap max Frank says he's heard of pitch down problems with that much flap and so we were planning to limit the flaps to 30 degree. What do you think?

Hi Hal

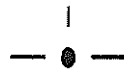
John Thorp recommended the flaps be limited to 30 degrees after someone encountered a "bunt" at forward CG and 40 degrees of flaps. The horizontal tail size was originally designed for a wing without flaps, which were subsequently added after Bill Warwick flight tested his airplane. Bill found that without flaps the landing approach was flat and fast. Adding flaps slowed the airplane 5 mph and steepened the approach

to normal, but it also increased the nose down pitching moment, in the worst case to a value higher than the horizontal stabilizer could overcome. Then, of course, when the horizontal stabilizer reaches it's stall angle of attack the bunt occurs. John thoroughly analyzed the problem and concluded the best solution was to limit the flap travel to 30 degrees. Subsequently he put that word out to everyone.

This is something you have to flight test for. If you want to have 40 degrees of flaps available to you. It involves ballasting the airplane to a gross weight/forward CG condition, climbing to altitude (more than 3000 feet AGL), and stalling the airplane in all flap positions. Worst case is at 40 degrees, fwd CG limit. Slow the airplane in a level 1g stall maneuver until it encounters a normal power off stall, or until the horizontal stabilizer stalls and "bunts" the plane over on it's nose to a vertical dive. (It's amazing how fast you can reset the flaps in that flight attitude). After that, reset the CG aft about an inch and repeat the test. When you get it set so the airplane doesn't encounter the bunt anymore with 40 degrees of flaps you have established your forward CG limit.

Every experimental airplane should be tested to determine both forward and aft CG limits, and a weight and balance report developed during the flight test period. Certified aircraft undergo these tests to define the CG envelope and the owner/pilot never has to think about them.

Lyle Trusty



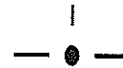
Hal:

I received a copy of Lyle's response regarding 30 versus 40 degree flaps. As he indicated, 30 degrees is required and is called out on the S-18 drawings. I checked Frank's drawings and his 631 Installation Dwg. is obsolete. That drawing was

updated and reflected the 30 degrees. The 743 dwg. of the flap bracket is 30 degrees, so if the part was built to the S-18 743 dwg. it would be correct.

I started a drawing update for reidentification and a revision system for all S-18 drawings. This is being done to eliminate this type of problem. Too many drawings with different information with no revision letter. I will drop off a drawing revision list at Frank's the next time I am over that way. Any questions, please don't hesitate to call. Thanks. Classic Sport Aircraft, Mike Archer

*Editor's Note: Printing the drawing revision list in the newsletter would be a good idea. How about sending it Mike?*



**Subject: T-18 Parts For Sale**

From: "Lee Walton" <lwalton@enron.com>  
Richard,

If at all possible would you mind including the following in the next issue of the T-18 newsletter. I have some parts that need to find a T-18. Thank you. Lee Walton

T-18 Parts For Sale

<2> Sets of Fiberglass Thorp/Style Cowlings - These are the remaining two from a set that my father made for a group of T-18ers.

<1> Left Hand Aileron for the folding wing with the integral Aileron Trim Tab

<1> Instrument Panel - I believe this one came from Sport Aircraft when Ken Knowles still owned it (No holes cut)

<1> Wheel Pant - No holes cut.

<1> Set S-18 Plans - Not used

All prices are up in the air (within reason). I'm just trying to get them out of my garage and onto an airplane. I can be reached at work during the day 713/345-5652 or 713/479-7223 or by e-mail lwalton@luminant.com

Subject: Propeller pitches  
"William Hymen" <t18\_pilot@hotmail.com>  
Hi Rich.

I have a propeller question/problem.

We have a O290 D2 on our 900 lb T18, and Sensenech recommended at 66 diameter x 74 inch pitch wide-chord prop. However, we can't get the recommended RPM on the engine.

We tried the 74" pitch prop on another T18, which has an O290 GPU with an O340 crank, and the extra horsepower really works well with the higher pitch prop.

During this test, we simply "swapped props" and put a 68" x 64" pitch narrower-chord prop on the O290D2 t18 (lower horsepower), and the RPM came up much higher.

Do you have an idea what diameter and pitch is recommended for a light T18 with a lower Horsepower engine, like the O290D2 ? Its not a strong engine. Bill Hymen

*Editor's Note: Drop Bill an email if you can help with the prop question.*



From: "Glenn Smith" <oakav@earthlink.net>

Richard,

I would like all back issues. I'll send you a check. I bought a 'per plans' Thorpe with an O290 converted engine, 400 hrs. TT engine and airframe. Excellent metal work. Light, stock, no mods. Beautiful Imron blue and white starburst paint. It's been sitting for a couple years so we are going to start the annual next week. I can't wait. I fly 'non-fun' type airplanes for a living... this is my mid-life crisis sports car.

I am going to fly to Porterville for the fly-in. Probably won't have the Thorpe ready, but I'm going anyway! Thanks for the response.

Glenn Smith

*Editor's Note: I've been having a mid-life crisis for about 30 years!*

From: "Miles Day" <milesday@hotmail.com>  
Dear Richard

I have purchased a Sunderland / Thorp S18 in Australia. I am learning to fly and have been told by our Civil Aviation Safety Authority (CASA), that I will not legally be permitted to train in the aircraft unless dual brakes are fitted. Currently there are only brakes on the left hand side.

My only option appears to be to find a friendly licensed aircraft mechanic to assist me with installing and signing off the installation of dual brakes.

I have the drawings that were used in the construction of the aircraft, they are only for single brakes.

There are no mounting tabs on the right hand side rudder bars for the dual brake pedals, also there are no mounts for the bottom pivots of the right hand side master cylinders. The manifold block that the brake lines from the left hand side master cylinders connect to, appears to have additional tappings for the right hand side brake lines.

To perform the dual brake installation and satisfy CASA, I require drawings for dual brakes. It appears that some of the original brake componentry was purchased from Ken Brock.

I was interested as to whether there are existing drawings and componentry available to perform the dual brake installation. Any information you can provide would be greatly appreciated.

Best Regards

Miles Day

290 Church St Richmond, Victoria Australia  
3121.

email. milesday@hotmail.com

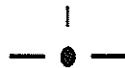
*Editor Note: I was able to steer Miles to the right folks to help get him information on dual brakes.*

Dear Rich,

My name is Mike Murchie & I've recently come into possession of a rather poorly built, unfinished T-18 project which I've been dismantling to extract all of the beautifully machined & welded Ken Brock (?) parts to be used in a new project. These items include such items as the landing gear A-frame, engine mount plate, battery box with brackets, tail spring, elevator push-pull tube, wing spars (require changing a few rivets to correct size), all firewall machined bits & pieces, etc.

As I'm not really interested in building a T-18 (sorry), I'd like to find someone who ~~would~~ really like to acquire these parts, along with the planset, & put them to good use. At the very minimum, I'd like to trade for a set of Wittman W10 plans, landing gear, & the remainder as cash.

Any assistance that you can give in directing this info to the right person would be greatly appreciated. Mike Murchie RR#1, Site 10, Comp. 7, Fort St. John, B.C.  
V1J 4M6  
CANADA  
PH/FAX 250-785-5653



Richard, below about 3/8ths of a tank, I was having fuel-feed problems with my gravity-feed fuel system T18. Finally discovered the problem was the hookup to the forward-facing tank vent - it had become disconnected because I'd used a plastic hose and no clamp at the tank fitting. The hose had shrunk in length enough to pull itself off the tank fitting. The tank vent hose is now rubber fuel/emissions hose with a clamp securing it to the tank fitting! Enclosed is a table which shows the pressure rise in the tank from ram air effects. The speed is in 2-knot increments from 60 to 160. Ed Pernic N137EP. "Pernic, Edward"  
<Edward.Pernic@AlliedSignal.com>

*Editor's Note: I've left off Ed's table because of space considerations. Anyone wishing this data can contact Ed via email.*

Subject: my S-18 project

From: *With-holding name to protect editor!*

Organization: Attorney-At-Law

Dear Mr. Snelson:

Saw your article on the net and wanted to contact you concerning a Thorpe S-18 project that I bought partially completed. Much of the work is done. I must build a right outboard wing, install the panel and canopy, plus firewall forward and interior.

I have been looking around for an engine, but don't know what types of engine have been successfully used. I have found a 220 h.p. lycoming radial engine. I have also located a 220 h.p. franklin engine. Do you know if anyone has ever used this large an engine on a S-18?

I also wish to contact a builder of a Thorpe in my area, which is the northwest corner of Alabama, about 120-150 miles from Birmingham, Memphis, and Nashville. Do you know of any one?

I would like to not place a fuel tank in front of the panel, but use this for luggage. Is there sufficient area in the wings to hold sufficient fuel for cross country flights? About how many gallons?

How to I contact Classic Sport Aircraft?

Thanks for your help. You have a beautiful aircraft. What type of engine and prop do you have and what are the performance figures? I would like to get your telephone number.

*Editor's Note: Comments any one!! I'm not sure xxxx will ever email me again, after my response.*

*P.S. He still hasn't ordered the past newsletters! Don't you think he should.*

Rich,

The post office did a good job getting the newsletter to me, forwarding it twice! First to the rental that we stayed in while we built our house and hanger, then to our new house. The new house is at Alta Sierra, a private airstrip. The hanger is a 50-foot walk from the house. The driveway-taxiway has a 15% slope. A little scary first time down, but Fat Cat handles it well. We have a sweeping view of the Sierras from the house and the hanger. Our new address is 17436 Airport Ave., Grass Valley, CA 95949. Telephone: 530 273 2164 and E-mail: harveym@necn.net.

The airport is on the San Francisco sectional and all T-18ers are invited to drop in. Call first to get directions on using the strip - it is one way - land uphill with a tailwind, take off downhill.

With a new 36x42-foot hanger and time on our hands a new project is calling. I just bought two partially completed Volksplanes. With Fat Cat satisfying our fast transportation needs, I wanted an open cockpit, low and slow, fun plane. Besides learning new wood and fabric skills, I will have another subject to apply my aerodynamic ideas to. That design could really use some aerodynamic cleanup!!! Harvey and Stephanie Mickelsen



Dear Richard,

Sorry to hear that you will not make it to Canyon City next weekend. I plan on going and have invited Al Pereira (T-18 builder and new Tucson resident to go with me. We will leave Tucson Friday morning about 9. Should take a little less than 4 hours.

Here is my dues for the NL. Sure do appreciate your work.

Here is a tip someone might be able to use. When I was painting some of my Buker parts yellow, some overspray drifted back into the hangar and got on my gloss black T-18! I was sick. Gus Gordon told me about a product called CLAYWAX sold at any automotive store. I found some at the local Pep Boys and tried it. It is unbelievable! It now looks better than before. I sure will be more careful next time.

It is hard to believe but I have now been flying my T-18 20 years. It took seven years to build so that means I started it 27 years ago. Here are some prices from that era: 4'X12' sheets of 2024-T3 .025 was \$14.20 per sheet. A landing gear from Merle Jenkins (long leg) was about \$175.00. I paid \$1,500 for my Lyc 0-360 A3A but had to overhaul it. I think the canopy and windshield were \$425. Counting inflation, maybe the prices aren't any more now! Hope to see you at Kentucky Dam in October. Steve Hawley



Rich & RoxAnne.

Hope all are doing fine. Did you ever pick up another Thorp project? Hope to see you in the air again soon. I'm afraid I won't be able to make the Colorado Fly-in. My folks and my brother will represent the family.

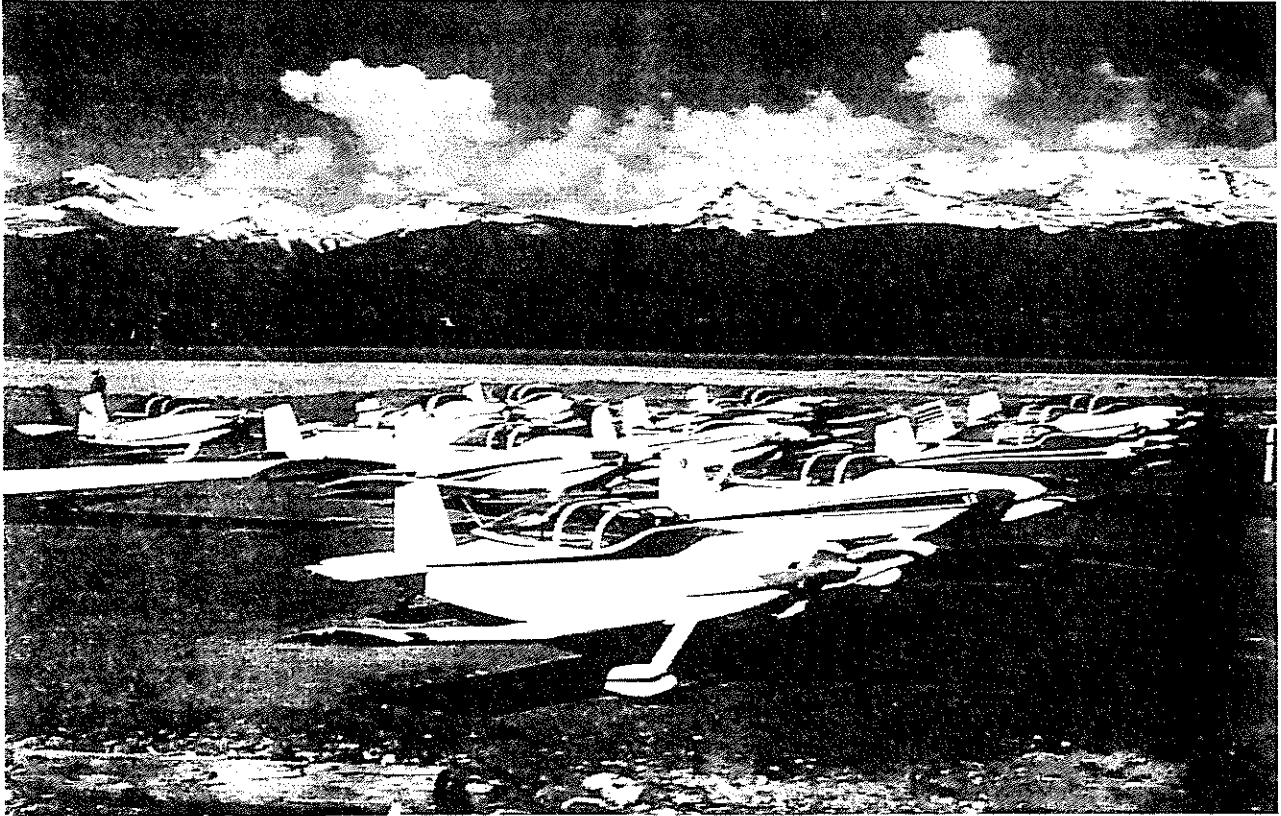
Enclosed is some dues money and a picture of my "kid" that are flying. Mon and Dad have the 47 Aeronca Superchief right now but it will soon go to my brother in Colorado. So he can teach his kids to fly. We've got to keep the tradition alive.

Take care and thanks for keeping the T-18 M.A.S. alive and well. Kind Regards, Tony Ginn.

*Editor's note: Tony and his "kids" are on this newsletter cover. Great shot Tony.*

## Colorado Thorp Fly-In

*by John Evens*



*This beautiful shot of the Thorps with the mountains in the back ground is posted on our web page.*

The first Colorado Thorp fly-in, June 11th-13th, was a great success. It was hosted and planned by Walt and Bev Giffin in their beautiful hangar at Fremont County Airport near Cañon City, Colorado. They were helped by John and Vicki Evens, and Dean Cochran, along with a tremendous amount of support and assistance from the airport manager, Dick Baker. Dick owns a beautiful T-18 himself. With the help of Dick and others, we had free hangar space for at least 20 T-18's, and with the threat of afternoon thunderstorms it was greatly appreciated by all.

The count showed 20 T-18's in attendance and several T-18 "Wannabes" (something called an "RV"). The Thorps came from Florida, North Carolina, Texas, Arizona, Washington, Missouri, California and Colorado. Some of the long distances flown and driven were testament to the airplanes we love and the friendship and camaraderie of our group.

Friday morning was exciting, with a rampaging bull on the field. After jumping over the tail of a sailplane, he was finally corralled. From then on many low passes over the runway (also known as "bull checks") had to be made.



Close to 50 people had arrived by Friday, and pizza and cold drinks were served at the hangar that evening. Saturday dawned with low winds and clear skies. After a short mountain flying briefing, 13 Thorps (and a couple of RV's) took off in groups of 3 or 4 to the West and into the Rocky Mountains, landing at Leadville, the highest public use airport in North America at 9927' MSL. Many beautiful sights were seen along the way, including the Royal Gorge Bridge west of Cañon City, beautiful mountain lakes, and some of Colorado's 14,000' peaks. Donuts and Coffee awaited us at Leadville, and many landing certificates were awarded (and expensive T-shirts and caps purchased). All agreed that it was a great and exciting trip.

A planned trip for lunch and on to a tour of the Royal Gorge, for the ladies, was canceled due to lack of participation. However, several of the group made the trip by train to the Gorge by themselves later on Saturday. Perhaps ten people also made a trip that afternoon to see the facilities of Bob Henderson, who does bronze sculptures of aircraft. A beautiful T-18 done for Dick Baker, and a large memorial to singer/pilot John Denver were on display at the Giffins' hangar. A couple of his aircraft sculptures are mounted at the airport, and his work can be seen, among other places, at the Air Force Academy in Colorado Springs.

There was quite a bit of flying and looking at T-18's all day long until the "Thunder Bumpers" began to build again in the afternoon. We got some heavy rain, which soon cleared. All Thorps were safely tucked away before the storm. That evening, we all enjoyed a banquet of prime rib at the Cañon Inn.

Sunday morning was the time to say our good-byes, and wish good friends a safe journey.

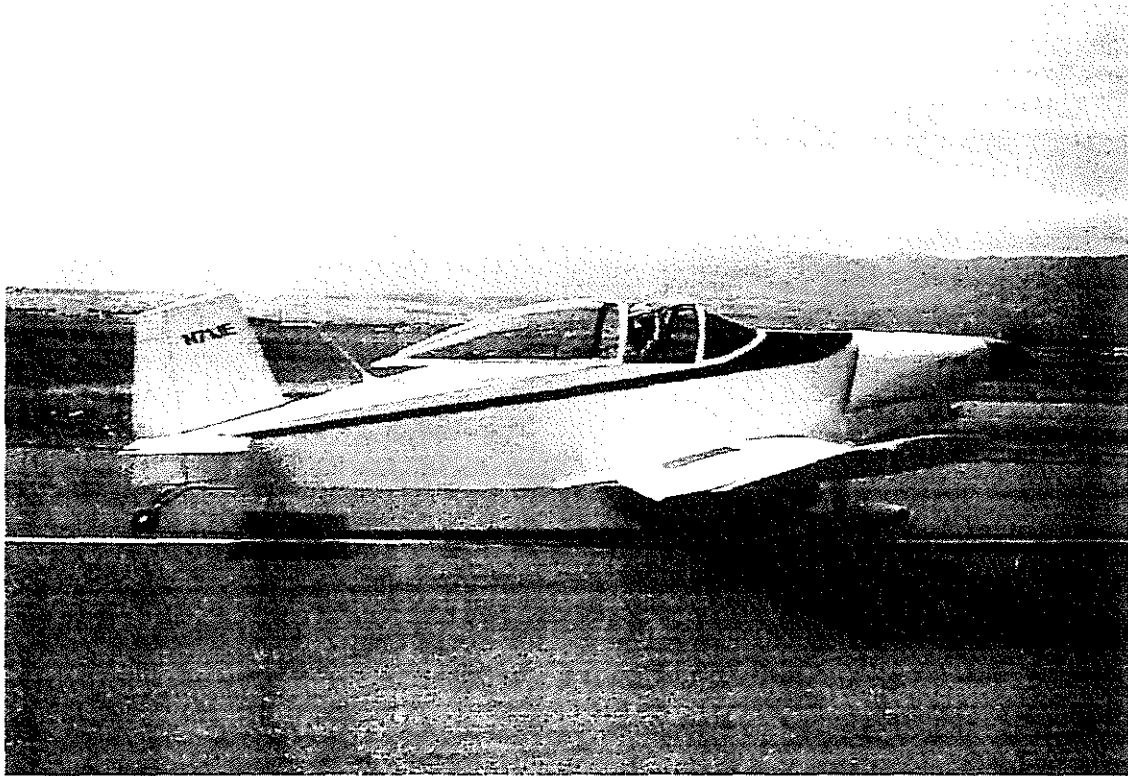
The following people were in attendance. I sure hope I'm not forgetting anyone. The first 20 couples and individuals flew in with Thorps, followed by those who drove, and finally our RV friends.

#### Colorado T-18 Fly-In Participants:

Walt and Bev Giffin. Pueblo West, CO. N78WG  
 Richard Baker, Canon City, CO. N976DB  
 Jim and Judy Paine. Hendersonville, NC. N747JP  
 Jerry and Carol Sheetz, Hendersonville, NC. N32AH  
 Ross Mahon. Kirkland, WA. N467JF  
 John and Vicki Evens. Arvada, CO. N71JE  
 Dean and Tony Cochran. Broomfield, CO. N11DC  
 Ron and Jane Hayes. Blue Springs, MO. N102RH  
 Steve Hawley and Al Pereira. Tucson, AZ. N9008Z  
 Bill and Mary Mitchell. Denver, CO. N895T  
 Chuck and Linda Borden. Santa Margarita, CA. N243X  
 Howard and Elaine Ginn. Camp Verde, AZ. N22DU  
 Rick and Louann Jones. Granbury, TX. N18117  
 Ed and Miranda Askins. Ft. Worth, TX. N2NE  
 Damon and Donna Berry. Shadowridge, TX. N89ER  
 Gary and Maxine Green. Granbury, TX. N118GG  
 Les and Margie Conwell. New Port Richey, FL. N181LM

Bill and Debbie Williams. Lakeland, FL. N30WW  
Bob and Susan Highley. Lakeland, FL. N711SH  
Pete Gonzalez and Scott Ginn. Colorado Springs, CO. N380G  
Richard and Kathy Brandiger. Rapid City, SD  
Ken and Donna Post. Rapid, City, SD  
Les Krumel and son. Cedar Crest, NM  
Bill and Austin Cordoza. Woodland, CA

*Editor's Note: Thank's to John Evens for a good report on the Colorado Fly-in.*



*John Even's and his Thorp at the Colorado Fly-In. A beautifully built Thorp. Nice job!*

# OSHKOSH "99" REPORT

*by Roy Farris*

Oshkosh "99" The single best word that describes this years EAA Air Adventure is "HOT"! I mean the temperature, not the activities! Wednesday through Friday the daily highs were in the mid to upper 90s as was the humidity, which made for a very uncomfortable few days. Friday night a nasty cold front moved through with lots of wind, lightning and rain. For those of us camping, it was quite a long night. Saturday morning brought with it a perfect temperature and clear skies. I did notice though, that several tents were missing that were there the night before. The wind made them disappear. I heard that a few ultralite aircraft were damaged by the storm, but I did not hear of any other significant damage.

Oshkosh itself was about the same as it is every year, high prices, warbird favoritism, and commercialism. I believe all three were worse than ever. A friend of mine purchased a hamburger, fries, and a lemonade and it cost him eleven dollars and some odd change. That seems a bit steep to me, but again that's Oshkosh. The show grounds have been moved around again, and everything was spread out. I believe the number of aircraft was about normal, but due to them being spread out, you had to do a lot more walking to see them all. The daily airshows went on as usual with mostly the same pilots and routines that we have seen for ~~years~~. There were a couple of new acts and aircraft that turned heads, like Jim Franklin and his jet powered Waco and Wayne Handley flying his Turbo Raven.

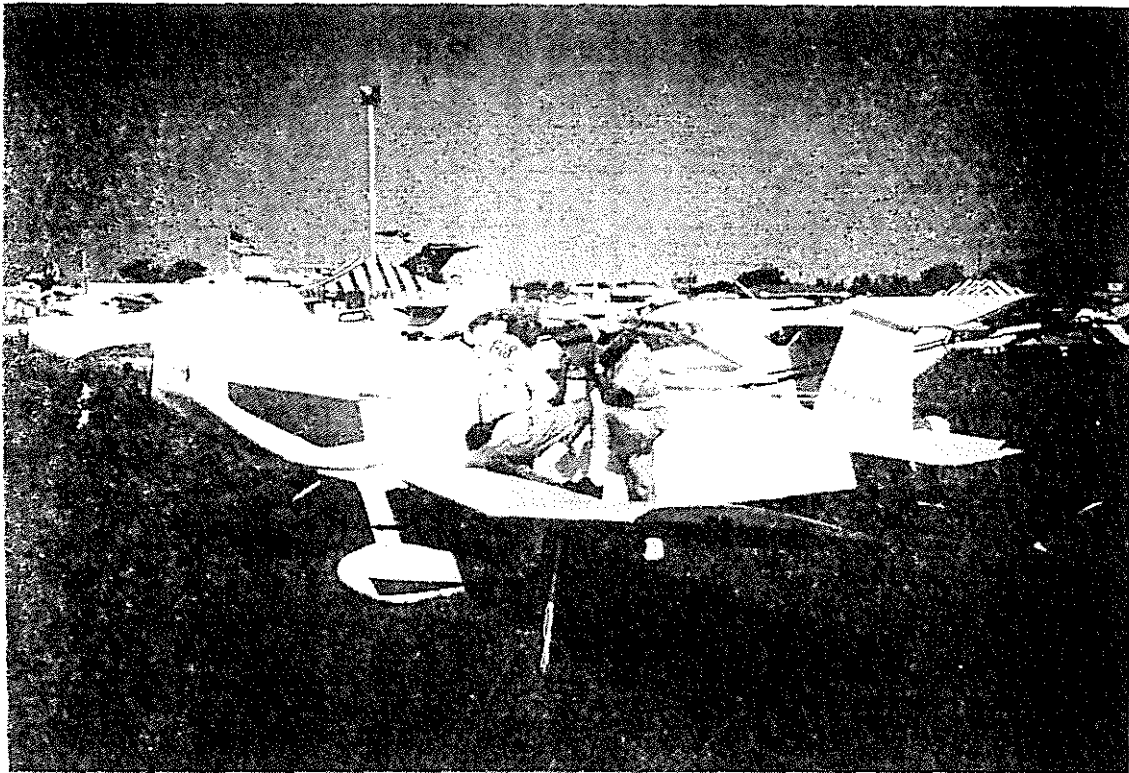
One point of interest, Bob Highley flew his T-18 in the RV formation on Friday and Saturday during the show. He flew with a gaggle of RV's including RV-3's, 4's, 6's and one Harmon Rocket. Bob said that he had no problem staying with them at all. He looked good up there and was quite easy to spot, being the only one with bent wings. I heard the announcer both days, and he pointed out the one with the bent wings was a Thorp T-18. Bob stated that we need more formation qualified Thorp drivers and we could

put up our own formation.

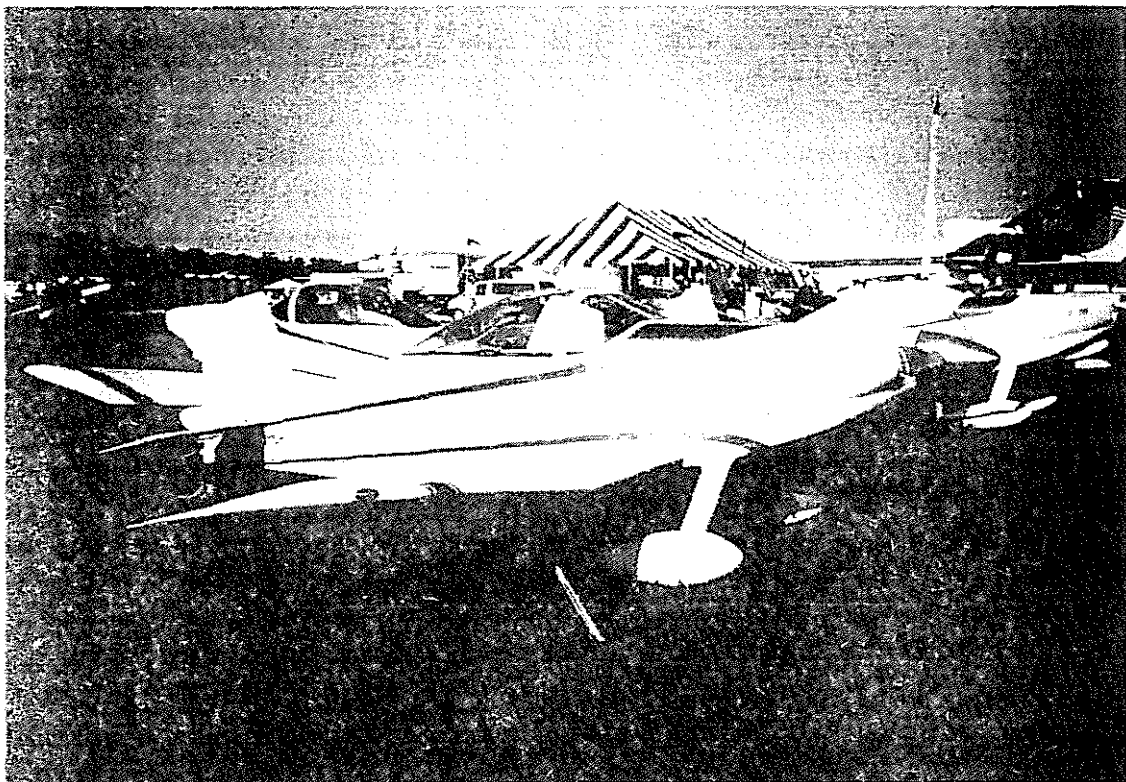
I'm not sure why but no one took an accurate count of T-18's this year. but it was estimated that we had between fourteen and sixteen on the flightline. I know of at least one T-18 that was turned away and had to land at Fondulac. The controllers told our T-18 driver that the field was closed to all aircraft, except by invitation only. The same thing happened to at least one T-18 last year.

Attendance at the forum/lunch was down a little this year with seventy five of us ignoring the heat and showing up for Bill Williams famous Brats. We want to thank Bill and Debbie Williams, Bob and Susan Highley, Ben and Teresa Scolla, Margie Conwell and everyone else that helped to put on the great feed and forum this year. As for the forum portion, we did not have a PA system this year and the helicopter noise made it nearly impossible to hear anything. Richard Ecklund gave us an update on his kit progress. He is working continuously, and the parts that he has completed look really good. He also reports that he has sold several sets of plans throughout the last year. The T-18 seems to be on the comeback trail. Bill Williams talked about flying in the T-18 and told a few stories. He then opened the floor to open discussion and a few questions were asked and answered by the group. Classic Sport Aircraft was curiously absent from this year's activities. I guess that about wraps up this year's EAA Air Adventure. We will try it again next year. See you there. Roy Farris

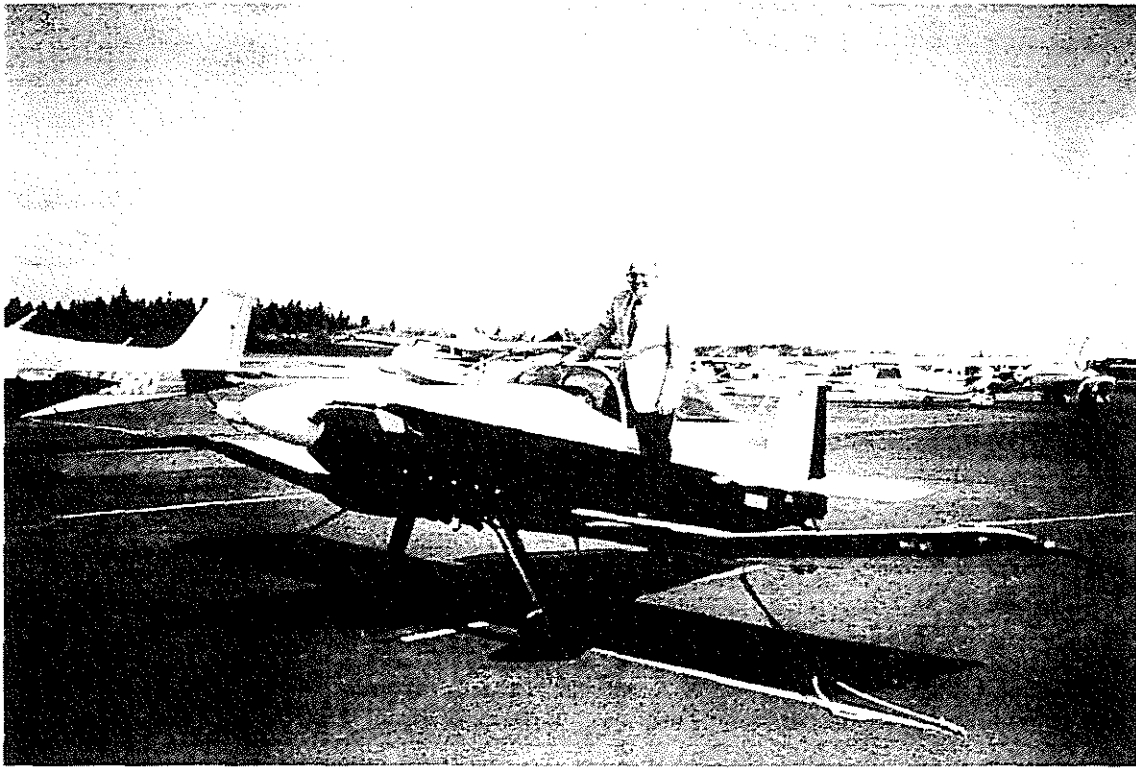
*Editor's Note: As those of us in the mid-west know Roy Farris shows up at all Thorp events he can get to. He's the first to be ready for a T-18 ride and has flown in most of our T-18s "many times." We have known for some time he would drive all day to get a ride in a Thorp! Now we've heard the latest, Roys going to visit Australia in Nov. because he's heard they have T-18s there. Gas up Aussie's the boy is on the way. Roy, just stay home and finish your T-18 project!*



Some Oshkosh 99 photos sent in by Dick Ecklund



*We see this airplane all over the country! Bob Highley never stays home except during Sun N Fun.*



*Tom and "josh how I miss her" N295RS*

Dear Richard: Re: N295RS

I'm assuming you got my note about acquiring your former T-18 from Pat Rokus in Roseburg, Oregon (and the check for the Thorp T-18/S-18 Mutual Aid Society). Pat delivered the plane to me in Aurora, Oregon on May 27th and my instructor John Paquete provided the much needed guidance from there.

Needless to say, my 75 hours in conventional gear aircraft was inadequate since it has been more than 50 years from that experience. After being turned loose last week, I have tried to fly most every day to bring up my skill level. Last Saturday I put in 4.5 hours with a trip from TIW Tacoma to HQM Hoquiam (mandatory Saturday breakfast). I then flew down to RDM Redmond (Oregon) and returned that evening. TIW had a 16 knot headwind with some crosswind (very turbulent) and gusting to 20 knots. It took most of the runway for me to get it down (really need that wheel landing instruction).

Your web page photo of you stepping in to N295RS is so striking a pose that I copied that stance for my friends to take a picture ... hope you don't mind the plagiarism.

So far I'm up to news letter #65 and I finally got an e-mail address for Classic Sport Aircraft. He sent me a price list for parts (RH lower cuff got loose and self destructed). Aircraft Spruce will send me a catalog also. What other suppliers are there out there? Also, I like to keep a complete list of equipment installed with the vendor who supplied them. I may have to get back with you if I can't find a listing from the stuff Pat supplied.

I made the 1997 Oshkosh scene, but it's probably not in the cards for this year. I plan to hit the Arlington, WA "Western Oshkosh" in July and plan to visit Mike's (CSA) booth. Best regards, Tom Worth



Eklund Engineering, Inc.  
PO BOX 1510  
LOCKEFORD, CA 95237  
209-727-0318  
FAX 209-727-0873  
e-mail ThorpT18@compuserve.com  
1/20/1999

For the Thorp T-18 builder, the following components are offered:

**MATERIALS and COMPLETED COMPONENTS:**

#637-2 Upper Main Beam Channel Extrusion - \$126 plus freight ... Custom extruded 2014-T6 aluminum, 133 inch length by 2 x 1.26 inches to reduce waste and trimming time.

#537-3 Lower Main Beam Angle Extrusion - \$105 plus freight

#1072, 4" Prop Extension, Clear Anodize with #905 Driving Lugs for the Lycoming O-360 engine - \$235 includes UPS standard delivery in USA. International delivery quoted promptly.

**CAD/CAM PRODUCED COMPONENTS and KITS:**

#502-1 2024-T3 Alclad Horizontal Tail Skin - \$87.20 per skin plus shipping.

These laser cut skins have all holes to size (except the -8 internal weight bulkhead holes) and are free formed to the leading edge radius. Only a light deburr of both sides of the holes is required plus dimpling.

#502-4 2024-T3 Alclad Horizontal Tail Stiffener - \$9 each plus shipping. ... Fully formed with holes to match #502-1 laser cut skins. Builder to deburr and dimple.

#502-8 2024-T3 Internal Tail Weight Bulkhead - \$16.50 per bulkhead plus shipping. ... These laser cut parts have all holes as .098 pilot holes to be enlarged for 1/8 rivets on assembly. The flanges are formed to the mating angles.

#503 6061-T4 Tip Rib -Horizontal Tail - \$24 each plus shipping. ... Ribs are fully formed with all holes to match laser cut #502-1 skins. Laser cut transfer strips can be provided for the skin (#502RSTRP @\$20)and/or spar (#502SSTRP @\$20) laser cut rivet patterns. Require builder to deburr and dimple if desired.

#506 6061 -T4 Tip - Horizontal Tail - \$90 per set (4) plus shipping. ... These stretch formed aluminum skins have flanges for rivet joining the halves, or they can be trimmed and welded per the drawing.

#517-1 2024-T3 Horizontal Tail Tab Skin, 517-2 Trailing Edge Strip and 517-4 Rib\$39.00 plus shipping. ... Laser cut skin, Strip and Rib with all holes cut to accurate size and formed as needed. Requires light deburring and dimpling prior to closing and riveting.

#611 6061 -T4 Aft Root Rib - Horizontal Tail - \$12 each plus shipping. ... Fully formed with holes to match the #502-1 laser cut skins. Laser cut transfer strips can be provided for the skin (#502RSTRP)and-or spar (#502SSTRP) laser cut rivet patterns. Require builder deburr and dimple if desired.

#612 6061 -T4 Leading Edge Rib - Horizontal Tail - \$16 each plus shipping. Fully formed with holes to match #502-1 laser cut skins. ... Laser cut transfer strips can be provided for the skin (#502RSTRP)and-or spar (#502SSTRP) laser cut rivet patterns.

#613 2024-T3 Horizontal Tail Spar - \$23.90 per spar plus shipping. ... The spar has all mating holes from the skin and ribs to size. Deburring and dimpling to be performed by the builder.

#531 R Aileron Kit - \$221 plus shipping ... All sheet parts are laser cut with accurate holes and are formed and primed as required. The builder need only deburr and dimple prior to riveting the assembly.

#561 Vertical Tail Kit - \$290 plus shipping ... All sheet parts are laser cut with accurate holes and formed as required. Formed ribs have all holes. The builder need only deburr and dimple prior to riveting the assembly.

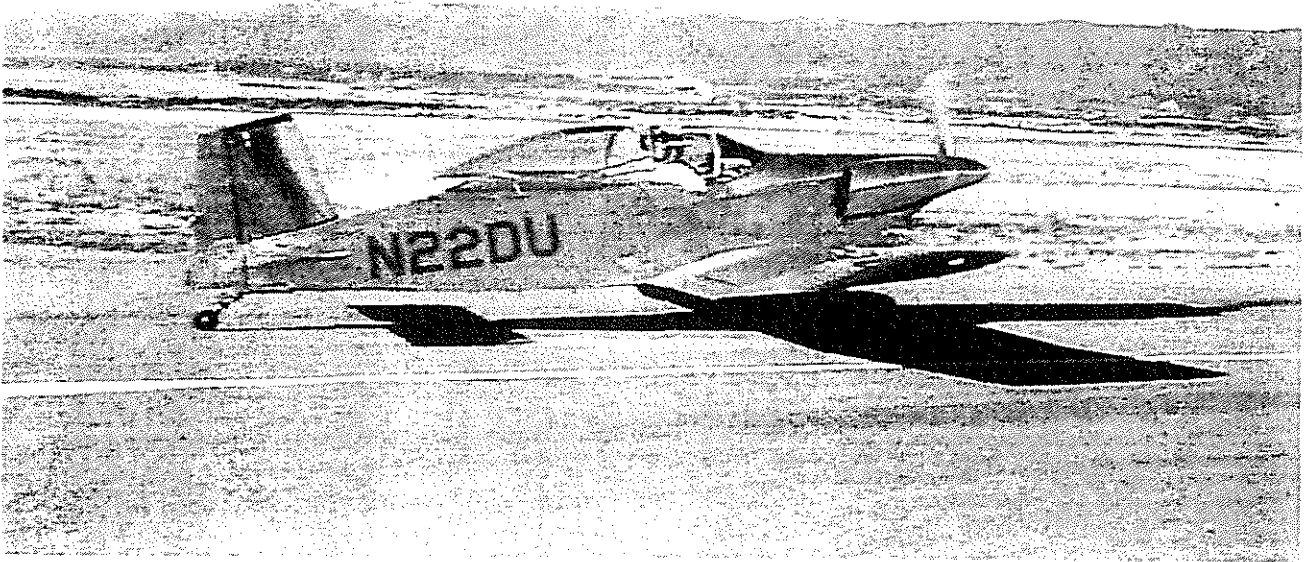
#569 Rudder Kit - \$375 plus shipping ... All sheet parts have laser cut accurate holes and are formed as necessary. Require only light deburr and dimpling prior to riveting.

NOTE: Additional sub-assembly kits are under development with the goal of making a complete airframe kit available in the near future.

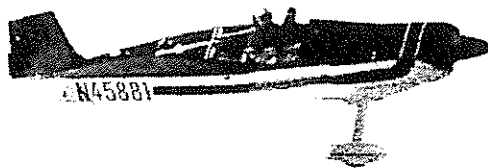


*Ecklund Engineering's Thorp N181RE at Oshkosh 99*

## Great Thorp Shots



*Howard and Elaine Ginn's shiny N22DU. They live at Camp Verde, AZ.*



*Jim Alfonso's in a wonderful air-air shot. He's from Whiteman Airpark, Los Angeles, CA.*



## For Sale Items

**THORP T-18** (the most fun you've had since your honeymoon) Wide body, convertible wing, 242 hours on new Lycoming 180, Hartzell CS prop, professional polyurethane orange on white paint, Full IFR panel, King Avionics, ADF, Narco Loran, M.B., Loaded with extras: 60 gal. fuel/wet wings, wing leveler, electric flaps, elevator trim, aileron trim, heated pitot, oil pan heater, Temperfoam seats, strobes, Sigtronics intercom, David Clark head sets, \$55,000 firm, Jim Fix

**For Sale:** Thorp T-18 Project: Fuselage on the gear. Include wings, tail and other surfaces. Canopy is included. Contact "Chris Belobrajdic" <cbelo@earthlink.net> Phone: 618-624-0253

**For Sale:** Floyd Myers' Thorp T-18. The aircraft is completed and signed off, but has not flown. It has a three bladed prop and a Subaru Engine. I had talked to Floyd only a few days before he passed away and he was asking \$18k for the aircraft. His wife can be reached at 801-476-0153 in Ogden, UT.



*Floyd Myers and his Thorp T-18.*



White on indigo blue



Navy on tan

## T-18 T-Shirts

High quality – All cotton  
 \$15.00 + \$4.00 S/H (Priority Mail)  
 (Up to 2 shirts for the \$4.00 shipping)

Sizes: L, XL, XXL Colors: Indigo Blue or Tan  
 (Limited quantities on some sizes)

| Qty. | Color | Size       | Total |
|------|-------|------------|-------|
|      |       |            |       |
|      |       |            |       |
|      |       |            |       |
|      |       | Total Cost | \$    |

**Name:** \_\_\_\_\_

**Address:** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Phone:** \_\_\_\_\_  
 \_\_\_\_\_

**Send to:**

John or Vicki Evens  
 6855 Allison St.  
 Arvada, CO 80004  
 (303) 420-2724

**e-mail:**

jrevens@aol.com  
 vicreads@aol.com

**T-18/S-18 Thorp Newsletter**  
**Richard Snelson**  
**Route 3, Box 295**  
**Clinton, IL 61727**  
**Phone: (217) 935-4215**  
**email: [rsnelson@dave-world.net](mailto:rsnelson@dave-world.net)**

Still need dues for folks with red circle on label. Check with me if you think my database is incorrect. Sorry if it is. Rich

Coming next Issue --- in December

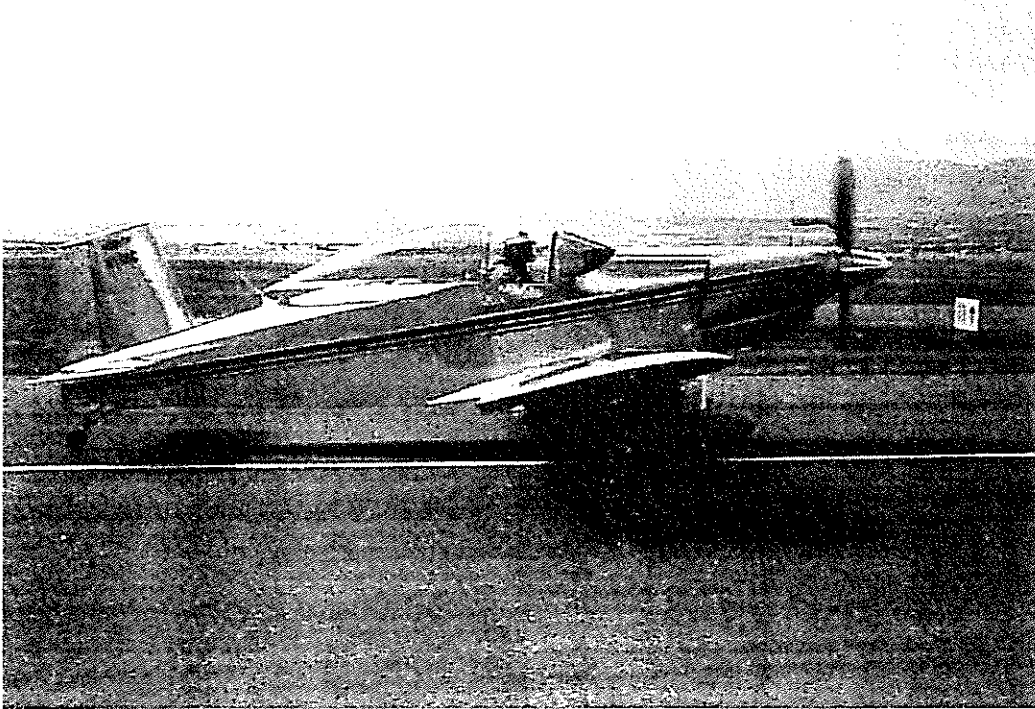
Up-to-date Thorp Newsletter Index

More Thorps on the Web

Kentucky Dam Fly-in Pictures

Let me know if you would like to be a Thorp Ambassador for your area. I would like to 1-2 people with flying T-18s/S-18 in each area of the US. And the same for our overseas members. I plan, with your permission to have the Ambassador's names, phone numbers and email address on the Thorp web page and in the newsletter.

# T-18 NEWSLETTER



*Dean Cochran on his takeoff roll at the Colorado Fly-IN*

## IN THIS ISSUE:

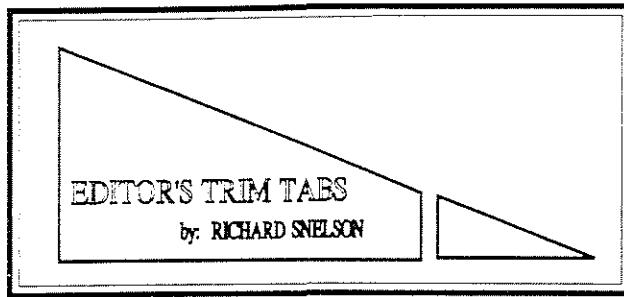
**Master Index for the past Newsletters**

**Larry Eversmeyer wins Lindy Trophy**

**T- 18 Auction Provides Excuse To Fly**  
**by Russ Verbael**

**Wing Panel Reskin**  
**by Ken Morgan**

*NOTICE: (STANDARD DISCLAIMER) As always , in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.*



## Thorp Ambassadors

As of this date the following individuals have signed up to be listed as Thorp Ambassadors. I will be posting their names on our Thorp webpage in February. If I have missed anyone that wanted to be included please let me know.

As all of us knows, we literally have hundreds of Thorp Ambassadors throughout the world. Anyone that has built or flown a T-18/S-18 loves the aircraft and has a passion for John Thorp's wonderful designs. Our list of Ambassadors give new individuals someone to contact in the various areas of the US and world. Having this on the website will help spread the word. So join the Ambassador list, email/mail me a note today!

Danny Cummings  
600 West Main St.  
McMinnville.Tn. 37110  
931-473-5401 Days est 8:00 to 5:00  
931-668-9899 Nights before 10:00 cst

Gary Cotner  
150 th East Ave  
Collinsville, OK 74021  
email t18cotner@aol.com  
918-259-4000 Days  
Home 918-371-4739

John Evens  
6855 Allison Street  
Arvada, CO 80004  
303-420-2724

Roy Farris  
Box 182  
Noble, IL 62868  
618-723-2594

Jim Hockenbrock  
193 Fawn Rd.  
Reedsville, PA 17084  
717-667-2790

James Paine  
1220 Gilbert St.  
Hendersonville, NC  
28792  
828-698-0368

Tony & Viv Schischka  
<a.schischka@xtra.co.nz>  
17 Bodmin Terrace  
Plimmerton, New Zeland  
644-233-8998

John Sullivan  
P.O. Box 551  
Chestertown, NY 12817  
518-494-3292

## Other News

The great news is that by the end of January I will be retired from Illinois Power Company. After a lot of struggle they finally offered us, the engineering group, an early retirement package. It added 5 and 5 to our age and years of service. This really helped me since I had worked there 16 years. I have a piano tuning business started and it is growing and should fill some of the income void that leaving engineering will cause.

## Spring Fly-in at Mattoon, Illinois

We have things setup for a June 9, 10, 11, 2000 fly-in at the Coles County Airport located near Mattoon, Illinois (MTO). The airport folks are setting up some rooms at the area motels. I think the Comfort Inn will end up as the best rate. Roy Farris will be the contact for this fly-in and can be reached evenings at 618-723-2594

## Send year 2000 dues now.

Looking forward to having more time for doing the newsletter. I won't have as many \$ so send your dues now. Still have 10% who haven't paid for 1999! Printing keeps going UP!

## Letters to the Editor

From: Danny Cummings  
dctires <dctires@InfoAve.Net>

Rich.

Just got my newsletter and as usual "I luv it " !!!!  
Great job your doing ! Also Luis's T-18 site is  
great as well !!! I also have some pics of my  
S-18 (118CK) on his site !

Anyway hope you and RoxAnne are doing  
fine? As you might know or remember me I live in  
middle Tennessee about half way between Chatt.  
and Nashville in Warren Co.(McMinnville). I have  
attended K-Damn for the past 5 years and really  
hated to miss this last one \*pout\*. But the  
weather was just too bad.

I was gonna have a friend follow me to K-Damn  
too. he has built (from what he calls a Turner  
crossbreed) a 1/3 Whitman, 1/3 Davis2A and a  
1\3 Thorp !!! I know your probably scratching  
your head by now, but its a really great plane and  
has flown over 100hrs. since May of this year ! I  
have included a pic of his airplane ! It has Thorp  
wings and tail cfg. A little longer wing for a  
2000 ft. grass strip !! By the way his name or the  
builder is Mr. Bill Turner (the not so rich and  
famous one). He has been appointed as an EAA  
thingy (you know when builders have questions,  
they can go to him).

But I have the S18(118CK) and I'm here anytime  
there's a person or persons who would like to  
look at it or take a ride in it. So if you need  
someone in this area I'm available and I'll leave all  
the technical questions to Mr. Turner, by the way  
he knows his homebuilts and especially the T-18 !  
I've included a few photos of my S-18 and Mr

Turners crossbreed. If you're ever over the  
bridge or the poor part of this country drop in  
and see us !!! Bye!

Danny Cummings  
600 West Main St.  
McMinnville,Tn. 37110  
931-473-5401 Days CST 8:00 to 5:00  
931-668-9899 Nights before 10:00 CST

*Editor's Note: Thanks for the email and the  
pictures Danny. Welcome as a Thorp Ambassa-  
dor. I've include the pictures at the end of this  
section. See you at Mattoon and KY Dam. Rich*



Subject: [ThorpList] 2000 Bar-B-Que  
From: "Charles and Linda Borden"  
<cbbitt18@concentric.net>

Dear friends: I am faced with a real dilemma,  
every year the weather is great in Paso Robles in  
February for the T-18 Bar-B-Que. But it is  
terrible everywhere else. I mentioned that we  
would have it in March next year so more  
people could attend but then we had terrible  
weather here last March. Also my wife and I are  
going to start building a house in February or  
March.

So I am asking for some Ideas. Please give me  
some feedback. I was thinking mid October.  
Does that interfere with anything? Send  
me an e-mail with your comments. Chuck  
Borden



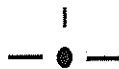
Hello Everybody,

I name is Dave White and I have a Thorp with  
serial number 2. According to the Thorp news-  
letters of way back my airplane is none other  
than John Thorps, first flown in 1972. Well,  
many. owners later the plane has managed to  
get jury rigged to the point where I was very

uncomfortable flying it, and I'm sure John Thorp would have been very upset too. So I had her completely gone over. It has been over a year now, and over 2000 hours of restoration. Soon she will be ready to take to the air again sporting fresh paint, zero timed motor, new leather interior, CD player, all new console with several new instruments, new military stick grips, electric trim, auto pilot, Garmin GPS 195, Garmin GNS 430, dual brakes, vertical card compass, indiglo cockpit lighting system, angle of attack indicator, glove box with drink holders, complete sound and fire proofing, lightweight starter, alternator, remote oil filter, steel braided hoses, and the list goes on.

Needless to say, we are very excited about getting her up in the air again and visiting all the other Thorps out there. We are in Clearwater, Florida and will be sure to make it to Sun 'n Fun 2000 to show her off.  
Take Care, Dave

*Editor's Note: Congratulations on getting your Thorp redone. I must however say, John would also be even more happy if we would keep the T-18s simple. I did the same thing you are doing with my 295RS, but would follow along the lines of folks like Dean Cochran who believe in keeping the Thorp simple and light weight.*



#### BUILD YOUR OWN WINDSHIELD!

I have the windshield form that Floyd Myers made, and I have no further need for it. I would gladly pass it on for just the cost of material and crating. I would, of course, select the truck line which offers the best rate such as UPS. (NOTE) this only fits the basic T-18 airframe - not the wide body. If anyone is interested, please write or call 717-2943892 or email edandal@nb.net.  
Edwin H. Layton

From: "Hal Stephens" <aerohal@inforum.net>

Richard, Count on Sept the first weekend for the California Thorp flyin. We may have a conflict with the new Golden West EAA flyin which took our weekend.....they are bigger, but we made out ok last time with the weekend before their blast. In any event....plan on early Sept. We'll set the date later. It's always fun to go to a Thorp flyin in California!! 65 degrees today....calm wind...50 mile vis. Hard to beat!

'Best wishes, Hal Stephens N8TT



From: "Don Nall" <don\_nall@hotmail.com>

I have a T-18C that I would sell. I've been working on a big project, building a new house, and just don't have any extra time to fly. My plane has a very low time IO-320, folding wings, almost IFR panel, etc. It needs to have the wings, tail, leg fairings, wheel pants, etc repainted as I've been sanding on them some. But otherwise the plane is in great shape. I'd take \$24.5K for it. If you would like more info just e-mail me back.

Merry Christmas  
Don Nall  
Jonesboro Arkansas

#### Next Issue of the Thorp Mutual Aid Society Newsletter:

**John Mel Clark flies after 15 years of building**

**Dave Goffs pictures of 3.8 Ford engine and mount.**

**Pictures and safety tips. We now have over 60 Thorp folks on the eMail list. The exchange of ideas and material has been great. Join us today. Check issue 110 for details for signing on.**

Rich.

Earl Atha purchased a T-18 project that is about 80% complete and is currently working on the project. He is looking for builders in the Georgia area that have projects flying or in construction that he can talk to about T-18's. You can E-Mail us back at Dons Dream Machines since Earl does not have a computer. It will be also ok to call him collect in the evenings at 770-227-5557. Any help that you can give will be appreciated.

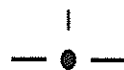
Earl Evans  
Avmtearl@aol.com



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"Charles and Linda Borden"  
<ebbitt18@concentric.net>

Dear friends:

I am faced with a real dilemma, every year the weather is great in Paso Robles in February for the T-18 Bar-B-Que. But it is terrible everywhere else. I mentioned that we would have it in March next year so more people could attend but then we had terrible weather here last March. Also my wife and I are going to start building a house in February or March. So I am asking for some Ideas. Please give me some feedback. I was thinking mid October. Does that interfere with anything? Send me an e-mail with your comments. Chuck Borden



Rich, some of our readers might be interested in how I installed a new skin on N118TX outer wing panel.

### WING PANEL RESKIN

The outer wing panel (left side) was damaged by a ground loop accident. The damage was not severe, and was localized to the front outer rib and skin at that point of impact; however, the damage was severe enough to require reskin of the wing. I received some good tips from Steve Hawley, Tucson, and proceeded to follow his advice, with some variations of my own.

I was fortunate that my original panel was straight with no twist. My first job was to remove the old skin. This was accomplished by drilling out the rivets, making sure I did not enlarge the dimpled hole. I used a 1/8 in drill bit, which is slightly undersized, then carefully worked the drilled rivet with a 1/8 in punch to dislodge it from the dimpled hole. Once the skin is removed you have the original wing framework exposed. This part of the wing can be laid aside until the new skin is bent, drilled, dimpled, and ready for final fit. The old skin is hammered flat with a rubber mallet for use as a template for the new skin. You may also flatten the dimples in the old skin to give a smaller hole, with better duplication in the new skin. I purchased a 4' X 12' sheet of 2024T3 (.025) as I wanted some extra sheet material for other projects. A 4' X 8' sheet will work as the skin lengthwise is approximately 81 1/2 in. The skin I purchased had a clear protective cover on the inside water mark side of the sheet. I laid this side up, with the old wing skin template inside up over the new sheet of aluminum. Precisely locate the old skin over the new skin making sure the edges and end of the sheets are properly aligned. Once this is accomplished, clamp the skins together so that that is no movement between new skin and top template. Now scribe a line at the opposite end, this will be the final trim line at the bottom rear spar location.



This next step is very important and is the key to getting the front bend in the proper place. To the previously mentioned scribe line on the bottom rear skin add two more inches. This will be the extra material required to make another row of holes to match the holes in the upper skin edge. You will notice the rear beam bottom row of holes in the original skin template are precisely 1 in from the edge of the skin. From this row of holes measure 1.7 in toward the 2 in extra material previously added. Scribe a line at this location across the 4' width of the sheet. This will be the centerline of the extra set of holes to match the holes of the upper rear beam. Proceed with drilling of the new holes through the template to the new skin. The clamps are still in place keeping the template and new skin perfectly in alignment. Once all the holes are drilled, remove clamps and slide the template toward the rear edge, align the front edge holes with the scribe line located 1.7 in from the rear spar holes. Drill these holes and mark as the extra set of holes that must be clecoed to the front upper beam holes for bending of the skin to properly fit the nose ribs. At this point, deburr both sides of new sheet, and dimple holes. You will now be ready to fold the skin, water mark on inside, and clecoupper rear beam holes to the extra set of holes located 1.7 in from the bottom rear spar holes. Make sure you are clecoed to the right set of holes, aluminum makes expensive scrap. You are now ready to make the leading edge bend in the new skin. Wrap a 4' 2 X 4 with newspaper to protect the skin. Start pressing the skin at its highest point, making sure the 2 X 4 is aligned evenly across the 4' wide span. As you continue pressure with the 2 X 4 the leading edge will start to form. Make a template of a nose rib, or use extra nose rib to check bend. This operation takes about 5 min or less and produces a perfect leading edge bend in the new skin. Once a nose rib fits nicely in the bend you have completed fabrication of the new skin, with the exception of shearing off the extra 2" that you had originally added to the lower skin edge. Again, make sure you are at the correct scribe

line. This information on bending the leading edge appears in several of the old newsletters, we need to thank the innovative early builders for this useful information. Fit the new skin to the framework of ribs and front/rear spars. I removed the outer nose and rear ribs on both sides of the panel to better access interior ribs for riveting. Riveting sequence is: bottom main spar, leaving last hole on each side to accommodate the outer nose ribs which will be installed later; top main spar, bottom rear spar; interior nose and rear ribs, using 3/4" X 2" X 15 1/2" bucking bar as outlined in NL # 56. You are then ready to rivet the outer front and rear ribs, and the rear top spar, this can be accomplished with a rivet squeezer. This will complete the riveting operation and close the wing panel.

Regards! Ken Morgan N118TX

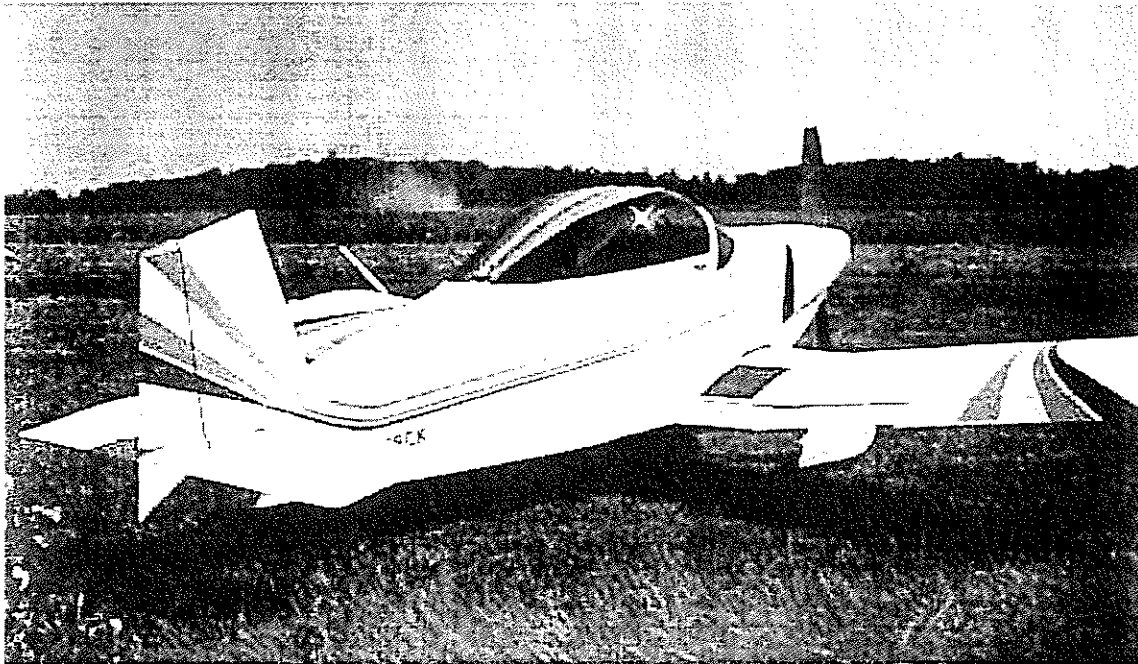


Mr Snelson,

My name is Eric Lundahl. My father, Ralph Lundahl was a very close personal friend of John Thorp and built a T211 in the late 1960's. I have just completed reburishing my father's "Sky Scooter" and have begun flying the airplane every chance I can. Wonderful little aircraft, and I am now seriously considering purchasing a T-18. I have become somewhat of a Thorp purest, so my interest would be in a T-18, all aluminum. Anyway I would be interested in joining any of the Thorp societies, etc. And attending Thorp fly-in's on the West Coast. I live in the San Francisco bay area. If you have any mailing list's please include my name. If you know anyone interested in selling their T18, feel free to pass my name along.

Best Regards,

Eric Lundahl  
401 Medio Ave.  
Half Moon Bay, CA 94019  
650-926-3141  
ewl@slac.stanford.edu



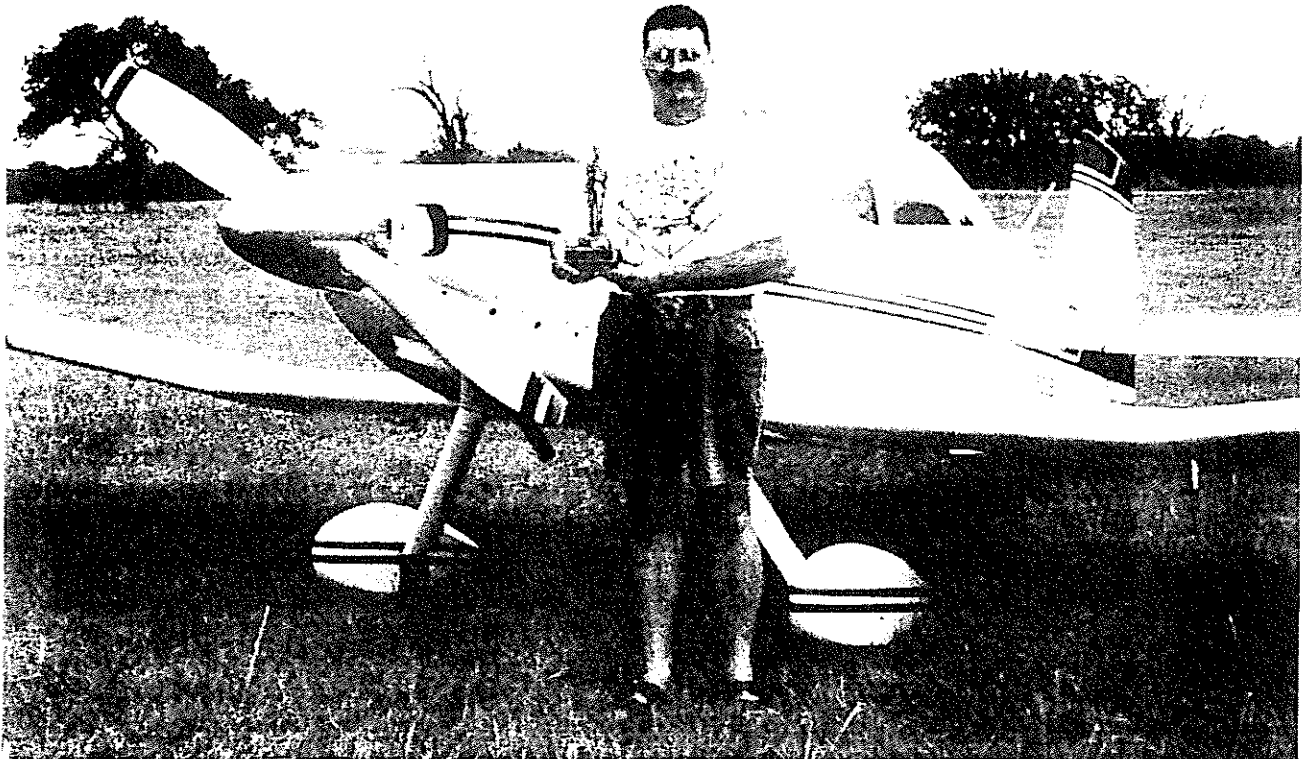
*Danny Cummings Thorp. A very popular paint job! Who started this pattern? I know....D.E.?*



*Turner crossbreed a 1/3 Whitman, 1/3 Davis2A and a 1/3 Thorp !!! and Mr. Bill Turner  
EAA Technical Counsellor.*

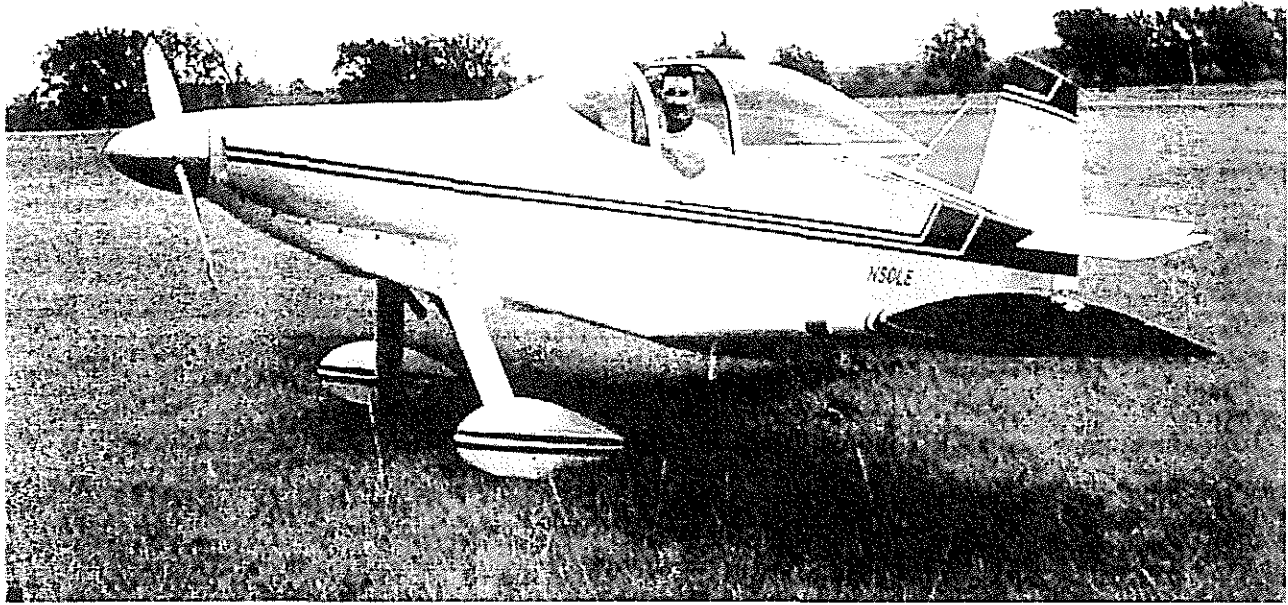
## Larry Eversmeyer's T-18, N50LE Brings Home The Bronze

*Editor's Note: Thanks to Larry and his wife for this story from their local newspaper. Congratulation to Larry!*



This year's Annual Air Show for the Experimental Aircraft Association in Oshkosh, WI took on special meaning for Larry Eversmeyer, an Aviation Safety Inspector Instructor at the Mike Monroney Aeronautical Center Academy in Oklahoma City. He was awarded the "Lindy" trophy for the Champion of Plans Built Aircraft. The bronze statue of Charles Lindbergh includes an engraved signature of that earlier aviation pioneer, and Larry's aircraft, Thorp T-18, N50LE.

Larry will be the first to tell you this was not an easy prize to capture. For one week every summer, Wittman Regional Airport in Oshkosh, WI, becomes the center of the general aviation universe. This year's event, held July 28th - Aug. 3rd, had over 800,000 people in attendance, and 11,000 airplanes participating, the world's largest recreational aviation event. Aircraft of every imaginable type fly in to Oshkosh to have their creation judged. It's also an opportunity to share their ideas and to learn new techniques and skills from others.



Competition is scrupulous for the amateur built aircraft, and Larry's hesitancy to enter was overcome with encouragement from his friends at Page Airport where he hangars his plane. Larry has attended this event several times, but this was his first year to fly his own homebuilt, a Thorp T-18. N50LE's maiden flight was in February, 1999. With less than 50 hours total flight time on the airplane, Larry's trip to Oshkosh was the longest flight to date, making this award even more significant.

Larry started his T-18 eighteen years ago when he bought the plans and supplies from another builder in Portland, OR in Aug. 1981, who believed the project was too massive an endeavor. Building a T-18, or any other aircraft, IS a major undertaking. However, Larry was able to overcome the obstacles through the constant support and encouragement from his family and numerous friends and fellow aircraft builders. He has never hesitated to call on others for their ideas, often starting over when he would see something that looked more effective.

Larry's wife, Leanna, and 14 yr. old daughter, Suzanne, have learned to cope with his fervent "madness" for anything to do with airplanes. "He is at his best when he is in the air!" is their frequent motto. They share in his excitement over this recognition, and plan to take to the air with him often.

In addition to winning his award for best plans-build airplane at Air Venture '99, Larry has won several other awards at Oklahoma fly-ins. In September, Larry took first place in the homebuilt aircraft category at the annual Tulsa fly-in. Then, in November, he was awarded first place honors at the Fairview airshow.

*Congratulations Larry!*



*Left to right: Gary Cotner, Gary Green, Matt Smith, Russ Verbael, J. Laney and Larry Eversmeyer.*

### **T- 18 Auction Provides Excuse To Fly By Russ Verbael**

After hearing about a T-18 being auctioned off at a sale in Cassville, Missouri, I realized that if the unbelievably beautiful fall weather would hold, I could just jump into my T-18 (N-8428) and fly down to see if there might turn up a great bargain. Our weather held, and I flew from Great Falls, Montana to Joplin, Missouri on Friday, Nov 19 and then flew the last 50 mile leg into Cassville on Saturday morning to attend the sale.

A group of T-18ers had gathered for the sale, so my chance of "sneaking" up on a bargain turned out to be pure fantasy. The aircraft being sold, N-5585X had been completed in 1980 by Mr. R.F. Woolaway, a highly respected and well known local builder of aircraft. Although this airplane had not been flown for a period of time, it appeared to be very well built and with the Lyc 360/CS prop combination, was definitely a juicy piece that lots of guys would love to own.

After several hours of inspecting the sale aircraft and waiting for auctioneers to get to the T-18 sale, our group of potential buyers collected around N-5585X were swiftly swept up in the bidding action. Low-ball bids went quickly to the mid-20's and a final, winning bid of \$29,000 made the sale complete. John Brown from Joplin, Missouri is the new owner.

Because I was over 1000 miles from home in late November, I wasted no time after the T-18 had been sold to get started back home. I made Holdrege, Nebraska by last light on Saturday, and flew back into Great Falls on Sunday. I guess some of us will use any excuse to go out and fly and this was a totally new reason for me. 14 hours of flight time, meeting lots of interesting folks, and witnessing a really great aviation auction made the trip totally worthwhile. I'd do it again next opportunity and definitely recommend it to anyone needing a new reason to go fly.

# Master Index for the past Thorp Newsletters

*by Jim Strickenberger*

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T-18/S-18 Thorp Newsletter  
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December 1999



RAWA SHELTON  
 1207 MANOR STREET  
 CLINTON, IL 61727

Please send your 2000 dues before Feb 15. Our printing cost are increasing and we still have a small group of members that wait until the very end of the year before sending. This makes it hard to budget now that we will be retired.

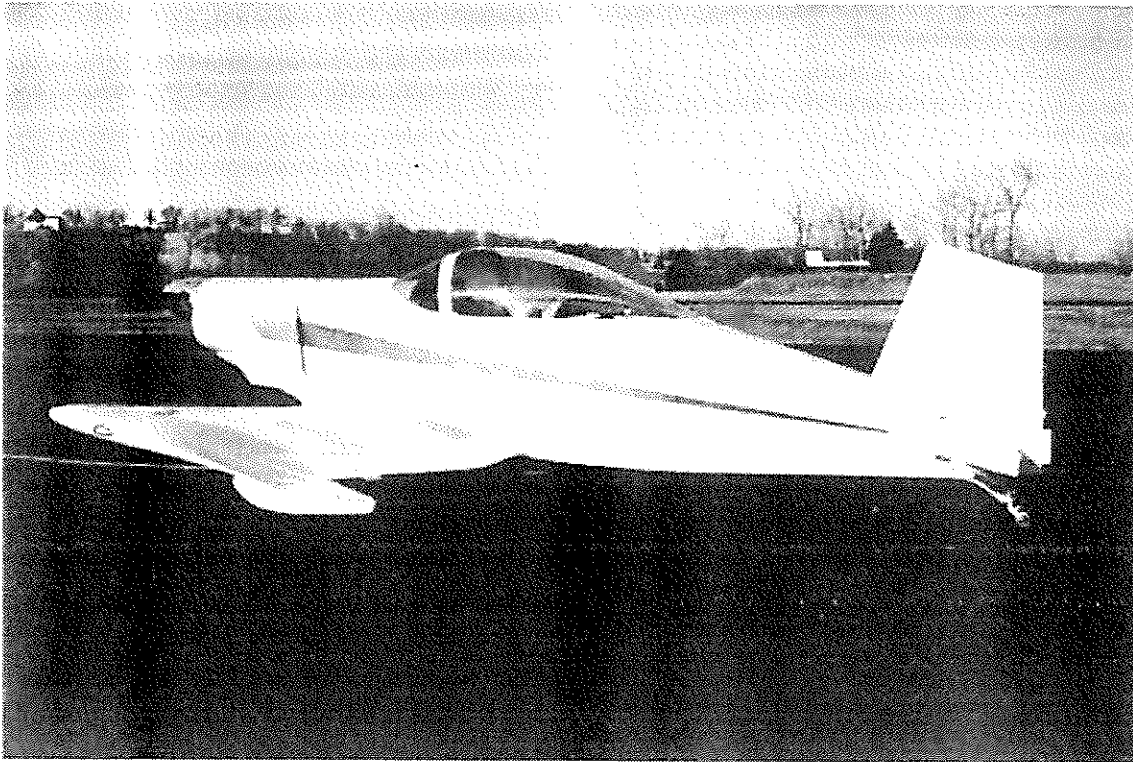
### THORP T-18/S-18 MUTUAL AID SOCIETY 2000 DUES

Please continue your support of this valuable exchange of ideas, building tips and safety information covering John Thorp's great design. Make checks payable to Richard Snelson, Route 3 Box 295, Clinton, IL 61727 \$25.00 US. \$30.00 other.

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# T-18 NEWSLETTER

June 2000



*Gerald Hogan's T-18C Franklin, Arkansas*

## IN THIS ISSUE:

**Richard Snelson Retires  
Plane Builder's Dream  
Fly-In's Colorado, Paso Robles  
Sun & Fun  
Tech Tips  
Thorplist Chatter**

**NOTICE: (STANDARD DISCLAIMER)** As always , in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.



## Richard Snelson Retires

I've never had any question in my mind as to who might be able to pickup the Thorp Newsletter Editor's job and excel at it if I needed to stop being the editor. Today that exchange happened. Our new editor is a builder that is on his way to having a show stopper airplane. He's willing to travel to ends of the earth to get another ride in a T-18. He's just gotten his Commercial rating and is working on his CFI. Even though he has stood a T-18 on it's nose I choose him to continue where I'm leaving off.

I almost changed my mind when a beautiful blue T-18 came over as we were talking this afternoon. About 100' over the building! Wow! What a sight.

I'll miss you guys, but plan on showing up at Ky Dam, Oshkosh and others.

Oh yea! I must say the new editor is also my friend. Mr. Roy Farris, please stand up.... More about Roy Later.

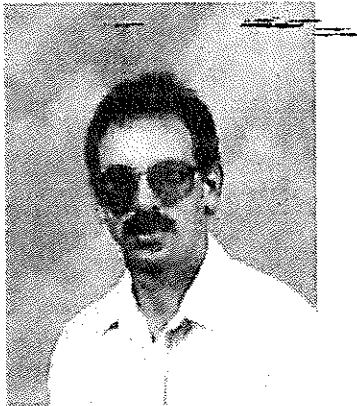
Best regards and I hope my years of editing and publishing the T-18 Newsletter has helped to keep the Thorp Mutual Aid Society moving ahead. Safer, more money for our airplane, exchanges of ideas and a lot of fine friends that I hope to stay in touch with.

Those guy who haven't paid there dues this year, get them in to Roy now! He's going to have some start up cost and each dollar will help.

Richard Snelson  
Piano Man...

---

## New Editor



Hello everyone, my name is Roy Farris, and I have assumed the duties of Newsletter Editor. I believe a brief introduction is in order. I have had a

passion for flying ever since I can remember. As a small boy, I remember wanting to be an airline pilot. I wanted to fly those big four propeller airliners. Well things changed as I grew up, especially the type of airliners. There just aren't many with four engines and propellers flying around anymore. I went to school and became an Electronic Technician. After a couple of small jobs, I wound up right back home in Illinois working for Diebold, Inc. I have been there for twenty years now. We build, install and service products for the banking industry.

My father has always been a pilot, at least as long as I can remember, so I grew up around the local airport. I became an airport bum very early in life. We went to many fly-in's and airshows and I just couldn't seem to get enough. I began my pilot training at the age of fourteen. I used my dad's Piper Colt, and logged about ten hours before something got in the way and stopped me. I began again at age twenty two, and received my Private licence at age twenty four. I bought my own Colt and was content with that for many years.

In 1990, I became interested in the T-18, and bought a project. My project was started in 1968 by a friend of my fathers. I dusted it off and have been building ever since. I hope to be flying in the next year. As all of you who have or are building know, it is an intense labor of love. I have really enjoyed the building process, but I must admit that I am ready to be done and get to some flying.

Recently I began working on more ratings, with the hope of becoming a CFI. I just passed my CFI written tests, and hopefully before long I will attempt the checkride.

Several of the East Coast / Central States Thorp drivers know me. I rarely miss a T-18 Get-together, and will NEVER pass up a ride in a Thorp. Most will say that I have, without a doubt, the most right seat time, in the greatest number of T-18's possible.

Following in Rich's footsteps will be difficult. He raised the newsletter to a new level. We all need to thank him for all his efforts, and wish him Good Luck. I can only say that my heart is in it, and I will do my very best to continue to publish the finest newsletter possible.

Roy Farris



## Thorp Ambassadors

As of this date the following individuals have requested to be Thorp Ambassadors. As I gain experience with my website (T18.Net), they will be posted along with a U.S. map to pinpoint their locations. These individuals will be the first contacts for people looking for information on the T-18. Hopefully they can provide the information and guidance to these potential new builders and owners. Posting it on the Web will get the information out to many potential Thorp owners. If you would like to become a Thorp Ambassador please contact me.

Danny Cummings  
600 West Main street  
McMinnville, TN. 37110  
(913)473-5401 Days cst 8:00 to 5:00  
(931)668-9899 Nights before 10:00 cst

Gary Cotner  
150th East Ave  
Collinsville, OK. 74021  
email t18cotner@aol.com  
(918)259-4000 Days  
(918)371-4739 Home

John Evens  
6855 Allison Street  
Arvada, CO. 80004  
(303)420-2724

Roy Farris  
Box 182  
Noble, IL. 62868  
email rfarris@world.com  
(618)723-2594

Jim Hockenbrock  
193 Fawn Road  
Reedsville, PA. 17084  
(717)667-2790

James Paine  
1220 Gilbert St.  
Hendersonville, NC. 28792  
(828)698-0368

Tony & Viv Schischka  
17 Bodmin Terrace  
Plimmerton, New Zealand  
email a.schischka@xtra.co.nz  
(664)233-8998

John Sullivan  
P.O. Box 551  
Chestertown, NY. 12817  
(518)494-3292

Harry Wheeler  
One Dana Drive  
Groveland, MA. 01834  
email  
(978)922-2220

Bill Bertrand  
438 Bella Vista  
Edgewater, FL. 32141  
(904)428-4874

Howard & Elaine Ginn  
2540 Piper Ave.  
Camp Verde, AZ. 86322  
email ginner@rachina.net  
(520)567-0490

Joe Gauthier  
9 Kowal Drive  
Cromwell, CT 06416  
email n22607@aol.com  
(860)635-4058

continued

continued

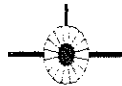
Thorp Ambassadors, continued

Robert (Bob) Pernic  
86 Dartmouth Rd.  
Williams Bay, Wisconsin 53191  
email [pernic@hale.yerkes.uchicago.edu](mailto:pernic@hale.yerkes.uchicago.edu)  
Home phone - (262)245-6445  
Work phone - (262)245-5555



## Notice : Newsletter Dues

Please take the time to look at the mailing label on the back of this newsletter. Look in the top right corner of the label. If you see a "PD" in the corner, this indicates that you have paid your newsletter dues through the end of year 2000. If there is no "PD", then you still owe dues for one or more years. Please be kind and send your dues !! Send to: Roy Farris P.O. Box 182 Noble, Illinois 62868



## Safety Issue

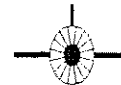
I am still hearing from people who are not aware of the tail mods. This is a scary deal. Persons who purchase a T-18 already built, and who do not research the Thorp, are at risk. There are several builders that have contacted me regarding the mods, who had heard of them but knew ~~nothing~~ about it at all. We as T-18 builders and pilots need to be aware of this problem, and keep a lookout for airplanes that do not have the mods done. For those of you who are not aware of what the tail mods entail, newsletter #27 listed the complete modifications that John Thorp felt were mandatory. Personally I cannot figure why someone would buy any airplane without researching the complete history of updates and modifications deemed necessary by the manufacture. For us, this newsletter is the best means of researching the T-18 and to keep abreast of the actions necessary to keep our machines in their best condition.

Lets all keep our eyes open !!

## Help Requested

I would like to get the newsletter more technically oriented again. I realize that nearly every aspect of building and flying the T-18 has been covered at one time or another in the newsletters. Times have changed, and new people are building and flying the T-18. With these new people come new ideas, and different ways to do things. I know while building my T-18, I ran into numerous problems, as everyone does. Some of the problems were solved simply by reading what others had done before me, but others were solved in my own way. I have written articles that have been published in our newsletters, and so can you. They don't need to be fancy, just tell others what you did or how you solved a specific problem. I welcome anything you care to send. I will clean it up if need be. I am requesting your help in making this a better newsletter. We are here to help each other build, fly and maintain our T-18's, and to help those who may be potential Thorp owners.

Roy



## More Newsletter Info

One of the things that I have heard through conversations with newsletter subscribers, is the poor quality of the older newsletters. Persons who have purchased a complete set recently, have complained that the print quality is bad and some are nearly unreadable. I am going through the master copies now, and trying to recopy some of them using my set of newsletters. Hopefully I will be able to get the quality back up to a readable level. Those of you who have purchased complete newsletter sets recently, and have some unreadable pages, please feel free to contact me. I will try to get you pages you can read. It may take a little time. My long range plan is to condense NL# 45 through #90 and print them in a book format similar to what Lu Sunderland did to NL# 1 through #44. I think this would be a better deal for those looking for the technical information.



Eklund Engineering, Inc.  
PO BOX 1510  
LOCKEFORD, CA 95237  
209-727-0318  
FAX 209-727-0873  
e-mail: thorpt18@jps.net  
2/17/1999

For the Thorpe T-18 or S-18 builder, the following kits are now offered:

**CAD/CAM PRODUCED KITS:**

**#561 Vertical Tail Kit - \$290 plus shipping**

... All sheet parts are laser cut with accurate holes and formed as required. Formed ribs have center punch marked holes to match the skin hole pattern. The builder need only punch rib rivet holes, deburr and dimple prior to riveting the assembly.

**#569 Rudder Kit - \$375 plus shipping**

... All sheet parts have laser cut accurate holes and are formed as necessary. Require only light deburr and dimpling prior to riveting. This is probably the most difficult part to lay out from the plans.

**#B502 Horizontal Tail Kit - \$1328 plus \$20 packing charge and shipping cost.**

... This kit uses a combination of laser cut and traditional machined components. All parts including the three lead balance weights (internal tip weights) are supplied. All formed ribs, aluminum tip shells and skin stiffeners have center punched rivet hole patterns to match the laser cut skin holes. Punching the ribs and trimming and punching the tips, plus light deburr and dimple or countersink are all that are required prior to riveting.

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**T-18/S-18 Empennage Kit - \$1993 plus \$25 crating charge and shipping cost.**

... This includes all sub-kits listed above.

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**NOTE:** Additional sub-assembly kits and hardware kits are under development with the goal of making a complete Thorpe T-18 airframe kit available in the near future. A list of individual parts with prices also available from above addresses.

## News From Classic Sport Aircraft

Rich:

Well, we made it through another year. We have another S-18 Kit ready for New Zealand, thanks to Wayne Matthews support.

The Thorp Fly-In at Porterville was a success and we had over 20 planes on the line and many people standing and waiting for rides and naturally they all LOVED their ride...lots of flying before the dinner.

The Golden West and Copperstate Fly-Ins were great and it was good to see Larry Eversmeyer at Copperstate with an Oskosh Champion Thorp. We have some newly completed planes flying now - Mel Clark of Huntington Beach, Ca. and Amos Ranck of Independence, OR....Congratulations to both of them. We would like to hear from anyone else that has a completion. Please send us a photo.

I will complete the drawing update for the S-18 this year. (Please note: This is for the S-18 only.) As I stated before, I have been answering drawing questions by e-mail or by phone. Also, as time permits, I am starting an update for the construction manual. Builders indicate the necessity.

Construction on my aircraft is coming along fine and I hope to be complete by year end. Updates in work are: The new 180 HP engine and the tri-gear (almost All requests I receive are for a tri-gear).

We are reviewing our schedule for 2000 and will let you know what fly-ins we plan to attend. We cannot cover them all as it is far too expensive and time consuming.

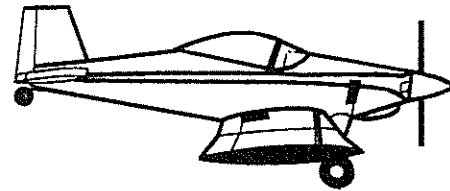
Thanks,

Classic Sport Aircraft

Mike Archer

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## Plane builder's dream takes flight



**Aviation:** After 15 years of working on an aircraft, it soars.

**By: Helen Gao**

The Orange County Register

Chino - John Mel Clark watched excitedly Friday as the two-seat airplane that he and his family have spent 15 years building at their Huntington Beach home finally took its test flight.

Clark, 76, flashed a toothy smile as he stood next to the runway at Chino Airport, and traced the path of the small red plane with silver and blue stripes. It ascended 2,500 feet, flew for 30 minutes and landed smoothly.

"Boy! It really worked!" he shouted.

Clark, a Huntington Beach resident who is working on renewing his pilot's license, had his instructor, Mickey Holton of Torrance, fly the plane. The Experimental Aviation Association recommends that a home-built plane be flown at least 25 hours by a certified pilot before a passenger is allowed.

Clark realized Thursday that he'd share the date of his plane's maiden voyage with some famous aviators: Friday also happened to be the 96th anniversary of the

Wright brothers' first successful flight, Dec. 17, 1903.

A former aircraft-tool designer for McDonnell Douglas, Clark began to realize his lifelong dream to build a plane in 1984, three years after he retired. He bought the blueprints for an S-18, believing the model would be reliable since another pilot had flown one around the world.

Clark searched for parts for the plane throughout California and elsewhere. He figures he spent up to \$25,000.

continued on pg 7

Plane builder's dream .. cont.

He worked part time on the airplane , which took shape in his living room, back yard and garage.

It was slow going, trial and error.

"I spent more time looking at the plane upside down than right side up," said Clark, who got some help from his wife, Mary, and son, Steve. He also drew on advice from the experimental aviation group and other friends who have built planes.

Mary Clark took all the clutter in stride. "You have to be willing to have an instrument panel on your kitchen table and parts on your bed," she said.

The instrument panel was the biggest challenge; more than a thousand wires had to work.

John Clark's fascination with flight began at a young age. When he was 8, he attempted to imitate a parachute jump he witnessed.

He climbed up the water tower in he's family's back yard.

"I tied up four corners of a sheet and tried to fill it with wind," he recalled. His nanny stopped him from jumping.

At age 11, he built his first airplane with two friends, using bamboo poles, sheets, wheels from a coaster wagon and baling wire.

He and his friends pushed it down a hill. The plane headed straight into a gully. "They (two passengers) were still alive - bruised up - and (it) knocked the wind out one of them," he said.

During World War II, John Clark learned to parachute as a soldier. After the war, he earned his pilot's license through the GI Bill.

But over the few decades that followed, starting a family and making a living took priority over building and flying an airplane.

"I wanted a plane bad, but I couldn't afford it," he said.

Now, he can't wait to fly the plane himself.

"Someday I would like to fly back to my hometown, Oakland, Mississippi," said Clark, who has a 90-year-old cousin there. "He's been waiting and waiting for me to fly back there to see him."

*Editors Note: John had sent me a neat clipping from the Orange Co. Register. I couldn't get it to scan correctly, so I reprinted the text portion. It had a nice T-18 drawing and spec sheet.*

## For Sale Items

### T-18/S-18 Project

1 set T-18 plans

1 set S-18 plans

S-18 fuselage almost ready to rivet

Inner and outer wings started. Wing is T-18 planform with Sunderland airfoil, inner wing ready to rivet.

Tail group basically finished.

Landing gear material, wheels and brakes.

Lots of misc. parts. \$4000.00

0-290G engine and spare parts \$1000.00

Call Andy at (509)925-6337

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### S-18 Project

VFR instruments

Transponder

0-320 wooden prop and extra metal prop

Zinc cromated inside and out.

Nearly completed airplane \$20,000.00

Call Eugene Fody at (334)393-3653

e-mail: efody@earthlink.com

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### T-18

THORP T-18 built in 1982 by Ned Eastman. Won Wright Brothers Award in 1984 at Oshkosh for the Best Plans Built. Folding wings. 900 Total Time Since New on Airframe and Engine. 325 Since Major Overhall on Engine and Constant Speed Prop. 0-360 A1A engine. It has a full panel with EGT/CHT/Fuel Pressure/Vacumm gauge/oil temperature/oil pressure/Sigtronic intercom/vacumm-horizon compass/TACH/VVI/ALT/AS, Narco AT-150 transponder and encoder, cockpit heater, oil pan heater, etc. Since August 1997 I have replace or redone the following:

New interior

replaced radio with KY97A

installed GPS Garmin 90

Replaced Mags and Alternator in April 2000

New long landing gear in 1997

New Scott tailwheel Dec 1999

Contact Ed Askins (817)492-9728

e-mail: askinsed@earthlink.net

For Sale, cont.

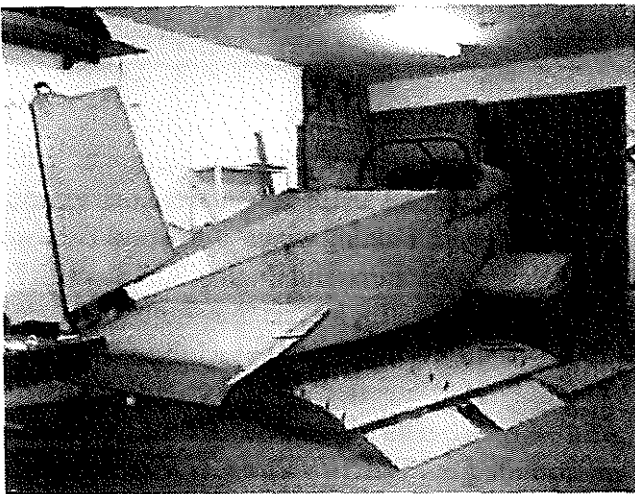
### T-18

T-18 project for sale: asking \$5,500

Includes: Fuselage, Horizontal Tail with trim tabs, Vertical Stabilizer,  
Center wing section with controls, Outer wing panels with ailerons, Inboard flaps, Engine mount, Engine cowling, Landing gear, Brake master cylinders and Rudder pedal frame.

Miscellaneous other parts: Aileron control rods, Convertible wing components,  
Wing tips and Complete set of plans

If anyone is interested in building a T-18, this will save countless hours of labor and dollars in materials. For details contact: Harv Seeger Ph (281) 474-9607 or email [hkst18@aol.com](mailto:hkst18@aol.com)  
Location: Taylor Lake Village, Texas, (about 30 miles South of Houston). I can also email additional photos to anyone interested. I've attached a photo which shows most of the project.



Harv's Project

*Editors Note: If you have any for sale items you would like listed here in the newsletter please forward the information to me and I'll make sure it gets listed. I can also place it on the T18.Net website.*

For Sale, cont.

### S-18

My Thorp is for sale, it's a great X-C and sport flying aircraft, built in 1982 by Nate Eastman. The following are the particulars:

Price-\$33,000

TTSN-900 Hours(aircraft and engine)

O-360 AIA with CSP (both have 325 SMOH)

White with Green stripes, gray interior(original paint and 97 interior)

A/C won Wright Brothers Award at Oshkosh for Best plans built in 84

Folding Wing

New KY-97 radio in 97

Garmin 90 GPS mounted on panel in 97 and wired into radio bus

97 Skytec starter

99 RV-6 alternator

99 rebuilt mags

Full panel including gyros but not IFR certified

All AD's complied with and extensive May 99 annual

Call me @ (817)578-8901 or e-mail me for e-pictures at [askinsed@earthlink.net](mailto:askinsed@earthlink.net)

Ed Askins



I keep reading about how great the T-18 is well here is just the ticket.

Wide body, S-non folding wing

Project is well along, by Boeing employee. Most pieces to finish. \$4000.

Andy (509)925-6337

Paul MacMichael



For sale: Complete pitot/static mast, per plans \$50

William Beswick  
[T18bes@aol.com](mailto:T18bes@aol.com)

AIRPARK PROPERTY FOR SALE

Harvey and Stephanie Mickelsen N118HM "Fat Cat"

This property is located at Alta Sierra Airport Estates, between Auburn and Grass Valley, California. This location is ideal for aviation. At 2300 ft. altitude, it is above the valley fog, yet below the snow line. This first class property is priced to sell at \$599,000 and marketed by Mark Weyman, Realtor Associate, Coldwell Banker, Grass Roots Realty: Bus. (800) 633-6899 ext 266, Res. (530) 477-1287, e-mail [mweyman@nccn.net](mailto:mweyman@nccn.net).

To see color photos of the property, go to the World Wide Web at  
<http://tappix.com/482007> or [www.goldcountryrealtors.com/markweyman3.htm](http://www.goldcountryrealtors.com/markweyman3.htm).  
 HOUSE:

1. New (July '99) single story home with garage and laundry underneath. 6 inch exterior walls insulated R19, ceiling insulated R30. Central heat and air conditioning and whole house fan.
2. Three bedrooms (two masters), 2 ½ baths, and large open great room with three sliders to large deck.
3. Dumb-waiter from laundry room to kitchen for groceries, fire logs, and laundry.
4. Sweeping Sierra Crest views (snowcapped mountains) from all rooms except guest bedroom (which overlooks a beautiful Tudor home and large professionally maintained garden).
5. Wired for high-speed computer modem, Prime Star Satellite dish and TV antenna (for local stations).
6. Alder cabinetry, oak door trim, and whitewashed pine ceiling in kitchen, great room and den.
7. High ceilings and Simonton 2000 designer windows with vinyl frames let in the outside while being thermally efficient and filtering ultraviolet.
8. Wilsonart flooring for durability and easy maintenance.
9. Skylights in master bath and kitchen can be opened and have blinds.
10. Latest kitchen appliances including Kitchen Aid 5 burner stove top, oven, dishwasher, and trash compactor, and GE refrigerator and microwave/convection oven.
11. Granite counter tops in kitchen and on deck.
12. Wet bar with instant hot water.
13. Large covered deck of no-upkeep Choice-Deck planking for outdoor enjoyment of the view. Steel railings around decks. Built in barbeque connected to house propane supply on the deck.
14. Floor to ceiling fireplace built by renowned Nevada County stone-mason Dan Reinhardt from Yuba River rock he selected from the river. Wood burning, but plumbed for conversion to propane if desired.
15. Propane fireplace in master bedroom.
16. Oversize 75-gallon water heater with re-circulation feature. Instant hot shower water.
17. Grohe and Moen plumbing fixtures.
18. Genie garage door opener for finished oversize garage.
19. Large, lighted, walk in "crawl space" entered from the garage.

HANGAR:

1. 42x36 ft. hangar with electric bi-fold door. Insulated R19, walls and ceiling, R10.8 door.
2. Propane for heat, 220v electricity, phone, and full bath.
3. Potential for partial second floor for office or guest quarters.
4. Driveway designed to accommodate a Cessna 180, or Bonanza. Drive could be widened to accommodate a light twin.
5. Rights to build an additional 50x50 hangar on the Association's Common Area.

PROPERTY:

1. 1.15 acres, professionally landscaped with 9 fruit trees at north end. Sprinklers and drip system.
2. House, lawn, and orchard protected by 6-foot fence with electric gate.
3. Additional paved outside parking.
4. Two rock swales control water drainage.
5. Large (8 people) HotSpring chlorine-free hot tub with Sierra view.
6. Community protected by airport security gate (soon to be electric).
7. 43 member Airport Association.
8. Association owned and maintained 3000 ft private paved airstrip which averages two or three operations per day. No night operations allowed.



## EKLUND ENGINEERING UPDATE

As I was folding a recent plans order, I was thinking of 1960 and the day I first folded T-18 plans in John Thorp's Burbank office. Little did I know that I would still be folding and now shipping T-18 plans in the year 2000. The wonderful design has continued to reward pilots as projects get completed and airplanes change hands.

The only negative aspect of the passage of the years is the impact of inflation. I see the cost of materials and services increase each year. As a result I am being forced to raise the plans prices for the first time since I put them back on the market in 1992. The **standard plans set** including the instruction articles will now be priced at **\$280 plus shipping**. The **Anniversary or Deluxe package** including plans, instruction articles, John Thorp Memories book, 2-T-18 logos and the logo-decorated case will now be **\$330 plus shipping**.

Eklund Engineering has always provided builder support for plans sets sold by either Eklund Engineering or John Thorp. Now that T-18 airframes are often in the hands of new owners, it is important to state some policy rules that must accompany the support exchange.

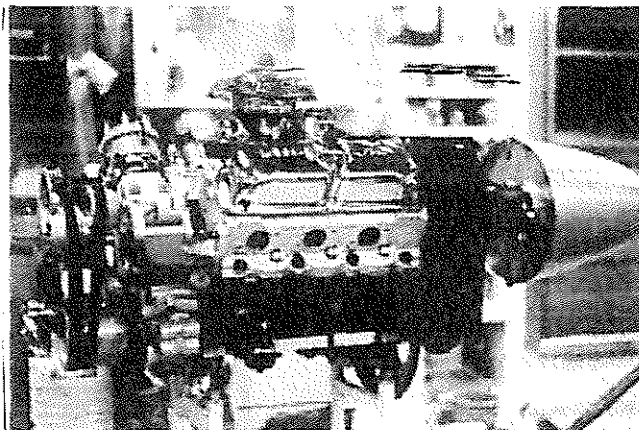
### **Eklund Engineering, Inc. will provide support if:**

1. The owner or builder has and refers to a current set of plans.
2. Support is limited to portions of the airframe conforming to the current plans or being brought to current conformity.
3. The following newsletter optional modifications are also considered current conformity:  
 Newsletter 40 (horizontal tail internal tip weight modification)  
 Newsletter 49 (wing main spar additional rivet row recommendation)  
 Newsletter 46 and 49 (wing main spar web angle stiffeners or material substitution)

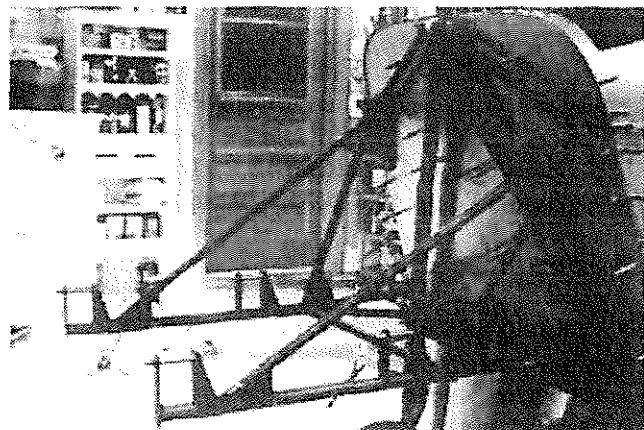
There are some e-mail groups covering communications on the Thorp T-18, however I do not have time to be involved. I will generally promptly answer any e-mail directed to [thorpt18@jps.net](mailto:thorpt18@jps.net). The current plans listing as well as replacement sheet prices are available on request. E-mail correspondence is preferred. Eklund Engineering, Inc. remains dedicated to John Thorp's enduring design.

Richard Eklund  
 President  
 Eklund Engineering

## Dave Goff's Ford 3.8 Liter Engine Installation

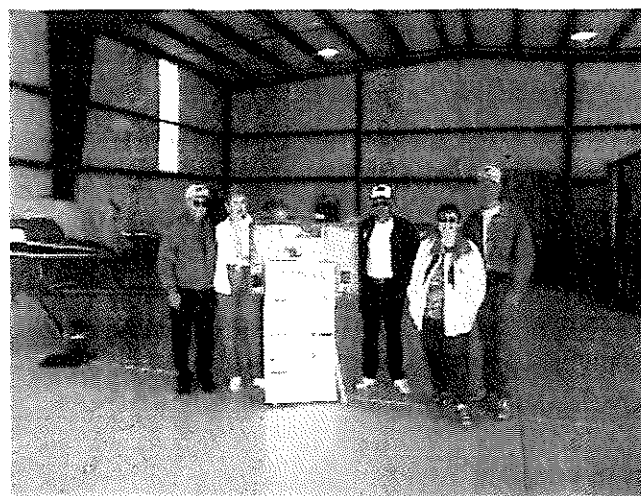
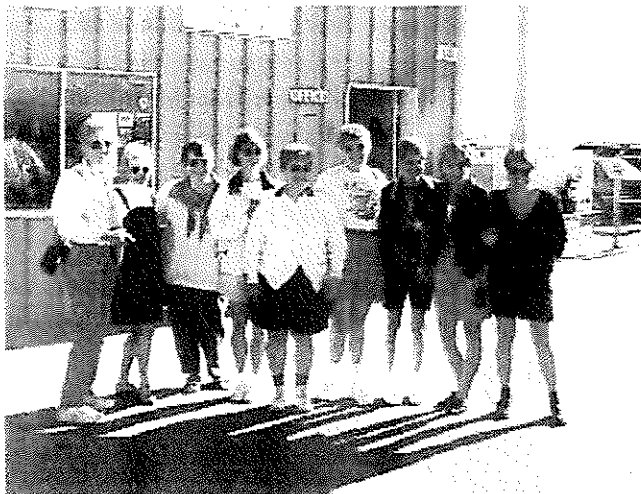


Ford 3.8 Liter with NW Aero Drive. 95% complete



Dave's Motor Mount 75% complete

## Colorado Fly-In



*Editors Note:* When I took over the newsletter, Rich gave me several photo's of the Colorado Fly-In on floppy disks. There were many beautiful, color pictures of the T-18's. I wish I could have included a summary of the event, but unfortunately there was no write up included. The black and white pictures don't do justice to the airplanes, so I will try to post some of the pictures on the "T18.NET" website. Looks like they had a lot of fun !!

Paso Robles T-18 Fly-In March 11, 2000

What started out to be a terrible month was a good reason to consider scrubbing the whole thing. By Wednesday the eighth the weather had completely gone amuck, then on Thursday the ninth a high-pressure system moved into California and by Saturday we had our beautiful weather back.

Only eleven airplanes showed up this year. I wouldn't be surprised if several people made other plans because of the weather we had been having for over a month.

The first pilot to fly in was Tom Worth from Edgewood, WA in # 295RS. Tom flew in Friday evening and gave Tom Hunter a call for a lift to a hotel.

On Saturday morning an additional 11 T-18's arrived. They were Howard and Elaine Ginn from Camp Verdi Arizona; their son Tony with his girlfriend, Star from Rosamond, CA; Carl and Sue Daughters from Santa Maria CA; Richard Ekland from Lodi, CA; Larry Kruchten and his wife Kathy with Rick Shaffer from Torrance, CA; Roy Medan and Ed Cox from Compton, CA; Sam McDaniel from San Luis Obispo CA; Steve Irving and Bill Melly from Camarillo, CA.

With my T-18 and Tom Hunter's almost completed ship we had 13 T-18s on the field.

George and Barbara Leader drove to our fly-in. They stayed with Linda and I the night before. Also Earl Ody, Pat Condon and Oly Smith drove up from San Pedro again this year. What a treat to have all my old friends together. And of course I can't leave out Vahuan and Peggy Parker from Santa Maria. It was good to see them again.

This year's judges were Mike Laughback, Ron Morea and Allen Skosberg. Sue Daughters helped sign-in everyone and once again Bill and Joyce Carlson let us use their wonderful hanger. This year they decided to take their motor home out and park it nearby to give us the extra room.

We counted about 80 people enjoying the delicious steak bar-be-que prepared by Rex Awalt. Bill Carlson even had his train running on an overhead track he built in a living room area of his hanger where lounge chairs, a TV and piano sit.

Oscar Bayer flew his beautiful Starduster to the fly-in and kept the beans warm for all to dish up on the way to the pit for steak.

My wife Linda finished putting together a large green salad while volunteers helped butter the French bread.

As everyone finished their meal, I announced the winners of our Spot Landing contest, The Oldest Plane, and The Furthest Distance Flown.

Tony Ginn and Richard Ekland won first and second place, respectfully in the Spot-landing contest. Sam McDaniel received an award for having the oldest T-18, built 30 years ago. And Carl Daughters received an award for first place Non/Standard T-18, 'Teacher's Pet'. Sorry to say but only one Non/Standard T-18 showed up. Tony Ginn also won first place for Standard T-18 and Steve Erving won second place. Furthest distance went to Tom Worth of Edgewood, Washington.

Marven Fenton who flew in from San Luis Obispo in his RV-4 brought his big band music on tape, which is always a pleasant compliment to the busy day. He also provided a microphone and speakers for the MC.

This year the T-18 Fly-In was another success. Linda and I really enjoy putting it together. It's great to see our friends again and meet new pilots who decide to visit our area.

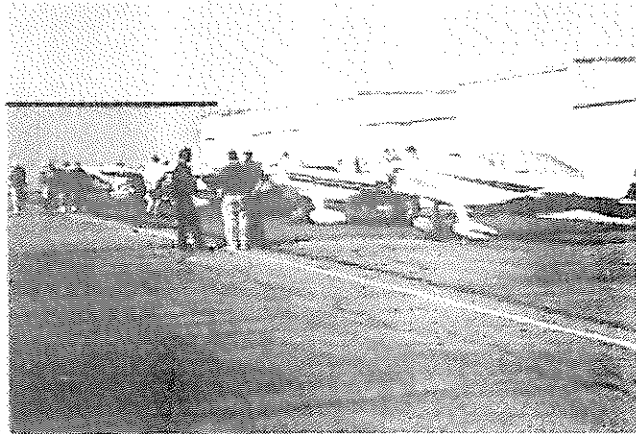
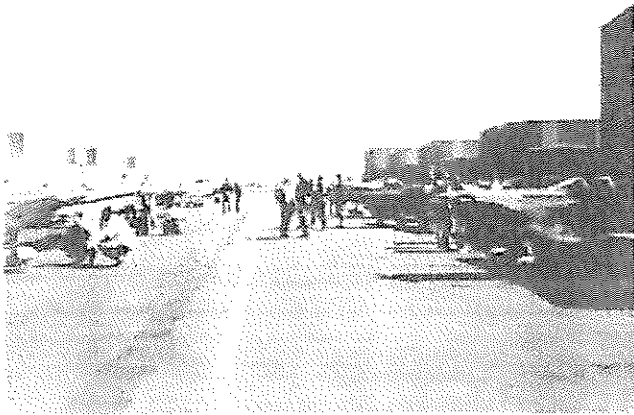
Everyone had a good time and we donate what comes in over and above expenses to our local EAA chapter# 170 in San Luis Obispo (a few miles south of Paso Robles). The proceeds for the Fly-In were \$588.00. The out of pocket expenses came to \$522.00. The remainder will be donated to EAA chapter# 170 who provided insurance for the event.

continued on next page

Paso Robles, cont

For the last three years we've held this event, we have done the whole thing on donations only. We do ask non T-18 owners and builders to pay for their lunch and accept donations from all. The eighty people who participated were very generous and as usual we had a great day at little expense to anyone.

Chuck Borden



T-18's on the ramp at Paso Robles



More hanger flying



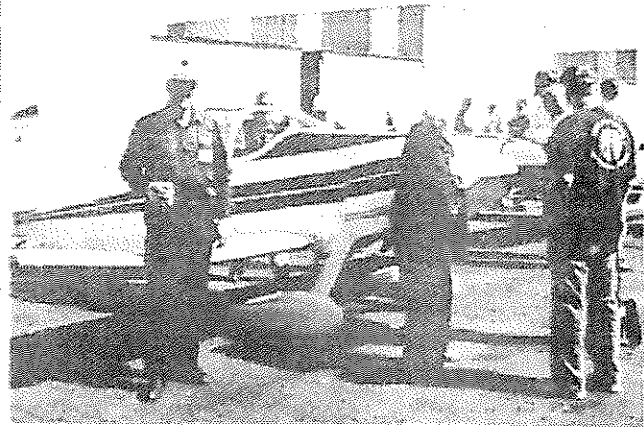
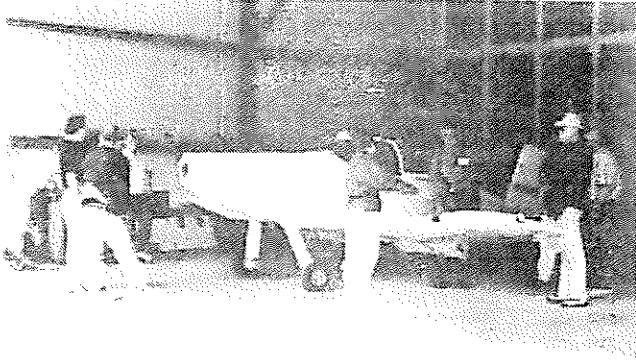
Rex Awalt -- Master Bar-B-Quer



Looks like there was plenty of food

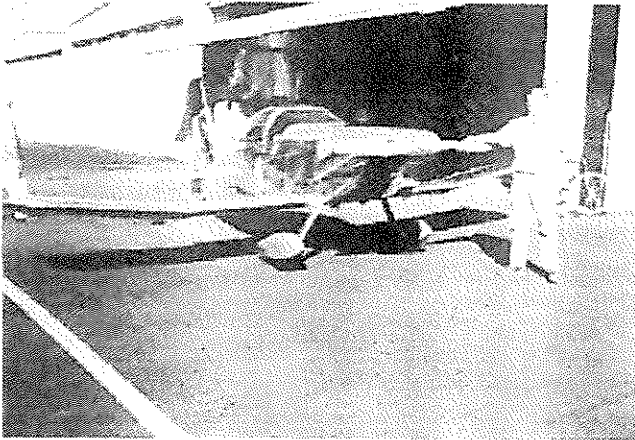


Paso Robles, cont.



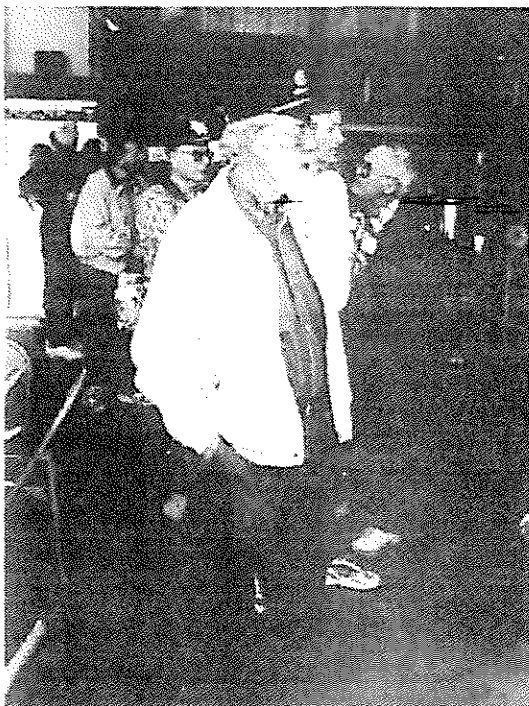
Tom Hunter's T-18

Sam McDaniel -- Oldest T-18



Chuck Borden and his beautiful polished T-18.

We wish to thank Chuck and Linda for all of their efforts in organizing and hosting this years get-together at Paso Robles, CA. Sure looks like everyone had a great time.

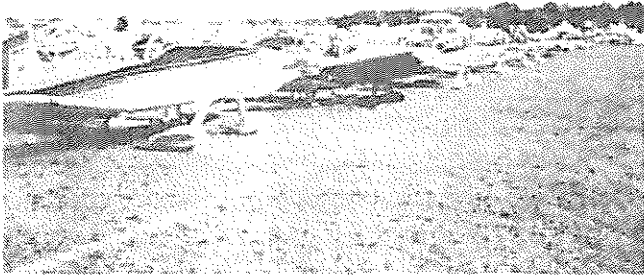


Richard Eklund -- Eklund Engineering

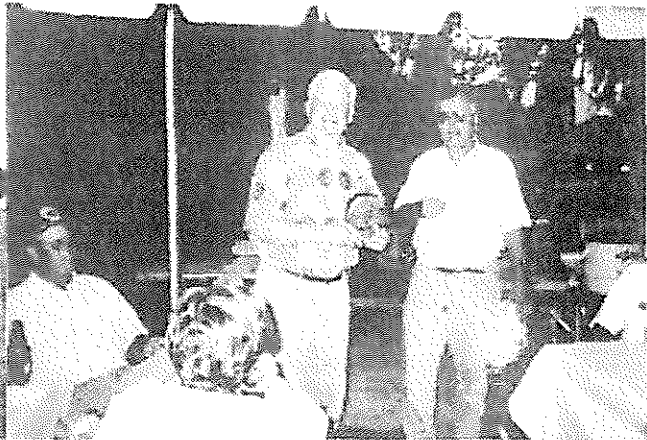


Hats off to Chuck and Linda Borden

Images from Sun & Fun 2000



T/S-18 Line-Up



Bob Pernic -- Best T-18



T-18 Forum had good attendance



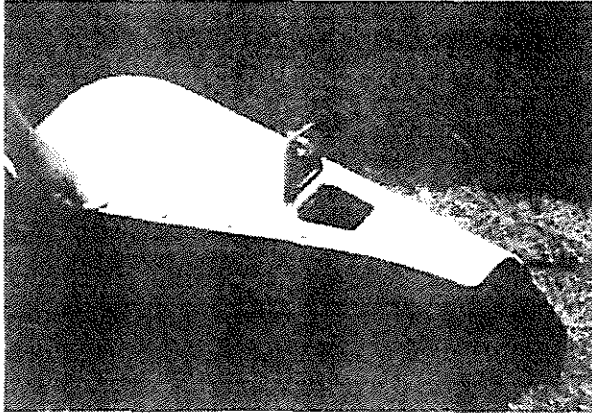
Artist at work



Did you ever notice - we seem to always be eating.

## Tech Tips

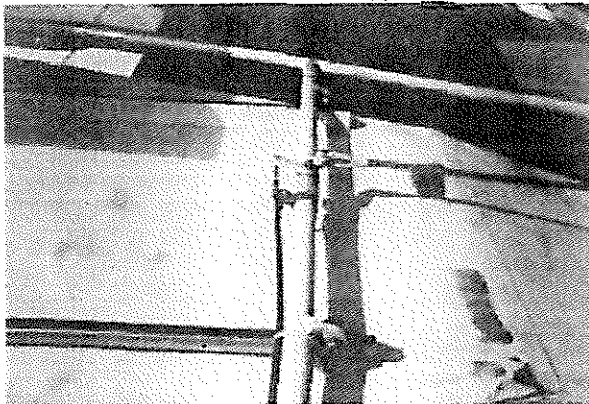
Did you ever wish you could check your oil without having to remove that cheek cowl? Well here is a neat little access door that would do the trick.



*Editors Note: I believe this photo was taken of Bob Pernics T-18 at Sun & Fun.*



Here is a neat idea for getting the aft canopy vent adjustment knob where you can get at it more easily. You can't actually see the control from this photo, but you can definitely get the idea. Looks like you can open/close the vent from the left side. The control is probably mounted on the canopy frame. Not sure who's this is.



*Neat Idea*

I am currently working on the instrument panel for my project. I am installing Electroair electronic ignition on the right side of the engine and leaving the mag on the left side as a backup. I was in a dilemma on how to hook up the mag and the electronic ignition, to give me the best combination of workability and cosmetic appearance. I could use two toggle or rocker switches (which was suggested by several T-18 pilots), or one toggle/rocker switch and the standard magneto key switch. In the first suggestion you need an additional switch for the starter, and the second just seemed ugly and wasted space. I received an e-mail from Ed Pernic stating that he was in the process of doing the same thing and that I should contact Electroair. He stated that they had a way to use the standard magneto keyswitch for both types of ignition. I called Jeff at Electroair and got the scoop. Its actually so easy that it's scary. You simply splice a wire onto the MAP Sensor output (red wire on Electroair units) at the connector plug on the MAP Sensor. Run this wire to the magneto switch and connect it to the appropriate side just as you would a mag. You then supply 12 volts to the control unit. Jeff suggested just running it from the master switch through a 5 amp circuit breaker.

### That's it !

Basically what your doing is grounding the timing pulse as it leaves the MAP Sensor. This causes the control unit to suspend the firing signal to the coils, and viola NO SPARK. Jeff told me that he has hundreds of airplanes using this setup, it works great, and hasn't caused any problems.

When you do your engine runup, you treat it just as if you had two mags. Jeff stated that there is only one little quirk to the setup. When you ground the MAP Sensor during the runup this shuts down the electronic ignition, when you remove the ground (selecting both, or left on the mag switch) the timing pulses race into the computer and it takes about two or three engine revolutions to get things sorted out again, so the engine will run rough (as it would on one mag anyway) for two or three revs after you have selected "both" on the mag switch.

I liked the simplicity of this setup and the space savings over other methods, and I don't need that extra starter switch.

T-18 Website

As I mentioned earlier, I have purchased the T18.NET website from its creator Luis Hernandez, Jr. Luis really did a great job on the webpage design, and is still helping me to keep it somewhat up to date. I have purchased and installed the necessary software into my computer, but I haven't really had the time to learn how to use it. In time I hope to be able to use the website to compliment this newsletter. The website will be a much better medium to display all of the wonderful pictures I receive. On the website they will be in color, unlike the newsletter that is printed in black and white. Please keep sending the photo's, I can always use some of them in the newsletters and will start posting them on the website as soon as I figure out how to do it. I believe the website will be a place for non T-18'ers to find us and learn just what a T/S-18 is.

For those of you who have access to the internet, please visit the website regularly, and feel free to email me with any suggestions, good or bad, about the site and its content. I want the site to be a positive motivator for the T/S-18. Any and all suggestions will be appreciated.

The website address is "www.t18.net"

Roy Farris

Thorplis

For those of you with internet access, there is also a T/S-18 email list. This is a great place to ask questions, answer the questions that others ask, post information and ideas or to just shoot the breeze with other Thorp enthusiasts. Once you get signed up, you just send an email message to "thorplis@egroups.com" and everyone on the list gets the message. Likewise if someone else sends an email to the thorplis you get it in your email. There are about ninety people on the list now and it is growing slowly. To join the list, go to "www.t18.net" and click on "Join the Thorp email list". It's a great place to share ideas.

Thorplis Chatter

*The following information was taken directly from the Thorplis Email list. Nothing has been edited.*

From: Tony Ginn <taildragger@alumni.calpoly.edu>

Just a couple of thoughts. Danny Cummings just wrote that he is replacing his alternator belt at annual. That's the ideal time. But what if your belt fails while you are away from your home field? Do you really want to have to pull the prop for such a simple fix? Next time you have your prop off, slip an extra alternator belt over the prop shaft and secure it (with tie wraps) tightly against the case. If your belt fails all you need to do is cut the tie wraps, loosen the alternator, slip the new belt on, re-tighten and safety the alternator and you're back in business. (For my plane, that's only one wrench and a pair of safety wire pliers.)

I write this next part with no disrespect towards anybody. In fact, I applaud the fact that questions are asked rather than just guessing at it. But it scares to me hear people asking questions regarding basic things such as torque values and hardware. As we all build, maintain and fly our airplanes I would hope that we have at least the basics in handbooks, how-to manuals and construction techniques. Here are a few examples of books that are chocked full of information that I keep in my toolbox and hangar:

Standard Aircraft Handbook, 5th Ed.

Written by: Leavell and Bungay

Published by: Tab/Aero (a division of McGraw Hill)

Source: Aircraft Spruce (800) 824-1930 \$12.95 p/n 13-11400

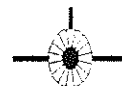
Standard Aircraft Maintenance Handbook, 1st Ed.

Published by: IAP, Inc

Source: Jeppesen Sales (800) 443-9250 \$12.95

There are many building and maintenance reference manuals out there. Get a hold of a few, get to know what's in them and use them. Let's keep the Thorp T-18 community safe. It would be a damn shame to give Thorp's design a black eye or, worse, lose a member of our community due to our own short-comings.

*Editors Note: Although not listed by Tony in his email, the T/S-18 Newsletters are one of the best sources of information regarding our airplanes.*





Thorplst Chatter,cont.

Address for Gee Bee Canopies

Address is Gee Bee, 16715 Meridian East, Puyallup, WA 98375-6260. The phonenumber is (253) 841-4614 (also fax). Glen Breitsprecher has made about 90% of the canopies (31 years at it). He visited John Thorp in CA many years ago and supplied John's canopy. For the E-mail it's [g.breitsprecher@worldnet.att.net](mailto:g.breitsprecher@worldnet.att.net)

Prices (at present) for windshield and canopy are:  
3/16" \$750 1/8" \$650

Canopy only 550  
Windshield only 150

These are shipped untrimmed and crating (contract) is \$110. Example freight is \$147 to San Diego. Glen can provide a price list or can give better information if contacted directly.

Hey folks ...how about that for service!  
Tom Worth - N295RS - Tacoma (TIW), WA  
Note: RS used Gee Bee canopies.

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John Evens points out how important it is to have good cockpit access for working on such things as the gas tank. One of the ways is to make the floor board removable. A solution that I incorporated in 966RP is to cut a hole in the underside of the fuselage directly under one of the seats. This when removed allows one to stand (kneel) on the ground and be in excellent position to work on any of the componets located in the cockpit. This of course can easily be done on any T-18 at any time. At the time I did a simple stress analysis that showed sufficient strength remained in that area of the fuselage if one uses dimpled holes and nut plates. I left about three quarters of an inch on the ID of the cut hole under the seat for the nutplates. The 6-32 nutplates are about two inches apart.  
I don't like to mess with J.Thorp's design, but this is an exception.

Bob Pernic

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From: [ggreen@itexas.net](mailto:ggreen@itexas.net)

Re: Canopy Locks;  
I have a cabinet lock on my T-18 that I used for nearly 15 years. I don't used it any more though. Heres why: It only keep the honest people out. Its like locking a convertible. About 3 or 4 years ago an RV-6 buddy and I, took our -

wives and went on a flying vacation from Texas up thru Yellowstone, Kalispell, Glacier Park, Seattle, Sacramento, Reno, Canyonlands, etc and home. While in Woodland, Ca (Yolo Co.airport), we had to leave my buddy's RV-6 tied down outside. (The T-18 20' 10" wingspan was able to squeeze into a hangar). Upon returning to the airport, we found the RV-6 (which had been locked up and with a canopy cover installed) had been broken into. The canopy cover was nowhere to be found. The perps had tried to break open the lock on the canopy release lever on the side of the cockpit, thereby boogering up the paint, sheet metal, and locking mechanism. Being out-foxed by the lock, the bastards did what any car thief would do to a convertible. They slit the top. But, instead of using a knife, they used a hammer or other blunt, heavy object and proceeded to smash a hole in the canopy big enough for one of them to crawl thru to get at the radios. They took the good stuff like the King radio, xpndr, etc. Had the RV-6 not been locked, in all probability, the stolen items would have been exactly the same. The airframe damage would have been zero. You ain't going to keep a thief out. Don't lock it with anything more sophisticated than a tiewrap or piece of safety wire. Its only going to keep the honest people out. The slug with the pierced eyebrows, studded tounge, ring in his ear, bone in his nose, and cap on backwards will get pissed and tear Hell out of things to get at what he wants. By the way, don't expect much help from the local gendarmes. They look at a homebuilt airplane like a hog studying a watch. The Feds ain't any better. They have bigger fish to fry. The theft ring preying on aircraft was caught in Calif, my buddy's King radio was found among a hangar full of stolen avionics. He still has not gotten it back and never will. "Evidence", ya know?  
The rest of the story. It was a traumatic experience for all of us. I have absolutely no doubt that either of us would have killed (no exaggeration) the culprits that day if we could have caught them. It was like rape. It took a long time to cool off and get a bit more rational. We eventually decided we could patch the RV canopy with sheet metal and speed tape sufficiently to make it airworthy to fly it home for repair. It wasn't pretty, and the view wasn't spectacular, but we figured it was safe if in formation. The forward portion of the windscreen was intact and he had a good view of lead. Maxine flew home on a Delta pass, Charlie's wife flew in my right seat, and Charlie flew on my right wing all the way home.  
We don't lock out planes anymore. Don't you!

Gary Green

Thorplis Chatter, cont.

### Tailsprings

I've never experimented with a locking tailwheel, which in general is used as a last resort on higher horsepower airplanes when a steerable tailwheel won't do the trick. The Glassair taildragger used one, as did a T-6, a P-51, a C-47, & etc. The RV's leave the chains slack and the pilots like the way the airplane handles, but the T-18 tailwheel steering links should be coupled to "Tiller" springs (compression type) with a little tension. Enough tension so the steering is positive, but not so much that you can't break the wheel out of center and swivel it just by tapping a brake or pushing on the side of the airplane. A worn out Scott tiller bar on the tailwheel yoke is very unsafe, in my estimation, because it requires that you do quite a dance on the rudder pedals to maintain control. I flew back to Oshkosh in 1995 with a worn out tailwheel assembly and fought it on every landing. I decided to buy a new Scott Tailwheel assembly while there and installed it in the fixit area. What a wonderful difference it made. I was very happy to regain good control again. I learned a lesson from that experience, to wit; Take care of your tailwheel mechanism and spring tensions or you'll find yourself joining the ranks of "those who have groundlooped," while losing your status of "those who are going to. groundloop."

No doubt a locking tailwheel could be made to work but you ought to talk to someone who has used one to get an idea of the reasons for it in the first place and, secondly, the positives and negatives of having one. It would require a redesign of my tailwheel adapter to incorporate a locking mechanism that you could control from the cockpit. I'm sure it could be done without much trouble but I would rather not do it. The unit works good now and accomplishes all the things I intended, so I would rather leave it as it is.

To clarify these comments, my criteria for the Tailspring Assembly was:

1. The tailwheel had to be steerable, full swiveling, and be able to incorporate a tailwheel fairing, using commonly available components that wear out over time. (The Yoke, Wheel Assembly, and the Tiller Bar are stock Scott components that I used which can be purchased individually)
2. I wanted the tailspring rebound rate to match up to the main gear rebound rate of 3/4" per G. (It now hops, instead of porpoising, on a firm landing)
3. I wanted to lower the tail to increase the ground angle of attack, so I could take off quicker and land slower. (This, in conjunction with 20 degrees of flaps on takeoff, gets you in the air two or three hundred feet sooner and allows you to land a little shorter by getting closer to the stall angle of attack on landing.)
4. I wanted to decrease the drag of the original 2-1/4" wide flat spring, which sticks down approximately 8". (The round spring, at ten degrees angle of attack to the relative wind has less than half the drag of the flat spring, resulting in a

slight gain in airspeed).

In the event that you don't have both drawings I still sell sets of these plans for \$10.00, Which just barely covers the cost of duplicating and shipping them, and I register each set so I can send you revisions if necessary. I'm not sure if your FAA Engineering Office (GADO, EMDO or whatever they call themselves now) considers this a major change or not, but you should have appropriate documentation and consult them to avoid invalidating your Airworthiness Certificate, which voids your insurance. AVEMCO pulled this trick on the owner/builder of a Long Eze a couple of years ago. He modified his fuel system, didn't like it and changed it back. Without him realizing it, his Airworthiness Certificate had been invalidated by the first action, and legally required renewal. Which, of course he had not done, so his liability Insurance was null & void, and he was not insured when he ran his airplane into something expensive. The NTSB decision was appealed, but was upheld by a Federal Judge. AVEMCO avoided paying the liability claim. The Experimental Category needs something like an FAA Form 337, which documents major repairs or approved changes to a standard airplane. But that's a story for another time. This is no doubt very bad news to "Experimenters" that have accumulated many little mods over the years. We need to be very careful in what we do to our airplanes to assure that we have not made a major change (as defined by the FARs) since our Airworthiness Certificate was issued.

Best Regards, Lyle Trusty

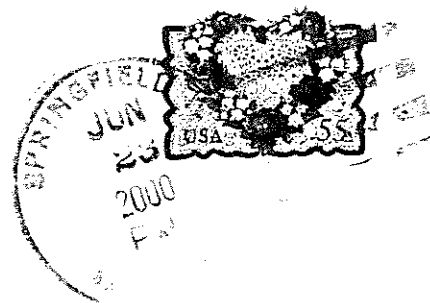
### Upcoming Events

Oshkosh, Air Venture 2000 -- we will once again have our Forum and feed on Friday July 28 at 12:00 noon in the Nature Center. Bill Williams will again be preparing his world renowned Brats. Everyone is urged to attend. For additional information, contact Roy Farris at (618) 723-2594 or email: rfarris@wworld.com

Kentucky Dam Fly-In --- Oct 6,7 &8, 2000  
Gilbertsville, Kentucky. Join the annual fall gathering in Kentucky. It's always a good fly-in. For further information, contact Jim Paine at (828) 698-0368 or email: jpaine@ioa.com

T-18/S-18 Thorp Newsletter  
 Roy Farris  
 P.O. Box 182  
 Noble, IL. 62868  
 Phone: (618)723-2594  
 email: rfarris@wworld.com

June 2000



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Please check your mailing lable for the "PD" entry in the upper right corner. If you don't see the "PD" entry, then you have not paid this years dues. Please be kind and send your year 2000 dues now.

## THORP T-18 MUTUAL AID SOCIETY ----- 2000 DUES

Please continue your support of this valuable exchange of ideas, building tips and safety information covering John Thorp's greatest design. Please make checks payable to: Roy Farris P.O. Box 182 Noble, Illinois 62868. Make check for \$25.00 US, \$30.00 for outside. I don't know yet how the postage increase will affect out mailing costs.

Name: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_  
 Phone: \_\_\_\_\_  
 Email address: \_\_\_\_\_  
 Notes: (building, flying, thinking about it, etc): \_\_\_\_\_

# T-18 NEWSLETTER

January 2001



*Amos Rank ~ N37AR ~ Independence, OR.*

## IN THIS ISSUE:

Porterville Fly-IN  
Kentucky Dam Fly-In  
Saftey Talk  
ThorpList Chatter  
Technical Tips  
Upcoming Events

**NOTICE: (STANDARD DISCLAIMER)** As always, in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearinghouse for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.



## Editors Notes

By: Roy Farris

Here it is, year 2001, and this is the years first attempt at a newsletter. In the last issue I made a plea for good technical information that I could use in OUR newsletter. With a minor exception, I haven't received a darn thing, so I will fill the pages with whatever I can come up with. I get many emails wondering when the next issue will be mailed, I get the impression that there are many of you that sit and wait for the next T-18 Newsletter, and anticipate all of the good technical info and goodies about building and flying our wonderful little airplane. I hope that these issues don't dissapoint any of you. It is really difficult for me to come up with twenty or so pages of good material without some help. There are several T/S-18 being built out there, and the interest in our airplane seems to be growing. For those of you that are building, I know that you have many good ideas and have overcome many obstacles to get where you are. Please send me those ideas and inovations that you have used to get past your obstacles. It will help others like myself, who are building, and are running into the same obstacles and problems that you have overcome. That is what this newsletter is all about, sharing your thoughts and ideas with others.

As always I will continue to try to publish this newsletter with interesting and technical information about our wonderful little airplane.

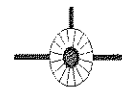


## Burn-Out

I received several comments via email on the Burn-Out article in the last issue. I see that I am not the only one experiencing this problem. I think that this is a problem related to all aircraft homebuilding and not just us Thorp builders. Several of you commented on the how's and why's of your delayed

projects, and I think all of us can relate. I also found through your comments, that for most of us, it stems from some part of the project that we are having great difficulties overcoming, so we get frustrated and just decide to layoff for awhile and collect our thoughts. A few days become a few weeks, then a few months, and then suddenly we find ourselves caught up in other facets of life and can't figure out how we ever found the time to begin with. Building an airplane needs to become a habit. We need to get back into the habit of getting out there and doing it. I find that after I get started again and work every night for a week or so, that I begin to get involved mentally and get back into the habit. When your project become a main priority, those other things that always seemed to be in the way, are suddenly on the back burner. Building is a long, time consuming process, that can take forever if we let other things get in the way, but if we make it a priority and get in the habit, it will only last a short time. When I began building my T-18, I was told by more than one builder: "Do something on your project every day." I believe that is very sound advice, that way you never get out of the habit.

With much pushing from good friends and fellow T-18'ers I have slowly resumed work on my project. (I did have to take time off to write this newsletter) I haven't gotten totally back into the habit yet, but I'm working on it.



## Newsletter Dues

Man is this a tough subject !! I want to thank everyone who sent their 2000 dues. I still have many of you that **have not** paid last years dues. I even show several unpaid for 1999, and several unpaid for 1998. **PLEASE look on the mailing label on the back of this newsletter.** Look above your name. If you see a "PD" then you are paid through 2001. If you see an amount, (ie \$25 or \$50) above your name, that is the amount you owe. Several of you sent your 2000 dues at the

cont. next page

Newsletter Dues, cont.

end of the year. I am not sure how the dues have been handled in the past, but I want to establish a policy for everyone. Beginning now, the newsletter subscription is due in January. So those of you who paid late for last year need to check your mailing label. If you have any questions, please don't hesitate to contact me. I hope we can resolve this issue, as I cannot continue to publish and mail this publication without operating capital.

Lets Talk Saftey

I commend Gary Green for the courage to report his S-18 spin incident, and Roy Farris for publishing it. I am, however, disappointed in Dick Cavin and other newsletter editors who knew of Gary's incident, and did not print it. Publishing our failures is just as important as our successes, because "it saves lives," and we all have the responsibility to do that.

In my opinion there are two possible causes for Gary's experience. There are two airfoils used in the T/S-18 series aircraft, the NACA 63415A and the LS-1. The NACA 63415A is a fifteen percent thick Laminar flow section with the maximum thickness at thirty percent chord and a design cruise lift coefficient of .4. The "A" means that the trailing edge cusp of the original airfoil was designed out by numerical calculations and, although it was never confirmed by wind tunnel data, is supposed to have the same aerodynamic qualities as the original.

The LS-1 airfoil was designed by T-18 guru Lou Sunderlund. Although it is based on the NACA 63415A there is a significant difference. The forward thirty percent of the airfoil was replaced with the forward thirty percent of a GAW-2 airfoil. This change gave the larger leading edge radius and the upper forward camber of the GAW-2 to the NACA 63415A, in hopes of a gentler stall and better climb performance, due to reduced drag at high angles of attack.

cont.

saftey, cont.

This "grafted airfoil" was never tested in a wind tunnel, so the exact location and travel of the center of pressure has never been known, hence its characteristics in a spin cannot be calculated. This does not mean that the LDS-1 is a bad airfoil. It works very well indeed, but we need to know all this up front before we start exploring the outer envelopes of our aircraft. We are all test pilots. Unless you built the airplane, or the original builder remembers, it takes a trained eye to identify which airfoil you have. The aircraft model type is of little value. The T-18 series (narrow body--non folding wing), T-18CW (narrow body--folding wing), are supposed to have the NACA 63415A airfoil, but I purchased a T-18CW with the LS-1 airfoil three years ago. Technically, this aircraft is a S-18, but the plans said T-18CW. I have also heard of non--folding LS-1 aircraft. All S-18's should have the LS-1 airfoil, if not, they are technically T-18CW's.

The other explanation for Gary's experience may be wing root fairings. The size and shape, or lack thereof have a critical effect on spin recovery. I have seen at least a dozen different types on T/S-18's. I am in no position to comment on which ones aid or hinder (or eliminate) stall spin recovery. Individual reports are always subjective to the reporter, but we all need input. So anyone who has experience with the different types or wing root fairings, please clue us in.

I am very glad Gary lived to fly with us instead of the angels. Someone else may not be so lucky. Be responsible..... Please write !!

Matthew E. Null  
Ann Arbor, MI.

*Editors Note: Matthew has some interesting points here, but in all fairness to past Newsletter editors, at a time when T-18 interest was low and growing slowly, printing articles that revealed a negative content about any phase of homebuilding or flying was considered detrimental to the hobby. Therefore most of them were not reproduced in print, but the T-18 community was always made aware.*

Safety cont.

Here in the northwest, the weather is noted for occasionally having some rain. A T-18 which I recently encountered had been tied down outside with no cover. When I first saw it, I was told that it had been in the NW for many years and was previously owned by an acquaintance of mine. At this first site, I noticed that the propeller was in need of refinishing to better protect it from the rain and sun. The airplane was repainted shortly thereafter and looked good until one got up close and saw that it had not been stripped (an "over" paint job).

Recently the owner complained to the FBO shop foreman about the engine running rough. When pulled into the shop, the lower plugs were pulled and water was found. After that discovery, a further inspection of the carburetor air box showed that a drain hole was plugged up. When it was cleared, about a quart of water ran out across the floor. The engine then ran alright, but the foreman wouldn't release the airplane until the prop was refinished.

So, T/S-18 owners, if you are unable to hanger your airplane, for sure get a cover for it, and probably one for the prop too. In any case, a wood prop needs some careful attention with marine spar varnish (per Aymar-Demuth) to keep it from deteriorating. Re torque the prop at ten hours after installation, and at each oil change (or 25 hours).

Tom Worth  
Edgewood, CA.

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### Preflight Inspection Item

After departing a nearby airport and while maneuvering at about 125 mph with low positive G loading (1.5-2.0) I suddenly found that I could not move the stick to the right beyond approximate neutral! This situation will get your undivided attention almost instantly. Aircraft control could be maintained with moderate right stick pressure which allowed the right aileron to move up very slightly due to slight 'spring' in the aileron circuit and left aileron and rudder application was available for yaw assistance. There is not much play

cont.

Safety, cont.

or spring in the Thorp push pull tube type aileron control system. Slow cruise speed seemed to allow best of marginal control.

By the time I got all this sorted out I made the decision to continue to home base. As I flew I could see the left aileron flex with right stick application from sun reflection and figured a jam condition at or near the tip. The approach would have to be precise to ensure touchdown at the optimum location (short and on centerline) on the 2200 foot strip. This was done and a normal landing and rollout with no more surprises, fortunately.

Immediate examination of the left aileron showed minimum clearance between the aileron mass balance and fiberglass wing tip-aluminum skin had decreased allowing normal up movement of the aileron and down movement to about the neutral point where a jam condition occurred. This was caused by the geometry of the mass balance arm and the lead weight dug into the skin. The aileron drawing shows that clearance should remain a constant with control movement but in my case it appears to be constant but is not precisely so.

No significant aileron or other damage is apparent except hangar rash you might expect to see in 25 years of service. Corrective action was to increase clearance from about nothing to the present 3/16" between the forward mass balance weight and the wing tip aluminum skin. This was done by enlarging the underside wing opening. Mass balance was removed for inspection and no evidence of damage or distortion. There is no excess play in the control system or aileron hinge. The tip is secure to the wing with no movement.

I would advise adding a visual check below the wing tips for this mass balance to wing clearance during preflight inspection. Should you experience any such unusual in flight circumstances I would recommend an expeditious landing at an airport with a long and wide runway.

For your consideration my experience background is retired professional pilot, A & P and current CFI operating various light aircraft. I wish you safe and happy Thorp flights.

Frank Baldwin, T-18 ~ N6937

Technical TipsBrake Lines, cont.**Brakes and Brake Line Selection:**

By: Lyle Trusty, T-18 N851LT

A few weeks ago I read something that said plastic brake lines were a poor choice. The writer indicating that the ones on his airplane had grown brittle with age and had fractured. He was subsequently going to install hard lines with metal fittings and flexible hoses.

This prompted me to investigate the subject, because my brake lines are plastic, having changed over from hard lines with flexible hoses and AN fittings in 1984, after installation of a set of Long Eze brakes. (These brakes are made by Cleveland and have 3/8" thick discs and slightly larger and thicker pucks. They are a much better brake for the airplanes fitted with 180 hp engines, and are able to hold the airplane during runup, even when they get old, as well as providing superior braking capability during landing and taxiing.)

Let me digress. My first brakes in 1974 were the popular 500 X 5 Cleveland disk brakes that are pretty much the standard for homebuilts in the speed and weight class of the T-18. They worked adequately, but I had to pump the brakes a couple of times before landing to get a good pedal height. The same thing before runup. I found that the metal line to the calipers was defeating the self adjusting feature of the brakes, so I installed a flexible hose, with the attendant hose fittings, in the last 8 or 10 inches of the lines before the calipers. This improved their performance; however, it was still unsatisfactory because of the stiffness of the hose. Moreover, about the time I would get to the prescribed RPM for the mag check the airplane would start creeping away despite my best efforts to prevent it from moving. Installing Chrome Disks would help for 50 to 100 hours of operation, but then the creeping would begin again. I lived with the problem for several years; replacing brake disks every year or two with new chrome disks.

After moving to California and flying out of the Antelope Valley for several years, I was fortunate to be able to change the engine from a 150 hp/constant speed prop configuration to a 180 hp/fixed pitch installation. Now, however, I was flying from a 2,800 foot dirt strip at our

ranch, at high density altitudes in hot weather. The "Go Power" was very nice to have – but the "Whoa Power" was marginal. Then I heard about the so-called Long Eze Brakes, supplied by San Val aircraft parts in Van Nuys, California, by special arrangement with the Rutan Aircraft Factory. Looking into this, I found that the Long Eze suffered from the same symptoms I was experiencing with my T-18. I was convinced that Burt Rutan had solved my problem, as well as the Long Eze's. So I bought a set, and put them on my airplane. This time, however, I used 3/16" Go Kart brakeline Nylon tubing, with brass fittings and sleeves, for brake lines. The flexibility of the 3/16" lines allows a simple, direct routing right to the calipers from the Master Cylinder. No need for anti vibration clamps, strain relieving loops or bulkhead fittings. The installation was a snap, even though I have dual brakes, and there have not been any problems with them since they were installed about 1,100 hours flying time and 16 years ago. I just finished inspecting them and they look and feel just like they did 16 years ago. The performance of these brakes sets the standard for a T-18 class airplane, in my estimation.

If there's any fault, it may be that it's possible to stand the airplane on its nose under two circumstances. The first is that a fly-weight pilot with a full main tank could possibly raise the tail during a full power runup, even with full back stick, to the extent that he could strike the prop. That is also possible with the original brakes, if they are in good shape. The other condition occurs on rollout, with application of excessive braking on both brakes, when a light weight pilot is flying solo. I've experienced raising the tail a foot or so, when using the brakes aggressively, however it was very controllable, and the natural reaction is to quickly get off the brakes

**Now to the nitty gritty; What is the right material, if you elect to use plastic lines in your brake system, and where do you get it?**

**The right material is 3/16 inch NYLO-SEAL TUBING, P/N 33-NSR, along with BRASS POLY-FLO NUTS AND SLEEVES, P/N 261UB-03.**

cont next pg.

cont.



### Brake Lines, cont.

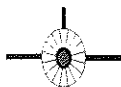
These items are readily available from Aircraft Spruce and Specialty Company. Look on page 115 and 117 of their 2000 – 2001 catalog. Read the specs for this tubing, and you'll see why other tubing is not suitable for brake system applications. This tubing has a Chemical Resistance and Physical Properties specification that makes it clear why there could be problems with other kinds of plastic tubing.

For Example:

NYLO-SEAL TUBING has a burst pressure of 2,500 psi at room temperature, with a working pressure of 625 psi. At 230 degrees F the burst pressure is still 1,400 psi, with a working pressure of 350 psi. All this at a safety factor of four. The heat distortion point is 302 degrees F at 66 psi.

POLYETHYLENE tubing has a burst pressure of 250 to 600 psi at room temperature, and a working pressure of 75 to 160 psi. At 140 degrees F this tubing has a burst pressure of 125 to 300 psi, and a working pressure of 37 to 80 psi. The heat distortion point is 107 degrees F at 66 psi. Do not use this tubing for brake lines under any circumstance.

Lyle Trusty



### Starter Solenoid

I had to once again replace the master solenoid on my T-18. This is at least the third one I've put on in 20 yrs. I know I have replaced it at least once before, and maybe twice. Anyway, I've discovered some things I either didn't know or had forgotten. I had heard of starter solenoids being installed up side down and then engaging the starter under high G loads. I hadn't thought about the reverse happening with the master solenoid as one taxied over rough ground or bounced in rough air, etc. I had my master installed upside down, so that when engaged, the electromagnet

cont.

### Starter Solenoid, cont

had to pull the plunger up. I got to thinking about this the night after installing the new one, so yesterday, I went out and reversed it. It now has gravity assisting the magnet to hold the contact engaged. While talking to Kevin about this, he dug out three old RVators that discussed this very problem. The 3rd issue of '98 has an article on page 13 showing diodes on both the starter solenoid (which I have installed) and on the master solenoid (which I don't have installed). The August '94 issue on page 13 also shows a drawing of those diode installations.

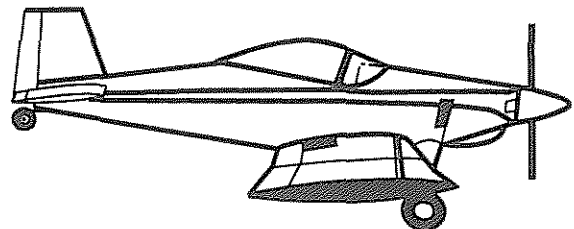
Gary Green  
Grandbury, TX.



### Jacking the T/S- 18

I just recently jacked up Jim Critchfield's N8TT to allow him to work on the wheel pants. I drilled a small hole in the cowl at the joint of the A frame at the horizontal crossbar and slipped a 3/8" grade bolt up thru the hole into the joint then jacked from there. It worked perfectly using the large wing jacks. He was able to work there, I was able to get in and out of the plane for various purposes and there is but a tiny hole in the fiberglass lower cowl that is not noticeable to the average person. Try it!

Best wishes, Hal Stephens



More Technical Tips

I jack my Thorp the very same way with fine results. I too have removable tie down rings which I built to screw into a fitting bolted to the main spar close to the dihedral break. I screw the ring in and use a hardwood block which aligns and constrains it and the end of a small hydraulic jack... it can't slip off. It's harder to describe the block than it was to make it. I use this set-up for routine maintenance. I use my engine hoist (cherry-picker) to lift the whole front end if I need to, and use a nylon strap to lift from the apex of the A-frame/engine mount at the top center of the firewall.

John Evens

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The aircraft came with removable tie down rings (male thread) to the spar. I took a similarly threaded bolt and ground it off to a rounded shape and placed into the female threaded socket.

My hangar partner had made a frame to hold a small hydraulic jack for his RV-6 and made an extra frame for it. By removing the extra frame, I used the jack to pick up the wing (T-18 is lower than RV-6) to change a tire. A piece of wood (doughnut shaped disk) with a small hole in it was placed on top of the jack pad. Of course the opposite main wheel should be chocked. Carl Daughter's idea for a framed box for the tail wheel is a good idea also.

When lifting, be aware that the lift side wheel will cause some shifting, so use care and be prepared to lower and relocate jack stand if necessary (and beware of jacks that leak some).

Tom Worth

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Be careful hoisting any airplane via the engine lift hook on the backbone of the case. It's OK for lifting the engine by itself, but not with an airframe attached to it. Look at a case sometime when it's apart. Ain't much mass there is there? I have heard of the case breaking out during such lifting attempts. If that happens, it ain't repairable. You're gonna need a new case.

Gary Green

Technical Tips, cont.

I use an engine hoist with strap around prop or if cowling is off a lift eye installed on the engine case. You can put a saw horse at empennage belly to stabilize. Tires or brakes can be serviced at same time.

Tom Worth

*Note: Use caution with this method! It has happened that the bolt has actually ripped out the side of the case when lifting more than the weight of the engine in this manner!!*

Carl ~ N647C

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Uneven Tailwheel Wear

*A question from Omaha:* Is it 'normal' to have uneven wear on a Lang tail wheel system on a Thorp? I'm not sure if it is due to the tailwheel axle being supported on one side versus the typical bracing on both sides of a typical Scott tail wheel?

I'm not sure if it's the tailwheel, a bent tailwheel spring, or improperly installed tailwheel system on my Thorp. Have had uneven wear through several tail wheels. Candid advice and comments appreciated.

Pete in Omaha

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The "typical" 6" Scott tailwheel IS supported only on one side, just like the Lang. It is not unusual to have either a little twist in the tail spring or a slightly out of square casting or other assembly on the tailwheel itself. If this bothers you, as it did me, it is easily corrected with a thin shim between the tailwheel assy. and the spring. This is one of the advantages of the flat spring design. I've seen many production aircraft tailwheels shimmed this way.

John Evens ~ N71JE

Landing the Thorp

*Editors Note: The following were replies to a question asked by a new Thorp owner.*

Don't rush it. Get used to the ground handling without doing high speed taxiing. The danger with high speed taxiing is the transition through the rudder effectiveness through to the tail wheel control occurs twice and can be further aggravated by the change in engine power and prop wash.

How much tail wheel experience have you had? If zero then it is important to be taught the principle of the tail wheel aircraft. It is better to do this on a slow light trainer where things will happen slow enough for you to identify them and respond with the correct control inputs. C120/140 Aeronca Chief or the like.

Is your tail wheel experience on very light control input (with short control inputs). The Thorp responds to light inputs on aileron, elevator and rudder. Do not attempt to wear a size 12 boot when flying the Thorp. Remember that different Thorps may not fly exactly the same. My Thorp (s/n 931) is a T-18 with the original wing section as opposed to that of the S-18. The length of my main landing gear is such that the Thorp touches down in the three point attitude at flying speed. (There is no such thing as a stalled landing). This can cause a problem or two for the newcomer. There is only one way to land my Thorp. It is the right way. Let me talk you through an approach and landing. There is nothing scary about it if one follows the rules.

Chose a very smooth grass runway or dirt. It must be long and wide. 3000 feet should do. I say very smooth because a hump in the wrong place could cause porpoising and pilot induced oscillations. Once I had my Thorp bounced high into the air at below flying speed. I was lucky to catch it with a good handful of manual flap input and checked it and "flew" down the runway in ground effect at an altitude of about 2 inches. The flap lever then became my new elevator until the Thorp accelerated to 80 mph with zero flap. Sorry there are two important things you need to know. (a) where the ground is or how high the main gear is above the ground, and (b) the look of the aircraft when it is in

Landing the Thorp, cont.

the three point attitude. If you get a hot landing aircraft too slow too high above the ground you could bend it. Now, where was I? Assuming you have a long wide runway, let me continue. If the runway has a tar or asphalt surface then you need to ensure that your main wheel are not too hard. Slightly low inflation pressure on a tail dragger will stop it being skittish on the runway. It is better to make your short final approach at a slightly higher speed. Say 85 mph instead of 80 mph. (add 5 mph for high altitude airfield.) This will give you the time to do a good flare/round out, stop the descent of the aircraft, and get it flying parallel to the runway at a height of six inches to two feet. If you made a lower final approach you could do the same but it all happens in two seconds. (i.e. check descent, close throttle, identify correct height above runway, identify three point attitude, put it down) Leave that sort of high work load with no room for correction for air show demo flights. Back to 85 mph. Trip the pressure off the stick. As you come in and you see that you are not going to undershoot, close the throttle, dive off the 20 or 30 feet of height and set the Thorp on a path parallel to the runway. From now on you need to keep both eyes out of the cockpit and looking straight down the runway. You are now flying entirely on attitude with NO reference to the ASI. With small elevator inputs set it up at about 2 feet above the runway. Keep it at that height and watch as its speed decays until it is on the three point attitude. As it gets to the three point attitude let it slowly lose height. The plan is to be about one inch off the runway when it gets to the three point attitude. You will get to this after some practice. In fact you will get to looking for the runway with the tail wheel while keeping the main gear at one inch. Most times you will make a three pointer but if you are a little too fast or slow you will not notice.

What can go wrong:- Remember, I said my Thorp lands at flying speed. The Thorp's tubular main gear is round in section therefore has to be ridged enough to prevent it flexing too much backwards and forwards. This is a disadvantage. If you drop the Thorp onto the ground it will bounce like a golf ball. A rectangular section landing gear spring as found on a Cessna

cont. on pg 13

# Thorp Fly-In 2000

Porterville, CA.

By: Hal Stephens

The ninth Annual Thorp Fly-In was again this year held at P'ville (That's Porterville, not Placerville) California on the labor day weekend of 1, 2, 3rd. Up to the last minute the weather was cooperating but then on Friday, when many of the Thorp drivers are committed to do it Mother Nature sent some nasty clouds down from Canada so a number of the pilots stayed on the ground or drove to the site. Just the same by Saturday afternoon over 20 Thorp T-18's were on the tarmac/lawn at Porterville.

We, as usual had a good lunch prepared by Frankie Archer following a get acquainted opportunity out on the ramp. Burgers over an open fire with all the good stuff that makes them juicy and tasty was served. Cleanup was accomplished and then Lyle Trusty began his annual Forum bringing forth all the latest changes and modifications that are practical for the Thorp. Mike Archer talked about the new Tri-Gear Auto Engined design that he is making happen. As with most of the airplanes that start as tail draggers.....the T-18 is undergoing a transition for those who prefer to refrain from fighting the "conventional" gear fly it to the hangar problems. Surprising how much interest was shown for this evolutionary process. The larger "long eaze" brakes were discussed as well cooling in the cockpit thru Dean Cochurn's side vents. A review of the latest cad/cam work done by Richard Ecklund was discussed and now certain parts are being made available for the standard T-18 series.

After the Forum the pilots were given the opportunity by Carl Daughters to fly a cork. The winners shared their libation with the onlookers and then it was off to a wonderful dinner of "deep pit barbecued" beef, again done by the Archers. Everyone there was stuffed when the sun went down .

By Sunday morning shortly after the sun arose, the flight crews had gotten by a good breakfast, compliments of the hotel and were headed for home to be able to spend one of their labor days with family. The ladies are given an opportunity each year to choose the most appealing airplane on the ramp and the lucky prize winner, receiving a crafted clock from Jim Critchfield, builder of N8TT, was Mr. and Mrs. Phil Key of Sacramento.

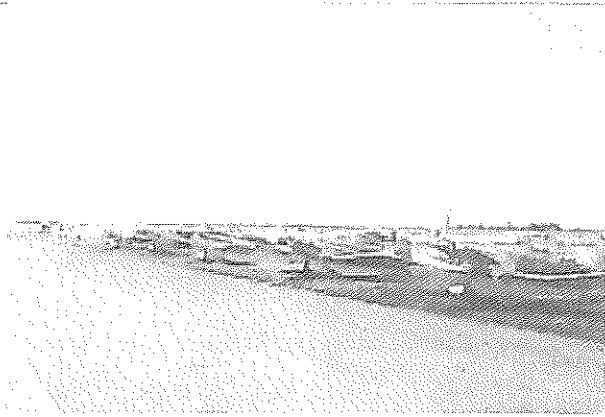
Next year is the 10th Annual and plans are underway to make the Fly-in even better. More gifts and a scrumptious dinner as well are in the planning. We are thinking of a weekend in September again as good weather is the usual fair. Best wishes and good flying..



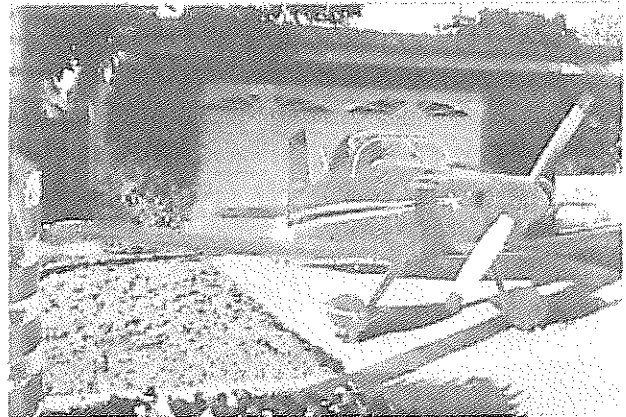
Ramp at Porterville Fly-In ~ Photo by Mac Booth

## Porterville 2000 Fly-In

Photo.s by: Mac Booth



On the Ramp at Porterville 2000 Fly-In



Mel Clark ~ Huntington Beach, CA.

I want to thank Hal and Mac for taking the time and effort to share this event with us. It looks like the Fly-In had a great turn out, and I am sure that everyone who attended had a great time. These events set us aside from many other groups. T-18'ers are the greatest bunch of people in the world, and I think we have the most fun. Everyone needs to make an effort to attend a Thorp Fly-In or event this year. Check page 19 for a list of events for 2001.

Roy Farris



Mac Booth ~ N1488 ~ San Jose, CA.



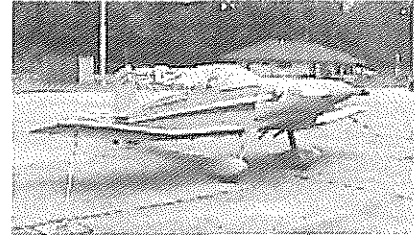
Mike Archer ~ Classic Sport Aircraft  
Springville, CA.

# Kentucky Dam 2000 Fly-In

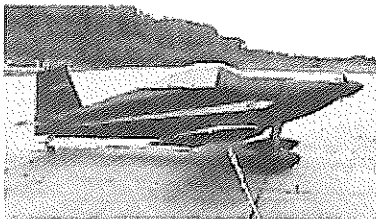
Gilbertsville, KY.

Photo's By: Tim Mason

This years Kentucky Dam Fly-In was held, as usual, in early October. Several arrived on Friday afternoon, and a few straggled in late that evening. Every year, our Friday night ritual begins with a trip to Patti's restaurant, located between the twin lakes that make up the Kentucky Dam Lake resort area. I am not sure how many attended the evening meal, but I would estimate around twenty five or so. Patti's is a wonderful place to eat and we all gorged ourselves, as stories of airplanes and flying filled the air. It's really a great time. We all head back to our rooms at the lodge, and a few rooms become the settings for more flying stories and discussions of how's and why's of building our airplanes.



Ben Mason's T-18 ~ Effingham, IL



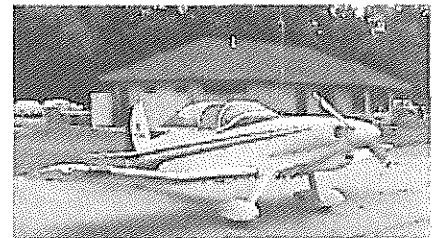
Steve Hawley's T-18 ~ Tucson, AZ

Saturday morning finds faithful Thorp pilots and builders gathering around the breakfast table in the lodge restaurant. We all enjoy a nice breakfast and then head out to the airport for more airplane stuff. There was a definite chill in the air on Saturday, and the temperature never got up to what one could consider warm, but the sky was clear and that's all we needed to go flying. Saturday at Kentucky Dam is the day for T-18 rides, and many were given again this year. I guarantee you that I was right there in front of the line. The group got a seven ship formation up and made some real nice fly-by's, even with the wind beginning to pick up.

Saturday evening finds us all together again, for a meal at the lodge, and a business meeting. Again I am not sure how many attended the dinner meeting, but I would estimate around sixty to sixty five. The lodge provides a nice buffet and the food is always good. During the short business meeting following the meal, several items were discussed, mostly concerning the future T-18 Fly-In's. The meeting was adjourned and we all gathered around the television set in the lodge, and watched video tapes of the days flying activities. We then adjourned to our rooms to get a good nights sleep.

Sunday morning found the temperature down right cold, and with a stiff wind, the windchill was unbearable. After the morning breakfast ritual, we headed for the airport. The weather just wasn't conducive to pleasure flying, so some packed up and headed for home, while others milled around not really wanting to leave. Everyone feels like family at this fly-in, and it's hard to say good-bye. No one wants to leave such a good time and head back to the same old daily grind. But all good things must come to an end, and eventually everyone was gone.

I am usually the last to leave, as I hate to miss even one of the farewell fly-by's. Another Kentucky Dam Fly-In goes down in history. All in All we had a great time and did quite a bit of eating and flying. That's what it's all about.....Isn't it!! We have it planned again for next year in October, Why not plan to attend.



Jim Paine's T-18 ~ Hendersonville, NC

Roy Farris

photo's cont on next page.



## Pictures from Kentucky Dam Fly-In 2000

Pictures By: Tim Mason



Bill Williams S-18 ~ Lakeland, FL



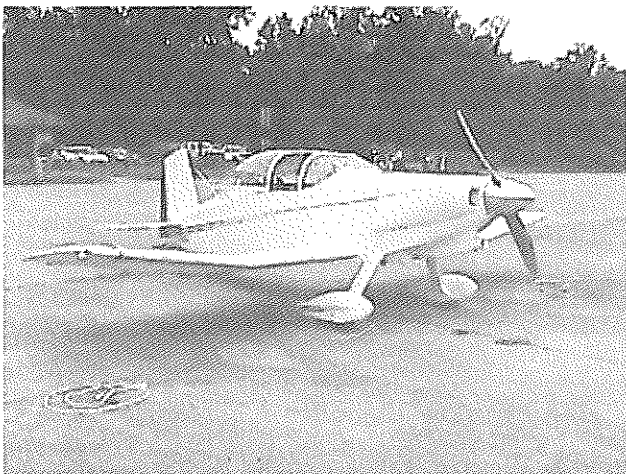
Les Conwell's S-18 ~ New Port Richey, FL



I'm sorry I didn't get your name.



Ken Morgan ~ Grandbury, TX



Gary Greens T-18 ~ Grandbury, TX



Jerry Sheetz ~ Ft. Meyers, FL.

Landing the Thorp, cont.

has more movement up and down than back and forward. It is for this reason many experimental aircraft use rectangular section spring gear. If you "drop" the Thorp onto the runway it could bounce you up to a height, nose high, where you run out of airspeed and ideas at the same time. Remember, an aircraft one inch above the ground cannot come to any harm. If you decide to go around. Take power and keep the Thorp about six to ten feet off the runway as you slowly bring the flaps up. (This is where a manual flat lever comes in useful. Let me know if you have electric flaps.) Once you have the aircraft flying properly and climbing at about 100 mph you can adjust the trim then give the tower a call. There are three reasons why you could "drop" the mail gear onto the runway. The first one is that you let the Thorp lose height too fast as you descend down onto the runway. This can cause you a problem even if you are in the three point attitude. The second reason is you let it descend unchecked onto the runway during the flare. The third reason is that you held the Thorp off the ground too long and let the tail wheel drop way below the main gear. As you descend onto the runway, the tail wheel touches first, breaking the angle of attack and the wings lose all their lift, resulting in the main gear descending even faster. If this happens you will not normally be bounced too high as you have not got as much lift at this lower speed. In most cases it is better to just ride out the storm and check on everything when you arrive. You might find damage to a wheel spat or two.

Darrell Miller  
South Africa

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Put the Thorp down with power, then you don't lose tail authority

Frank Roncelli

Landing the Thorp, cont.

I go down the "downwind" at about 110 mph, "base" at 90-95 mph and then on "final" I use 84 mph and once "over the fence" I use about 75-70 mph with an indicated stall at 64 mph. I use no more than 20 degrees flap and as was mentioned add just a tweak of power before touchdown in order to get the nice air flow over the rudder. Wheel landings are sweet if just a bit of nose down trim is applied on final so the aircraft has a tendency to "stick" upon squeaking onto the tarmac. Personal procedure.....do what you like.

Hal Stephens,  
Placerville, CA.

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You can land SHORTER in the 3 point attitude. The T-18 lands very nicely either way. With a wheel landing ("2 point"), the touchdown speed is slightly greater and there is less airframe drag. The angle of attack is less. I wheel land mine 90% of the time. Either way, forward visibility is great with the Thorp, as opposed to many other tail-draggers. Good luck.

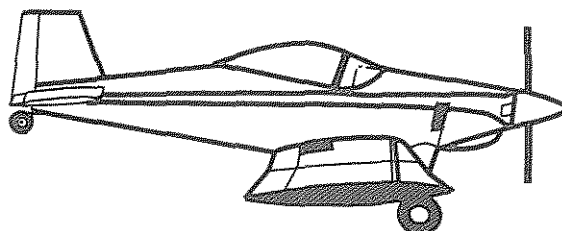
John Evens ~ N71JE

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I find the airplane on landing will float once it is in ground effect. I have no problem with a power off approach if I maintain a 1.3 V<sub>ef</sub>.

Have fun! It is a good airplane

Roger





Mandatory Mods. cont.More on Mandatory Modifications

A couple of safety items that you need to be aware of: This applies to any new Thorp owner who might not know the particulars of the T-18.....especially the older airplanes. There are 3 mods to the horizontal tail that are mandatory "flutter" mods. Thorp drawing C-595, revised 28 Feb 69 adds a lead tip weight on the outboard rib of the horizontal tail (shaped like a bullet). Thorp drawing A-517L revised 30 Jan 69 adds a .015 stainless steel strap on the horizontal tail tabs. See drawing B-502, assembly, horizontal tail, revised 3 Jun 68 to verify that the 502-7 sleeve is installed inside of the 502-3 spar tube. If the other two mods are verified, it is most likely that the spar tube is also...it's a little harder to do, but we can give you several ways to check it. The easiest of course is to check with the builder and have him attest to the completion. The other critical item, if you have a Sensenich metal prop..check to make sure the prop is NOT an M-74 blank. It must be a M-76 model. Your GPU WILL shuck a blade if it is an M-74. If it is a M-76, make sure it has been vibration tested by Specialized Testing Service to determine your safe operating ranges on the cut-down prop. The paperwork with the airplane should have a plot of the test results, if it was done. We have needlessly lost some fine people who failed to heed John Thorp's excellent advice. If these items are taken care of, you will have a very safe, proven airplane. If you need help with any of these items...just holler. All of these items are covered extensively in the T-18 newsletters, but they go back over 30 years and are difficult to research. The Thorplists make it much easier to get any info you may need. Again, welcome and happy landings.

Howard Ginn ~ N22DU  
Camp Verde, AZ

*Editors Note: The Newsletters contain an index that makes looking up old technical items fairly easy.*

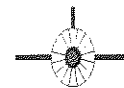
Thorplists Chatter

*The following information was taken directly from the Thorplists Email list. Nothing has been edited.*

More on Jacking the Thorp

There is no real good place to jack up a T-18 unless it is added during construction. I almost always have the cowl off when I'm changing tires or working on the wheels so I always put the jack on a wooden stool I have and then place the jack under the large area steel washer that the 3/8" bolt goes through on the lower gear attachment. I always let the plane down at least once to equalize "spring" so there is no side load on the stool or jack. Has worked well for 21 years. I always have a solid 4'X6' solid block ready to slip under the axle as soon as the wheel is off and I then let 90% of the weight of the plane back down on the axle. Much safer that way. I think that a Goodyear Flight Custom II tire is about as good as you can get. I compared them on a "cost per landing" basis and they end up being more economical than the cheap(?) McCrearys. I really can't imagine any T-18 requiring a 10 ply tire. These are just opinions and as every one knows, every one has at least one!

Steve in Tucson ~ N9008Z



I just joined the thorplists and read some letters on engine mounts. I just picked up some new LORD engine mounts for my T-18 at Herber Aircraft. They have a web page.

<http://www.herberaircraft.com>

The prices were better than Aircraft Spruce. Hope this info is of some value to the group.

Randy Noyes

ThorpList chatter, cont.

I switched from my original Prestolite geared starter, which I had for almost 10 years, to a new Sky-Tec #149-12LS a few months ago. It works beautifully, and seems to turn the engine over twice as fast, and weighs approx. 8 lbs. less. I've found that my #4 AWG copper cable works just fine. My battery is located behind the baggage compartment, and the total run of cable to the starter is less than 10 feet. #4 is good for over 150 amps with less than 1 volt drop at this length. If you're using the aircraft structure for the ground conductor path (I used the heavy extrusion at W.L. 26.10, and then #4 cable from there to the engine block) a couple of details will help to make that a trouble free installation. First, wherever you make a connection on the aluminum, shine the contact area with a Scotch-Brite pad (or similar) and clean with acetone, lacquer thinner, etc. immediately before bolting the terminal end to the aluminum. Next, coat that connection with a sealer of some kind. I used a printed circuit board coating compound called silicone resin lacquer. The paste compounds made for using with aluminum wire would also work well, I'm sure. The idea is to keep air and moisture from the connection to prevent oxidation and corrosion... aluminum oxide is a very good insulator. I am using a "gel-cell" (Power Sonic #PS-12330) which is rated at 33 AH. My last 2 have lasted over 5 years each. It is important to check the output voltage from the regulator, to make sure it is optimum for the gel-cell type battery, for best results and maximum life. I have an Electrosystems #VR600A regulator, which is physically the same size as the Ford S.S. regulator. It is adjustable and has built in over-voltage protection. Here is another tip... if you use a standard starter switch with "turn to start", and magnetos with left mag only impulse coupling, there is the possibility of starter or gear damage if the engine doesn't fire on the left mag when you release the switch. A severe back-fire can result if it fires at that point on the right mag (the right mag is un-grounded automatically when the switch is released and turns to the "both" position), which can actually break the end right off the starter. The solution is to use one of the switches

ThorpList chatter, cont.

with the "push to start" feature instead, or use a separate start switch and magneto switch, and start on left only then switch to both. The damage is potentially greater with the newer starters since they turn the engine at a greater speed.

John Evens ~ N71JE



Everyone has an opinion and here's mine: I strongly favor mounting the oil cooler vertically on the left side of the firewall, with the top about level with WL 42. The inlet and outlet fittings face inboard. One must fabricate a scat hose and plenum chamber feeding air to the cooler. I also had to put in a flapper valve in the scat tube fitting on the back of the left baffle to choke off cooler air in moderate temperatures. I don't like oil coolers on front or rear baffles. In most of those installations, one is constantly battling cracked baffles or leaking oil coolers due to the high vibration levels. You really have to beef up structures to mount one on the baffles, front or rear. Then modulating the flow of air through it in those locations is more complicated.

I also used a Mac servo for my aileron trim. I placed it inboard on the right aileron simply because the right side was closer to my work bench when I started working on it. I placed it inboard because it was easier to run the wiring since my wingtips are not removable (fiberglassed on... mistake, Make 'em removeable.) The trim tab is about 2" x 8", I'd guess. It works great. I wish it was on the left side though, so I could see it from the cockpit while flying. I did not rebalance the ailerons after adding the servo and I've inadvertently had it up to 240 indicated on more than one occasion.

Gary Green

More Chatter from the ThorpList

I used stainless steel hose clamps on the exhaust pipes to hold 1/2-inch wide stainless steel strips bent, twisted and drilled to bolt onto heavy rubberized strips to provide vibration isolation. These, in turn, simply bolted to adel clamps on the motor mounts. The system has held up well for 3 years with no sign of cracking in the exhaust and no excessive play in the pipes. What's more fabrication was cheap and quick.

John Sullivan

---

*The following were in response to a query about building the T/S-18 with pop rivets.*

I think Chuck Bordens analysis was great - you get what you pay for. If you like pop rivets, by all means use them. Most people looking to but a T-18 will prefer the 470/426 variety but remember the T-18 was designed to be built with pops if desired. Here is a little story that is true. I was fortunate to be one of the guys who worked in John's shop back in the 70's and he told this story one morning while were having coffee at Mr. C's (I think that was the name) A man named Russ Bayse built a T-18 back in the late 60's. He lived in Fresno and I knew him well. It was a tricycle gear retractable with a Lyc 180 and a CS prop. He flew it to Rockford and won top honors there. One day soon after it was completed he flew it down to Whiteman Airport in San Fernando where John had his hanger to let John see it. I know John was never enthusiastic about all the modifications Russ had done but it truly was a beautiful airplane. While Russ was there and John was looking the plane over, another T-18 came in from Lancaster CA. It had an O-290-G engine in it and was put together entirely with pop rivets. When they left (this was before Whiteman was a controlled field) they took off together and the pop rivet plane out climbed and out ran Russ's plane. The real moral here is not type of rivets, but weight. I am a real believer that light airplanes are efficient airplanes - and safer too.

Steve Hawley

More Chatter from the ThorpList

My Thorp is assembled with mostly monel pop rivets. While you can build it that way there are some considerations:

1. Don't substitute stainless for monel. When you need to drill out the rivets stainless are near impossible to drill without turning, monels on the other hand are similar to aluminum and the rivet doesn't turn when you start drilling.
2. Monel rivets work OK for areas like general skin riveting, but I recommend using regular bucked rivets in high stress areas as the joints usually are tighter with more even load distribution rivet to rivet. The end result is you don't have rivets coming loose.
3. For wing skin to spar attachments I had monel rivets that always smoked. The flap brackets came loose, rivets around the firewall came loose. Rivets on various brackets came loose. Same thing - Monels work well in low stress environments, but not as well in highly stressed applications.
4. Monels have a different countersink angle - Be careful that you use the correct tool for dimpling and countersinking, which I had difficulty in getting.
5. Monels have open area where the shank goes - You need to fill this before painting, which is a job!

Those are my thoughts - My airplane uses them and for the most part they work well, but you can't use them everywhere. And don't substitute stainless for monel - If you damage the airplane it basically will be scrap, that's how difficult it is to drill SS rivets.

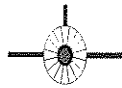
[Rossair@aol.com](mailto:Rossair@aol.com)

cont next pg.

ThorpList Chatter, cont.

I put a scupper in my tank. After making tank made up a aluminum box approximately 4" square and 4" deep. Welded in the tank fitting (to take screw in neck for cap) this assembly is welded into tank inset sufficiently to keep tank cap below fuselage skin. The portion above tank surface is trimmed to match contour of skin and this can have a rubber seal on it to seal to skin. I welded in a 3/16" pipe into bottom of scupper for spill collection and goes out through tank wall forward with plastic hose attached and runs down and out bottom of fuselage with tank vent line. Sounds like a bit of work but it was quite simple and has worked OK.

Tony Schischka

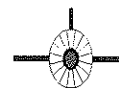


There have been many T-18's built with .035 side skins (mine being one). I've seen many butt joints and a few lap joints. Actually, you probably see a lot of details, like butt joints, as least as often on fine aircraft like the T-18 as you do on production aircraft. To the gentleman with the 36" inseam... that is what mine is, and I'm 6'3" tall. If you can accept some bend at the knees instead of your legs being straight out, you will be fine with the design. I find it very comfortable, but "snug". When I built my Thorp, I maximized the leg room as much as possible. As for the fuel pump question, it's been discussed in great detail, probably as long as the T-18 has been around. Here's my long-winded opinion: I can tell you with absolute certainty that a fuel pump is not needed if using the standard fuselage tank, IF you build your fuel system correctly... minimum "-6" (3/8") fuel line (stainless braided teflon is good), no unnecessary restrictions, starting with a properly sized finger strainer in the tank, A full-flow ball valve, a minimum number of 90 deg. bends (I have 2), a high-quality gascolator, a 45 deg. (steel) fitting into the carburetor, and a good fuel vent fitting facing into the airstream (don't forget a small, coarse screen on

More ThorpList Chatter

the end to help prevent insects like "mud daubers" from clogging it- important with or without a pump). I know of MANY T-18's without pumps, including 180 hp ships, that have run perfectly for decades and many thousands of hours. It gets back to the KISS principle... why would you want to add a pump (which generally means TWO pumps and usually a bypass check-valve to boot), adding more weight and complexity... something else to fail, if you don't need to (also something else hanging on the back of the engine clogging up that area)? I truly believe that the airplane is MORE reliable if you can avoid the pumps, and this is based on solid fact. It is very important to test your gravity system before the first flight. I got my main wheels up on some ramps, and filled my tank with just 2 gallons of fuel, and disconnected the line where it enters the carb (leave the 45 deg. fitting on the hose if you want, for complete accuracy). Keep the end at the same level that it enters the carb. Use a measuring container and check the flow rate. You're looking for 150% of maximum take-off requirements (in my case with a 160 hp 0-320, about 17 gph, I believe). Keep in mind that you are doing this test without the benefit of ram air pressure into your vent tube, which you will have during flight... and which creates a considerable amount of extra pressure. I've never had any sign of inadequate pressure during limited aerobatics or very steep nose high attitudes. I have experienced momentary loss of pressure during sharp negative G's, but I believe that pumps can "unload" during those situations also. My advise would be to test it, and if you don't like what you see, add the pumps.

John Evens ~ N71JE



More from the ThorpList

This week I responded to my second ever request to check out a pilot in a T18. It ended with being off the runway and some skin damage to the wings and the prop being trashed.

The owner is in the desert while I'm in the LA area and he thought that, as the insurance wanted him to have 15 hrs of dual, it would be better for me to qualify his instructor. Not enthusiastically, I agreed (by the way, I usually use my CFI only for EAA'ers BFRs and an occasional hr of instruction). The instructor hadn't flown a taildragger in 10 yrs. His experience was in the low power J3 Cub types. We did 2 lds for me and 7 or 8 for him. He in the rt seat with controls & brakes. I thought that we were finally making progress when we make a nice landing and he brings the stick back (I guess that a full-stall 3 pointer in a Cub will stick). As we bounced back into the air, we came down a little nose high (he had tended to flair too high and too slow). As the wing dropped (stall) he jammed the power on and didn't catch the rudder. Neither did I. I also wasn't forceful enough to get him off of the throttle. With high power and torque, but low airspeed, the rudder wouldn't give us a right turn. Off into the boonies we went. Trying to go thru this, I see my biggest mistake in being a failure to treat this CFI as a beginner and not briefing on the (1) torque effect if you aren't on the rudder, and (2) let me have the throttle when it happens.

Harold Underwood

Lets Talk Props

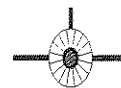
I have some strictly personal observations. I know of 2 aircraft (non-Thorp) in the Denver area which have experienced Ivo prop failures... both showed cracks and distress in the hub area of the blades... with 150 HP or greater, & then there's Harvey M. (with his bad weld). The concept is very appealing, but

cont.

More from the ThorpList

being the well-educated group that we are, with a lot of propeller experience good & bad (remember the tests using Bob Dial's T-18?), we should be as aware as any group about how ULTRA critical a propeller is. Ivo seems to bend over backwards to get their props on the higher horsepower engines in the field... to get some free test piloting perhaps? Nothing wrong with that, except we're talking propellers here. Harvey was lucky, but others may not be. With all due respect to Ivo (and Harvey), I wouldn't lay my butt on the line. There was a local guy with a longEZ. According to him, he was strongly encouraged to try the Ivo Magnum on his pusher. Probably most of you know that this is considered a definite no-no by Burt Rutan - a pretty smart guy. There is something about disturbed airflow before it gets to the prop, greatly increasing the potential for destructive vibrations, and wooden propellers are the safest choice. After a very short time the thing showed distress in the hub area (they use a piece of metallic tape that shears as a warning). He sent it back, got another one just like it, and installed it! No guts, no glory I guess. I have an Aymar-Demuth 68-75, 160HP, true airspeed 180 mph at 2550 rpm, 7500' msl, less than 7.5 gph. Full throttle, 2800 rpm, over 200 mph. Home field elevation (Jeffco) almost 5700' msl, and climb is better than 1000 fpm fully loaded. At sea level with just me, better than 2000 fpm. Some guys prefer the props with more laminations... there are pros & cons. Remember, more laminations, more glue which has no real strength itself. Of course, fewer laminations and the quality of every one is more critical.

John Evens~N71JE



*Editors Note: We will have more Prop Talk in the next issue. Please send me your thoughts on propellers for the T/S-18.*

## Upcoming Thorp Events

MARCH 24, 2001 ~ Plans are in the works for another Paso Robles Thorp Fly-In, mark your calendars !! On Saturday we'll get together for another fantastic Tri-Tip BBQ. Be prepared on arrival, we'll have a line out on the runway for a spot landing contest. Awards will be given for best of types, furthest distance flown, and others. Flyers will go out soon but mark your calendars now. Come out on Friday and we'll plan a late afternoon flight out to see the gorgeous California coast on an airborne tour. Sights will include Pismo Beach, San Luis Harbor, the Diablo Canyon Nuclear Power Plant, Montana de Oro State Beach, Morro Bay and it's famous Rock and then The Hearst Castle. That night we can experience one of Paso Robles' great restaurants.

April 8-14, 2001 ~ Sun'nFun Fly-In, Lakeland Florida. As of this writing the Thorp Dinner is planned for Tuesday, April 11. The date and time for the Forum have yet to be decided. The exact time and date will be posted on the "t18.net" website as soon as it has been set. Contact Bob Highley at: "n711sh@aol.com" for more information.

May 18-20, 2001 ~ Thorp Fly-In at McAlester, OK. The Ramada Inn at McAlester has rooms for \$49 single and \$54 for doubles. Cancellations until 6 P.M. on the day of arrival. Their ph # is 918-423-7766. Ask for the Holt-Green Party. Contact Gary Green at: "ggreen@itexas.net" for more information.

July 24-30, 2001 ~ Airventure 2001 ~ Oshkosh, Wisconsin The T-18'ers usually have a lunch and a forum on Friday in the Nature Center at 12:00 Noon. We have lunch, followed by a small informative meeting. This years activities are tentatively scheduled for Friday July 27. Anyone who has an interest in the T/S-18 is encouraged to attend. For more information, contact Roy Farris at: "rfarris@wworld.com"

October 5-7, 2001 ~ Gilbertsville, Kentucky T-18 Fall get-together. For Lodge reservations phone: (800)325-0146 and ask for the Paine Party. For more information contact Jim Paine at: "jpaine@ioa.com" or call (828)698-0368.

**T-18/S-18 Thorp Newsletter**  
**Roy Farris**  
**P.O. Box 182**  
**Noble, IL. 62868**  
**Phone: (618)723-2594**  
**email: rfarris@wworld.com**

**January 2001**



\$25



Please check your mailing label for the "PD" entry in the upper left corner above your name. If you don't see the "PD" entry, then you have not paid this years dues. Please send the dollar amount listed on the label. Any amount over 25(US) or 30 (outside US) indicates that you have failed to send previous years dues. Please be kind and send your dues now.

## THORP T-18 MUTUAL AID SOCIETY ----- 2001 DUES

Please continue your support of this valuable exchange of ideas, building tips and safety information covering John Thorp's greatest design. Please make checks payable to: Roy Farris P.O. Box 182 Noble, Illinois 62868. Make check for \$25.00 US, \$30.00 for outside. I don't know yet how the postage increase will affect out mailing costs.

Name: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_  
 Phone: \_\_\_\_\_  
 Email address: \_\_\_\_\_  
 Notes: (building, flying, thinking about it, etc): \_\_\_\_\_

# T-18 NEWSLETTER

April 2001



*Jack Kirkham ~ G-BSVN ~ Warrington, England*

## IN THIS ISSUE:

**Letters to the Editor**  
**Installing Dual Brakes**  
**More on Stalls**  
**Technical Tips**  
**Safety Concerns**  
**Landing Gear Cracking**  
**Some First Flights**

**NOTICE: (STANDARD DISCLAIMER)** *As always , in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.*





## Editors Notes

By: Roy Farris

Here is my next effort to provide you with a exciting and informational newsletter. I want to thank the persons who sent me the articles you will be reading. They are what this organization is all about, to share their wisdom and experience's with the rest of us. I encourage each and everyone of you to write an article on your T/S-18 experience. It could pertain to building, or completing a project, test flying your airplane or just your experience in the flying or maintaining of your Thorp. We all have ideas and experiences that we can share with others. We have a great number of new people interested in our "family" and our great little airplane. Any words of wisdom and encouragement go a long way in helping them in deciding weather the T/S-18 is the correct choice. I get several calls each month from people looking for just the "right" airplane to build. They ask many questions pertaining to the construction and the cost of building the T/S-18. Most had been unaware of the T/S-18, are surprised to hear of it's history. I always invite them to read the back issues of this newsletter, explaining that they contain everything one needs to know about the T/S-18.

The articles you provide will add to the knowledge database, and will be the tools and guidelines that future Thorp builders will rely on to construct their dream airplane. The old newsletters cover nearly every aspect of building and flying the T/S-18, but those are ideas from the sixties, seventies and the eighties. With modern technology, better tools, and fresh ideas we can sometimes improve on the methods that were once used. These are the ideas we need and desire to be printed for future generations to use. What others figured out years before and was printed in this newsletter, helped us build and fly our Thorps with a minimum of problems and trouble. Lets continue that tradition and help future builders by giving them even more information to draw from.

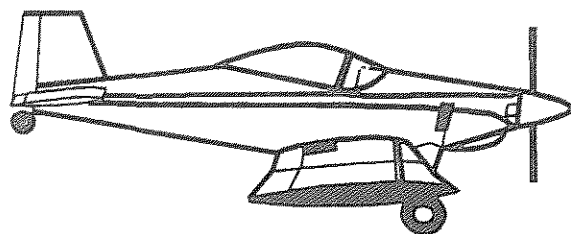
Write an article !!

## Newsletter On the Web

I have been entertaining the idea of making this newsletter available as a downloadable file from the T18.net website. I have had a few members request this feature, as well as a few contacts by email from the website visitors. This would be an addition to the newsletter service and would not replace the printed copy that you are receiving now. I would be interested in hearing from those that would like this option. Basically the way it would work is that there would be a "Members Only" page on the website, that would require you to enter a password to gain access. Once in the "Members Only" section, you would find the current newsletter as an Adobe Acrobat file that you could download to your computer. Once downloaded, you would need Adobe Acrobat to open and view the newsletter. For those who do not have the Adobe Acrobat Reader, I would provide a link to the Adobe website, where you could download and install the program on your computer for free. One neat feature of the Web Newsletter, is that all of the pictures would be in color. You would be able to view and/or print all or part of newsletter as you see fit.

The \$25.00 annual dues (\$30.00 for outside the U.S.) would continue, and as a paid member you would be granted access to the "Members Only" section. You would still receive the printed copy unless you notified me that you didn't want it.

I am in the process of collecting information needed for me to add this feature to the website, as well as sending this newsletter out by email to a few selected members as a test. If you are interested in obtaining the newsletter from the website please let me know. Email me at: [rfarris@wworld.com](mailto:rfarris@wworld.com)



Letters to the Editor

Happy New Year. Thanks for assuming the newsletter editor duties. I almost said "congratulations", but that may not be the proper word! I write one article a month for my local EAA Chapter newsletter, so I know just how much work it can be to put together a whole newsletter.

On the subject of Burn-Out, For me it's a matter of not knowing how to do the next step, and being afraid of screwing up and ending with something that is not airworthy, ugly looking, or both. Building the structure seems to go fast once you learn the required skills. It's just a matter of measuring, cutting, bending, drilling, deburring, dimpling, riveting, and doing those actions over and over and over while listening to your favorite jazz or oldies radio station. However, it took me a long time to work out the engine compartment. The John Thorp cowl is pretty and streamlined but so tight fitting that space is at a premium under there. I didn't know where to put all the accessories so that they wouldn't interfere with each other or some future part that would have to be installed later, such as throttle and mixture cables. I took much trial and error putting everything in with tape and wire before drilling holes in the firewall or installing platenuts, and I'm still not sure if it's going to work out! Because the fuel tank takes up so much space between the firewall and instrument panel, I can see that the same will be true for the electrical and pitot-static Systems. What I'm really stuck on is the canopy. I see lots of pictures of nice looking canopies, such as Earl Ody's red T-18 that was in Sport Aviation a few years ago. It fits very well, and the windscreen blends into the canopy perfectly. But nowhere in the newsletters have I seen any information on how to do this job. How do you seal it from water and air leaks? How do you know where to trim the sides and hack off the Plexiglas? How do you get the front top and sides to blend in with the angle of the windscreen nicely? I don't know how to do this and I don't want to make mistakes with a \$600 canopy, so I just sit there in the shop and stare at it, trying to figure out how to begin.

Well, I guess I didn't provide any answers, just more questions. But any information that you can find about installing the canopy for inclusion in the newsletter would be greatly appreciated.

Robert S. Hartmaier

More Letters

I really enjoyed the #114 newsletter, especially the "Burn-Out" information on page 2. I certainly am guilty of that many times over. When I first started in the early nineties, I buzzed through most of the movable, smaller assemblies in good shape and then started on the fin. Everything went quite well till the last dozen or so rivets, when the rivet gun did a take off on me and I bunged the left side rather badly. I smeared it with "bondo" but was never satisfied with the end results, so I tore it apart with the intent to redo it and that is where the whole project stopped.

I read your "burn-out" info and decided to restart. I built it the first time per John Shinn's build-info per N.L. 112 page 13 and diagram on page 16. Of course, I since destroyed the jig, so I am trying for a flat layout. I would appreciate anyone having information on measurements for the flat layout contact me.

Jim Strickenberger  
(814)825-2918

*Editors Note: I laid out my Fin and Rudder in the flat layout method. I got all of the dimensions directly from the plans, and they came out*



Here's a tidbit you may want to put in the newsletter, in case anyone else is wanting to get one of Trusty's tailwheel springs.

Gary Green

Date: Monday, February 19, 2001 12:00 AM

Just got 5 springs from Harmon Lang. When I placed the order he said that he was going to make a batch of 10. Should be 5 left. Contact Harmon Lang.

Installing Dual Brakes

Mike Archer ~ Classic Sport Aircraft

The first thing you must do for installation of dual brakes is inspect what you have on your aircraft. Check the right seat rudder pedals for the tabs welded on the 489-1 tubes. If your aircraft was built to drawing, chances are they are missing on that side. Also, check for the 492-1, -2 & -3 installation on the floorboard, right side. Parts required for the co-pilot side are:

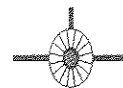
- 2 ea 491-2
- 1 ea 491-3
- 1 ea 491-4
- 4 ea 490-1 Bushings
- 2 ea 491-1 Pedal
- 2 ea 491-2 Mast
- 2 ea 492-1 Bracket
- 4 ea 492-2 Plate
- 4 ea 492-3 Spacer
- Two Brake Assemblies
- Various flex lines (Aeroquip 303 or Stratoflex 111)
- Reservoir (if you have the assembly that has the reservoir as part of the brake assembly, a separate one is not required.)
- 4 ea AN3-5A Bolt
- 2 ea AN3-7A "
- 2 ea AN3-6A "
- 8 ea AN365-1032 Nut
- 8 ea AN960-10 Washer
- Remove the 489 rudder pedals (if you need to remove rivets from forward tunnel, (reinstall it with nutplates). Weld the 491 tabs to the pedals for the right side. You are duplicating what is on the pilot side. Install the 492-1, -2 & -3 to the floorboard on the co-pilot side. Again, note the pilot side for reference.
- Install the 491-2 to the 491-1 and bolt them to the 489 rudder assembly. Assemble the brake assemblies to the 491-2.
- Reinstall the rudder pedals and bolt everything in position. **Don't forget to reinstall the springs and cables.**

Installing dual brakes, cont.

- Now you can finish the project by routing the flex hoses to the proper position. Routing for hoses is as follows for master cylinders requiring offsite reservoir with the master cylinder arm mounted up. The lower hole is fluid OUT. The upper hole is fluid IN.
- Install incoming line from reservoir to the top fitting on co-pilot left pedal - the tee from left top to right top. This now gives you fluid to both cylinders when using the master brake cylinders with the built-in reservoir (like Scott 4100) the incoming line is eliminated.
- Next, route a flexline **from** the co-pilot left bottom **to** the pilot left top. Route a flexline **from** the pilot left bottom **to** the left wheel brake assembly.
- Route a flexline **from** the co-pilot right bottom **to** the pilot right top.
- Route a flexline **from** the pilot right bottom **to** the right brake assembly.

I will be incorporating the Dual Brake System into the S-18 drawings. Also, we have started welding tabs on all rudder pedals, so if you want dual brakes, that step is eliminated for you.

*Editors Note: If you have any questions concerning the installation of dual brakes on your T/S-18 please don't hesitate to contact Mike at Classic Sport Aircraft.*



cont.

**SOME THOUGHTS ON STALL - SPIN**

by: Bryant Rowland

Stalls-Spins. cont.

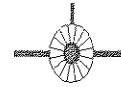
After many years of doing flight instruction, and pilot examinations, and the past 23 years of flying my T-18, I will offer these thoughts about the stall-spin accidents in the T-18. When I test flew my T-18 in 1978, it was the biggest thrill I had ever had in an airplane. At that time I was making my living as a full time flight instructor, so was very much aware that, hey, this is not your average Cessna or Piper trainer. It is a wonderful airplane with great balanced controls that just cry out to be flown. The airplane was designed for performance. It was NOT designed for unlimited forgiveness of gross mismanagement in flight. O.K. so we have an airplane that is a great performer, and not a forgiving trainer, we all know that. So I think we should fly it accordingly. For the traffic pattern we should have some airspeed numbers in our heads that are stuck there more solid than our own names. We should know the speed that the airplane stalls at, under different loading and flap conditions. We should also know the speeds that we are going to use in the traffic pattern, downwind, base and final. We should have a number that we will NEVER, NEVER go below, until starting into the landing flair. For me these numbers are: 110 mph for the downwind, slow to 90 mph for the base leg, then once established on final with full flaps, go to 80 mph, and this is my NEVER, NEVER GO BELOW number. If the wind is cross, and or gusty, I will use one notch of flaps, and a speed as high as 90 mph, depending on how high the wind and gust. I will never maneuver below 90 mph, even medium turns. When making turns in the pattern, lower the nose a little, so as not to slow the airplane. Remember, keep it moving, it needs that airspeed in order to keep flying. If you overshoot final, do not bend it around into a steep turn, simply go around. I used to tell my students and pilot applicants that I would score them much higher for a decision to go around rather than try to make a good landing out of a bad approach. Airspeed control should be very tight, not as much as 5 mph either side, however, airspeed control is only one part of the equation, the other part of course is flight control coordination. Remember, the T-18 does not tolerate gross

cont.

mismanagement here. Keep that ball in the center. Once I am established in the traffic pattern at the proper altitude, I only have two instruments that

mean a thing to me, the airspeed indicator, and that ball. Outside the airplane is your primary concern, but include those two instruments in your scan. Do it quickly, and very often. One more thing. The numbers that I offer here are only MY numbers, not necessarily the ones for you to use. Develop your own, stick close to them, and keep that ball in the center.

SAFE FLYING.



One thing to remember about the T-18, it has a laminar flow airfoil.

This means a rather abrupt stall break but not a real problem. I think where a lot of people got into a little trouble was in shape of the LE of the wing. As you may know, laminar wings are very sensitive to airfoil shape. If the shape of the LE varies, even slightly, the stall point will be different. You can check your airplane by going out and doing a few stalls. I believe you most likely have the original airfoil shape that John Thorp first came up with. It should stall around 62 mph flaps up. Approach it slowly and you'll notice that the controls get mushy a few mph before the stall. A lot of people have attached a short stall strip on the LE. Your airplane may have this stall strip. If you do, you will get a vibration in the stick as you approach the stall. Stall two notches of flap is about 58 mph or so. Don't be surprised to find the speeds different as most experimental airplanes as marginal static inputs. What ever you find, use 1.3 Vs as Vref. Mine comes out about 75

to 77 mph. I have an angle of attack system installed that makes all this a lot easier. Stalls are rather abrupt but it varies from airplane to airplane. It will most likely roll toward one way or the other depending on your trim or weight

cont next pg

### More about Stalls

is somewhere around 30 or so. You most likely have a steerable tailwheel so if you don't raise the tail until 40 or so it is never a problem. One thing about small airplanes like this, the stickforce/g is small. That means you can develop a lot a "g's" very quickly. I am sure you find that out. I find the airplane on landing will float once it is in ground effect. I have no problem with a power off approach if I maintain a 1.3 Vef.

Have fun! It is a good airplane

Thorp Email List ~ Author unknown



### Flying the Thorp

More comments from our Members

I must comment on the articles about landing the Thorp. Either I don't fly a Thorp or someone poured a whole barrel of pussycat all over my airplane when I wasn't looking. Simply said, it ain't that complicated, nor should it be. My advise would be to: take care of the preflight requirements, and then fly the damn plane!

1.) Preflight the airplane and fix it for nice ground handling characteristics, ie.. fix what needs fixed!!

a.) You need a good steerable tailwheel with no slack in the steering springs

b.) Check the main wheel alignment. My main gear assembly (store bought) came with the left axle pad skewed outboard. (left wheel toe-out) The plane would dart one way or the other depending on which main had the most weight on it. Using Cessna tapered shims at the axle pad, I aligned the mains to be exactly parallel. That tamed my Tiger.

c.) Tire inflation - look at the tire ribs (tread). Reduce pressure until all of the outside ribs on each tire contact the ground, but not so low as to cause bulging sidewalls.

### More on Flying the Thorp

I suspect people who use six ply tires and keep the tires inflated to what is recommended for a Piper or Cessna, will experience some crow-hopping on landing if not a high bounce on occasion.

d.) Taxi the airplane around until you can recognize the three point attitude. WATCH OUT, if you taxi too fast, the plane will fly, Mine did. Don't taxi any airplane you can't fly !! Make sure the airplane is airworthy...just in case.

2.) Fly the airplane. This assumes of course that you know how to fly and have at least a normal amount of talent. If you are not fully current with your flying, get some dual to get sharpened up.

a.) Takeoff - Flaps Up (always) Make sure you and your Thorp are ready to fly.

Trim set slightly nose up from neutral.

Ease the throttle in, holding full aft stick to keep the tailwheel planted until the rudder becomes effective. Then ease the stick to neutral, the tail will start flying. Let the nose rotate down just a bit, and hold it there (the tailwheel will be slightly off the ground) with the stick until she flies off.

b.) Landing - 110 mph downwind, 100mph with 20\* flaps on base (solo), 90 mph on final. Nail the speeds every time. Add 5 mph for higher gross weights, and add 1/2 the gust factor to these speeds if gusty winds are present. If you aren't carrying a little power on final with 20\* of flaps your decent rate is too steep. Fly down the runway (very close to the runway but not touching), this is your flare. Once you are very close to the runway with rate of decent in check, ease the throttle to idle and fly the plane. Hold it off until you reach the landing attitude. Be ready with a little bit of power to keep the rate of decent in check. The airplane will touch down in the three-point attitude. Don't try to salvage a bad approach--go around. Any lateral deviations are usually caused by uneven brake application or crosswind.

Ted Conrad

cont next pg

## Technical Tips

### 79-83 Honda Accord or Prelude Starter Bracket for Lycoming Engines

Submitted by: H Karibian ~ Panama City, FL.

I have enclosed a drawing and notes of the starter bracket I used on my project. A rebuilt starter from Wester Auto cost me \$67.00 and saved 8 pounds. (refer to drawing on page 8)

#### Tech Notes for Starter Bracket

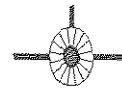
1. This clearance is only required on engines with larger (9 3/4") alternator drive pulley (L2C)
2. This edge may be further contoured for baffle clearance.
3. Standard starters have 2 dowel pins. I find them unnecessary. If used they should not extend more than 11/32"
4. Some minor contour modification may be required on some model in this area.
5. The 25/64" hole is required for a 10mm bolt. Required is a 10x1.25x50mm bolt, obtainable from most NAPA dealers. (Threads directly into starter)
6. An AN6-16 bolt is required to assemble the 1981 Honda Accord starter, and the 10mm in note 5.
7. All edges and inside corners must have a generous radius. No sharp inside corners.
8. Material: 2024 or 6061 aluminum angle, 3/8x4x4.5". (A professionally welded angle can work)
9. Extruded aluminum angles have a generous radius on inside corner. It is better to remove material from the starter flange to permit assembly, than to remove material from the radius.
10. After mechanical assembly, pull starter gear into ring gear. If clearance is minimal, add .010" shims under the four base mounting bolts.
11. Disconnect battery and complete assembly of electrical wires and switches to starter. Connect battery and crank engine. Be very careful to keep a safe -

## Honda Starter Notes cont.

distance from the prop while observing the engagement. Solenoid should engage gears 65% or more.

12. Complete assembly of alternator and any modifications to the engine baffle, if required. A small mechanical link that connects the alternator to the starter may be required for stability.
13. Scale all dimensions not shown. Drawing reduced and reproduced to 11x17. (Scale: 4" = 5.75")

*Editors Note: If anyone has questions regarding the fabrication and use of this bracket, contact Mr. Karibian at: (904)874-1586*



### Landing light installation

Submitted by: James Wolhaupter  
McMinnville, Oregon

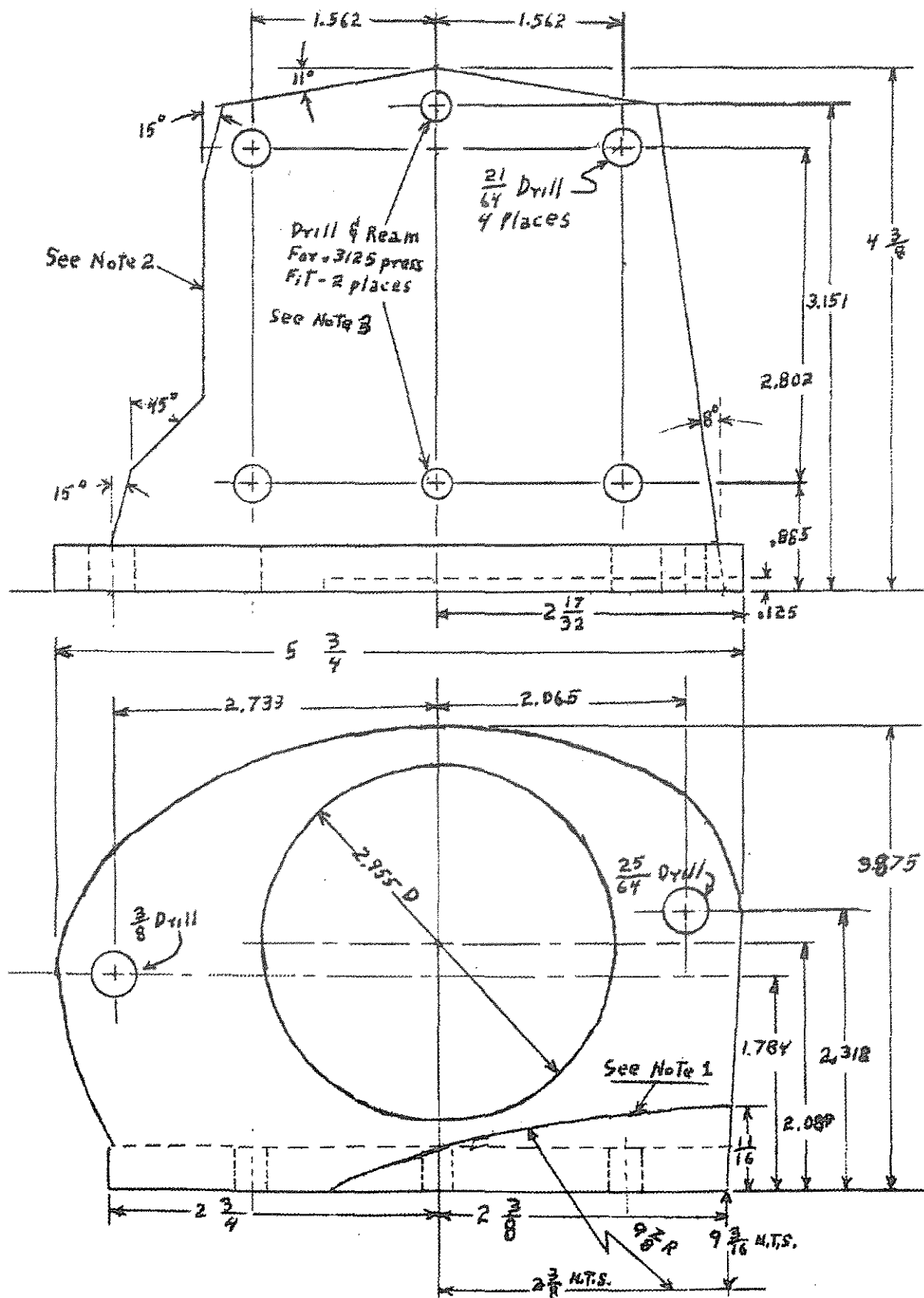
Recently on the Thorp Email, a series of questions and replies were written about landing light installation. I recently finished my installation and thought I would share my solution to this issue.

The previous owner of N2NE had installed a single landing light in the left wing and is just outboard of the wing folding point. During talks with him he informed me that after the installation he had made only ONE landing in the dark and he would not try it again. He warned me of insufficient light and fast landing speeds of the Thorp made for a pretty scary situation.

I did not really want to cut into my wing and I could not find any place acceptable to glass one in on the nose anywhere so an external light was my only recourse. I did not want anything hanging down in the air stream messing up Johns incredibly sleek aircraft so I needed to make them easily removable. Most all of our flights are during the day but on occasion we also like a night hop so a simple removable landing light -

79-83 Honda Accord or Prelude Starter Bracket for Lycoming Engine

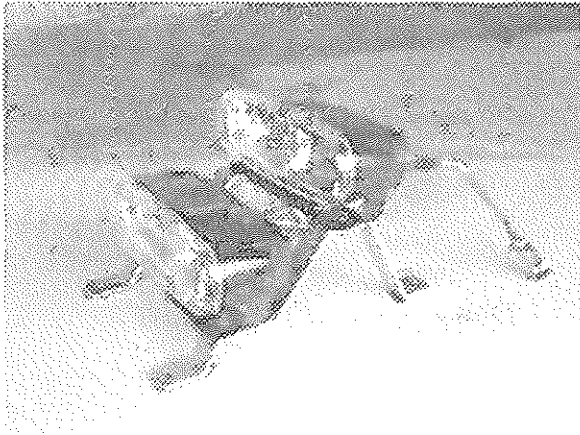
Submitted by: H. Karibian



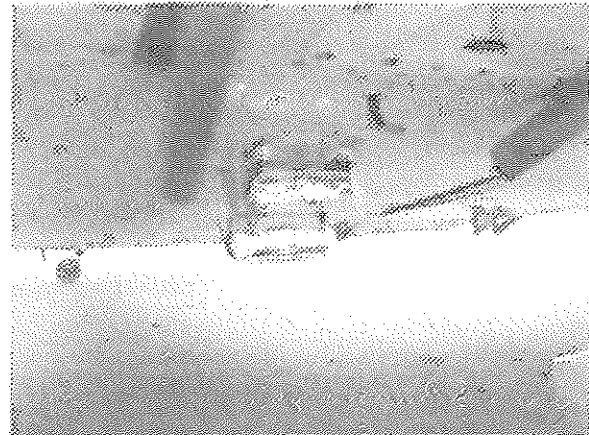


## Landing Light Installation

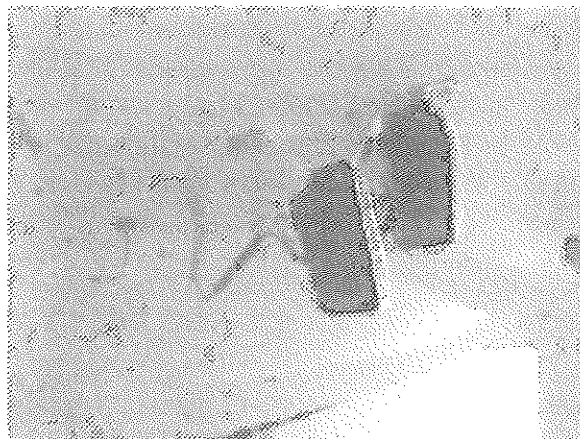
James Wolhaupter ~ N2NE



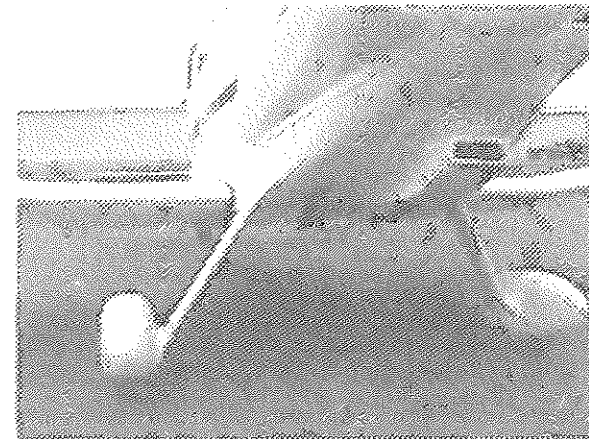
Low profile automotive driving/fog light assemblies mounted on simple aluminum frame. 2 lights per unit



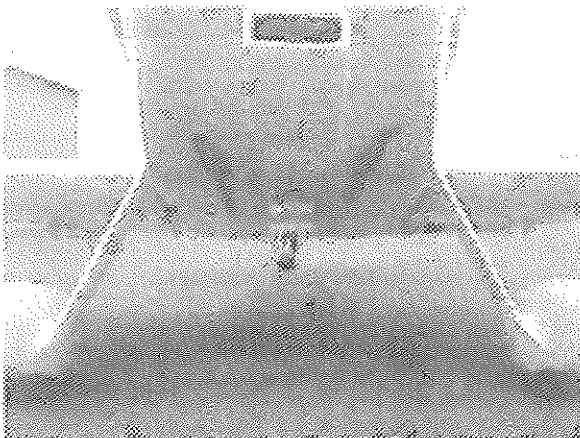
Lights mounted on forward belly, just behind and between exhaust stacks



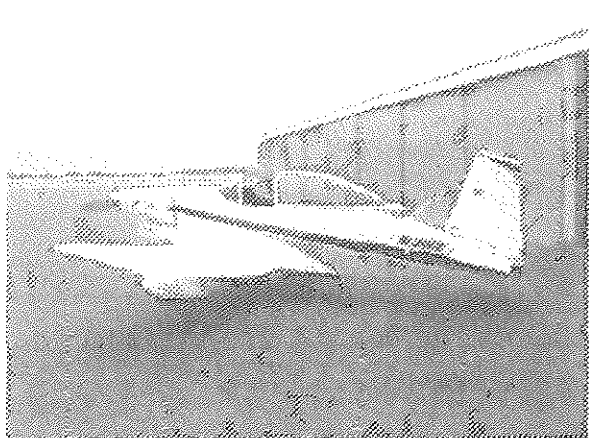
Lights are removable, bolted to the center tunnel forward mount points. Power via a cannon plug.



Non intrusive lights, no cutting into the wing. Removable simply via four bolts and a cannon plug.



Lights cast no shadows. One set is aimed for 3 point landings and the other for wheel landings



N2NE McMinnville, Oregon



More on Landing Light Installation

- would allow this yet keep the airframe clean for most flights.

I found a very nice light set made by Hella in the JC Whitney catalog that contains a driving light and fog light built into one low profile unit. These lights give me the long range look down the runway with the driving lights and also a wider near area is lit very well with the fog lights. I tried them in several locations under the main spar but found the exhaust stacks and the gear legs created too many shadows.

I decided on a location using the existing mounting screws for the forward tunnel. This placed the lights up front, forward enough to be clear of the exhaust and landing gear. The units were stacked and placed inline to fit in between the exhaust flow. I fabricated a riser mount out of bar stock aluminum that lifted the lower light off the belly and the upper one just above that and aligned the mount to fit the existing holes. A single cannon plug was installed directly behind the unit making the unit removable with 4 bolts and the cannon plug.

The problem with the existing light is that during landing it shines well down the runway in a three point attitude but just makes a bright spot right in front of your left wing in a two point attitude. The advantage of these dual lights is that you can set one light for a 3 point and the other for wheel landings. No matter how you land one light is always shining down the runway. The fog lights really light up the sides well and work great for taxi. I have the two driving lights wired to one switch and the fogs to another and usually use all 4 plus the original during landings, as I believe there is no such thing as too much light while landing this fast little airplane at night.

*Refer to the pictures of Jim's landing light installation on page 9.*

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**Beware of Projects**

The "project" Larry Liposky and I purchased had two prior owners. It had an S-18 fuselage up on saw horses and skins were cleco'd on.

cont.

Beware of Projects, cont.

The center section of a T-18 wing (with S-18 airfoil) was bolted on (no skin). I hauled all of the pieces back to Tacoma (TIW) and Larry started work on it.

He found the bottom fuselage skin to be 1/8" to 3/16" shy of reaching to the edge of the stringer. He then pulled the skin off and I learned about bucking rivets while replacing it. The side skins were also slightly shy, but Larry said they can be corrected with " aerodynamic smoothing compound". (from his military C-141 repair background)

Next Larry found a corner bracket that had not been made in an "L" shape per the plans. In the accompanying pictures the removed stiffener is shown next to the fuselage bottom forward spar box area, (fuselage is upside down in photo) with the correct part shown installed. From the second photo it can be seen that the angle bracket (1"x1"x.050") had a notch cut out of the forward end. This prevented the angle bracket from being attached to the side skin/ firewall joint.

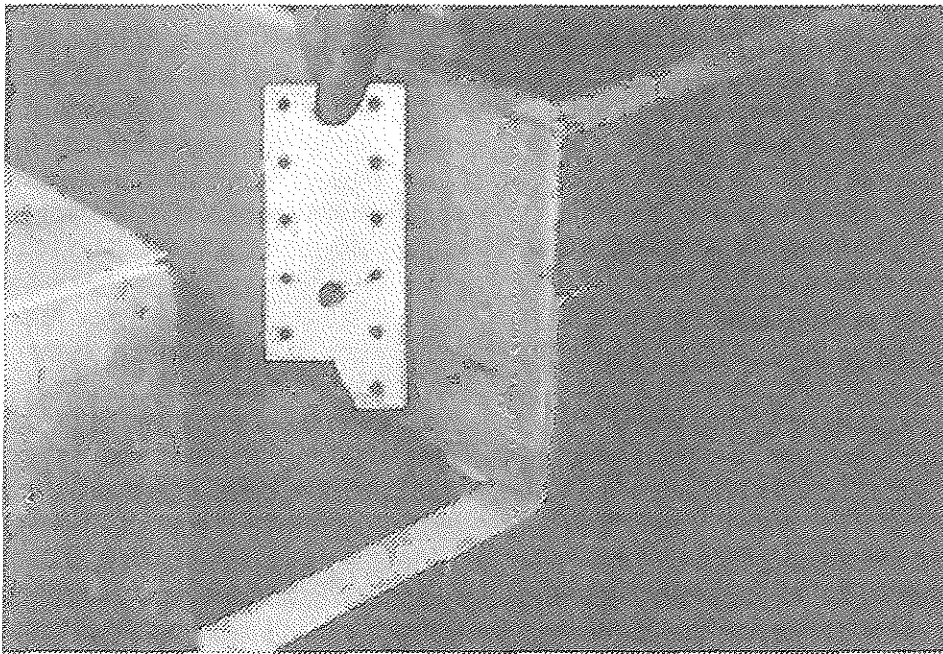
Tom Worth ~ Edgewood, WA.

*Editors Note: Refer to the pictures of Tom and Larry's project on page 11. The "corner bracket" Tom refers to is found on drawings - 601. The original drawings (ref -601) show a .032" bearing plate (601-3) to be installed as was found on their project. That was superceded sometime in the late sixties by drawing C-580. This called for the bearing plate to be replaced with a .032" doubler that is bent ninety degrees and wraps around the corners of the - 601 frame. Drawing C-580 had a note stating that this modification would be added to the - 580 drawing sometime in the future. I am not sure if this was ever done, but I am sure that Richard Eklund at Eklund Engineering can answer that question. If anyone has questions regarding that modification please contact him at: (209)727-0318 or email at: thorpt18@jps.net*

tech tips cont pg 14

### Beware of Projects

Pictures submitted by Tom Worth



Reference drawing -601 and C-580. The part being held is the 601-3 part that was originally called out on the -601 drawing. The new "doubler" is shown installed. As you can see it wraps around the -601 frame and is placed between the frame and the side skin.



Reference drawing -580 to find these angle stiffeners or "brackets". You can see the notch cut out of the lower unattached bracket. As Tom noted this is incorrect. The correct bracket is shown installed. As a note here.. My brackets are fabricated from 3/4"x3/4" 2024 extruded aluminum angle

**More Technical Talk****Scribe Lines**

Scattered throughout the T-18/S-18 build instructions is the phrase “scribe a line” or words to that effect. The intent is for the builder to mark a line, fastener location, etc on a piece of aluminum, but I have seen examples where a line was actually scribed (scratched) into the metal! This is a no-no; however, the builder will know with near certainty just where his plane will form cracks. Most of us are using alclad sheet metal (bear with me if you already know this) in which the cladding is a very thin layer of almost pure aluminum for corrosion resistance. The cladding layer is considered to have practically no strength, so scratches to the cladding are not a structural or fatigue problem. However, if the physically scribed line penetrates the cladding, then the builder should assume that structural integrity has been compromised and that the scratch mark is where cracking will initiate. Of course, the urgency of the matter depends on how long the scratch is, where it is located, and the amount of load or fatigue cycles experience by that region of metal. Be particularly concerned about any scratches or gouges near fasteners. In the example that I observed, the scribed line was for a row of fasteners on a wing panel; that wing will need to be reskinned. If the scratch in question is small enough, shallow enough, or in a non-critical enough location, it can be blended out with a 10-to1 (or better) blend ratio. And if you have any doubt, consult with a technical counselor who knows his stuff and can evaluate the scratch in person.

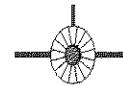
The aircraft builder should also know that marking aluminum with a pencil is also a no-no. The pencil “lead” is graphite and will work its way between the grains of the aluminum and cause intergranular cracking. The best means of marking metal is with a fine-line felt-tipped marker. A ball-point pen is OK to use in a pinch, but the ball-point usually skips so badly that it isn’t worth the trouble. A grease pencil will work, but you’ll have to thoroughly clean off all the residue before painting. The best route is to buy a box of “sharpie” permanent markers and use them...

cont.

**Scribe Lines. cont.**

...liberally for marking trim lines, fastener locations and builder notes (such as “this side up when assembling”). The one exception I can think of is when it comes time to mark the canopy; anything that will clean off permanent marker will probably cloud the canopy, so I will be using a crayon or grease pencil.

Andrew Robinson

**Landing Gear Cracking**

I am sending you an update on my two already identified cracked landing gear-to-firewall mounting bracket welds.

Bottom line today: TWO ADDITIONAL CRACKED LOWER HORIZONTAL WELDS FOUND ON THE BACKSIDE (HIDDEN FROM VIEW) ON EACH OF THE TWO LOWEST HORIZONTAL WELD CRACKS LOCATED BELOW THE TWO LOWER BOLT HOLES. That makes a total of FOUR cracked welds for this landing gear that was reportedly bought from Ken Brock Manufacturing (not his fault—the landing gear is simply made by Ken to the plan specs.) by the previous owner.

To determine if you have cracks on the front of your lower landing gear wells: Clean the actual welds with acetate, then spray the fluorescent dye onto the area, wipe off excess, then use a black light on the area. Mine stood out with a black line of grease in the middle of the hairline crack prior to cleaning—thought it was just a crack in the paint—it wasn’t. The cracks on the back side appear slightly wider—two ‘hair’ widths vs. one.

Solution: What the certified A&P mechanic (and proficient aircraft welder) recommended I have done—and am going to do, to my airplane’s landing gear:

cont pg 15

### Landing Gear Cracking, cont.

1. Take your landing gear mount off the firewall.
2. Have a professional A&P welder completely inspect the landing gear, additional dye checking, etc.
3. Repair the old welds by grinding out the old welds that are cracked and rewelding.
4. IMPORTANT: Then add additional steel straps from the existing leg/brackets through additional welding to help take up the stress in the area of those two stress points.
5. Stress relieve the area through additional welding heat.
6. Check the legs for straightness while your at this too!

Do have a certified mechanic do all work, including jacking up the T-18, removing the engine, and the landing gear.

Some additional background information on my airplane: not built by me; not flown off of grass; very heavy empty weight—1180lbs; both of the previous co-owners learned to fly taildraggers in this airplane so I'm sure it has had hard landings; airplane has 250 hrs total flying hours on it. The mechanics felt that the design of the two lower landing gear mount/brackets were designed in such a way that it is similar to hyper-extending your own arm at the elbow joint—the more you extend your arm fully out or beyond it's normal range (hard landings, grass landings, or less than a smooth landing), the greater the stress on that joint (i.e., the welds). The two welded brackets need additional steel-strap support. Don't hesitate to contact me on this subject. Thanks.

Pete Lemaire  
Omaha, Nebraska  
(402)-291-0987

*Editors Note: Cracks in the gear at this point is common, however it appears that Pete's gear cracked more than normal. I am not sure why you need a certified A&P to work on your Thorp. I wouldn't want one to work on mine.*

### First Flights

Tom Hunter's Thorp T-18 takes to the skies! The airplane is a standard body T-18 with the Bill Johnson airfoil and extra fuel in the wings (similar to Lyle Trusty's). It is powered with a 160hp Lycoming IO-320 turning a Warnke wood propeller. The plane has electric roll and pitch trim, manual flaps, wing leveler, and other goodies. Tom is a craftsman and did a terrific job of building. Much attention to detail. Tony Ginn flew N18XT on it's maiden voyage on January 9, 2001 at Paso Robles, CA.

The first flight was 45 minutes long. The airplane weighed in at only 975# so the initial R.O.C. was the first indicator that Tom has a real performer on his hands. The airplane flew great with just a slightly heavy left wing that was easily corrected with roll trim. Since the engine is a fresh overhaul with chrome cylinders the flight concentrated on engine break-in rather than slow speed/stall regime. That will come soon. Congratulations to Tom for a job well done!

Hail all,

Happy Spring news from the central San Joaquin valley, California. I got my first hop in N432YP, ~ 45mins, over retired Castle AFB this morning. Temps nominal even without an oil cooler, (0290-D accessory plate coming with oil cooler connections etc.) pressure nominal, EGT, CHT all nominal on our GPU. Ambient air in the 60s f.

Initial stats:

- Margie Warnke's 'Air Claw' 68x64-76
  - max static 2150rs on a GPU with a MA4SPA 10-5062 mounted on a 0290 pan with a RV6 carb scoop below.
  - flatout to the firewall level 5k = 2500rpm indicating 157mph on GPS
  - 2100rs level indicating 147 on GPS
- NO pants, gear fairings yet.

She drops-off to the left in level flt as expected with pilot (~170lbs only) (We'll tab the right ...

cont pg 18

For Sale

I have A nice T-18 That first flew in 1997. If anyone wants more info they can call me at (661)940-1709 between 8am-4pm or (661)256-8613 after 5pm California Time. I would deliver

Steve.

---

I have a Thorp S-18 kit in my basement that I need to sell. I am working on my master's degree and intend to start my doctorate after that, so I cannot see a beginning to the project. The fuselage kit is untouched. The wing portion came off of a flying S-18. Apparently the wing suffered barbed wire damage and was reskinned. The wing was reskinned incorrectly, so it will have to be redone. The control system for the ailerons is complete from the sticks to the aileron push rods. The flaps and ailerons have not been built yet. I have the landing gear and the canopy and frame. I have a complete set of drawings and newsletters. I am looking for about \$6500, but I am willing to negotiate. Please pass the word if you know of someone interested. The project is located in the Atlanta, GA area, and I can be reached at the following:

Forrest D. Ferdon  
(678) 432-1696  
[theferdons@mindspring.com](mailto:theferdons@mindspring.com)

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Thorp N97SE is for sale. The airplane is located in So. California Registered in 1997. Lycoming 0-320 180 Hp. Estimated. Electronic ignition, Rat Ray cowling and new spare. Four cylinder EGT, CHT, digital fuel flow, OAT, Fixed pitch metal prop (polished), Full Gyro panel, Garman 250XL GPS com, Vor/Glideslope, Elec. trim, Wheelen Strobes  
Panel lights. Baggage compartment top is cut out for easy access. \$ 42,000.00 For more info and pictures E-Mail: [irving@qnet.com](mailto:irving@qnet.com) or call (661)256-8613 Eve. (661) 940-1709 Day.

For Sale

I'd consider selling my S/18 !!! I'm in Tennessee and if intrested just e-mail me or call me !!! 931-473-5401 Days or 931-668-9899 nights !!!

Danny Cummings

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Perhaps it fell through the cracks, but I have a 7-1/2 gallon tank for sale @ \$300. It fits under the rear deck. E-mail [wocon@att.net](mailto:wocon@att.net)

Tom Worth - (253) 922-0137



Thorp Wanted

I told you a few weeks ago that I had purchased a T-18, and had no need for an ad. I did, and it was a beauty. Due to insurance requirements, I had to have 15 hours dual with an instructor who was current in T-18s. None was local, so I got a CFI in LA County who had one to come out and make an instructor here current. He came out on January 14, and those two characters went out and wrecked my nice plane, totalling it. Now I need another.

I am hangared in Palm Springs (PSP). Would like a good T-18, with a 125 to 160 h.p. engine. Low to mid time. All ADs against the engine addressed, Mode C, vacuum panel; nice looking; no radio or intercom problems; no odors in cockpit (wife's requirement). Please contact me at 760-837-0222 - Work; 760-202-0108 - Home; [gr8dds@desertsurf.com](mailto:gr8dds@desertsurf.com)

George Avans

## News from Eklund Engineering

### Eklund Engineering T-18 Kit and Plans Update

We continue to develop the laser cut and formed sub-assembly kits for the T-18 airframe. The process is proceeding slowly for several resource reasons. In order to clear the path somewhat, we are offering the following in-stock kits at reduced prices:

- 1 Rudder Kit - \$320 plus \$10 crating charge and UPS shipping cost. (Originally \$375)
- 5 Vertical Tail Kits - \$245 (each) plus \$10 crating and UPS shipping cost. (Originally \$290)
- 2 Horizontal Tail Kits - \$1180 (each) plus \$15 crating and UPS shipping cost. (Originally \$1328)
- 2 Aileron Kits -  $\$176 \times 2 = \$352$  plus \$10 crating and UPS shipping cost. (Originally \$221 each)

It is hoped that the Flap kits will be complete by the Oshkosh 2001 fly-in.

Because we will be changing the publishing technique for the plans sets, we are offering the last 2 Blueline drawing sets for \$270 each plus UPS shipping cost.

Future ordering procedures will require 50% non-refundable payment with the order. Full payment will be required at shipping. Orders will be shipped in less than 30 days or a full refund can be requested.

Eklund Engineering, Inc.  
P.O. Box 1510  
Lockeford, CA 95237  
209-727-0318  
Fax 209-727-0873  
[thorpt18@jps.net](mailto:thorpt18@jps.net)

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### Our Members Photo's



Bill Beswick ~ N2618B



Roger ? ~ N8613A



## Newsletter Dues

Man is this a tough subject!! I want to thank everyone who sent his or her dues. I still have many of you that have not paid last years dues. I even show several unpaid for 1999, and several unpaid for 1998. **PLEASE** look on the mailing label on the back of this newsletter. Look above your name. If you see a "PD" then you are paid through 2001. If you see an amount, (ie \$25 or \$50) above your name, that is the amount you owe. Look below for samples of the mailing labels.

Several of you sent your 2000 dues at the end of the year. I am not sure how the dues have been handled in the past, but I want to establish a policy for everyone. Beginning now, the newsletter subscription is due in January. So those of you who paid late for last year need to check your mailing label. **For those of you who are three years or more behind, this will be your last newsletter.**

If you have any questions, please don't hesitate to contact me. I hope we can resolve this

### Sample Mailing Labels

**PD**

Roy Farris  
PO Box 182  
Noble, IL. 62868

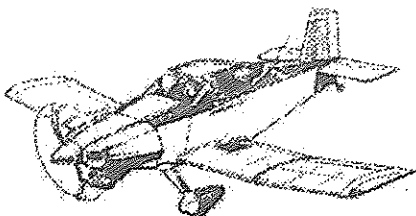
This Label shows "PD" above the name. This indicates that your membership is current.

This label shows "25" above the name, indicating that you owe \$25.00 to make your membership current.

**25**

Roy Farris  
PO Box 182  
Noble, IL. 62868

Send Your Dues    Send Your Dues



## Items Wanted

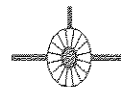
Hi ... I purchased SN510 from Earl Atha.... I am looking for a conical engine mount for a Lycoming 0-290. I would like to hear from T-18 builders and fliers in the Atlanta area.

Jeff Maynard  
213 Barry Whatley Way  
Griffin, Georgia 30224

### Wanted

Canopy (preferably 3/16" thick)  
Engine Cowl (have the T18 nose cowl for 4" extension)  
Wood Propeller for Lycoming 0-320 (150hp)  
Cleveland 500x5 wheels and brakes

Lionel Robidoux  
195 Crestview Road  
Ottawa, Ontario K1H5G1  
(613)783-1066  
[lionelr@mondenet.com](mailto:lionelr@mondenet.com)



### First Flights, cont.

...aileron this year and do Lyle T's ingenious roll trim mod next winter.)

Power-off stall ~65mph straight ahead to buffet ONLY for today.

Three wheeled her with a hop and power-on halfway down 31 right traffic Castle with flaps UP. She doesn't slow down! ;)

ecstatic, exhausted,  
Stretch

## Upcoming Thorp Events

*If anyone has an upcoming Thorp Event that they would like listed here,  
Please notify me by phone or Email*

May 18 -20, 2001 ~ Thorp Fly-In at McAlester, OK. the Ramada Inn at McAlester has rooms for \$49 single and \$54 for doubles. Cancellations until 6:00 P.M. on the day of arrival. Their phone number is (918)423-7766. Ask for the "Holt-Green party" Contact Gary Green by Email at: [ggreen@itexas.net](mailto:ggreen@itexas.net) for further information.

July 24 - 30, 2001 ~ Airventure 2001 ~ Oshkosh, Wisconsin The T-18'ers usually have a combined lunch and forum on Friday at noon in the Nature Center. We have a nice lunch followed by a small but informative forum. This years activities are tentatively scheduled for Friday July 27. Anyone who has an interest in the T/S-18 is encouraged to attend, and bring a friend. For more information contact Roy Farris at (618)723-2594 or by Email at: [rfarris@wworld.com](mailto:rfarris@wworld.com)

September 1 - 3, 2001 ~ 10 Annual Thorp Fly-In, Porterville, CA. ~ A reminder about the P'ville California Labor Day Thorp Gathering. Again this year put on by Hal Stephens and a great team of people from California and held in Porterville. Mike and Frankie Archer's Classic Sport Aircraft, home of the Thorp parts and plans will provide hangar space, and will be hosts to the guests flying their beautiful Thorps or driving in to see them. Labor Day is the first weekend in September.....It's the Tenth Annual.....can you believe it.....9 proceeded this one and they only get better....Everyone is invited....ya'll come! For more information contact Hal Stephens at (530)295-1867 or by Email at: [aerohal@inforum.net](mailto:aerohal@inforum.net)

October 12 -14, 2001 ~ Kentucky Dam Fly-In, Gilbertsville, KY. For Lodge reservations phone (800)325-0146 and ask for the "Paine Party". For more information contact Jim Paine at: (828)698-0368 or by Email at: [jpaine@cytechcis.net](mailto:jpaine@cytechcis.net)

*Editors Note: In the last Newsletter (#114) I misprinted the Kentucky Dam Fly-In date as October 5-7, 2001. The above Date of October 12-14, 2001 is the correct date. Sorry for the confusion.*



T-18/S-18 Thorp Newsletter  
 Roy Farris  
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\$25



Please check your mailing label for the "PD" entry in the upper left corner above your name. If you don't see the "PD" entry, then your membership is not current, and we may be forced to stop sending your newsletter. Please send the dollar amount listed on the label. Any amount over 25(US) or 30 (outside US) indicates that you have failed to send previous years dues. Please be kind and send your dues now.

Make a photocopy or clip out this form and return it with your payment.

### THORP T-18 MUTUAL AID SOCIETY NEWSLETTER DUES

Please continue your support of this valuable exchange of ideas, building tips and safety information covering John Thorp's greatest design. Please make checks payable to: Roy Farris P.O. Box 182 Noble, Illinois 62868. Make check for \$25.00 US, \$30.00 for outside the U.S.

Name: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_  
 Phone: \_\_\_\_\_  
 Email address: \_\_\_\_\_  
 Notes: (building, flying, thinking about it, etc): \_\_\_\_\_

# T-18 Newsletter

September 2001

Oshkosh 2001 ~ Reserve Grand Champion ~ Plans Built



*Bernie and Melva Fried ~ N18XS ~ San Antonio, TX*

## IN THIS ISSUE:

**Oshkosh 2001**  
**Tips From Down Under**  
**Lets Talk Propellers**  
**Oil Coolers and Filters**  
**Upcoming Events**

*NOTICE: (STANDARD DISCLAIMER) As always , in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.*

T-18.Net



Here it is, time once again to set down in front of the old computer and create twenty pages or so of T/S-18 news, tips and related information. I really enjoy doing the newsletter, and I enjoy the countless emails and phone calls I get from you - our members, but it sure would be nice to receive some good technical input from some of you. I tell you, it is difficult to pull together enough good information to keep these newsletters alive. I know that there is a wealth of untapped information from you members out there. The question is, how do I get you properly motivated to set down and write me ?? I haven't been able to answer that question yet, and I feel the editors before me were unable to answer it. As of now all I can say is that any and all help would be greatly appreciated. Please help me out and send me something ! It doesn't have to be fancy, and you can mail it to me or send it by email.

I was somewhat disappointed in the lunch/forum turnout at Oshkosh this year. I know of several T-18'ers that were at Oshkosh, but did not attend our Friday noon activity. I guess I don't understand why T/S-18 owners and pilots would not want to be part of the Thorp Family. My mind must work differently than most, I am completely ate up with Thorp's and want to be a part of the "Movement". I enjoy the camaraderie and being around people with the same interests. Doing things as a group is just plain fun, and as a group, we are able to promote our great airplane, and expose it to more potential owner/builders than any one of us could do alone. As a group we are stronger, and have a wealth of knowledge to draw from. Most of us would not have access to this otherwise. Lets all work together as a family, and try to attend more Thorp functions. We have a wonderful family, be positive and lets all support it.

For those of you who are computer savvy and visit the T-18 website, you may have noticed some changes. With the help of David Taylor, (a future T-18 owner - he has one bought) the picture on the homepage now switches at random each time the page is loaded. This is a neat feature and keeps the homepage from being boring. I could use some more pictures to use in the rotation. If you have a neat picture of your Thorp, I would love to include it on the website. You can send me a photo through the mail, or you can email it to me.

I am trying to keep the website as current as my time allows. Events like Sun n' Fun and Oshkosh are being posted in the "Events" section and usually contain color pictures taken at the event. Be sure to check them out.

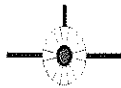
The current newsletters are also available for download from the "Newsletter" section, beginning with newsletter 114. The downloaded newsletter is exactly like this hard copy, with the exception that the pictures are in color. The detail in the color pictures really helps the quality of the publication. There is no additional cost for the downloadable newsletter. If you are a current Mutual Aid Society member, and your dues are current, all you need is a password to access the newsletter page on the website. You can sign up on the website by going to the "T-18 Newsletter" page, clicking on "Subscribe", and filling out the registration form, or contact me by email and we can work out your password that way.

I am thinking about dropping the T-18.net email option from the website. I have found that it is not working properly, and that not many of you are actually using the service. If any of you out there are using it, I would like to hear from you. I am trying to figure out if there is enough usage to justify keeping it, and getting it to operate correctly. So please let me know by sending me an email at: rfarris@wworld.com and giving me your comments.

Check it out at: [www.t18.net](http://www.t18.net)

**Help Wanted**

I need an artist !! Any of you like to draw ? I am gearing up for a rewrite of newsletters 45 through 90. The quality of the masters is getting poor, and the backissues I am sending out leave much to be desired. Therefore, I am going to rewrite the newsletters and put them in book format similar to what Lu Sunderland did on newsletters 1 through 44. What I need is someone to redraw the illustrations and drawings that are contained in those newsletters. They can be ink drawn or done on a computer, it really doesn't matter, as long as I can either scan the image or import it directly from a computer file. It won't be a real easy job, but I know someone out there is up to the challenge. I would love to hear from anyone interested in tackling this project. Call me at: (618)723-2594 or email me at: rfarris@wworld.com

**Newsletter Index**

I am working on an updated newsletter index that will cover newsletters 1 through 115. Thanks to Jim Strickenberger's work, I have the index he created and was published in newsletter 102. All I need to do is get it updated and published. I think what I plan to do is publish an updated index each year. Instead of including it in a newsletter issue, I am going to print it separate. That way, when you receive the new current index each year, you can discard the old one and always be current. As the list of newsletters keeps growing, it is becoming more important to have a good current index. I get several calls and emails each month by members trying to locate information in the newsletters. My goal is to have a current version out by the end of this year. Any comments on the index would be appreciated.

**Work by A&P Mechanics**

A comment was made in newsletter 115 about not wanting an A&P to work on a T/S-18. My original intent was that if you build your airplane, then you know more about it than anyone else, and I believe this to be true. However it was brought to my attention that many Thorp drivers are not homebuilders and did not build the airplane that they are flying. The T/S-18 has been around for a long time now, and many have changed hands several time. Many Thorp pilots have purchased their pride and joy from someone who bought from someone else who may have acquired it from the guy who actually built it. Many are not mechanically inclined, and I am finding that many T/S-18 owners and pilots do not even own a set of plans for their airplane. The FAA says that if you did not build the airplane, and possess a repairmans certificate, then you can not sign off any of the work, including the condition inspection. That means that if you are the second, third or fourth owner, you are going to have to contact a professional A&P or probably an IA to help you out. If you are mechanically inclined, you are permitted to do the work on your airplane, provided the A&P is ok with it and supervises all of the work, but keep in mind that he must make all of the logbook entries and signoffs. For those that are not inclined to do the work, you must rely on the professional to do his thing, and by all means do so. We don't want to fly unsafe machines now do we?

One point that this brings up is that in order for the A&P to be able to do his job correctly, he must possess the documentation pertinent to the job at hand. I don't think he will find any airframe data for the Thorp on his micro-fish or his computer. The only source for relevant T/S-18 airframe information are the blueprints. Anyone who owns and operates a Thorp must have the blueprints .... its really not an option .... its mandatory. How else can you or your A&P know the proper way to repair your airplane ? If you don't have a set of blueprints, please get smart and contact Eklund Engineering or Classic Sport Aircraft and order them today.

### Landing Gear Repair - Safety Concern

In newsletter number 115, there was an article on repairing the cracking that is common in our T/S-18 landing gear. The article was submitted by Mr. Pete Lemaire, and was published as I received it. It has been brought to my attention that there is a problem in the way the repair was performed. (at least in the way the procedure was written for the newsletter) The -515 landing gear as we all know is a heat treated assembly. The landing gear drawing (-515) clearly states this, and states in note #2 "Heat Treat To 180,000 #in squared". In Mr. Lemaire's article, it appears that perhaps the actual repair in itself is ok, although I have been advised that adding the additional straps was probably not necessary, and may simply cause the stress and cracking to move to a different location, but nowhere does the procedure call for the gear to be re-heat treated. Step five says to stress relieve the area through additional welding heat, which is a common step for most steel welding, but is not a substitute for the heat treatment. **This is a dangerous situation and could lead to premature gear failure.** In making the repairs to the gear, his certified mechanic made several welds, and the heat from the welding changes the quality and the strength of the original heat treatment. Any time that you weld on material that has been heat treated, you must heat treat it again to bring it back to the same strength that it was before. So in this case, **the landing gear must be re-heat treated.** If it is not, then the gear will be soft in the area around the repair, and will most likely fail. This could be quite a surprise on landing.

This may be a situation where the owner did not have a set of drawings and was unaware that the gear was in fact a heat treated assembly. The mechanic, also unaware, made what he considered a normal repair to a cracked steel structure. Both had good intentions, just did not have the information pertinent to the job, and have possibly set a future accident in motion. (It is also possible that the gear was heat treated after the repair, but just wasn't listed in the article.)

### Lets Talk Propellers

My T-18 is a standard version with the O-320-E2D, 150 HP engine. It has a Ted Hendrickson 68 X 72 wood prop and is a good match for the airplane overall. The engine turns up to a high cruise RPM - I run in the 2500 - 2800 rpm region, and at altitude even see 2900 - 3000 rpm. The prop has been on the airplane for most of its 1800 hours of flying time, and when the cylinder barrels were removed not that long ago for leaking cylinder base gaskets the engine shop said they had never seen an engine with 1800 hours on it and so little wear!

The climb performance at sea level on a cold day with one person is over 2000 ft/minute and I have taken off with no problem from Leadville, CO (10,000 MSL or so).

But, as has been mentioned before..... Each prop manufacturer has different rating systems for what they are building so the numbers I use as stated above are probably not the same as what you would order - Ask the propeller manufacturer. However my suggestion is that you opt for a flatter pitch and higher cruise rpm if you want better take-off performance. Also strongly recommend the plastic leading edges as they are resistant to rain and replaceable when severely damaged.

Ross Mahon

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### Metal Props

After seeing some of the comments regarding the safe use of certain model props I found a letter by John Thorp in newsletter #80, stating that the Sensenich M74DM prop was involved in three in-flight failures and is NOT to be used on the T-18. The preferred Sensenich prop for us is the 76EM series cut to 68 inches. The pitch seems to vary somewhat depending on engine choices from what I've seen in the newsletters by T-18'ers. But again, I would check Newsletters 78 & 80 for reference

Robert Jaeger

cont pg. 7

**Tips From Down Under**

Submitted by: Ray Tilley ~ Tasmania, Australia

Some Comments on my T-18 VH-TLY (my wife's initials) Now flown 300 hours

Built from original plans with the following little "mods", or difficulties highlighted, which may be helpful to other builders.

1. FORWARD CENTRE TUNNEL Will not fit if built to plans - make a cardboard mock-up and try it first.  
Fit several large inspection plates.

2. BRAKES. Fit them both sides with a Park Brake. (sorry I didn't)

Do not replenish brake fluid with automobile fluid. (how dumb can you get?)

Fit pump oil can with plastic tube to top up from the wheels (its great!).

Do not throw the brake bleed rag on the wing (good paint stripper!)

3. TIP TANKS: Fit extra tip tanks (very good idea!)

But bought many four port fuel shut off valves - sooner or later they all jammed, graunched and leaked.

Suggested to manufacturer that they "Teflon" coat them - not interested, so I had one done locally - has now worked beautifully for six years. Difficult to get fuel caps for tip tanks which are rain proof {mine are under a flap and sit in a well with a drain, but they still leak.} Plan carefully!

4. FUEL PUMP mounted on firewall works well despite theoretical disadvantages.

5. WEIGHING don't let the weight and balance engineer push your plane off your platform scales. Damage to the spats and their brackets will result. Do it yourself and if it happens, replace the aluminum brackets with stronger more durable stainless steel ones

6. COWL FLAPS: Fitted on each side operated by "T" handle on the instrument panel. Look great but they do not seem to contribute anything to speed.

7. LANDING LIGHT Retracts under one seat, very challenging to get the action right but very effective.  
Three positions, landing, taxiing and retracted.

8. A.S.I. Tried several, finished up with a Piper Pitot mounted under wing with static points each side of fuselage (as recommended by Vans Aircraft) the one in the photo is from a "Victa Air Tourer" very inaccurate!

9 VENTS: Built several manufactured exactly to plans NASA Ducts of various sizes. All proved much less effective than scoops with which I replaced them.

10. TACHOMETER The original instrument was geared wrongly and had us chasing carburation, timing etc. after checking the propeller revs with a spectroscope, found the tac. had the wrong gearing.

11. IDLE. Make sure you can reduce your idle to about 500 r.p.m. otherwise your Thorp will float on ground effect the full length of the runway.

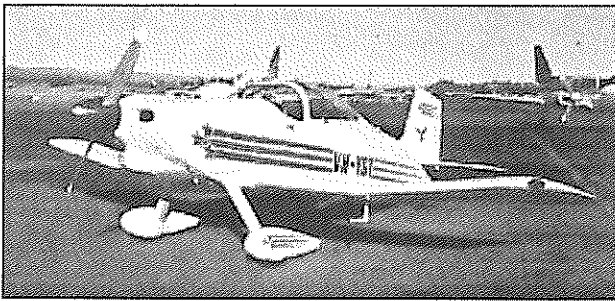
**Tips from Down Under, cont.**

12. Despite ball joints and sleeves, my crossover 0320 Exhaust pipes cracked. Make sure they are very flexibly attached to the airframe.
13. OIL TEMPERATURE was a bit high flying in the tropics. The fitting of an ADC. Filter on the firewall does a great job filtering the oil, has a warning light if dirty and drops the oil temp well down.
14. WHEEL ALIGNMENT Tyre scuffing and lively ground run on landing proved that the undercarriage stubaxles were out of parallel. Cured this with tapered aluminum shims.
15. STALL STRIPS Triangular section, faired 8" long mounted 3" out from wing fuselage junction, made stall innocuous.
16. COWL Tight fitting fibreglass, faired to fuselage - looked lovely, but fit was too neat. Hammered aluminum bumps to clear alternator pulley exhaust bends etc. and riveted these on to cowl after numerous attempts to get an acceptable fibreglass bump to clear hot or moving bits.
17. TRIM WHEEL Check the ergonomics. Mine is too far forward and too close to my leg. My first trim indicator arrow (attached to a specially made coarse thread nut and spiral screw in brass at great expense) had to be remade because it did not indicate in the natural sense.
18. TAIL WHEEL the Maule" was a poor article. Hubcap dented, grease nipple fell out, steering assembly arm was assembled with slop in the attachment. Cam was asymmetrically formed allowing tail wheel to release too easily on one side with disastrous cross wind landing results. Top cover cap is a press on and gets lost in the grass. Connector spring chains are of bath plug type, quickly rust, wear and break with more disastrous results.
  - a.) Make a heavier aluminum hubcap that will take a thread for the grease nipple and not dent so easily.
  - b.) Reform the cam to make it release equally to pressure both sides.
  - c.) Carefully press the cover cap sides to a circular shape and ensure snug fit. Inspect daily.
  - d.) Replace the bath plug chain segments frequently. After careful daily inspections. (Being VERY prudent, I have locked out the fully castoring" feature and carry a length of nylon rope to loop under the tail wheel to make it easy to pick up the tail for moving backwards.)
  - e.) TAIL WHEEL FORK: For convenient ground movement. Cut a short length of U shaped aluminum extrusion and cut slots to fit over the tail wheel steering arms. Rivet on two barrel bolts fashioned to pass under the arms to secure it. Weld on a tube bent down to clear the rudder and bent up to hand height. Fit cross tube for handle.
19. 0320 E2A RUNNING IN Zero time engine burnt oil because I "babied" it too much and glazed the bores. Advised to climb full bore to 10,000 ft! it no longer burns oil.
20. BUILT WOODEN GANTRY ON CASTORS: Great idea for moving engine fuselage and wings etc. So light, wife and I could manoeuvre it about easily - (steel gantry was impossibly heavy and awkward). We frequently sat wings on a wooden castored mount and easily fitted wing mount bolts etc.

**Tips from Down Under, cont.**

21. FINAL ASSEMBLY at the aerodrome. Helpful engineers rushed to help. Served up the wing to the fuselage carelessly and forced the rear spar attachments on the wrong side of the fuselage attachments. Despite my cries of anguish, they forced the bolts home. The result was a rebuild of the rear spars. Next time, refilled by family members who would slowly do exactly as they were told, it fitted snugly and easily (beware a lot of over enthusiastic and helpful engineers.)

I hope these notes help other builders!



Rat Tilley - VH-TLY - Tasmania, Australia

**Lets Talk Propellers, cont.**

My Ivoprop, installed on a IO360 almost killed me. I changed blades to Ivo's new high pitch range blades and after 9.6 hours, the blades failed. Assuming that the high density foam cores don't provide any strength, my blades lost all but 30% of their strength during a 1.5 hour flight. The aft carbon fiber face was cut at the edge of the aluminum plate completely across each blade. This allowed the spinner to cut the front face 20% across the blades. These blades had been installed and inspected and re-torqued according to Ivo's instructions. Ivo is refunding my money. I am now flying with a Prince wooden prop. The word is that the problems with the Ivoprop are only with engines of 150 hp and up.

cont.

**Lets Talk Propellers, cont.**

Ivo admits that there are problems. The design is weak in terms of handling the torque pulses, particularly with four-bangers. He uses knurled plates which bite into the carbon fiber skins. He has a schedule for torque the prop bolts to establish the "bite". If any movement occurs the knurls become a sawblade and destroy the skins and thus all of the strength of the blades.

Harvey Mickelsen  
N118HM - Fat Cat

---

I just replaced my Ted Hendrickson 68 x 74 with an Aymar Demuth 68 x 75. I have a 160 hp O-320. Here's what I found;  
The original prop would turn 2200rpm on initial takeoff roll. The top speed (all things being equal) was around 133kts. After the switch, I only get 2150 on takeoff roll. However, I estimate getting off the ground 3 to 500ft shorter! My top speed is now a solid 140kts. I believe that no 2 manufacturers can be compared. They all carve different airfoils on the props. Do I like the ADP? You bet! Do I think I can do better? I think slightly less pitch is warranted for this engine. I can only turn 2600rpm, even with the harmonic dampener. My next deal will be to time my tach.

Jim Grahn  
831 GR

---

I use an Aymar-Demuth 68 x 70 on my 125 hp g-motored T18. It will turn 2250 rpm static. A 68 x 68 probably would have been a slightly better choice.

Ed Pernic  
137EP.

cont pg. 8



**Lets Talk Propellers, cont**

Im using a 68x68 on my 0-290g and my next prop will be a 68x70. I have exceptional climb performance now but I can sacrifice a little for a little more speed. my airplane now will true out at 180mph turning 2700rpm. that is exactly what John Thorp told me it would do.

Bill Jennings  
N18WJ

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The Sensenich M76 prop IS the correct prop. The M74 is the killer on a T-18. The M76 is the right one BUT, it must be vibration tested to determine the potential danger areas (RPM) to avoid. As soon as a prop is cut down, the vibration characteristics become an unknown until that prop is tested. The only source that I know of for testing is "SPECIALIZED TESTING SERVICE", only a couple of blocks from Whiteman Airport in San Fernando, CA. The last phone no. I had is 818 344-1851. The owner is Sandy Freizner....who did the flutter testing on the T-18 in it's early days. The last one I had tested was \$75 and it is the cheapest insurance that you will ever buy. If you can find anyone else ..who is qualified and equipped to do such a test, I suspect the cost would be far greater. Sandy does it as a favor for T-18er's as he worked with John Thorp for many years, and is very aware of our need to have these props tested. I would suggest calling and verifying the current status, cost etc, and then update the info on the thorplist. Most folks will not understand all of the modes, nodes and frequency's, but he will give you a plot showing clearly any RPM ranges to avoid (continuously). Of course the new pitch must be established before the vibration test. Without the testing it is strictly Russian Roulette.

Howard Ginn

**Lets Talk Propellers, cont.**

I have an Aymer Demuth 68 x 72 prop on my 150 hp Lycoming Thorp. It added 15+ knots to cruise over the old metal 68X68 Flottorp with only a slight decrease in indicated climb rate, once we get going. But the old prop (which cannot be run at full throttle in level flight because it will overspeed) gets me off the runway faster, and allows me to climb at 2,500 fpm as soon as I pull up, at my 1,040 ASL airport elevation. It all depends on what you want: I don't have much of anyplace to go in a hurry, but I like the snappy performance so I run the old prop most of the time and cruise at 120 kts at 2300 rpm at 6 gph. But when I travel, on goes the A-D prop for 140-kt cruise, 2400 rpm and 8 gph — the price you pay for speed in a plane that isn't particularly clean.

John Sullivan

---

I have an Aymar-Demuth prop that has about 800 hrs on it and and it is the only one you want. I switched from a Warnke prop and gained 14 knots and climb performance.

Mike builds a very good prop.

Gary Cotner  
N57GC

---

I concur about the Aymar Demuth giving excellent performance and it seems to be a quality prop. In addition I wish to pay them a very big compliment. Their first prop for me was a bit too much.....I carefully recorded and forwarded the performance criteria as per their request. They built me another prop at no additional charge and had a good attitude about doing so. Their second try is a great prop and I would buy from them again.

cont. Larry Church ~ N14GM

cont pg. 9

### Lets Talk Propellers, cont.

I'd suggest caution. Several people that I have talked to have informed me that there isn't a clearly defined standard for measuring prop pitch. Most notably, Sensenich wood props are reported to be 6" in pitch more than a similar wood prop from someone else. I'm replacing a wood prop in another experimental plane due to a mishap, and ordered a prop from Props, Inc. If I'd stayed with Sensenich, I'd have gone with a 68/62, but I ordered a 66/56. If it ever comes in I'll let you know how it works out. I've been waiting over two months.

Best information I have is that you should track down someone with a similar plane and if he likes his prop, try to get one like it. I've gotten quite a bit of advice, varying from: "Get a prop that turns 2300 static on your engine, and don't worry about the cruise." (Probably OK for a climb optimized prop.)to:

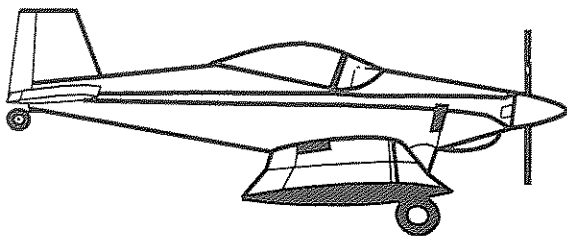
"If it turns 2000 RPM's static, it'll fly" (from a Thorp owner. - probably a good cruise prop.)

Rich Woodcock

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If you supply details about your plane to a reputable propcarver, he can probably hit it pretty close. Instead of ordering a particular pitch, tell him what hp you have, how clean the airframe is, whether you want climb or cruise, etc & let him pick the pitch based on his measurement system. Most will tweak the pitch after you fly it if needed.

Charlie England



### T-18 Mutual Aid Society

In the early days of the Mutual Aid Society, many Thorp pilots traveling across this great United States were invited to stay in the homes of fellow T-18'ers. This enabled them to spend time with people of the same interest, and had to make for a wonderful vacation. Wasn't that a neat idea. As time progressed, the world seemed to run at a faster pace, and people seemed to loose site of that "family" concept. Now everyone has to be here or there, and just can't seem to find the time for their own life, let alone inviting some stranger into their home ..... or can they ?? Recently on the Thorp email list, a new discussion has been taking place. Many of you have expressed interest in bringing that "family" concept back to life, and I for one think its a terrific idea. What better way to meet new friends that share the same interest in flying and airplanes.

My idea then, is to start a list of Mutual Aid Society members that are willing to open their homes to T/S-18 travelers. Several of you emailed me that if a list were started that you wanted to be on it, so here's your chance. If you wish to be on the list please let me know. You can call me at (618)723-2594, or email me at rfarris@wworld.com, or even send me a letter by snail mail. The address is on the back cover. I will compile the list and publish it in future newsletters. I will also create a new page for the T-18 website and place the list on it as well.

Any comments or ideas on this venture are welcome. Let me know what you think.

Roy Farris

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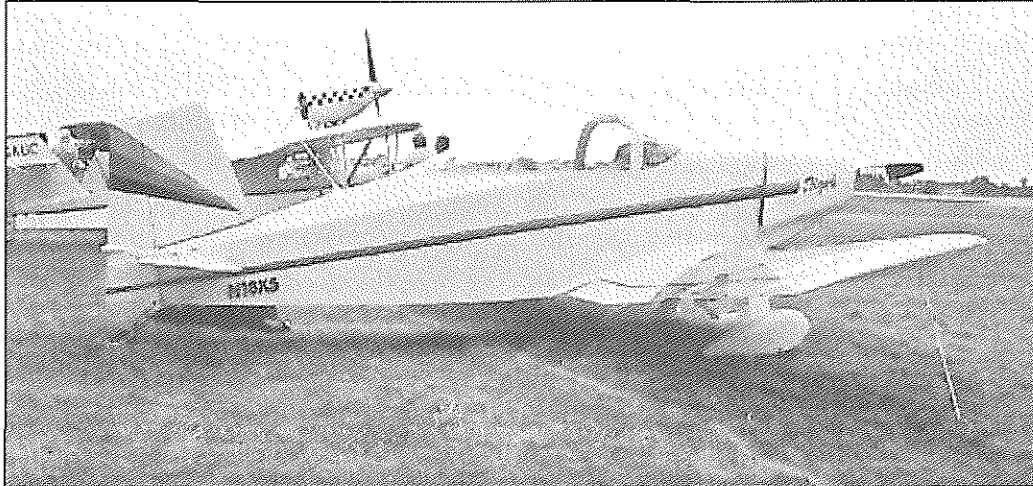
Keep thy airspeed up, less the earth come from below and smit thee. -William Kershner

When a prang seems inevitable, endeavour to strike the softest, cheapest object in the vicinity, as slowly and gently as possible.

- Advice given to RAF pilots during W.W.II.

**Oshkosh 2001**

**Congratulations to Bernie and Melva Fried  
Winners - Silver Lindy - Plans Built**



Bernie and Melva Fried's award winning T-18C ~ N18XS

---

Congratulations To Bernie and Melva Fried for receiving the Reserve Grand Champion Plans Built Award. Their T-18C was beautiful, and showed great attention to detail. Bernie stated that he had purchased the airplane in flying condition, but was not happy with some of the small things, so he began fixing all those little things that annoyed him. I am not sure he knew where to stop. He sure did a fine job, and truly deserves the attention that he received.

It seemed to me that the attendance at this years AirVenture was noticeably down. I was able to walk the exhibit buildings and the flight line at any time without being pushed or prodded, and I never had any wait time at any of the exhibits. I spent four nights in Camp Schroller, and the attendance there was smaller too I think, and people seemed to be leaving much sooner. The campgrounds were showing bare spots by Saturday.

The T/S-18 population was down this year as well with somewhere around fifteen Thorps present. Thirteen were fairly close together in the homebuilt area, and I heard of a couple more somewhere in aircraft camping.

The T-18 forum attendance was also quite low, with forty two persons signing the register. We all renewed old friendships and had a nice lunch, before the actual forum began. Several people had topics that they wanted discussed, so each one in turn took the floor. Some excellent topics were discussed, and of course a couple of war stories surfaced, about off runway experiences and the like.

cont. pg 11

# Oshkosh 2001, cont.

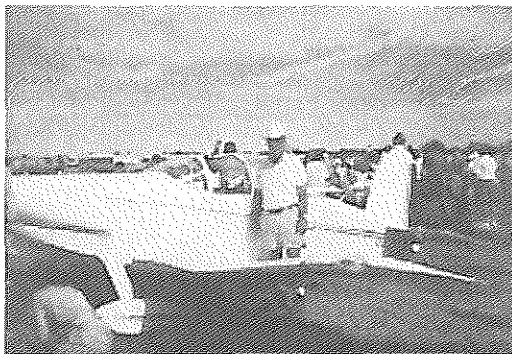
I was a bit disappointed at this years turnout. I am not sure why the Thorp people are not turning out for this unique event. Perhaps it is the constantly rising cost of attendance, or perhaps the fear of getting ones airplane damaged. I do know that the Thorp family is the most wonderful bunch that I have ever been around, and I strongly wish that we could come together at least once a year, (you know, a family reunion) whether it be at Oshkosh, Sun & Fun, or just a really big Thorp Get-Together. We need to hold this group together, and show the world that we really do have the best airplane in the world.



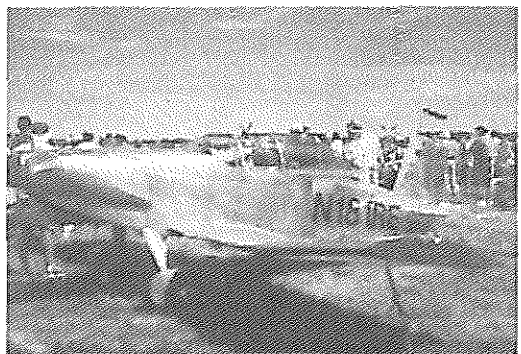
Ron and Jane Hayse - N102RH



Tom Kerns - N10TK



Gary Green - N118GG



Richard Eklund - N181RE

More Pictures  
on page 12



Ed Pernic - N137EP



Gary Cotner - N57GC

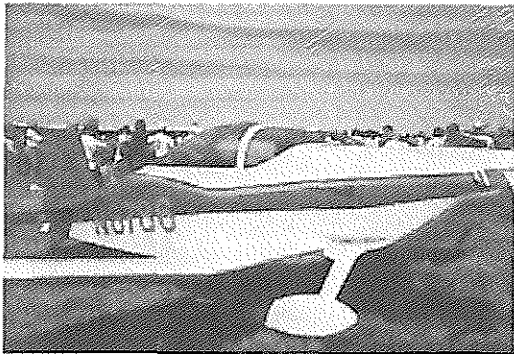
More pictures from Oshkosh 2001



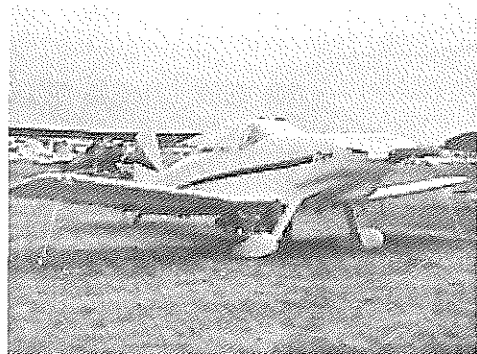
C. W. Shuster - N3706



Gale LeCount - N5GL



Glen Baumgartner - N8786



Bernie Fried - N18XS



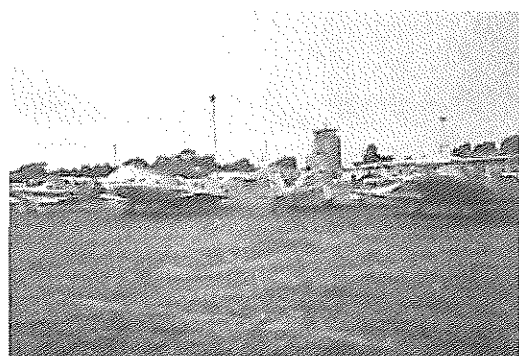
Bob Pernic - N966RP



Flight Line



Flight Line



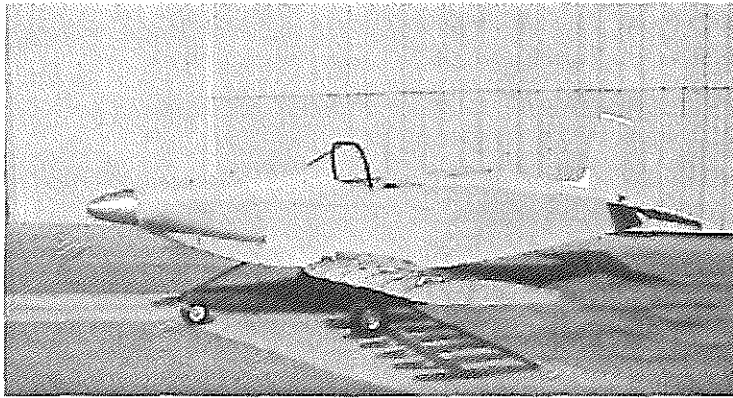
Flight Line



### News From Classic Sport Aircraft

I have finally found the "lost picture" I told you I would send a month ago. This is the S-18 Tri-gear. As you can see, we still have a ways to go to get the wings, canopy and all the fairings completed. I have the instrument panel in with the engine instruments operating. Also, even though you cannot see it, our V-4 engine is under the cowling. I will keep you posted as we progress.

Thanks,  
Mike Archer

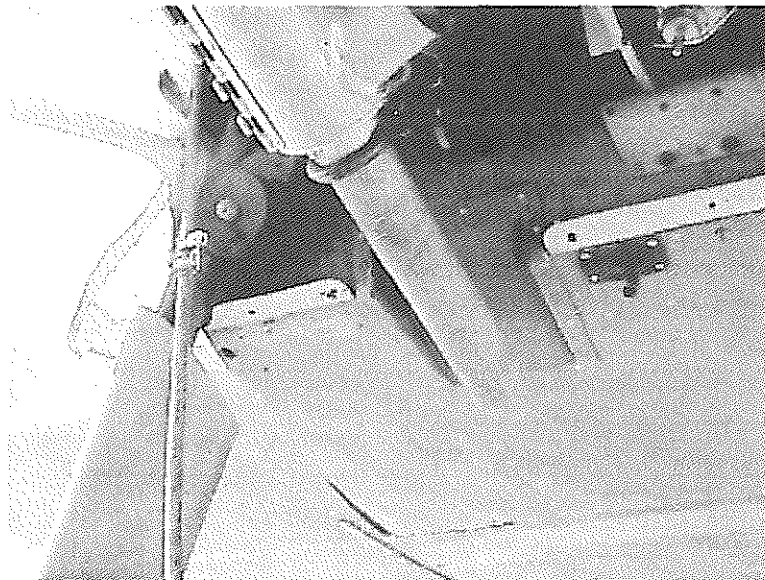


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### Exhaust Pans By; Frank Roncelli

This looks like a good picture to put in the newsletter. The pans, I call them fit between the rudder pedals. With sound proofing and wood floor boards the noise is kept down to a low roar. Keep up the good work

*Editors Note: The installation of these exhaust pans are covered in depth in past newsletters. I have seen several Thorps with this neat little mod. Good for drag reduction.*



**Oil Coolers & Filters**

I used an adapter that was available from Volkswagen people back then. I installed it on the firewall as high as possible on the pilots' side. The fittings for the oil line are the same size as the fittings on the accessory case. Initially, I had intended to use a Cessna spin on filter, which would fit on this adapter, but I discovered that one of the auto filters, don't remember the brand, would filter particles of a smaller micron than the aircraft filter so I started using it. Nowadays I use any good brand since they all keep my oil clean. I place a large hose clamp on the top of the filter with a hole drilled where the screw driver goes in such a way that the safety wire goes through the screwdriver slot after the clamp is tightened then safety it to a small hole drilled on the web of the adapter. Never had one leak and as you know, the Volkswagen oil pressure runs quite high-as high as the Lycoming-so that you can be sure that it will handle the pressure. Also, the filter I get are the ones with an internal bypass.

Pete Gonzalez

---

For a partial flow system I used a Franz oil filter, don't know if they are still available or not. This was installed on an 0290GPU. Install AN4 fitting at pressure port, silver solder a plate over diameter of this fitting and drill 0.090 in hole in the soldered plate. Can be brass on brass, or brass on steel. This will restrict flow from pressurized gallery to filter. Restricted flow is required to maintain oil pressure at idle. The 0.090 dia hole is about right to get good flow to filter and not lose oil pressure. The output of the filter is then dumped back into the crankcase via plate covering the fuel pump pad on accessory case. Mount appropriate fitting on the plate to accommodate the AN4 hoses. This will give you a partial flow filtering of oil. Maybe about as effective as full flow, as full flow is bypassing part of the time

cont.

**Oil Coolers & Filters, cont.**

with higher oil pressures. In place of the Franz filter, one of the firewall mounted units sold by the auto specialty houses will do. The Franz filter was popular some years ago, and was certified for aircraft use.

N118TX uses an Oberg filter, it is great but heavy. It has a reusable screen, with a warning light for supposed high pressure operation due to dirty clogged filter screen. A filter of full or partial flow is good insurance for your engine.

Ken C. Morgan

---

I too am using a Frantz filter on Fat Cat. I have had one on my cars and trucks for 35 years and am a real believer in them. I am also considering becoming a dealer to try to promote them to the EAA world. The company doesn't advertise, but is alive and well and has a websight: [www.wefilterit.com/frantz.htm](http://www.wefilterit.com/frantz.htm).

Harvey  
Fat Cat N118HM

---

I purchased an ADC oil filter system about five years ago and its a GREAT system !!! It comes apart so you don't have to buy a filter opener to inspect what your engine may have spit out. It also has other features as well, like a oil pressure bypass valve (with a panel mounted yellow warning lite),also a low oil pressure valve(with a panel mounted red lite) and also a chip detector that detects engine metal partials. I got everything that they had to offer except for the chip detector. The filter is reusable again and again. You need only to wash it out with warm soapy water and reinstall ! The unit is FAA approved and comes with STC certificate.

cont pg. 15

### Oil Coolers & Filters,cont.

It also extended my oil changes from twenty hours to forty hours too ! Oil filters systems is a must in my book for all engines I think !!! I mounted it on the pilot's side firewall for easy access. The system comes complete with the oil filter adapter, hoses and electrical connections too ! The cost was around seven hundred dollars then, don't know what they are now, but it is one of the best and cheapest things you can do for your engine !!!

If you'd like to call ,here is their number, their in Washington state. 1-800-944-3011

Danny Cummings

---

J.C. Whitney, an auto supply parts outfit in Chicago sells a remote filter assembly that is of very high quality and costs around 30 bucks. It comes with all the necessary hoses and fittings for an auto installation, throw those away and use standard aircraft hoses and fittings. I mounted mine on the fire-wall in a convenient location near the gill opening on the right side. It will take a standard aircraft filter. One caution that must be observed is to make sure the threaded hole which receives the filter is tapped deep enough. This is easily enough accomplished with a standard tap of the correct size.

Bob Pernic  
N966RP

---

I used this same remote filter assembly mounted on the firewall. I flew for 7 years using an automotive oil filter with no trouble. Then the manufacturer changed the gasket material and I suddenly had unpredictable massive oil leaks when the gasket would pop out. The entire oil sump would be drained in about a minute! Don't trust the automotive filters. Stick to the aviation type. They are heavier and the gaskets are glued into position.

Carl N647C

### Oil Temp Problems ?

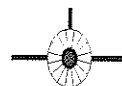
OK guys put your thinking caps on and help me figure out this problem. Lycoming manual says my O-360 should run 180 degrees oil temp and 245 degrees maximum. Mine is running in the cold and cool air of Oregon at 220 degrees! So far I have,

1. Tested and checked ok that the gauge is reading correctly, it is.
2. Removed and tested that the thermister is expending fully and it does at 180 degrees.
3. Removed and checked that the oil lines to the cooler are free and not clogged, they are open.
4. Removed and checked the oil cooler is flowing free both with air pressure and fluid, cleaned it out with solvent and it has good flow in both directions.
5. Checked and rechecked the cooler for free air passage through it. It is fine and my oil cooler is mounted just inside the left air inlet, it gets plenty of air.

So whats the problem? I took off yesterday morning with the outside temp at 32 degrees. I should have a problem with my oil being too cool with those air temps but the oil temp climbed to 220 degrees within 20 minutes. It never goes above 225 but I would like to see it cooler around the recommended 180 degrees. My oil pressure runs at 65 pounds and I wonder if it is over-powering the thermister valve and not letting the oil into the cooler, is that possible? It truly seems to me no oil is going through the cooler as it always tops out around 220. The cylinder head temps run a cool 250 degrees or so. How and why would no oil be going to or through the cooler with good engine oil pressure of 60-70 lbs?

If anyone has some answers for me please get back to me as Im stumped!

James W. N2NE





### Oil Temp Problems ?,cont.

The thermostatic valve or “vernitherm” has a “cone” on the end of it which closes a hole in the accessory housing when the unit gets hot and extends the cone towards that hole. If the hole is not being closed off, little or no oil will be forced through the cooler circuit. Check the vernitherm to make sure it is extending sufficiently at around 180 deg. Also make sure that the cone and the hole it mates with are in good shape.

John Evens N71JE

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Make darned sure that you are using the proper in and out fitting ports on the back of your engine’s accessory case. We had a fellow here in Florida ruin a new 180 Lyc by using the wrong holes. He fried the engine after 1/2 hr of flight. Your temps and pressures are what one would expect if you had no oil going through the cooler at your ambient temperature. Also, don’t assume that new hoses are good!

Bob Highley  
N711SH, Ser. # 835

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### Oil Overboard ?

We have a GA oil/air breather installed as follows:

- oil out of vacuum port to the oil/air breather
- returning oil to fuel pad
- running air breather overboard out an alum. pipe between pipes.

The belly is covered in oil after an hour hop and there is an oil drip on the end of the alum. tube we run overboard. Is possible we are sucking oil out of the engine? Suggestions?

cont.

### Oil Overboard ?, cont.

Have you done a blow-by test on all 4 cylinders? What can happen with pistons and rings if they don’t seal between the piston groove and the ring. The gases then don’t blow by between the ring and the cylinder but get between the ring and the piston groove. This is easily remedied if identified as the problem. The place to start is to do a blow-by test. If you have a leak into the crankcase it would result in oil carryover through the breather. By “blow-by” test I mean the standard differential pressure compression test on the cylinders.

Darrell Miller  
South Africa

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If the vent discharge line is angled backwards in the slip stream and/or cut off on an angle, you can create a slight suction on the crank case and it will pull some oil overboard. I remedied this on my aircraft by bringing the vent line back up just inside the cowling (it could still drip out but was not in the slip stream any longer) and by drilling a small hole in the vent line about one+ inches above the end (flow will come from the area of least resistance - therefore if a slight suction is created it will pull the air from inside the cowling versus from the crankcase - also acts as a secondary vent if the end were to ice over).

Donald Conner  
Houston, Tx.

---

Sometimes, even if the end of the pipe is out of the slip stream, there can be enough flow through the cowl opening where (if the vent tube is in line with this flow out of the cowling) it can still act like a suction on the line.

Don Conner

cont pg.17

**Oil Overboard ?, cont.**

Just adding another point to this discussion - I started running my oil quantity at 6 quarts and it cut the oil consumption out the breather (And the oily belly syndrome).

Ross

---

It is not normal to have mid to upper 70's on compression (hot I assume) and still have enough blow by to carry oil over like that (assuming the quantity is as large as you indicate - a little oil goes a longgggg way).

The only other thing I have seen and heard of is to ask where you mounted your oil separator relative to the crank case vent on the engine. I generally try to put an upward slope in the vent line where it leaves the case and goes to the oil separator. I have mine run up over the engine mount tubing (giving a roughly two inch rise in the tubing) and then over to the separator which I mounted as high as possible on the fire wall. You hope that the more you use gravity to help let the oil mist drop out (especially if the velocity is low like it should be) the less oil there will be for the separator to have to handle in the first place. Most of the oil separators, like the quart size can type Wagaero and Aircraft Spruce sell, are pure centrifugal separators and do not use a mist extractor element inside them. The vent tube enters on an angle near the outer edge of the can and the overboard vent line comes into the unit about mid point and goes inside to the middle of the space. Theory is oil will be extracted due to centrifugal forces and decreasing velocity as it enters the can. Vent is in the middle because the center should be devoid of oil. The higher the velocity of incoming gases the truer this becomes. In higher priced oil separators they will usually use the same principle but with the addition of a mesh screen like material inside to also act as a trap or collection mechanism for the oil particles.

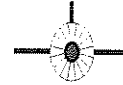
If you feel

cont.

**Oil Overboard ?, cont.**

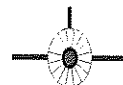
comfortable dropping your oil level to around 6 1/2 quarts it should help some. Otherwise if you continue to have the problem you may have to look at a more sophisticated separator (translates into dollars).

Don Conner

**Brake Linings**

I have been making my own for years. Buy a brake lining tool (Aircraft Spruce P/N 824 \$16.95) Buy Rivets " " \$ .05 each (Get the correct length) You might be able to eliminate the brake tool by using pop rivets, but I don't know about this. Go to an automotive brake specialty shop and they will sell you a flat piece of brake lining material approx. 3/16 inch thick. Use your old lining as a pattern and cut with a bandsaw or jigsaw or even a hacksaw. Drill the rivet holes. Drill the countersunk holes. (You will have to dedicate a 1/4in. drill bit by grinding the cutting edge flat so that the rivet head lies flat in the lining. Clean up the edges with sandpaper. Inasmuch as they don't use asbestos anymore I don't think there is any danger if you breath any of the dust however you should wear a mask. Insert the rivets and set with your tool.

Ted Strange



*Well guys I just ran out of stuff to put in this newsletter. I hope you all decide to send me something before the next one. It just ain't gonna be easy to fill twenty pages with nothing, so get to sending !!*

**For Sale**

I am dismantling a project that was highly modified and have some parts for sale:

Std landing gear  
New Maule tailwheel  
Elevators push-pull tube  
Trim & Bearing assembly  
Std seats frames & pan  
Windscreen frame  
Alum fuel tank  
Fiberglass fuel tank  
Rudder  
Fin  
Horizontal stab with alum. tips  
Brake pedals & assembly  
Std outer wing panels with glass droop tips  
Complete walking beam with control sockets  
Canopy rails  
Call for details and prices.  
Bob Jaeger 815-498-3945

[rjaeger@prairienet.com](mailto:rjaeger@prairienet.com)

---

Sensenich metal prop for 180 HP Lycoming.  
Sensenich EM76 blade shortened to 68 inches with 84 inches pitch. Prop was purchased from Santa Monica Prop, Inc and the vibration analysis was completed by Specialized Testing Service in N. Hollywood. This is a complete assembly, ready to bolt on to your 0-360. The prop is polished and has a polished Ken Brock spinner and has the Ken Brock 4 inch prop extension, complete with prop bolts.

This is the same prop set-up that John Thorp used on his T-18 and is the same set-up that Don Taylor used on all of his around-the-world record setting flights.

Asking \$1800 and I'll pay the shipping (CONUS only).

Gary Green  
817-579-1995  
[ggreen@itexas.net](mailto:ggreen@itexas.net)

**For Sale**

I have both outer wing panels completed from the original print #547 which I would like to sell to any one who might be interested you could take a look at them and make me an offer { P.S. im not looking to get rich }

Ed.Mason  
[Ed.Mason@valley.net](mailto:Ed.Mason@valley.net)

---

sensenich 76mm 400smoh 68/81 with 4in ext all bolts a good buy at \$1000.00

[slauff@aol.com](mailto:slauff@aol.com)  
(352)867-0372 days  
(352)347-2181 eve

---

I have a complete Horz Stab heavy duty landing gear fuel tank and several other T-18 parts for sale if Interested I can send photo's

Make me an offer

Thanks

Edward Williams  
[ewilliams1@jam.rr.com](mailto:ewilliams1@jam.rr.com)  
(601) 502-1804

---

1 belly skin with 1/8" holes (rear)

2 side skins with 1/8" holes

The skins were copied from John Thorps Templates.

Nearly complete set of fuselage frames cut out in the flat, no holes

Rather than sell this stuff for scrap, I will give them to someone for the cost of shipping.

Dean Cochran  
(303)466-3472

**T-18 For Sale**

1985 Thorp T-18  
Lycoming O-360 956 TTSN  
1130 TTAF  
KX-155 Navcom  
Apollo GPS  
AT-50 Mode C  
Voice Actuated Intercom  
Electric Trim  
  
Asking \$29,000 Call for Details  
  
Roy Medan  
(310)327-0251

**Landing Gear Jig**

I've got some crude jigs I made for making my landing gear if somebody would like to borrow them. I couldn't find anybody who carries 1 1/4"dia. 4130 in .313 anymore but Dillsburg, Pa. had 1 3/8"dia. that could be turned down on a lathe. The problem is, the machinist told me not to bring him any more.

Hurant Karibian  
N407HK  
(904)874-1586

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**Upcoming Thorp Events**

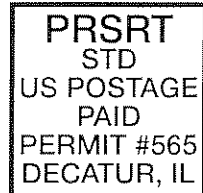
September 1 - 3, 2001 ~ 10 Annual Thorp Fly-In, Porterville, CA. ~ A reminder about the P'ville California Labor Day Thorp Gathering. Again this year put on by Hal Stephens and a great team of people from California and held in Porterville. Mike and Frankie Archer's Classic Sport Aircraft, home of the Thorp parts and plans will provide hangar space, and will be hosts to the guests flying their beautiful Thorps or driving in to see them. Labor Day is the first weekend in September.....It's the Tenth Annual.....can you believe it.....9 proceeded this one and they only get better....Everyone is invited....ya'll come! For more information contact Hal Stephens at (530)295-1867 or by Email at: [aerohal@inforum.net](mailto:aerohal@inforum.net)

September 15, 2001 ~ Goderich, Ontario ~ Aviation Day, Hosted by Sky Harbour Aircraft and COPA 45. We will be providing breakfast, and are eager for members of the T-18 Mutual Aid Society to display their aircraft. For more information contact Jerry Hall at (519)524-2165

October 12 -14, 2001 ~ Kentucky Dam Fly-In, Gilbertsville, KY. For Lodge reservations phone (800)325-0146 and ask for the "Paine Party". For more information contact Jim Paine at: (828)698-0368 or by Email at: [jpaine@cytechcis.net](mailto:jpaine@cytechcis.net)

T-18/S-18 Thorp Newsletter  
Roy Farris  
P.O. Box 182  
Noble, IL. 62868  
Phone: (618)723-2594  
email: rfarris@wworld.com

September 2001



Please check your mailing label for the "PD" entry in the upper left corner above your name. If you don't see the "PD" entry, then you have not paid this years dues. Please send the dollar amount listed on the label. Any amount over 25(US) or 30 (outside US) indicates that you have failed to send previous years dues. Please be kind and send your dues now.

## THORP T-18 MUTUAL AID SOCIETY ----- 2001 DUES

Please continue your support of this valuable exchange of ideas, building tips and safety information covering John Thorp's greatest design. Please make checks payable to: Roy Farris P.O. Box 182 Noble, Illinois 62868. Make check for \$25.00 US, \$30.00 for outside. I don't know yet how the postage increase will affect out mailing costs.

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

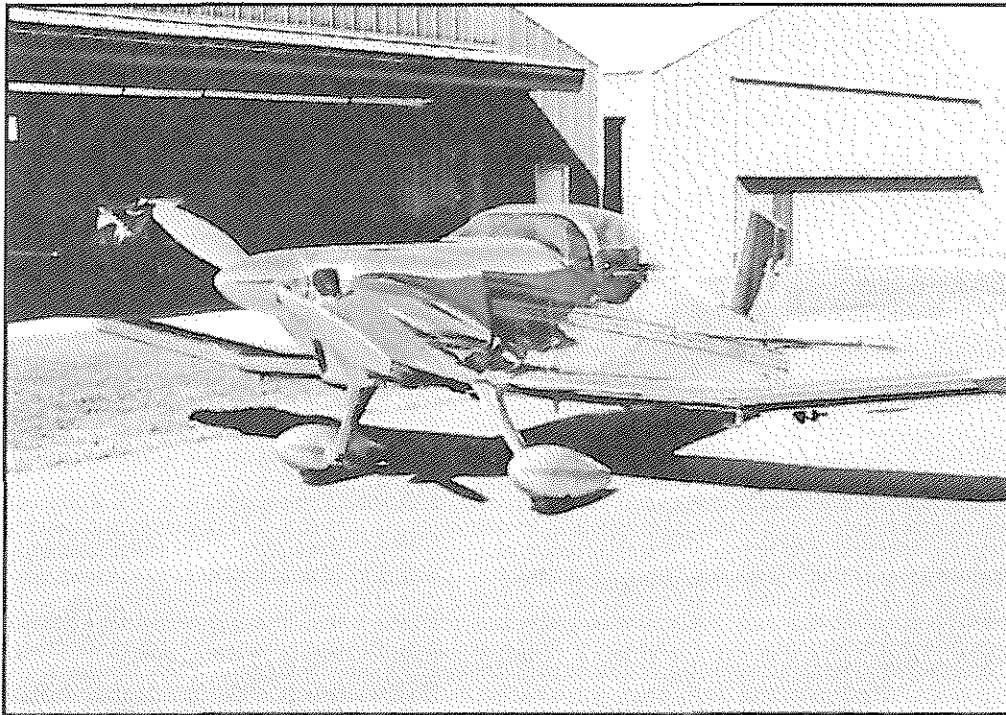
Phone: \_\_\_\_\_ ☐ Yes, I want the Web version of the Newsletter

Email address: \_\_\_\_\_

Notes: (building, flying, thinking about it, etc): \_\_\_\_\_

# T-18 Newsletter

March 2002



*Beautiful Polished T-18 ~ N18CH ~ Built by Carl Hoots*

## IN THIS ISSUE:

**More About Membership Dues**

**T-18 Newsletter ~ On-Line**

**Members Letters**

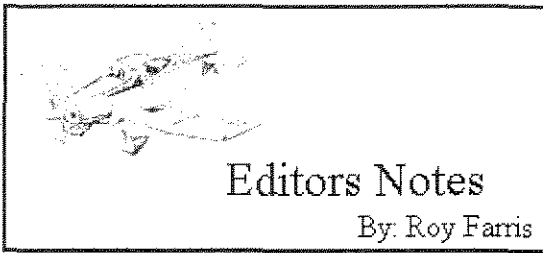
**More On Ken Brocks Accident**

**Antenna Talk**

**Heavy Ailerons**

**Items For Sale**

**NOTICE: (STANDARD DISCLAIMER)** As always , in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.



## Editors Notes

By: Roy Farris

Well gang, here it is March of the year 2002. I am going to have to apologize for being a little late in getting this issue out. I have had a terrible time collecting enough information to assemble this particular newsletter. For some reason I cannot seem to get you good folks to send me any information. Heck I have only received a couple of good pictures lately that I can use on the cover. You guys and gals are really making this job difficult, but as always I will do what I can.

I have received a lot of phone calls and emails lately about our wonderful little airplane. It seems that more people are taking notice of the Thorp. I am not sure why, but there has been a couple of magazine articles in the recent past that may have stimulated the interest. I wrote a very nice and informational article for Kitplanes Magazine and sent it to them. Unfortunately, they did not consider it worth printing in their magazine. To bad, it was a nice write-up about the T/S-18. I guess it's really no big deal ... we know that we have the best airplane, don't we !!



## Membership Dues

This is a repeated and never ending subject. I want to thank all of you who have sent your dues and those of you that constantly keep your membership up to date. I really appreciate your attention to the matter. Our membership fell by about fifty members at the beginning of this year. I have pleaded and begged and gave everyone the benefit of the doubt ... but it has to end somewhere. So I have had to cancel

cont.

## Membership Dues.cont.

several memberships. This is sad and also a hardship to me. I have, in good faith continued to send out the newsletters, expecting that I would receive the required membership dues. So now the financial loss and burden falls on me. I wonder if these people ever think of it in those terms. If someone doesn't wish to receive the newsletter, a simple written note or an email to me is all that is required. I have even went as far as sending invoices in an attempt to collect, but most of them go unanswered.

I will get off my soapbox now and get on with the rest of this newsletter. But if you have not paid your membership dues for 2002, I would appreciate it if you would get it in the mail. For those of you who still don't know the system, look on the mailing label on the back of this newsletter. If your membership is paid up you will see a "PD" just above your name. However, if instead you see \$25 (\$30 for outside the US) then you still owe for this year. If you see any amount greater than \$25 (\$30 for outside the US) then you owe for more than one year. You owe the amount that is printed. So take a moment and look at the label. If you owe some dues please get that checkbook out and write that check.



## T-18 Newsletter On-Line

For those of you still unaware of the on-line version of this newsletter, I thought I would take a minute and give you a little information on it. I think that most of you are aware of the T-18 Website. If you have never visited it, go to [www.t18.net](http://www.t18.net) and take a look. I began making the newsletter available through the website starting with issue #115. Because of space limitations on the website I am only able to post the latest issue, but I do have all

cont. pg 3

T-18 Newsletter On-Line,cont.

of the on-line versions available. If you would like a back issue just let me know and I can email it to you.

If your membership is current then you are eligible for the on-line version. There is no additional cost. You do however need a password to access it on the website. There is a newsletter information page on the website. From that page you click on the "Subscribe" button, there is a form for you to fill out. Once you have completed the form, click the "Submit" button. That's all there is to it. I will have you set up within a day so you too can access the on-line newsletter. If you haven't seen what the on-line version looks like, there is a sample on the newsletter information page. Simply click it and you can view the sample. Give it a try, you might like it.

Members Letters

I wanted to give you an update on my aircraft. I have now been flying it for a full year...and have 108 hours on it now. It has a fuel injected 160 hp Lyc 10-320 with a Warnke "almost constant speed" prop. It is 72 in dia. by 74 in pitch. I bought it originally for an O-360 and then had to settle for the O-320. As a result I can only turn about 2100 on climb. However, I can cruise climb at 145 mph at 500 fpm. At 7,500 feet I can only get about 2350-2400 out of the engine, but I average about 190 mph at 7,500 feet. I am considering changing to an aluminum prop and would be happy to sell the Warnke to someone who has an O-360. It is important to point out that I have a custom wing with the Lyle Trusty airfoil. It is optimized for 190 mile cruise. Lyle has an O-360 and cruises a little over 200. And it is a wet wing, leading "D" cell of center section

cont.

Members Letters, cont.

and the plane carries a total of 47 gals. The total wing profile is different. The only part that is the same between the original "standard" wing, is the inner and outer spars. The rear spar is different as are the ailerons and flaps. The wing sits close to 0 degrees incidence. Well, as zero as I could get it. Handling wise, can only relate to my experiences with it. It is extremely stable. Gives a good stall indication and drops straight ahead. Tony Ginn was my test pilot and he said it just handled outstanding. I wanted to soften up the stall and carry extra fuel and I wanted to make all the templates, form blocks etc. to build the wing, so it was a fun exercise.

I have only made one trip so far where I needed to use the wing fuel, and that was from Tucson to Paso Robles in the afternoon and early evening. After landing I measured my remaining fuel and had almost enough for another 2 hours to tanks dry. It is 612 miles from Tucson to Paso Robles. So it would seem that my no wind range with full tanks would be about 800 miles with reserves. While I do not have a fuel flow meter, I did a flight test where I ran each wing dry with exactly 9 gals. per wing and my usage worked out to 7.2 gph. I then drained the wings to see what my unusable was and it was less than a pint per wing. I have the Lyle Trusty roll trim tab in my left aileron. That is really an excellent addition to the plane and makes it extremely easy to balance out lateral trim. With two equally weighted people in the plane, the little tab (which is within the left aileron) is in trail position..so I deduce that the wing is pretty well true. While John's original left flap down for trim is certainly workable, it does add more drag than the little anti-servo tap within the aileron, and drag..well is a drag. I have an Andair Fuel Selector valve..(see Chief Catalogue) and I recommend this as an excellent fuel valve. It is on the center tunnel..easily reached by your right hand...I debated the whole idea of moving rudder cables outboard and eliminating center tunnel, but in my case I decided that I needed the tunnel on which to mount my Fuel selector

cont. pg 4



Members Letters, cont.

valve. I have an Earls stainless flex line from tank to valve..and then a feed line from valve to firewall and thru to boost pump and then to Andair Gasalator..which has the benefit of a very fine screen in it...which is easily serviceable. The feed is then from Center Tank, Right wing or Left wing..with down as OFF. I do not have any fuel senders in the wings. John use to say that if you can leave something out of a system, then it can never fail! So I decided that I would manage the fuel in the wings by time. I was going to fly left wing 15 min, then right 15 min, etc...but Lyle said to try it left only till dry and then right only and see if the trim would handle the lateral loading imbalance. And that proved to be the case on the test flight and the subsequent flight from Tucson.

Problems encountered in the testing period.

1. Landing. I had a devil of a time at first. Every landing seemed an excursion. Guess what? If the tail wheel is not straight up and down but canted off say 8 degrees..you will be amazed what correcting it to a more vertical position will have on the handling. Now, I have not idea how come my tail wheel was like that. The Spring itself appeared not to be to blame. I think the Maule casting was just machined wrong. I corrected it with a shim and it then worked fine.

2. Fuel Injection system...I added a factory certified but overhauled Bendix unit off a 90 degree elbow facing rearwards. I built a filter box and induction system using parts mainly from an auto junk yard. I mean, if the car had fuel injection on it, why wouldn't the induction unit work on a mechanical fuel injection unit for an airplane motor. Right? Wrong! The mechanical injection system relies on air flow over little tubes to activate the low RPM circuit. Not enough airflow and the engine idles like it has a real hot cam..you know it lopes along..going up and down in RPM. At first, I thought this up and down idle variation was being caused by

cont.

Members Letters,cont.

a bad magneto. So, got a new Slick Mag. No. Problem is still there. Ok..dirt in injectors...better clean them. No change. OK...something really wrong with Fuel Injection servo. Pull it off. Start checking part numbers...(don't take it on faith that a particular part is for a specific task with out verifying it yourself!). Found out my servo is NOT for an 0-320. Send it to overhaul shop Number 1. They want \$1,500 to fix it! Get it back. Talk to guy I bought it from . Talk to guy he sourced it from. Talk to overhaul shop in Texas. They agree to look at it..and bid. Seems fare. Send it to Texas. "Only" \$750 to have it rebuilt and flowed for 0-320. Guy I bought it from pays half..so it wasn't the end of the world and I learned an important lesson.

OK..put it back on the plane..and the change is dramatic...engine starts..and runs so much better. However, at idle it still will not hold a constant rpm. Now, at this point, I was wondering, is there a vacuum leak? no. Is there a sticking valve...is there a flat spot on the cam. Is the valve timing off...? What is going on. Oh, by the way, the engine is a fresh overhaul by a guy I know who was an FBO and has rebuilt Lyc's for years. So, I decided to start by removing the filter in the induction system. AND this is where CFM became an important thing to know about. Seems the filter I had only flowed about 180 CFM but the LYC at full power needed more and at idle due to the impact tubes not getting enough air to activate the low idle circuit, it just didn't run for beans. I may not exactly have explained it according to the book..BUT, removing that filter made it run like a totally different engine! I took off my fancy induction system which fed air off the right rear baffle and sub'd a high performance filter mounted direct to the 90 degree elbow on the back of the servo. It's CFM is a little over 400. I have not yet constructed a plenum chamber and induction system for it, so it is picking up its air behind the accessory case. My manifold pressure is 29.5 however, so it isn't suffering too much back there. However, I will build up a fiberglass induction

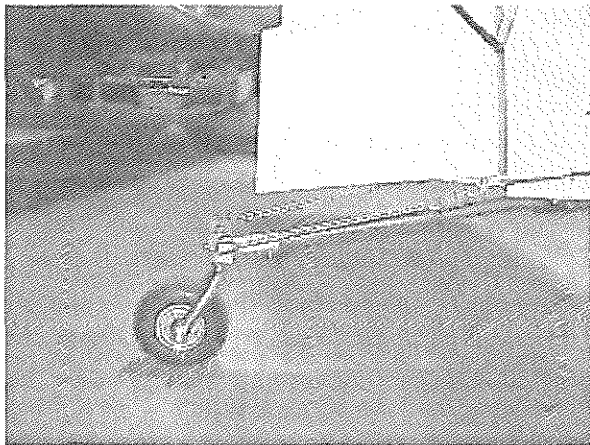
cont. pg 5

Members Letters,cont.

system to feed it fresh air with some ram potential.

Mods that I have made recently:

1. Lyle Trusty tail spring with heavy duty tail wheel. I just added that in Jan '02 and the plane is much easier to handle on the ground and is a little easier to land. And according to my hangar mate, Chuck Borden, it looks better too! So, I have a standard leaf spring and Maul tail wheel for sale. It does have a shim in it where it mounts to the spring. 150 \$.
2. Electric Flaps. I am in the process of adding electric flaps. I have purchased a flap motor and jack screw assembly from Van's. It is used in the RV6 and 8. PN is ES 85615-157. I have designed a mounting bracket and bell crank that fit under the baggage compartment floor which will NOT require any micro switches to limit travel. I am adding this to the plane to get rid of the flap lever AND gain some additional space on which I could add a pedestal for my IPAC computer, running the anywhere map software. I also like the idea of being able to select 10 degrees of flap for take off. Originally I was against the idea of electric flaps for weight and complexity reasons, but if my installation works out as planned it will be very simple..and the motor and jack screw from Van's is very light.



Thomas Hunter ~ N18XT

Members Letters,cont.

Today the sun was out in Oregon, the wind was calm so the call of that little airplane was on my mind most of the day. Even though I still had presents to wrap and a few last Christmas things to do I soon found myself on the way to the airport. In the hanger the little plane sat, cold, dusty and in need of some TLC. I looked her over good and besides the tires being a little low she seemed fine and ready (I hoped) to start. There was no mistaking by the slow wrrrr - wrrrr of the propeller that the battery was indeed a little low after sitting for two months without any attention. Anyway the O-360 finally fired and off to the pump I taxied. After fueling we taxied down the long axis of the airport to set up for a runway 4 takeoff, breaks, oil pressure, temps, mags, carb heat, and propeller governor all checked out fine and off we go. Its been awhile since I have flown my little speedster and after flying the slow old helicopters for two months strait its always a good Idea to do at least one pattern and familiarize myself to this aircraft's speed again and especially the landings, I chirped one down flawlessly and felt good about myself again. This time we powered up and set in 25/25 climb power giving me 140 mph and 1800 fpm climb. I leveled off around 4500 heading somewhere towards Mt. Hood. I listened to the traffic coming and going from the Aurora airport and kept on heading towards the mountain. It was at this time that I realized how beautifully clear it was this day. I could see all the peaks of the mountain range for 3-400 miles north and south. From the Sisters to Rainier all shown clearly in their white cloaks of snow, reaching for the skies, striking and beautiful.

It was somewhere in this area that I realized I was not the only pilot enjoying the blue clear skies. I had several starts that made my heart jump as other aircraft suddenly appeared near me. None were really ever a danger to me but made me take notice just the same. One that really got my attention was a beautiful Lancair "something." Now Im pretty proud of my little T-18

cont, pg 6

Members Letters,cont.

and with the big 360 its quite fast, but I have to admit while just enjoying the view at 170 mph that sneaky little sleek Lancair snuck up behind me and blasted past me like I was standing still. After the pass and a hard climbing turn he disappeared back into the blue from which he had come. I never heard a word from him and I suspect he just wanted to show off. (Guess I cant really blame him) I flew on toward the mountain some and the snow line, the Forest's looks so nice in their blanket of snow this time of year. I made a large swing down around the Salem area and then back on toward McMinnville. The smooth clear glassy air put had me in the mood to show off a little bit at the airport, hell maybe someone might even see? On extended final for runway 4, I pushed it over and bumped the power up a little, at 10 feet I leveled off and zipped the along the runway near the tarmac area at 205 MPH, it made me smile just a little.

On a day like this it was over all to soon as these days in the Oregon winter are few and far between. Nevertheless I did have these enjoyable moments in our little Thorp and I thought just maybe you might enjoy the story.

James W.  
McMinnville Oregon

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### **Some Thoughts**

I have 6 years on my Thorp now, and have found a few things I changed for the better. I had an all-stainless-steel cross over exhaust system, which was not made correctly. It was like most you see, with two long primary and two short primary. The exhaust temp was never better than 200 degrees and I had two wet cylinders and two clean ones. I changed to two equal primaries per side (short); similar to the pipes

cont.

Members Letters,cont.

Aircraft Spruce has for Pitts. All cylinders cleaned up and at 2,575 RPM I can get all exhaust temp within 20 degrees. I have an O-290 G low compression MA4 carb. , 1 7/16" vent - .100 main jet, 68-68 Sensenich prop. At Rosamond Airport, at 2,415 ft. elevation, it will turn 2,200 RPM static. When I first got my prop from Santa Monica Propellers, the tips were cut square and the vibration mode came in at 2,625 RPM. I had them change the tip to the round type and retest. Now the vibration mode is 2,810 RPM, and the plane is faster. On a cool day it will turn 2,750 at 5,000 ft. and indicate 175. The best I have ever seen is 197 ground speed at 10,000 ft. Not bad for a low compression generator motor. I degreed the cam and at top dead center on overlap, both valves were open only .030. A Model-T Ford has a better cam than that. I will work on that later. I have been running auto gas (Union 91 Oct.) most of the time. When I first started my test flights, I found the motor would die at 10,000', drop to 9,800', and then it would start up okay. I found I had too much ram air. I cut the carb. air box opening to 2" x 3 3/4" and installed a second tank vent one 1/4" and one 3/16". Both turned into air stream. That fixed the problem and picked up speed. With my engine, the auto and AV gas run the same. AV gas may get a little better mileage, but on miles per dollar, auto gas wins. Also, my spark plugs stay clean and so does my oil.

Oil Cooler-I have 50 years + experience with racecars and motorcycles and 35 years with aircraft engines. Talking about race motors: If you pump much over 100 psi, it will heat the oil and in some cases cut a channel in the Babbitt bearings. We have found that if you try to flow too much oil through a cooler, it will also heat the oil. The same is true with a water radiator. It won't heat it but it will not cool as good. All these figures are written in stone somewhere. (Earls and SAE). On my 0290, I put a manifold block in place of the filter screen with 2 ports. I run an A-6 line to a firewall mounted filter,

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Members Letters.cont.

which is a Fram HP1 filter,( I may get disagreement for this), out of the filter to a manifold block that has a bypass port of 11/32, one port to cooler and a return port that joins the bypass back to the in port at back of motor. (I checked oil pressure at 4 places: Filter inlet, Idles at 110psi, cold, and at 110 degrees 100 psi. When flying, it stays at 100 psi. After a flight here, which is desert, and hot in the summer, taxiing in, it will have approximately 60psi. I moved the gage to back oil port on right hand side and the oil pressure would idle at 40 psi hot and fly at 80 psi when oil temp gets to 200 degrees, which is common for here, or pressure will go to 90 psi. I talked to two Lycoming experts and they see 100 psi or more in the test cell. They have a special filter with an inlet port. They tell me that this is normal. The customer never sees that side of the filter. I tried a two quart truck filter and got the same numbers. I checked with some filter people and they all have 30 psi bypass valves. I am bypassing oil all the time except maybe when taxiing in after a hot day flight. Some of the troops that are running too hot in cold climate may need to put a bypass line around the cooler, or if they have a thermal valve, they could try a weaker spring in the bypass valve. It might be worth a try. I don't think that most coolers I see could handle the oil that a Lycoming can pump. John Thorps system for the 0290 would probably be the best. No high pressure lines.

Rudder Wheels—When I built my plane, I bought a used Lang unit. I cleaned it up and put it on the plane. The first year or two, every so often I would take a wild ride. I thought it was me, so I overhauled it. Mag inspection found cracks in the crossbar, the cam worn out, and the aluminum top worn out. I installed a new cam and crossbar and bored out the aluminum top to install a stainless steel cup to hold a longer lock pin and stronger spring. It's a cream puff now (almost). When I push on the wing tip, the rudder tire will skid before unlocking. Good test! I think they should all be that tight.

cont.

Members Letters.cont.

When taxiing the plane to park, I can still pivot on one wheel.

Larry Cresse ~ N4075K  
E-mail: [roselync@earthlink.net](mailto:roselync@earthlink.net)

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Cross Country on Mogas

Last winter I took a job overseas (the Mid-east) and, being home alone, my wife made arrangements to visit with our kids in the Baltimore area. The job in the Mideast didn't work out and, five weeks (mid-May) after leaving Los Angeles, I was home again. Being home, I decided that I would accompany my wife to Baltimore, but then I saw my T18 sitting in the hangar. I just felt that I couldn't just let it sit in storage. So, I decided to fly it East and tie it in with Oshkosh's AirVenture on my way home. Along with my decision to fly came a slump in airline traffic and airline price cuts. Now I was feeling guilty. The gas for the T18 was going to cost me more than an airline ticket. I made a decision to mitigate this – mogas was to be my answer. Over the past 10 years, I've had good results with mogas. My Thorp has a 150 hp O-320-A2D (low-compression, 80 octane design), and there is no fuel pump in the system. Gravity does all the work. I used the Airnav web page ([www.airnav.com](http://www.airnav.com)) to check on airports where mogas could be found. My initial concept was to the Baltimore area with an overnight with friends in Durango. The friends were out of town, so I then started to look at Albuquerque as a route and a stop at Belen Airport. One thing led to another and I ended up with a stop for 100LL in AZ. (The only option being via Cal Black Memorial Airport at Halls Crossing on Lake Powell.) With a stop in Holbrook, AZ (100LL at \$2.05), I ended up with my first overnight in the OK panhandle town of Boise City, OK. It isn't much of a place, and the airport's hangars look like they are left

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Members Letters,cont.

over from the Dust Bowl days, but it is the center of an area with wheat, cattle, and natural gas. [Having said that, there is nothing there, and, as a boy from the city, it is a place in which I sure wouldn't want to live.] I was able to continue east with mogas purchases in El Dorado Springs, MO and Muncie, IN (I overnighted with my EC-121 navigator – we flew them in 1960-62 – in Indianapolis). On my way to Baltimore, I got mogas in Punxatawny, PA (remember the ground hog?). With an overnight at State College, PA, with high school friends, I was on to the Baltimore area. I had trouble finding it, but finally located and landed on the 2300' runway at Suburban Airport in Laurel, MD. I then moved it to the former Fort Meade AAF (now Tipton Field, Odenton, MD.) where I filled it by the 5-gal can from the local gas station. [I moved it from Suburban Airport so that I could take a friend flying; the friend is BIG, and was cramped in the T18. I did this kind of thing from Suburban once before and used up 2000' of runway while I sweated obstacles on climbout.] It took a little work, but I was able to find mogas on my way west. Visiting in Philadelphia (PNE), I ended up with hauling gas from the local gas station; on the way to OSH, however, I was, once again, able to get mogas at the pump in Punxatawny. I overnighted in Indiana to visit relatives and avoid incoming weather. I stopped at a grass strip in Butler, IN and found that I made a mistake of not calling the owner. Unless you call ahead, the pumps are locked and no one is there. Out of pure luck, another pilot pulled up and sold me 10 gal of mogas that he had in his trunk. It worked fine. A final stop before AirVenture was a landing that I made at Guntly Memorial Airport (62C). Southwest of Milwaukee, the airport has 2400' of rough grass for a runway. Mogas in the state was not inexpensive, but the purchase was still less than getting it on the field at OSH. Still, this was not a T18 friendly airport. Between the rough field here and the cross-country taxi to the "South 40" at OSH, I ended up with a broken bracket

Members Letters,cont.

on one of my wheel pants. And, when it came to departure, the undulating grass runway seemed to slow my takeoff. I used almost all the grass – bounding into the air off of an upslope something like a ski jump ramp. Homeward from OSH, I planned a stop for fuel at Audubon, IA. Unfortunately, upon arrival, I found the airport absent of anyone from which to get fuel. Several phone calls established that their mgr was in the hospital and no one could help me. Forty mile further west, I landed again – this time at Harlan, IA. I'd stopped in Harlan three years earlier. They are a good facility to use and I would recommend them for a fuel stop. Shortly after noon, I was off to Alliance, NE. At Alliance, I was able to fill up and replace a lost wheel pant bolt at the same time that our Richard Ecklund landed. Richard stayed overnight in Alliance while I wanted to try one more stop before doing an overnight. My target was Bountiful Airport, right next to Salt Lake City International Airport. Weather for the flight was no problem, but it was a long haul. I plan 4 hours endurance and my planning came up with 3.3 hours for this leg. The flight was at 10.5K, but didn't make my 140 kts TAS. Density altitude was one thing, turbulence was another, but another possibility was that I had leaned the mixture a bit too much. I was 3.6 hours takeoff to shutdown, and still had 6 gals remaining. Along the way, Flight Watch was reporting CB's in the Four Corners area, making me feel good about not going that direction. I got home the next afternoon. I had to buy 100LL at a stop in Boulder City and back in Los Angeles, the only mogas source is from the local gas station. By the way, should ever be passing by the Salt Lake City area, Bountiful, UT has the Skypark Airport. It deserves your support. This airport came close to being another housing development/shopping center, but was saved by investments from local pilots. It is just a few miles north of the SLC international airport – the Class B airspace has a notch to let you in.

cont. Jack Kenton

Ken Brock's Accident

By: Lyle Trusty

Tony Ginn told me that one of Ken's old friends went to see the wreckage with Ken's Son, after the funeral, and found that the tailwheel installation was a Maul, (I assume this was a model SFSA tailwheel assembly) and confirmed that it had broken off halfway up the fork (#26) between the axle (#27) and the spring bracket (#7). That's what's commonly used on the T-18, along with a flat 2 leaf spring. (Refer to the parts breakdown of the Maul tailwheel on page 218 of the Spruce Specialty 2000 - 2001 Catalog) I've never heard of a failure like this on a Maul, but haven't researched it either. They say the same type of fork construction is used with the larger 8" pneumatic wheel installation used on Maul, Cessna, etc., taildraggers, but I note they mention that "all working parts are heat treated", when describing the larger wheel installation parts. Also mentioned in the fine print in the parts list is a statement to the effect that "Old Style (pre 1976) has 3/4" Fork Shaft & New Style (Post 1976) has 7/8" Fork Shaft". (This would not seem to me to be a factor in the accident.)

Another thought occurred to me; Ken's neck was broken when the aircraft overturned, and Marie only had a bad bump on her head. I don't know how tight the seat belts and shoulder harnesses were but that could be a factor in this fatality. I have resolved to cinch up tighter because I'm six foot two, a large guy, and I've hit the canopy pretty hard a couple of times in turbulence.

I expect that the NTSB will have a metallurgical analysis done on the failed part to determine the failure mode. They can establish if there was a pre-existing crack, what the heat treatment value was, if it failed due to fatigue or if it was stressed to ultimate load, or due to other causes. If I can obtain this information I will forward it to you, however, it is not usually available until several months after the accident.

Some Thoughts On The Tailwheel

By: Lyle trusty

I meant to get back to you sooner with information on the tailwheel failure experienced by Ken Brock, but things have been a bit hectic for us during the past couple of months. All the discussion about landings, and then this, makes me think it's about time to speak out. With the greatest respect to all who have offered their opinions, I hope my own experience with the T-18 will help to clear up any misconceptions, and not add to them.

Connector springs should be "compression" types (as opposed to "tension") so as to be "fail safe". When a "tension" spring breaks, or as more usually happens, becomes disconnected, you lose tailwheel steering control and the usual result is you end up in a ground loop. It almost happened to me, but fortunately I was landing at Mojave on a super wide runway and managed to salvage the landing with large rudder inputs, and heavy braking. I installed compression springs, with positive attachments after that incident and keep a little tension on them for positive tailwheel steering action, yet have full swiveling for good maneuvering capability, or to get it back into the hanger. Maul claims that having a lighter spring on the left side than you have on the right side will upset the natural frequency of the tailwheel and prevent tailwheel shimmy. They sell an "Anti-Shimmy Connector Spring Set, part number 06-15600 shown on page 219 of their 2000 - 2001 catalog. I gave up on Maul tailwheels a long time ago because the tailwheel bearings are simply mounted in the solid rubber tire and you never know when you're going to roll it right off the axle. A bit too much grease in the zerk fitting is a bad thing. Any sign of the outer race of the wheel bearings rotating within the tire are grounds for removal and replacement of the tire asap. It's been my experience with Scott tailwheels that If I get a tailwheel shimmy it's time for a new steering arm assembly, item 4, part number 1709 on the scott model 2000 tailwheel illustrated parts list on page 217.

cont. pg 10

Some Thoughts On The Tailwheel,cont.

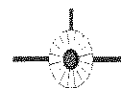
If that doesn't fix it you also need a new fork. It's amazing how much easier it is to land a T-18 if you have a good tight tailwheel steering installation, and wheels that point straight ahead on the main landing gear. Zero toe-in/toe-out is best. One quarter of a degree toe-out, although it increases directional stability somewhat, drags a tire approximately 264 feet sideways each mile of travel. That's about one landing and a taxi back. (Simply put, it's a skid mark 264 feet long) Figure it out - one quarter of a degree is one quarter of an inch in five feet. 5,280 feet divided by five = 1,056, and that times .25" = 264'. On the other hand, a quarter of a degree of toe-in results in a remarkable degradation in directional stability during landing. The reason is that the weight transfer to the outside wheel during a turn, or swerve, puts all of the toe- in effect into decreasing the turn radius. The inherent ground looping tendency of a taildragger is therefore increased by toe in.

The landing gear deflects 3/4" per G and is stiff enough to be considered fixed, aside from transients due to bounces, braking, etc. It will take a tremendous load and immediately return to it's original position, as many of us can attest to. If you have good rubber pads under the fuselage landing gear mounts, good straight up and down and straight forward main gear alignment, and brakes that can hold you during runup you have a winning combination for good landings. At very light weights you can do reasonable power off landings with full flaps, but as soon as you start loading it up with people, luggage and gas the wing loading goes up, the stall speed goes up, and the landing characteristics change significantly. Slow down on short final to get into your landing attitude, then carry enough power to kill your descent rate as you get into ground effect then fly it on in a three point attitude. My original Cleveland 500 x 5 brakes, after about 200 hours, would not hold the airplane during runup. I had a 150 HP engine with a constant speed prop, and it was more than the brakes could hold.

cont.

Some Thoughts On The Tailwheel,cont

I cured the problem by putting on new chrome brake discs. They worked great for awhile but were worn out again in about two hundred hours. I continued fighting braking problems for several hundred hours. After putting on a 180 HP engine, which aggravated the situation even more, I installed a set of Long Eze 500 X 5 heavy duty brakes (ordered from San Val). That was the end of my brake problems, however, they are powerful enough to bring the tail up during hard braking on roll out, or runup. You get used to that quickly and enjoy their safety factor. The pucks last forever, it seems, yet the only difference you can see is thicker brake discs.

Smart Coupler Fix

For those of you who are using the Smart Coupler with the Navaid autopilot, there is now a cure for the tendency of the autopilot to make a turn when transmitting caused by RF interference. I spoke to Jim Ham of Porcine Associates today and he has developed a fix for the problem with the Navaid autopilot. He will replace the insides of the Smart Coupler with an upgraded unit for \$85.00. He can be reached at 800 326 6272.

William Beswick

On The Lighter Side

Keep thy airspeed up, lest the earth come from below and smite thee. - William Kershner

When a prang seems inevitable, endeavour to strike the softest, cheapest object in the vicinity, as slowly and gently as possible.

- advice given to RAF pilots during W.W.II.



## T- 18 Hats and Such

I have produced a new set of T-18 hats and have them for sale. The hats go for \$15 each plus a shipping fee. They are good quality hats in a stone color with the logo's in green, blue and burgundy. Please feel free to contact us anytime as we are looking into a full back logo on jackets and maybe T-shirts too.

James and Sherry Wolhaupter  
McMinnville, Oregon  
[Rotortime@aol.com](mailto:Rotortime@aol.com)



## A Story From Don Taylor

Some years ago, about the time of my record setting flights, I went to a big airshow and fly-in at the USMC base at El Toro, California. EAA Chapter 92 had a booth set up and I was to display my T-18 *Victoria* there. On my final approach to the parallel runways, the tower changed my runway from the right one to the left one. No Sweat !! a quick side step, and a nice landing (for a change). I was firmly planted on the runway and at about forty to forty five m.p.h. I looked up and realized that the net barrier was up. It was too late to execute a go-around and still too fast for hard braking. Luckily, my main gear went over the cable, but the tail wheel hooked it. I stopped in about forty feet. The first T-18 carrier type landing and probably one of the shortest Thorp landings on record. Unfortunately, the tail end of the airplane was torn out.

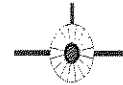
I remember calling the tower everything I could think of, and none of it complementary. I heard no response ! Ken Knowles and I rebuilt the tail on my T-18 in three days. A good man that Ken Knowles.

Don Taylor ~ N455DT

## Check Those Sticks

I wanted to share an accident that is circulating amongst the Harmon Rocket guys, that applies to the Thorp community. Apparently, a Harmon Rocket was crashed after the control stick disconnected from its socket. The fiberlock nut had backed off, and the bolt finally worked its way free. The pilot survived. Make sure you are checking this assembly on your Thorps during your annual/conditional inspections. I have heard of bolts working free, and even the stick cracking at the socket, and breaking. Fortunately, we can reach across the cockpit, if need be. Just to be extra safe, I'm going to install a castled nut with cotter pin on my control sticks.

Jimmy Cash



## Heavy Ailerons

The ailerons on my ship were so heavy that I seriously worried about the aluminum stick breaking off, I made a longer stick to get more leverage and I inserted a steel sleeve in the base. Still worrying about excessive control linkage pressures I made a set of **aileron spades** for the ship. They really lighten the stick forces and seem to enhance the roll rate in a good way. I started with 7"x7" spades then increased the size to 8"x8 1/2". I've tested up to redline 210MPH with great results. I like to do limited aerobatics (0 to +4g) and the spades really made a tiger out of the plane. One downside is a little less ground clearance under the wings. The ailerons are still heavier than an RV, but more effective at low speeds than an RV. I think it makes sense to have the spade doing part of the work directly from the outboard end of the aileron and the linkage doing the rest at the other end.

Any comments will be appreciated.

Roger ~ N33TB

cont. pg 12



Heavy Ailerons,cont.

I've heard others comment about the T-18 ailerons becoming heavier as speed increases, and modifications (such as a "folded" trailing edge) improving this for them. Personally, I think that mine are just right for me... maybe they are different than some of the others, I don't know. They certainly do stiffen at higher speeds, but I like that... I feel that the "feedback" helps me to avoid overstressing the structure. Mine are built exactly to the plans and feel light enough for me (have you ever flown a Skybolt? Talk about heavy - especially the elevator!). I think that the roll rate is more than adequate too... incidently, it is greater than an RV-6, although, granted, the forces are not as light. The "spade" thing worries me a little. They certainly should not be necessary! If the force is so great that you were worried about breaking the stick, something else may be going on... deformation causing binding, or excessive friction, or something else? I hope you're not expecting the T-18 to be something it is not. Have you ever flown anyone else's Thorp? It is a wonderful, responsive design and a true joy to fly, but it really shouldn't be compared to acro-ships, designed for that purpose.

Respectfully,  
John Evens N71JE

---

I agree with you, John, the forces should not be that great. I'd check everything you mentioned, and make sure the hinges and pivot points are lubed properly. Also, does this Thorp have only one hinge that runs the length of the aileron? I have heard of some who have deviated from the plans by adding a full length hinge (as a gap seal), only to find out the controls were heavy. The problem is that the wing flexes, which is OK with the two hinges called for in the plans. But, when a full length hinge tries to flex with the wing it has a tendency to bind. At least, that is what I've been told.

Jimmy Cash

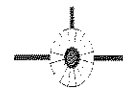
Heavy Ailerons,cont.

Something is wrong with your airplane if you need spades or a longer stick to control the ailerons at redline. My airplane and my friend's S-18 are fully controllable with two fingers up to redline (and beyond). Get out the incidence board and check the rigging. I get 25 degrees up and 10 down at the stops. The differential is important. I must tell you that I tore the skin on my original ailerons in a high deflection maneuver at high speeds. These had the .016 skins as called out in the plans. My present set (.020) have a folded trailing edge and are a bit pillow shaped just due to the curve in the aluminum stock. As for high speed aerobatics, are you familiar with the term "rolling G limits"? If you are not, I suggest you, or anyone else out there doing aerobatics in high performance aircraft, have a frank discussion on the subject with a jet fighter pilot. This is important!

Bob Highley  
N711SH, Ser. # 835

I will second the warning about "rolling G limits" We had a T-18 wing with wrinkles in both directions in the skins and major distortions in the spar webs. The pilot was really lucky to come back alive. If you have any further questions about "rolling G limits" contact Paul Kirik at [KirikPaulJ@JDCORP.deere.com](mailto:KirikPaulJ@JDCORP.deere.com) Paul has moderated the T-18 forums at Oshkosh and is well versed in T-18s as he has built about three.

Cy Galley  
Editor, EAA Safety Programs



## Folding Wing Play

For the T-18C folks.

I was concerned about the amount of play I was seeing at the wing tip, both vertical and horizontal. During my annual condition inspection my mechanic and I have replaced quick release pins at the main and aft spars with bolts. This replacement has made the wings Very secure and solid to the airframe. The wings are still easily removable, just not as quick as before, a good and welcome trade in my book. If anyone is having problems / concerns similar to mine I would be happy to detail exactly how we made the changes.

James W. ~ N2NE

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I, too replaced the pins with bolts for the same reason. I feel far more secure now with the bolts and zero play!

Carl ~ N647C

---

I just unfolded my T 18C's wing and I must admit that it was difficult. I think that my rear spar attachment area has gotten bent. I also ran into problems with the wing skin getting bent and caught as I tried to put things together. What I don't have, however, is any play/looseness in the fittings or at the wingtip. To get everything snug, you need to have your mounting pins snug. I would think that the ones that a builder makes initially (unless worn for some reason) would provide a better fit than using bolts. All that the bolt does is make it more difficult to remove the wing. I don't see where it makes any great impact on how much wing play you have — a nut/bolt isn't going to be able to hold a wing if the pins bolts are not tight in the mounting holes.

Jack Kenton ~ N921JK

## Folding Wing Play,cont.

I've been calling my N921JK a T18C with its folding wing and standard everything else. For someone looking to fold the wings frequently, I do think that you should find someone that is successfully doing it and speak with them. I have had a difficult time getting the rear spar "lock pin" into place after an unfolding exercise. It seems to be hard work that I rather not have to do (just to get everything aligned in the unfold process).

Jack Kenton



## Radio Interference

Can anyone help? I am picking up RF interference from both mag's. Both mags are Bendix. It is not alternator interference because if I turn the mags off the interference stops before the engine stops turning. I pick up the interference on both my Narco Com 11A's. I have totally screened the back of the radio racks so it is most probably not due to bad antenna screening. The plug leads are standard and so are the plugs. The engine is a 150 HP Lyc. Any ideas?

Darrell Miller

---

P-lead wires?

P-leads should be shielded wire, from the ignition switch all the way to mags and grounded properly. If your using regular wire, that may be the source of your interference.

cont. pg 14

Radio Interference,cont.

If you have the capability to switch your alternator off the circuit, do it, while the engine is running. If the interference stops, you need a good filter on the output of the alternator. It would be better if you switch or pull the fuses for the field and the output for the check, but just breaking the field circuit should keep the alternator from generating. I used a large CB radio filter from radio shack about 1973 and it's still doing fine.

Pete Gonzalze ~ N380G

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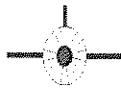
You can buy filters for your mags, Aircraft Spruce p/n 07-03200.

Tom Thompson

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Shielded "P" leads didn't solve my problem but "P" lead filters did. Pretty expensive for a simple capacitor.

Hurant Karibian

Antenna's and Cable's

Is it possible to lengthen the antenna wire on my GPS without destroying or decaying the performance?

Ted Strange  
[tedstrange@home.com](mailto:tedstrange@home.com)>

Antenna's and Cable's,cont.

On the II Morrow gx55 I have it was just a matter of lengthening the coax. On marine units we cut or lengthen gps cables all the time with no degradation. Just make sure you use high quality coax connectors.

Doug

---

Here's 2 questions. Except for building a small bracket to mount my GPS antenna so it's level during flight ( the king manual says so ) has anyone installed one flat on the deck above the baggage area or on the top skin behind the canopy with success? Also has anyone used a Comm antenna inside the wing tip?

Dave Goff (S-18 still building)

---

Regarding internal antennas, I recently removed the com antenna on top of my T-18 and installed a homemade one using a BNC fitting and located it inside the canopy just aft of the horizontal reinforcing bar when its in it's aftmost position. It bends forward to follow the contour of the canopy. It seems to work better than the original antenna. I also mounted the ELT ant. in there too.

Roger

---

Tip comm antennas may or may not work as comm antennas are vertically polarized and by laying it down in the tip you will attenuate its signal. Also it needs a ground plane to balance out the monopole element. Putting a VOR antenna in one tip only even though its horizontally polarized will cause some reception problems when the station is on the opposite side of the a/c to where the antenna is. It may work on close in stations

Antenna's and Cable's.cont.

but if the station is a ways away you may not be able to get it. You can test the VOR reception by going say 25 miles away from the station and fly a wings level cicle and see where the warning flag replaces a strong signal in you CDI. Then try it at 50 miles again you will notice a loopsided pattern (called a Smith chart in antenna engineering lingo).

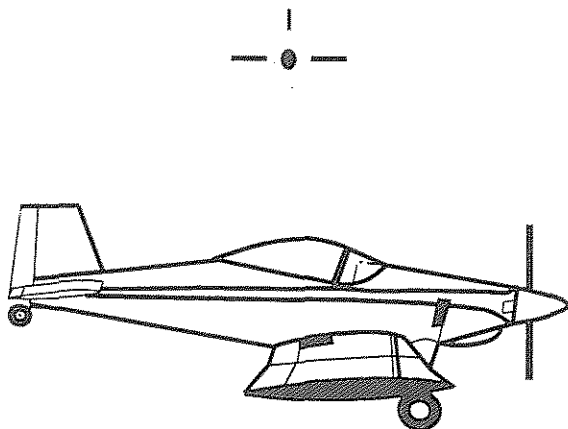
CliffBiggs

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I've got the Archer VOR antenna in my right wingtip. My father put the plane together with it and it works fine. We originally had a problem when my father installed the wingtip lights and strobe and ran an electric wire across the antenna. We went for a year trying to figure out the problem. Once I re-routed the wiring so as not to go across the antenna, it has been fine (reception) for the last 10 years.

We have a guy in Chapter 96 (so. Los Angeles) that has sold antennas for VOR wingtip installation for 15 yrs. He started doing antennas for a "raised" fin installation some 8 yrs ago, and now has a wingtip comm antenna that folks say, while not as good as the fin, is as good as any other installation that they've ever had.

Jack Kenton

The Passing Of A Friend

To all in the Thorp community, bitter sweet news. We have unfortunately lost a fellow T-18er. Ed Cox passed away Sunday night after struggling with a debilitating disease. He was the owner of N64EC which made it's first flight in November of this year. Ed had sold his Aircoupe to buy the project with the intent of finishing the T-18 in time to retire and enjoy his toy. Not long into the project he started to become ill and was having difficulties working on the plane, but he was fortunate to have some friends around to help. They did the things he wasn't able to handle and completed the airplane with the hope he would at least be able to get a ride in it, unfortunately his condition didn't allow this. I got to do the first flight in the plane and I am in the process of flying the time off . It fly's great and looks good, they all did a great job on this plane. It will go to one of the friends who helped him finish the plane, he is a current T-18 owner and I expect he will be a great care taker.

Steve  
T-18 N97SE



T-18 ~ N118JT ~ JERRY TINDELL ~ PANSEY, AL

## New Stuff From Classic Sport Aircraft

Classic Sport Aircraft has been approved as OEM for the following items

1. Hartzell 2 Blade Constant Speed prop for 320 or 360 engine. It is a 72 inch dia. using a 7666-4 blade. Cost is \$5966.00 plus tax and shipping.

2. A 5 point harness available is a variety of colors. Cost is 298.00/ea plus tax and shipping. Compare to the one in All Aircraft Spruce for \$376.00.

Call Mike Archer at 559-539-2755.

## For Sale

T-18 with a 0320 Lyc. engine. It has no radios. Took thirty years to build. It as been ground taxied.

Just about thirty miles east of Birmingham AL. If anyone might be interested in his bird, please give him a call at 205-967-3338. Mr.Frew is asking 19,000.00 for the plane.

Mr.John Frew ~ Pell City AL.

*(Note: This T-18 has now been flown. It has around 2 hours on it)*

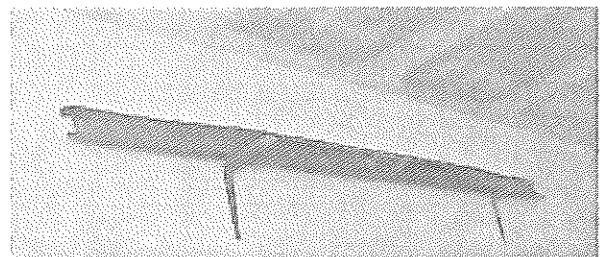
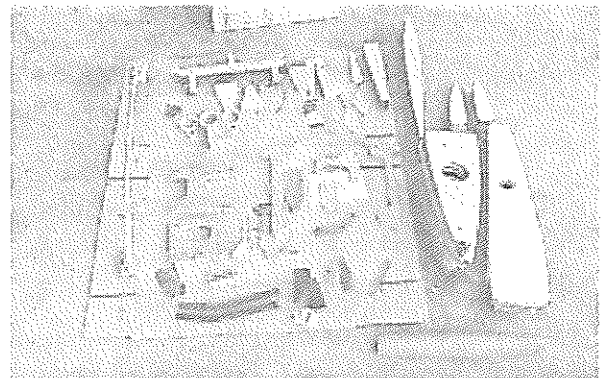


## For Sale

### Parts For Sale

- Prop. Ext.per dwg. #1070 modifiable to dwg. #1072 by drilling - \$120.00
- Scott tail wheel model #3200 (used) - \$300.00
- Main landing gear - \$600.00
- Engine mount (straight) - \$300.00
- Straight mount eng. collar - \$70.00
- Standard 29 gal fuel tank - \$250.00
- Windshield frame assy. - \$125.00
- Lycoming starter ring gear (122 teeth) - \$150.00
- Walking beam assy - \$75.00
- 500x5 cleveland wheels (2) with new chrome disks and new bearings - \$450.00
- Control stck sockets—(2) - \$52.00 ea.
- If all items are purchased together an overall 10% discount will be made Inquiries may be made to Jud Carter @ ph.(770) 952-7139 Fax (770) 952-7103

### Some Extra Parts



If you are interested in these parts contact Hurant Karibian at: karibian@worldnet.att.net

For Sale

Having lost my medical 147 DS is for sale.  
Partial list of panel: wet vac pump, 360 GPS,  
transponder and incoder, art-horizon, 0320-400  
hors since overhaul Ayma-Demuth prop.  
There are other T-18's & 0320 160HP out of  
License. Asking 13,500 dheap but I want to move  
it.

Regards  
Bob Slagle  
[bob\\_helen\\_slagle@yahoo.com](mailto:bob_helen_slagle@yahoo.com)

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THORP T-18 . AVAILABLE FOR SALE!!  
Thorp T-18 1997 500hrs,Lyc  
O-320 180 hp, Fixed pitch polished metal prop,  
Full Pannel, Vor/GS,  
Garman gnc 300 XL GPS/COM , Alcor fuel  
totalizer, intercom W/music  
input, electric trim, 4 cyl egt/cht, Rat-Rey cowl  
and wheel pants,  
new tires and breaks. Sold with fresh anual and  
data card for  
gps.Extra parts. Price \$37,500 Contact Steve  
Irving located Lancaster  
CA US. Telephone: 661-256-8613.

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THORP T-18 . FOR SALE!! 752hours on air-  
craft, but only 49 hrs. on  
new O320-E2A. Metal prop,sliding canopy, King  
720 ch VHF, King ADF,  
Apollo 604 Loran, and transponder and encoder.  
All metal cowl. Fresh  
annual.\$25,000 Contact Henry Strauch located  
Junction City OREGON  
USA. Telephone: 541-998 8576.

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Gentleman, I have a Val 760 channel Comm  
Radio just removed working well. I Have the tray,  
Harness and manual, in a box. I will sell it for  
\$300. or best offer. Call me at 904-692-1443

For Sale

Electroair Ignition System EIS-1 by Jeff Rose  
4 cylinder  
Includes:  
Direct Ignition Unit with coils. Timing housing  
with alignment pin (This ignition trigger installs  
in the removed magneto hole. Gear driven, no  
flywheel triggers required, and timing is much  
easier and more accurate).Spark Plug wires with  
screw caps and spring ends. Instruction Manual.  
This system is brand new, and has never been  
installed. Jeff Rose sells these units for over  
\$800. The first \$700 gets this one (price in-  
cludes shipping and insurance in the US). Email  
me with any questions.

Thanks,  
Jimmy Cash  
[jcash@granbury.com](mailto:jcash@granbury.com)

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New 508 instrument panel - \$65.00 Less than  
the cost of the material to make it.  
2 sets of Cessna 150 rudder pedals - \$15.00 ea.  
set.  
1 set of Lancair rudder pedals - \$15.00

Karibian [karibian@worldnet.att.net](mailto:karibian@worldnet.att.net)  
1-850-874-1586

---

I have some fiberglass parts for a T-18. If your  
intrested call me at 931-473-5401 during the  
days. I don't have any pics of the cowl, but its  
the flat type with no cheeks and no air induction  
on the bottom of the engine cowl . Its a two  
piece cowlng ! I have wing tips(with nav and  
strobe lense builted in),wheel pants,horizonal  
fin tip and engine cowl. I'd take 500.00 dollars  
for all of them. I Also have a prop extention  
for a 150or 160 Lyc.too if anyone needs it.

Danny Cummings  
[dctires@blomand.net](mailto:dctires@blomand.net)

### For Sale

I got this Aymar Demuth 68x74 prop from John Sullivan when I bought a cowling, wheel fairings, etc. It's been tried on my T-18 with a 150HP O-320 engine. However, the original AD 68x73 is a better match. The 74 inch pitch would be better suited to a 180HP or 160HP engine. I found that the 74 was just a bit too much "cruise" for my 150HP.

Price is \$400 with prepaid freight by me.

Tom Worth - Tacoma, WA - (253) 922-0137

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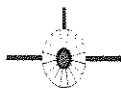
Paul Krogh in WI has some sets available for std and wide body. Contact him at 262-534-6916 or [pmkrogh@execpc.com](mailto:pmkrogh@execpc.com).

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In case anyone is interested I know of a nice T-18 FOR SALE! It has a 0-290 engine with 227 Hrs.SMOH and 227 TT on airframe, King KX-125 new AT-150 transp. With encoder, Dual cleaveland brakes New engine control cables, New tires and tubes and cabin cover. I flew the plane and it's fast and solid! A 9 inside and out. inspection due sept.2002 Anyone interested can call Tom Larravee at 386-749-0516 or 386-749-2734 North FL

My name is John Dors. My friend George Truver has passed away and had asked me to sell his T-18 with many extra parts and tools. Any interest please email. Also would you let Mike Archer know as I don't have his address. Thanks

[ios@adnc.com](mailto:ios@adnc.com)



### For Sale

#### T-18 N71SC FOR SALE

1550 TT; 300 SMOH (Mattituck); Lyc IO-320B1C, 160 HP, Hartzell C/S prop.

AVIONICS: IFR. KX-155 with G/S, KN-62A DME, KT-76A with Mode C, GEM-610 Graphic Engine Monitor, NAT Intercom, EI Volt/Ammeter, Shadin fuel computer.

COCKPIT and INTERIOR: Great upholstery. New carpets. Custom stick grips with "HOTAS" buttons and F-14 Comm switch, leather stick boots. Custom canopy latches. Four-point harness. Zinc-chromated throughout.

ENGINE: Super-clean install. Red Mattituck finish with matching powder-coated A-frame and dynafocal mount. Nye Nozzle cam lube STC. Custom stainless X-over exhaust. All teflon core braided steel lines with firesleeve. Oil filter. Electric boost pump and aux pump.

EXTERIOR: Trusty tailwheel mod with custom machined pieces. Trusty roll trim mod with Mac trim servo. Whelen "Comet Flash" wingtip strobes. Bruce's custom canopy cover. Separate hangar dust cover and wing covers. Special wingroot and gear-leg fairings unique to this aircraft.

One owner for the past 17 1/2 yrs. Always hangared and pampered. No Damage history. Original 1972 candy apple red paint. Needs paint and cosmetics. Have original letter from John Thorp calling it "a gem". Hate to sell but I need four seats! \$35K

Bill Mnich  
Bellevue, WA  
Evening (preferred): 425-401-1580  
Day: 206-544-8058  
[wrmnich@earthlink.net](mailto:wrmnich@earthlink.net)

## Thorp Events for 2002

**Pacific Northwest Fly In** ~ McMinnville, OR. (MMV) Pacific Northwest Fly In April 27, 2002. McMinnville, Oregon is 40 sm SW PDX, and 15 sm W UBG (117.4). 1st meet will be 1 day only to visit Spruce Goose and have a burger burn. For questions RSVP James Wolhaupter at: RotorTime@aol.com" or Tom Worth at: WOCON@att.net

**SUN'n FUN 2002** ~ Lakeland, Florida ~ Spring Celebration of Flight. April 7th -13th, 2002  
Contact: (863)644-2431 or www.sun-n-fun.org

**Sun & Fun Dinner** ~ The Sun 'n Fun T-18 Dinner will be on Tuesday, 9 April 2002. We will meet at 1800, have dinner and then watch the night airshow.  
For more information contact Bob Highley - n711sh@aol.com

**Florida Spring Get Together** ~ Cannon Creek, FL. ~ The Florida bunch is in the planning stages for a spring gathering here in Florida for 2002. I have spoken to the principals at the Cannon Creek Airpark in Lake City, FL and they are in favor of it. The proposed dates are 17-18-19 May 2002. This is the weekend after Mother's Day and is Armed Forces Day. There are two runways and a great old farmhouse to hold the event. Details are still in the works, but some of the features are: Local restaurant on Friday night, big country breakfast on the field Saturday with other fly-in friends, Low Country boiled dinner on Saturday. Bill Williams is setting up the dinner. Don't laugh until you have tried it. Contact: Bob Highley ~ N711SH@aol.com

**Airventure 2002** ~ Oshkosh, WI. ~ Annually at Oshkosh, at noon on Friday, we have a lunch/forum get together in the Nature center. I will post more information as soon as I get it.

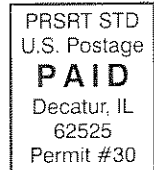
**Porterville** ~ Porterville, CA. 11th Annual Fly-In , Likely we'll do another P'ville Thorp Gathering as we have done in the past ten years. We have used the Labor Day week end as late as it doesn't conflict with the Reno Air Races which took our former weekend. You can post it as a tentative as I have not conversed with "the committee" a dedicated group of Thorp people who work with me as the organizer of the event. Hal Stephens ~ aerohal@earthlink.net

**Kentucky Dam Fly-In** ~ Held every year in October at the Kentucky Dam State Resort in Gilbertsville, KY. I will post more information as soon as I receive it.



T-18/S-18 Thorp Newsletter  
Roy Farris  
P.O. Box 182  
Noble, IL. 62868  
Phone: (618)723-2594  
email: rfarris@wworld.com

March 2002



Please check your mailing label for the "PD" entry in the upper left corner above your name. If you don't see the "PD" entry, then you have not paid this years dues. Please send the dollar amount listed on the label. Any amount over 25(US) or 30 (outside US) indicates that you have failed to send previous years dues. Please be kind and send your dues now.

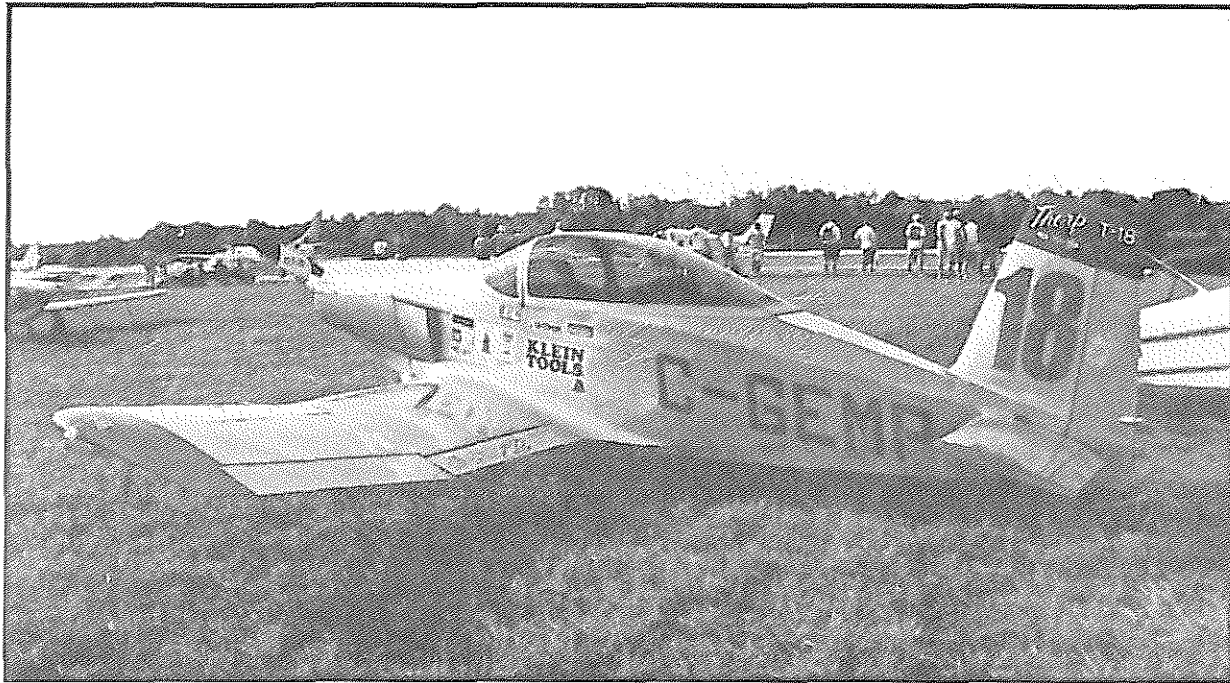
## THORP T-18 MUTUAL AID SOCIETY ----- 2002 DUES

Please continue your support of this valuable exchange of ideas, building tips and safety information covering John Thorp's greatest design. Please make checks payable to: Roy Farris P.O. Box 182 Noble, Illinois 62868. Make check for \$25.00 US, \$30.00 for outside.

Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Email address: \_\_\_\_\_  
Notes: (building, flying, thinking about it, etc): \_\_\_\_\_

# T-18 Newsletter

May 2002



Robert Affleck ~ Harrow Ontario ~ C-GEMP

## IN THIS ISSUE:

Thorps  
Win  
Awards at  
Sun'n Fun  
2002

New Dues Policy  
A Look at T-18 Cooling  
Letters From Members  
Sun & Fun 2002  
Technical How To's  
Upcoming Events



*NOTICE: (STANDARD DISCLAIMER) As always , in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is expressed or implied and is without recourse against anyone.*



## Editors Notes

By: Roy Farris

Well gang, here I am again sitting in front of my computer attempting to put together another newsletter filled with action packed stories and technical articles that will boggle the minds of those among us who are engineers. Unfortunately, our membership has not been generous in supplying me with information for which to attempt such a feat. I have not even received any photographs that I can use as a cover shot. I do thank those of you who have supplied me with information, but I sure could use a lot more. It constantly amazes me how many calls and emails I receive wanting to know why someone hasn't received the next newsletter, only to find out that the member has not paid membership dues in three years, and has never contributed even a single piece of information, yet this person is upset because he/she thinks that they have missed an issue. Come on members ... this is our newsletter. Everyone out there has something that they can contribute. Send me something, a write up and some pictures about your airplane, or a trip that you took in the Thorp. Anyone that is still building has hundreds of things that could be shared with the group. Take pictures of your project and send them to me. I always need good pictures to use on the cover.

Now lets talk about membership dues. People, I have had all I can take on this subject. I do however want to thank all of you that have kept you membership dues current. Those of you that are constantly up to date know who you are. Again I want to thank you and to let you know that I appreciate it. I have dropped one hundred and seventy two members this year for non payment. All of them were at least two years past due. In years past, in order to promote the T-18, we have always extended a courtesy to members, and gave them the benefit of the doubt. That policy has been terminated as of this year.

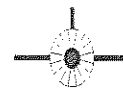
cont.

I have accepted the financial burden for as long as I intend to. Don't get me wrong, I love writing this newsletter, and plan to continue unless you decide otherwise. I did as some of you suggested and contacted the delinquent members. You would not believe some of the names I was called, and the cussings I took. From the one hundred seventy five members I contacted, only three paid their back dues and wished to continue their membership, the rest are history. So this brings us to the end of this story. Beginning this year the T-18 Mutual Aid Society is adopting a new membership dues policy. Read on for more information.

### New Membership Dues Policy

Beginning this year, 2002, the annual membership dues for the T-18 Mutual Aid Society will run from January 1 to December 31. This means that your membership will expire on December 31, 2002. If you have not sent your 2003 dues by then, you will not receive any T-18 Newsletters after December 31. I will have membership dues reminders in the last couple of newsletters per year. If you let your membership expire, you simply will not continue to receive the newsletter.

I hate to do it this way, but I just don't see an alternative. I can't afford to send out hundreds of free newsletters, and the cost of sending letters and reminders is just to much. If anyone has any questions, please don't hesitate to ask.



### Fun Aviation Terminology

Knots - What full stalls do to some stomachs.

Slow Flight - Flight that extends beyond pilot and/or passengers bladder limits.

## A Look At T-18 Cooling

Submitted By: Richard Eklund  
Eklund Engineering

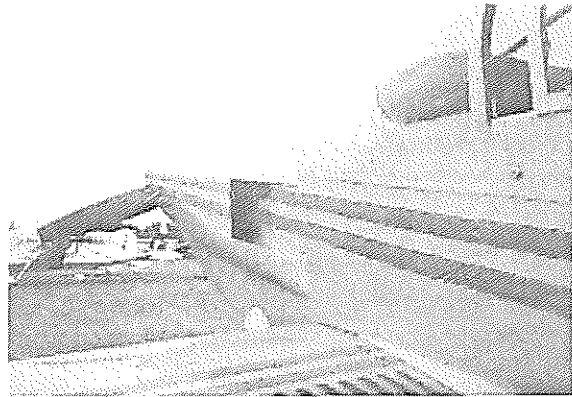
John Thorp's N18JT incorporates the metal pressure cowl he designed when it became apparent that this would be a high performance



homebuilt. This is the shape that was copied for most of the fiberglass cowls used on the T-18. John appears to have sized the inlets for a hot day climb condition at 100 mph. This would be consistent with the lowest (125 hp) powered airplanes. He knew from experience that this relatively large inlet would be efficient on the higher powered airframes if the engine baffling were kept tight. At higher climb speeds (120 to 140mph) the air would simply spill around the nose of the well shaped cowl. I believe he violated his standard rule for the exit area in order to simplify the metal fabrication. Normally the exit area is only 10% greater than the inlet for a system with well designed baffles. John's compromise was to use a flat wrap of metal for the cheeks aft of the inlet nose bowl. This resulted in about twice the exit area required. The exit is located in the low pressure field of the wing, improving the cooling during climb. John was a master at weighing the necessary compromises of engineering design.

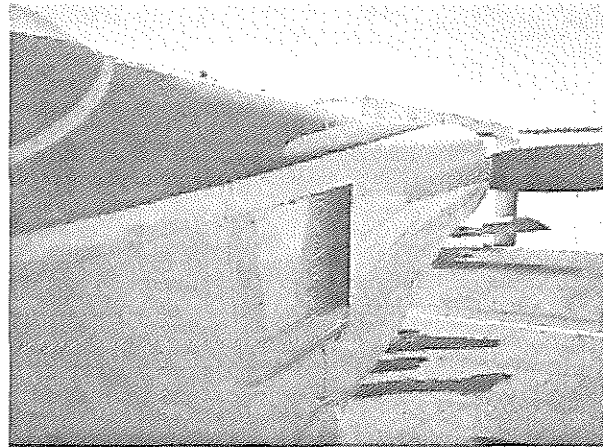
If one wishes to make the greatest improvement in lower drag, the exit area and the internal entrance to this area can be modified. One of the early efficient examples is on Tom Kerns' cowl. It is carefully sized to his Lycoming engine power, while the bug-eye inlet has been unmodified

cont.

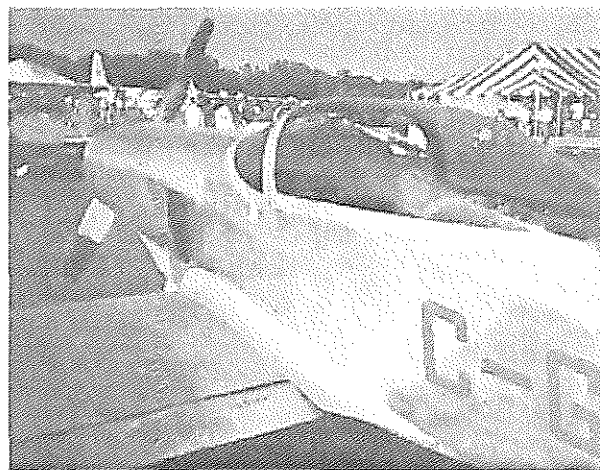


Tom Kerns Cowling

Other builders have incorporated cowl flaps on the exit both internally and externally as shown. These are probably an unnecessary complication unless extreme variations of temperature must be addressed. Of these, the internal cowl flap is the lowest drag.



Internal Cowl Flap

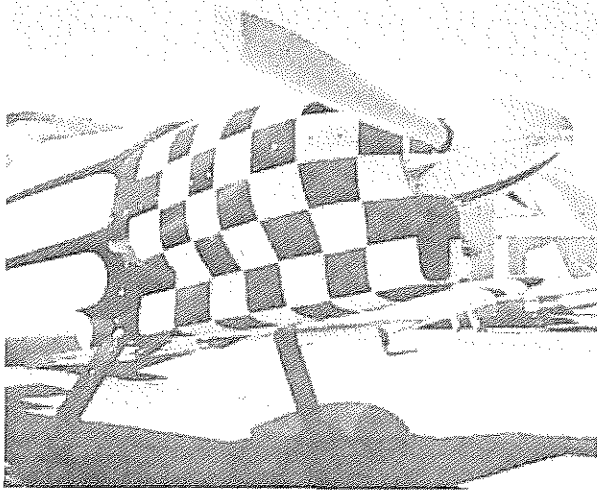


External Cowl Flap

cont pg. 4

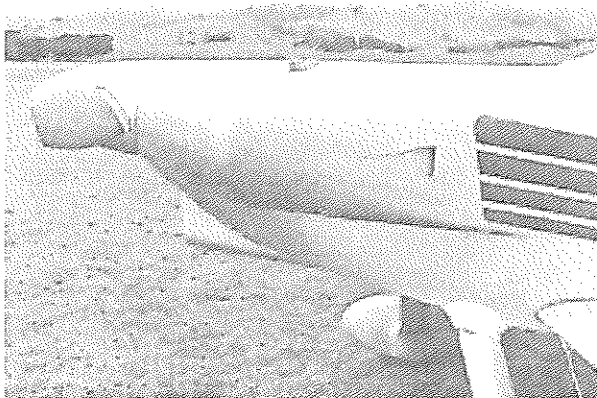
A Look At T-18 Cooling, cont.

Peter Garrison designed a cowl for the T-18, which placed the inlet at the highest pressure point in climb attitude and modified the shape and size of the exit for lower drag. This design retained the downdraft engine cooling airflow. The Garrison cowl offered several knots of performance improvement.



Peter Garrison's Cowling

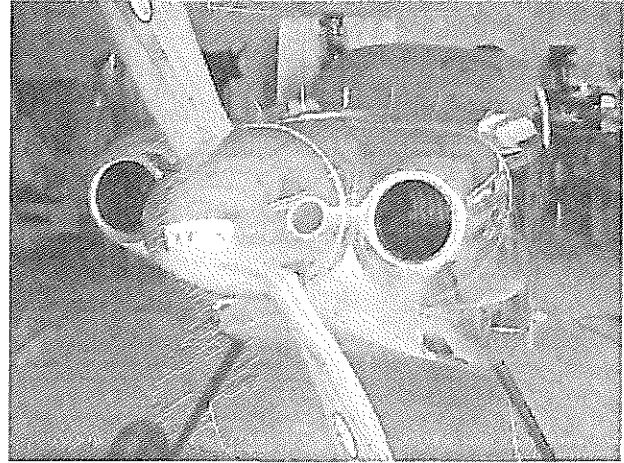
Tony Schischka also uses the low front inlet with the outlets located on the top forward portion of the cowl. The inlet has an efficient diffuser shape, which aids pressure recovery. This pressure recovery is also available to the engine induction system thereby increasing power at altitude. He also separates the oil cooler air exit flow. This is similar to a Rutan design and successfully uses updraft (reverse flow) cooling of the engine.



Tony Schischka's Cowling

A Look At T-18 Cooling, cont.

One trend that will improve the bug-eye inlet recovery, is the move to circular inlets that match the recovery chamber with less loss than the rectangular inlets. They also incorporate a boundary layer path from the propeller flow to increase prop efficiency. Although not yet tested, Dave Neustel's cowl should provide these benefits.



David Neustel's Cowling

The basic function of a good cowling design is to optimize the following as much as practical:

1. Low drag exterior shape.
2. Minimum airflow through the system to adequately cool the particular engine under the expected conditions. Lycoming can provide cooling air mass flow and pressure drop requirements for their recent engines.
3. Maximum inlet pressure recovery.
4. Maximum velocity recovery in the exit air to reduce its drag or possibly provide thrust.
5. Minimize weight (complexity) of the system.

All these modification efforts are designed to minimize the cooling drag without unduly complicating the system or the installed weight. Just remember that you should carefully instrument your system including thermocouples on all cylinders if you make major modifications to John's cowl. Also, please try to accurately quantify your

cont pg. 5

A Look At T-18 Cooling, cont.

quantify your results and share them with the T-18 community. And remember that a well-built T-18 with the original cowl will still run away from the competition.

Richard Eklund  
Eklund Engineering  
thorpt18@jps.net  
(209)727-0318

Readers Comments on T-18 Cooling

General rule of thumb for cooling is that the exit should be about 10% larger than the inlet. For an O320 150 HP the inlet should be about 48 square inches. These are the figures for my installation which works OK. Mind you I have a true updraft cooling system on my engine, ie. the intake is chin mounted and is a divergent duct (lowers velocity & increase pressure). The baffling is completely reversed on the engine and the exit is directly above the cylinders on the top of the cowl. Cyl head temps are very consistent a vary little between climb, cruise and descent (about 50 - 80 F). This installation is similar to the Rutan Defiant front cowl.

If any one is interested I could take some pictures.

Tony  
ZK-VMS  
a.schischka@xtra.co.nz



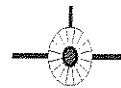
I have the Spruce pressure nose bowl, and the air inlets look very large. Originally I was going to use a water cooled engine, and planned on plugging them, putting radiators aft of the baggage compartment, sort of P-51 style.

cont.

Readers Comments on T-18 Cooling, cont.

Then I bought a Lycoming engine, and I have the same problem as everyone else. I have read some stuff on cooling drag, but have come to the opinion that it is not an exact science.....i.e. trial and error.....change one thing at a time..... From what I have read, Thorp, Cessna, Piper, etc scoop up all of the cooling air then slam it into a wall, forcing it down through the cylinders, letting it escape through the bottom of the cowl-ing. As air is heated in the process of cooling the engine, it tends to rise, which is opposite of the airflow, causing resistance, i.e. drag. Also, from a fluid mechanics standpoint, when you force air to make a sharp 90 degree bend, it loses all of its velocity momentum, because it goes from say 200 MPH to zero when it slams into the wall, then has to accelerate again. This causes resistance.. i.e. drag. I have seen some Piper's that have the intake under the cylinders, forcing the air up through the cylinders and out over the top of the engine. I have heard this causes other problems too, but do not know exactly what they are. I think they look kinda funny too. This is pretty tricky stuff, because if you get the air going too fast across the cylinders, it doesn't pick up as much heat either.

Robert Mardis



Fat Cat has a cooling air intake under the spinner that is less than half the area of a "standard" Thorp intake. By careful baffle sealing, sealing the spinner gap, and a faired outlet with a cowl flap on the bottom, my engine cooling is fine, even on hot days. Thorp, Cessna, Piper, etc. took the easy route by oversizing their inlets to obtain enough air to cool the engine even with leaky baffles, etc.—conservative, but inefficient.

Harvey Mickelsen

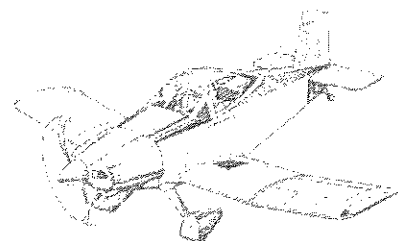
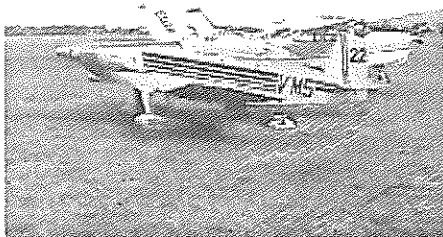
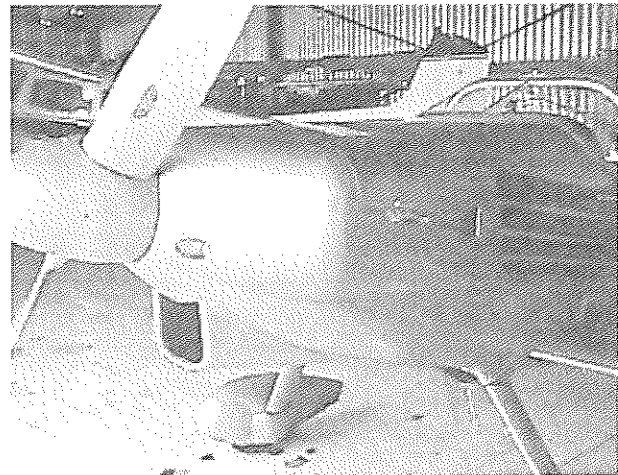
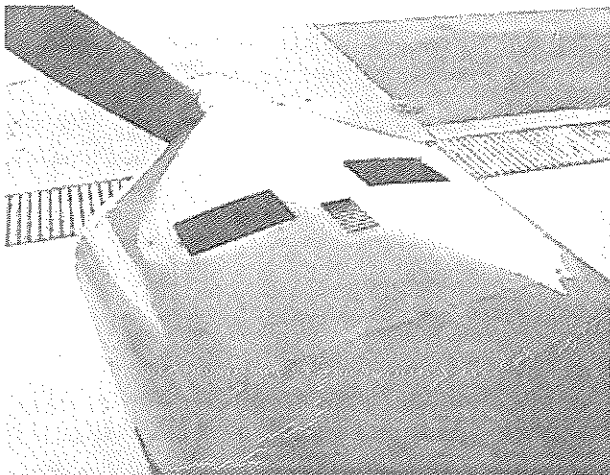
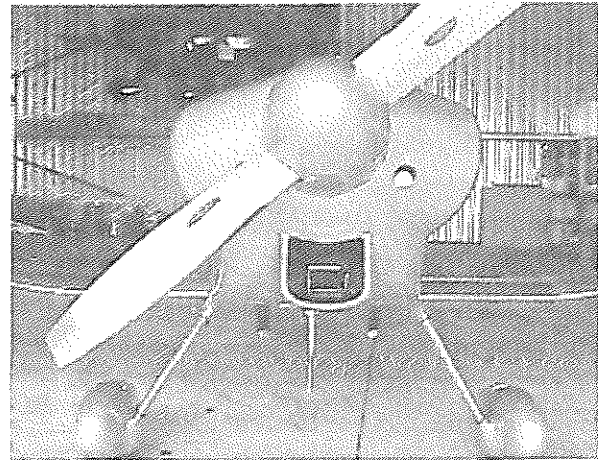
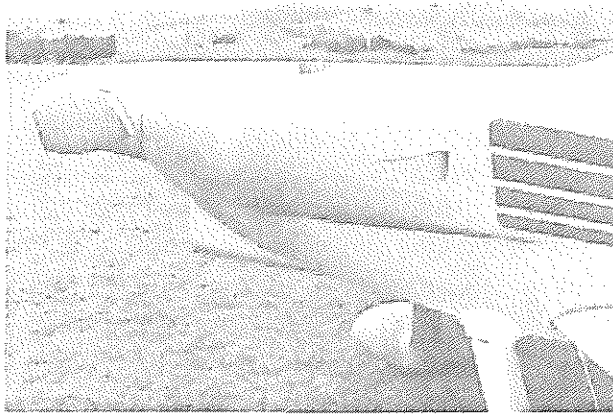


## Tony Schischka's Updraft Cowling

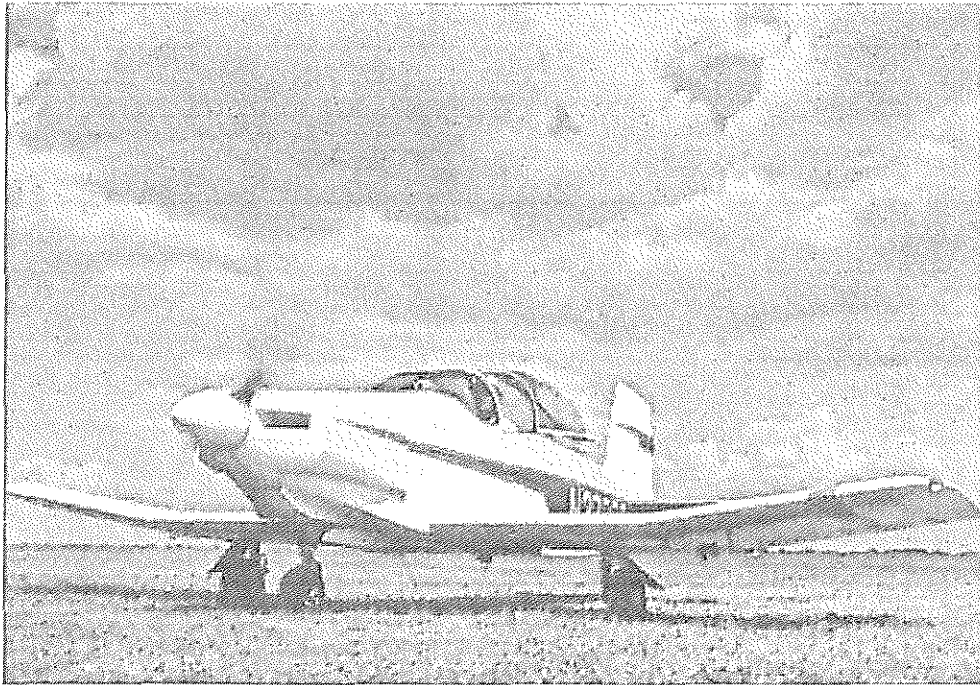
Here's some pics of my updraft cowl I took today. As you can see the lines are clean and lots of clearance between prop and cowl (necessary for efficient prop). The metal object you can see in the intake is the standard T-18 filter housing with the front cut off.

Top view shows main outlets, I had to put on lips to get sufficient flow. The reason for this is that in level flight the cowl is very nose down to the point that there is a positive pressure on top of cowl tending to choke the outlet. I think the drag is less than normal cowl as I have O-320 A2A (150 hp) and at 8500' @ 2600 rpm get a TAS of 155 Kts and this with Sensenich W66 LM 76 wood prop.

Tony Schischka  
ZK-VMS

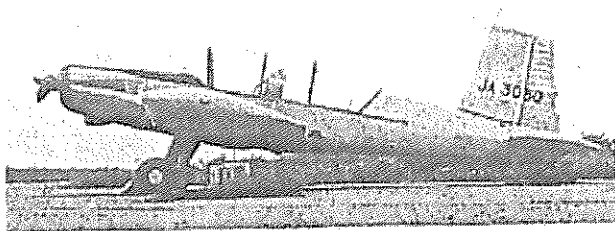


## From the Past

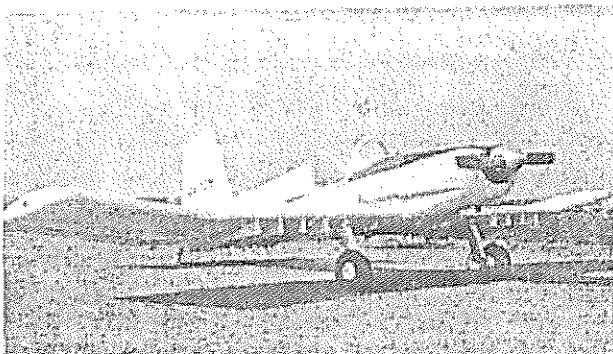


While throwing out some old magazines, I came across this old picture. It was in the December 1969 issue of air Progress. This picture was contained in an article about the Rockford Fly-In. I have never seen this airplane. Wonder what happened to it. Does anyone out there in T-18 land know any details about this airplane ? Dave Eby ~ Wichita Falls, TX

## John Thorp's Defender



Toyo FD-25A Defender



Toyo FD-25B Defender

The Defender, an American design, owed its inspiration to former Lockheed design engineer John Thorp, who sold his idea for a small, low cost ground support aircraft to the Fletcher brothers in 1950, soon after the outbreak of the Korean war. Three demonstration aircraft were built in the USA, the first being a single seat FD-25B (flown on April 14, 1951) and the second a tandem two seat FD-25A with a slightly longer fuselage.

Thorp's idea was that such an aircraft, costing less than 10% as much as a complex jet fighter, was also far more suited to the type of combat operations encountered in south-east Asian territories and was capable of carrying an equally lethal load.

The Defender, weighing only 1 1/4 tons fully laden, had a pair of wing

cont pg. 8



John Thorp's Defender, cont.

mounted 0.30 in. machine guns and under wing racks for two 33 gallon napalm tanks, two 250 lb H. E. of fragmentation bombs, up to forty 2.75 in. folding fin air rockets, four 5 in. heavy rockets, or twenty 80mm Oerlikon rockets. It was received enthusiastically at numerous demonstrations to field units throughout the USA, but no official support was gained and the US forces lost what today would have been a useful COIN type.

In 1952, the Toyo Koku K.K. in Tokyo realized the aircrafts possibilities and acquired a manufacturing licence for the Defender, with the aim of selling it to South East Asian Airforces. The first Toyo built Defender (an FD-25B) was flown in March 1953, but in August 1954 the company went bankrupt and production ceased. About half a dozen FD-25B's had then been sold to the Cambodian Airforce, and two FD-25B's and a FD-25A to North Vietnam. A number of completed but unsold aircraft were stored on Fujisawa Airfield and three of them were bought by a Toyko aeronautical engineering college early in 1961, for study purposes. All models of the Defender were powered by a six-cylinder, 225 hp Continental E-225-8 air cooled engine.

Submitted by:  
Mac Nussey ~ Pembroke Ontario, Canada

*Editors Note: Thanks for the article Mac, sure looks like they have some T-18 in them.*

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Letters From Our Members

VFR/IFR Paso Robles Journey  
By: Tom Worth

After checking the wx on my course for the Paso Robles Fly In, I left Tacoma (TIW) in mid morning on Friday (03/22/02). What a beautiful day to fly. ...down across the Portland airport, past Mt. Hood, and across the

cont

VFR/IFR Paso Robles Journey, cont.

Cascades. As I crossed the mountains, it became a little rougher and then turbulent on into Kiamath Falls (LMT). With a runway that's 10,000 feet, there isn't much danger of an over-run (F-is squadron - none flying).

After refueling, the tower reported 21 Knots at 170 degrees with some gusting higher. I elected an intersection takeoff with 7,000 plus feet remaining. Now this runway is 14 (150 feet wide), so I gingerly taxied to the very left (NE) edge for a diagonal takeoff (trying to minimize the crosswind). That trick works as I lifted off just prior to the very right edge.

As I continued on southwest to Red Bluff (RBL), the tops kept building, so at 13,000, I air filed for the remaining 40 miles inbound. Now this is near Mt. Lassen, so when I asked for 10,000, the controller really would have liked me at 14,000 ...but he gave me 13,000 (the normal hemi rule for east bound). Recently Bill MNick (recently traded his T-18 for a Mooney 252) told me of an ice encounter at 11,000 feet on the East Coast. His case of ice plugged up his tank ram air tube causing an engine stoppage. He descended through JFR to 3,000 feet until the ice melted (a chilling thought for my situation).

Well, after descending through the ice band with my prop continuing to turn, I made a VOR approach into RBL. Others were going into Redding (RDD) because it has an ILS. But it's also between some ridges. I heard the controller counseling some of those rusty IFR fellows about their off course deviations. RBL is further down the valley and flat. So I was more comfortable with the VOR approach and hit the field (near minimums).

Many planes were tied down at RBL, and the wx man said I'd be flying down the middle of the front with only a few spots of VFR. In the valley, the minimum enroute is only 3,000 feet however, so I filed for 7,000 feet and continued my flight. It was the usual NW type of clouds and rain (but no ice) (Town to PRR. A VOR/DME approach brought me to the field and Tom Hunter came by and picked me up.

cont.pg 9

VFR/IFR Paso Robles Journey, cont.

Though the fly in was not well attended due to the wx, those that came had a good time and traded a lot of good information. About mid afternoon, I departed northbound on an IFR plan. The wx man said Ukiah (UKI) was a better choice as RBL was really bad with a tornado north of Sacramento.

Jack Kenton left about the same time (towards LAX) and he reported that he had hit ice at 9,000 until reaching visual at 10,000. I had filed for 8,000 which was in and out of the tops. With the first one I went through, there was ice, so I went up to 10,000. A LOC/DME approach into UKI could have been performed better, but broken clouds helped.

On Sunday, I departed UKI VFR and found a beautiful clear day at Crescent City (CEC) where I had lunch with an old friend. As I was going on up north on the backside of the front, my luck ran out at Tillamook (S47). A new front was moving in and met the old one north of there. After refueling, an IFR flight plan out of there was on top after climbing through the wx. Great trip ...14.7 hours - 54% IFR.

N18XT Sun-N-Fun 2002

By: Tom Hunter

18 XT was built over a 32-year period. During that time a number of modifications were made to enhance the usability of the airplane. And during that time the builder wondered if he would ever get it finished! I think I fell in love with aluminum and also experimenting as I went along. However, I was always careful to ask the opinion of John Thorp in the early days when I worked in his shop in Burbank. And latter, other experienced builders. All along, keeping the plane light was a foremost goal.

N18XT Sun-N-Fun 2002, cont.

The original design carried only 29 gallons of fuel in a main tank. I initially built a standard wing. Then I considered a folding wing. Finally I decided to build a new wing with a new airfoil and wet the "D" cells in the center wing, added an additional 10 gals per side. The wings are sealed with Pro-Seal and there are access panels under each bay in the center "D" cell.

This wing was scratch built using only a master wing profile supplied by Lyle Trusty as a starting point. Flat layouts for inner and outer wings as well as flaps were made. Ribs were formed over form blocks made of ash. 2024-O .032 and .040 was used and then the ribs were heat treated to T-4. Using the O (dead soft) aluminum allowed for a full 90-degree radius on the leading edges...even on the small flap ribs. Which you can see if you pull down on the trailing edge of a flap and look inside the end of the flap. Another added advantage is the additional stiffness you get with 2024 ribs over the standard 6061 ribs.

A special feature of the wing is a leading edge strikelett, which near the fuselage is at a higher angle of attack. The rib nearest the fuselage is 20 % longer and inverted. The logic is that the air stream off the prop at the position is more downward in moment, and upturning the wing close to the fuselage will reduce overall drag. This piece of metal, which includes the wing filler caps, is a complex shape and was difficult to make.

The wing tips are custom. They were first made as solid male plugs and then female molds were made over these male plugs. From these female molds, one-piece wing tips were created. Running your hand along the surface of the wing tip will show the benefit of the single piece construction possible within a single piece female mold. And, if you sight down the wing tip, you can see that the rear edge of the wing tip is upswept. Access to the landing light is thru the left wing tip; there fore the lens could be made smaller.

cont.

N18XT Sun-N-Fun 2002, cont.

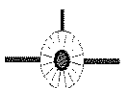
The wings were guide coated twice to achieve a high degree of surface smoothness. Dupont base coat clear coat was applied over primer surface water sanded with 600 weight.

All the wing ribs are anodized. The ribs in the outer section are anodized gold...those in the inner wing are clear. All wing ribs have lightening holes with 45-degree flanges. The left outer wing rib has a flanged access hole to access the landing light.



For those of you who need some light in the cockpit for instruments, I saw this add in a newspaper flier the other day and thought that it might provide sufficient light so that I could mount it under the lip of the instrument panel cover and the light would shine down and illuminate the face of the panel. I haven't mounted it on the cover but have made other tests and I think that it will be just the ticket. The name of the product is NEON WIRES and was purchased at my local TARGET store for under \$20. It consists of small transformer, a short length of wire at the end of which there is some type of thin flexible neon tubing which glows very bright when connected to a 12 volt source. Since the shortest length is 6 ft I just doubled it over to obtain the length I needed. The color I chose was blue, there is also purple. The diameter of the neon part of the wire is smaller than a soda straw and the whole system is very light.

Paul Mac Michael

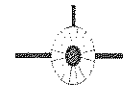
More Letters Form Our Members

Gentlemen (and Ladies):

We can be justifiably proud of one of our own. If you saw the perfectly timed fly-by by F-15E's at the Las Vegas Busch Race, you saw our own Jim Grahn lead a nearly flawless flight for the start of the race. Way to go, Jim! And how about the lead solo's rendition of the National Anthem!

Check Six,

Bob Highley  
N711SH

Do It Yourself Electronic Ignition

I ran across the guy with the plans for the do it yourself electronic ignition on Ebay, if anyone is interested. His e-mail address is [ronvdw@xcelco.on.ca] Here is his reply to me if anyone is interested.

If you would like a set of plans, send a money order for \$35.00US to me at:

Ron Vande Weghe  
499 London Rd.  
Sarnia, Ontario  
N7T-4X3  
Canada

Be sure to include your return address.

Robert Mardis

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Need More Legroom ?  
One Members Answer

I am about 6'5" +/- and have been somewhat concerned about headroom and legroom in my S-18. I originally approached Mike Archer about getting

Cont pg. 13

### Remarks From Another Member

I don't have any earth-shattering tips or know how on building the T-18, but I do have a few thoughts after all these many years - almost 30 since I bought plans #888. I know I'm not the leader in building longevity, but I am close if I don't get in the air soon. Spending this many years on any project is more an exercise in commitment rather than in common sense. By that, I mean, I am now 70 and in pretty good health. What does that tell you. I know, shift into high gear!

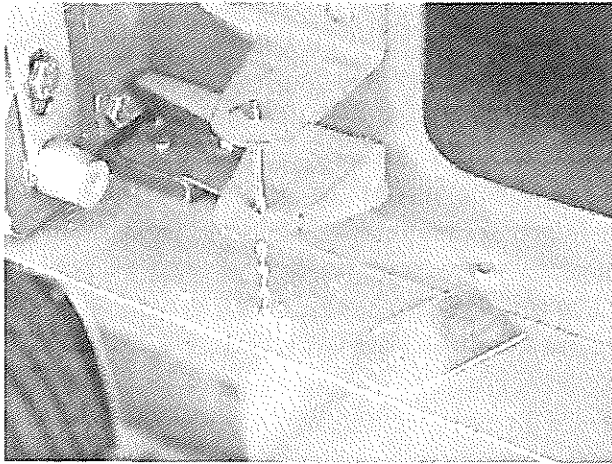
Another down side to all this time is, unless you are a meticulous record keeper, you will forget what you did long ago and how you did it. Many of my parts turned out pretty good, but I can't tell you exactly how I did it. So much for building tips. I have pretty much worked alone all these years not having lived and worked among many T-18 builders like many of you have and I have worked two jobs in order to pay the way. Lu Sunderland told me once that if I had to work two jobs, I would probably never finish. Well, he was almost right, but if I can get these folding wings on (which I will never fold now), it will fly. I would like to harp on this point again - If you really need to fold the wings, fine. Otherwise build the standard wing. There will be a weight reduction and a much less complicated building process.

This my method for drilling the holes (after everything was put together). I hope the photograph (Reference photo on pg. 12) shows well enough to show what I did. First, I made a little template out of 050 material (the thicker, the better in order to guide the #40 drill bit). Of course, I started with the inner wing. I carefully (everything is done very carefully) taped the little template to the upper bracket, which matched the radius of the bracket. Drill a #40 hole in the upper bracket. Remove the template and tape it to the lower bracket and again drill down through the upper bracket using the template to guide the drill through the lower bracket, again very carefully so as not allow the drill to wander. Now the tacky part, which seems to be a little primitive, but it worked. From the pic you can see I placed a very sharp #40 bit through the two brackets, and carefully twisting the bit with my fingers, drilled through the bottom wing skin. You can't drill from the top because of the upper surface of the wing skin and I didn't want to use my angle drill with a longer bit because it is a little to hard to control (at least for me) and I wanted to get it done, so this is the way I did it (about 10 minutes of twisting). Now I installed the outer wing, got on my back and with a longer # 40, guided the bit up through the bottom skin through the two holes of the bottom bracket of the inner wing. My this is wordy! Now I have the two holes of the bottom bracket guiding the bit to the upper brackets of the inner wing. Now, very carefully so as not let the drill wander, drill up through the two upper brackets. This now gives you a common axis for the brackets. Now very carefully (as you can tell, everything is done very carefully, so I'll shut up about that), continue to enlarge the holes with successively larger bits until you can finally finish with an E drill (you may have to buy a few long bits to do the job). Voila! Common axis and the pilot hole, now an E size is on the bottom skin instead of the top, and I'll just cover it with a little chassis plug from the local electronics store. I can't reinstall the outer wings now until I move to a hanger. In the meantime I have to remove the bracket on the rear beam, inner wing and make a new one, which entails de-skinning a portion of the bottom skin in order to get at every thing. Problem - holes didn't mate on the inner and outer brackets of the rear beam, but that's another story. This is why it has taken me (I started in about 1977) a few years to get to where I am (close, but not close enough). Hint, hint — pay attention, work very carefully and don't make mistakes (and don't build the CW wing unless you REALLY NEED IT).

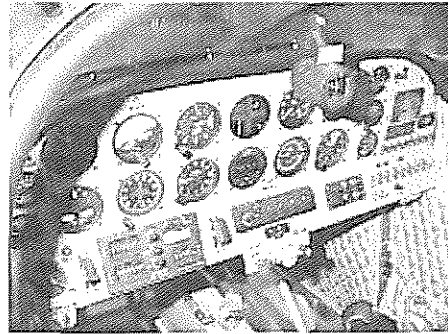
Bob Clayton

Salt Lake City, home of the 2002 Winter Olympics!

## More From Our Members



Bob Claytons Method of Drilling



Bob Clayton's  
Panel and Interior



Bob Clayton's Project

Need More Legroom?, cont.

more legroom in a S-18 and brought up moving the firewall forward a couple of inches. He did not like that idea, and suggested that possibly the cockpit aft bulkhead could be moved aft an inch. I got to exploring this, and feel that it is possible. I sent all of this to Mike and he thinks it might work too. I did all my work in CADD (Microstation), and feel that it is about as accurate as I can be. As I recall, Mike told me that he had someone that was 6'5" sit in his and he was OK. Also, since then, I have met Sam Tilleman who lives near Granbury, Texas. Sam is 6'4" and flies an original T-18, with what appears to be conventional seating arrangement. The only problem he has is that he has had to notch the instrument panel to clear his knees.

I am attaching Drawings 598-1 and 609mod1. (refer to drawing on pg. 14) Let me try and do a little explaining. Look at 598-1. Keep in mind that the cockpit aft bulkhead consists of two parts, the smaller 596 bulkhead on the bottom, and the larger 598 sloping bulkhead on top. Also, the 597 fitting, which the wing rear beam attaches to, is attached to the 596 bulkhead. In doing this, we do not want to move the wing, so it is imperative that the 597 fitting remain in the same location. What I did first was basically move the location of the 596 bulkhead from the front side to the rear side of the 597 fitting. This results in moving the bulkhead .220 inches aft, which is the sum of the thickness of the fitting (.188") and the bulkhead (.032"). Next I placed the top and bottom angles on the rear side of the 596 bulkhead. Originally they were shown on the front side. I have tried to show the original locations of these angles with dashed lines. I am planning on putting a lower angle on the front side of the bulkhead too, but this has nothing to do with moving the bulkhead back. More on that later. After you have reconfigured the 596 bulkhead, it is possible to slide the 598 bulkhead 1" aft. The only thing I am concerned about is that you don't want to upset the smooth lines of the fuselage sides by moving the bulkhead. Therefore, before I drilled the fuselage sides or the longerons,

cont.

Need More Legroom?, cont.

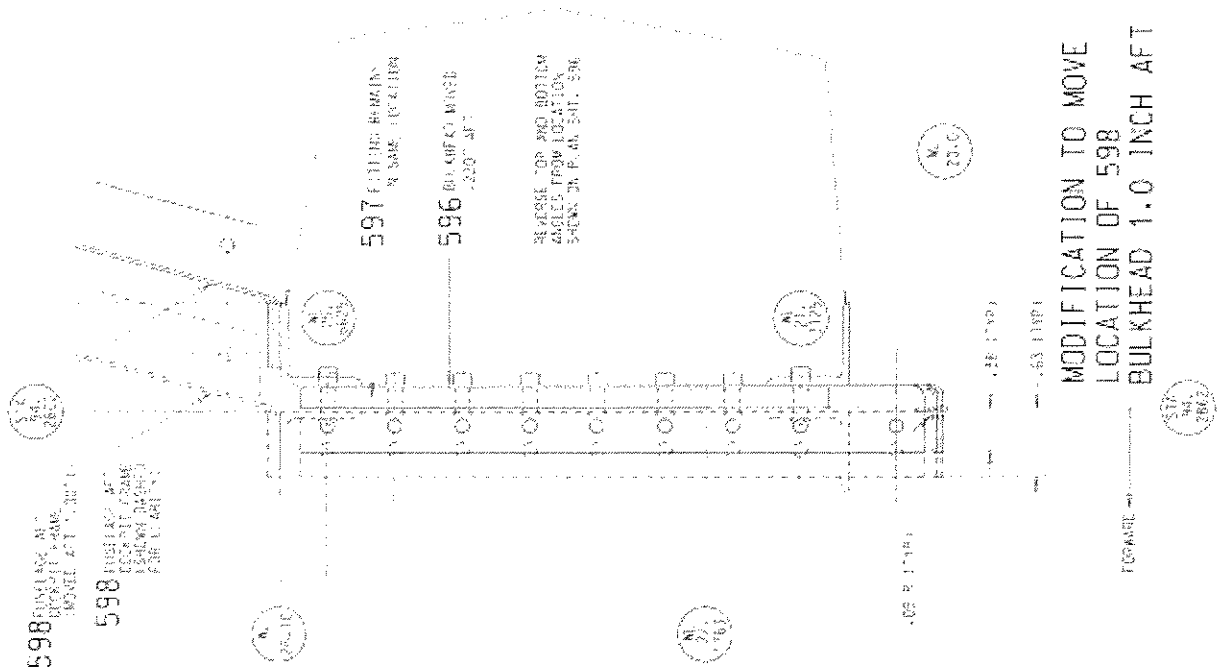
I would clamp all of this together, and just eyeball down the fuselage sides to see if everything is a nice smooth curve. I really do not think it will make any difference. I have not built this, so I cannot yet say. Now, the reason I put the extra angle on the front side of the 596 bulkhead is to support the seat bottom. I am planning on lowering my seat, and not using all of the planned seat support apparatus that are given in the Sunderland plans. Look at the drawing 609mod1. This was also done in CADD, and shows the bulkheads moved 1" aft. The reason I sent it to you was to show you how I was planning on supporting the seat bottom. A couple of more things. After talking to Sam Tilleman, I feel that raising the level of the bottom of the instrument panel will be necessary to clear my knees. Also, consider this. The S-18 and T-18 show the rudder cables going down the center of the aircraft through the center console. Last weekend I saw the T-18 project of Bill Manning with the rudder cables routed down the sides of the airplane, by connecting them to the ends of the rudder pedals. What this does is eliminates the need for a console forward of the main wing beam tunnel, which gives you more room to move your feet around when getting into and out of the airplane. *(Editors Note: The outboard rudder cables are an old modification and been in the newsletter many times in the past)* If you have any questions, please feel to e-mail me at: [Robert.Mardis@Halliburton.com](mailto:Robert.Mardis@Halliburton.com).

Robert Mardis

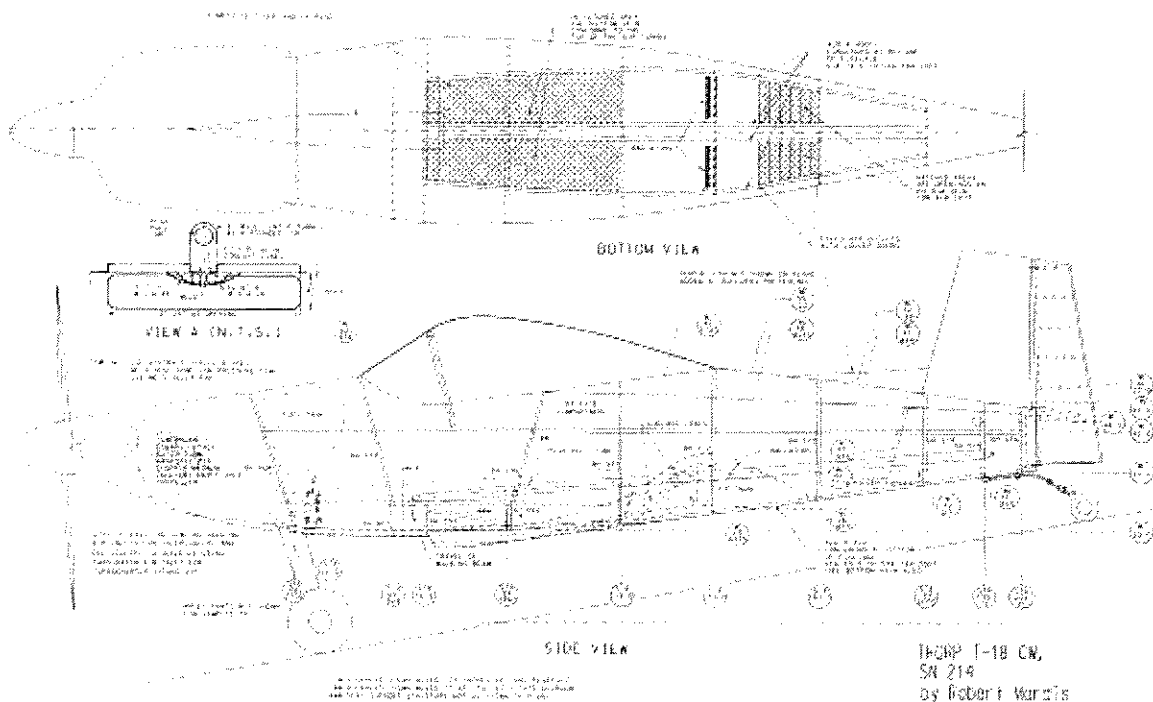


To most people, the sky is the limit. To those who love aviation, the sky is home.

Need More Legroom ?, Drawings  
Submitted by: Robert Mardis



Drawing 598 Mod1.



Drawing 609 Mod1.

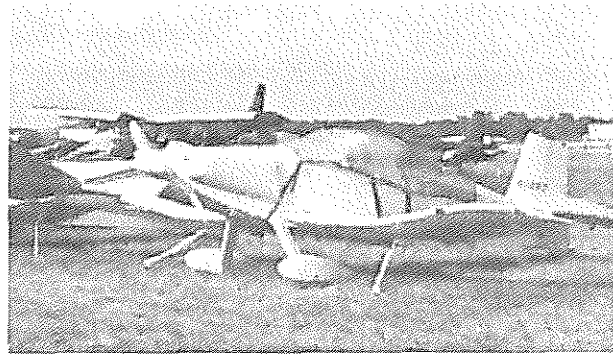


Sun'n Fun 2002

Submitted by: Andrew Robinson



Bernie Fried's S-18



Tom Hunter's T-18

I arrived at Sun 'n' Fun right at 11:00 am last Tuesday, so I scurried straight to the Thorp builders forum where the mornings talks had just started. Someone I don't know was leading the forums and calling on more people I don't know to come up and speak. We need some nametags next year. I tried to write down names for this article, but please forgive me for places where names are missing. The big news (in my humble opinion) is that we have two award winners within the T-18/S-18 crowd. That means that our guys walked away with 10.5% of the homebuilt awards; not bad for our relatively small contingent.

The forum was opened by John Starr, a Sun & Fun Chairman and T-18 owner from Lakeland. Mr. Starr proceeded to call several builders up to the front to talk about their projects. One person who we did hear from was Tom Hunter, who after 30+ years of building now has his Thorp completed and flying. Yer inquisitive reporter was tacky enough to inquire if this was with or without using the "quickbuild kit". Fortunately Tom does have a sense of humor and didn't throw anything at me. I later made it out to the flightline to examine his aircraft, and while I hope that I finish my T-18 more quickly, I will be hard-pressed to match Hunter's aircraft for features and workmanship. Tom handed out a three page document of his airplane's features, so there isn't enough space for all of it here, but I will list a few highlights: leading edge strakes at the wing roots, integral wing tanks in the strakes and leading edges of the inner portion of the center wing, beautifully formed edges on the metal tips on the horizontal tail, a Lang tailwheel installation, and much more. Maybe Tom will post his document for those who weren't there. Apparently the Sun 'n' Fun judges agreed with me and they bestowed Tom with an Outstanding Aircraft (Homebuilt) award for N18XT. Another speaker was Bernie Fried who talked about his S-18. This is a beautifully done airplane with a gorgeous paint job and a lot of attention to fit and finish. In fact, this airplane is a 2001 Oshkosh Silver Lindy winner (Homebuilt Reserve Grand Champion-Plans). In something unusual for our airplanes, Fried has equipped his with aileron spades to get the control feel as he likes it. At the dinner later that night, Fried received the T-18 builders award for his airplane, appropriately tail-numbered N18XS (his words, not mine). Bernie was also presented with an Outstanding Aircraft (Homebuilt) award for N18XS. I am currently working on my center wing, wanted to look at the fastener patterns, and made the mistake of looking at Tom and Bernie's airplanes. The problem was that they have such nice, smooth paint jobs that I couldn't really see the rivets! Chuck Borden showed us his kit for installing a landing light kit in the leading edge of the wing. The parts are all laser cut and ready for installation;

cont pg.16



Sun'n Fun 2002, cont.

even the light is included. I believe he said that the whole kit cost about \$60. Chuck is from Atascadero, CA and has a laser cutter for fabrication work. Anyone who wants an instrument panel should talk to him. [Cborden@slonet.org](mailto:Cborden@slonet.org) We also heard from Lloyd Toll who informed us that he learned to fly at a small strip known as Mines Field. He wouldn't be able to get instruction there now as it is known as Los Angeles International. Mr. Toll also told of us his short field landing technique (part of which involves diving at the ground and scaring the daylight out of your passenger) which results in a 500-foot landing distance. However, as Bob Highly later mentioned, this does point out a "secret" of landing the Thorp: a power-off landing (such as most of us learned in Cessnas) forces you to keep up your airspeed in order to keep the tail effective in a Thorp. Landing with some power keeps air blowing over the tail, and the additional tail authority means that the Thorp can actually be landed in a shorter distance by using some power. I think that I will try it first on a big runway. Just in case. Mr. Toll was there with his daughter; Lloyd still has his T-18 and mentioned they may sell the bird to an interested party. A day of listening to Mr. Toll's aviation experiences would be time well spent. Tom Hunter also talked about parts procurement at the Walmart aviation department. He was able to purchase an oil separator for less than 4 dollars, or about \$214 less than you can buy one from a major parts supplier. This is a stainless steel vessel that only requires drilling a couple of holes for the inlet and outlet tubing. Pack the canister with a scrub pad to help separate the oil. If you have trouble finding one at the Walmart, remember that it will probably be labeled "COFFEE". I think that must be the Chinese translation for "air-oil separator." We also heard from yer author about his experience with the Office Depot Aviation Tools department. Not wanting to spend hundreds of dollars on a sheet metal shear, I found that an \$80 paper cutter will satisfactorily cut up to

cont.

Sun'n Fun 2002, cont.

I finally made it out to the flightline late in the afternoon after the airshow. I will say one thing about part of the airshow: the picture was a WACO biplane going straight up on a plume of smoke; the sound was clearly jet noise. That can seriously screw with your head if you aren't careful. And seeing a Learjet 23 doing aerobatics was pretty different. Anyway, I counted a total of 13 T-18 and S-18 aircraft and I took some photos of all the airplanes lined up there. Careful observers will note that the ranks of Thorp aircraft were infiltrated by Midget Mustangs; not much I could do about that. I did see one oddity that left me thinking "that looks different": it was a Midget Mustang on trigear. I am looking forward to Mike Archer's upcoming release of a tri-gear modification for the T-18. While some purists will howl, it will no doubt be good for cheaper insurance costs for some of us, and for broadening the appeal of the airplane.

The dinner that night was attended by about 40 Thorp builders, wives, and friends. The food (steak, potatoes, salad and desert) was excellent and no one went away hungry. After most people were done eating, we went around and all introduced ourselves. It was good to be able to put faces with names that I have seen in the newsletters and on the email lists. Next year we need to bring a bullhorn to pass around while talking to the group as most of the speakers could not be heard by any of us sitting more than one table away. It seems that every time someone went to speak, another airplane would fly over. Go figure. Among others, I had the pleasure of talking to Paul Tyrrell, a T-18 owner who hails from Canberra Australia. Paul says that he is planning on attending Oshlosh in 2003, so make plans to say hi to him if you are going to be there (or in Canberra). There was also a gentleman from England, but I was not able to get his name in time for this article. There was also someone there from Canada with a very nice looking polished finish C-GEMP. In addition to being all-metal from front

cont pg. 17

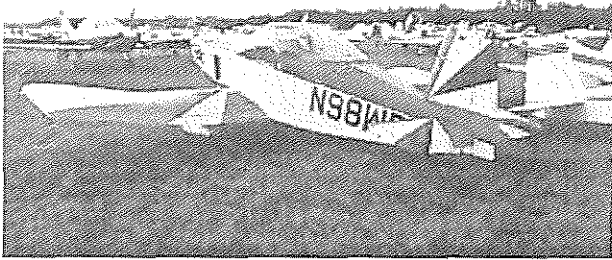
Sun'n Fun 2002. cont.

to back, this airplane also had adjustable cowl flaps. It would be interesting to read an article about this airplane (hint). Add to this our Thorpers from the left coast, and we were pretty well represented at SnF.

(By the way, the oil-separator is a slightly modified travel mug).

Andrew Robinson

*Editors Note: Thanks for the excellent write up Andrew.*



Sun'n Fun Photo



Sun'n Fun Photo

Technical Information

## Safety Issue

**Tailwheel Condition** - Check your solid rubber tailwheel tire for small radial cracks that start on the inner radius and work their way out. I noticed some of these on my tires, but didn't think to much about it - "I'll just change it at the next annual." A short time later while taking off heavy on a hot day at Mojave, I heard a funny sound just before lift-off. I heard the same sound upon landing 600 miles from home in Jackpot, Nevada. What I found when I jumped out of the plane was a mushy tailwheel tire that felt as if I could roll it off the rim. I took the tire off to find a thick steel cable had worked its way through the inside diameter and had relieved all strength from the tire. I was on my way to Kalispell, Montana but not until I got a new tire installed. I called some friends and they brought me a new tire that was going to be installed at the *next* annual.

We recently lost a friend due to the loss of directional control on the ground. The price of a new tire is cheap in comparison to what could happen. Check your tailwheel tires by looking for the cracks and by checking to see that the tire is solidly mounted and can't be easily rolled with side pressure.

Tony Ginn

Just a quick letter to warn anyone with a Maule tailwheel not to make the mistake I made. During a few landings the other day I was picking up a little shimmy. At the hanger I thought I'd look the wheel assembly over and see if there was anything noticeable. I popped the cap off and seen the large fork retaining nut and it seemed not as tight as it should be based on movement. With the appropriate wrench and a small amount of torque applied the nut simply snapped off in the wrench. The threaded top of the fork itself broke off. In further review it seems the movement I noticed was simply the spring loaded plate beneath the nut for centering the tailwheel.

James ~ N2NE

## T-18 Flap Kits Now Available

### **Eklund Engineering now has laser cut flap kits available.**

All sheet parts laser cut, with all holes. Skins free formed with leading edge radii. Ready for light deburr, dimpling and assembly. Left or right hand flap kit \$536.50 plus shipping and sales tax in California. Contact Eklund Engineering at: 209-727-0318 or email: [thorpt18@jps.net](mailto:thorpt18@jps.net)



## For Sale Items

Propeller for sale: As removed from mt T-18. Lycoming 0-320 flange forward, 4" extension, spinner, all bolts and Warnke 70 x 70 Almost Constant Speed. Plus a steel ring harmonic dampener. All in excellant condition. \$600.00  
Phone:(406)227-8898

Bob Ryan

I have a complete set of templates and wood form blocks that were used to build T-18 SN# 411. These are for the standard T-18. I will sell for \$50.00 if someone will just pick them up. For info call: (414)541-0318

Gerald Czarniak

Bendix Mannetots with shower of sparks(SLN-200, part# 10-163005-2; SLN 204, pt# 10-163045-3) completely rebuilt 20 hours ago by IA. New Slick harness \$500.00 for all

Flap Handle, beautifully chromed, \$100.00

Maule Tailwheel Asmy. 125 since new, 10 hours on new wheel, \$100.00

Rochester Guages (pg. 349 Spruce catalog) fuel level - \$50.00, voltmeter - \$50.00

cont.

## For Sale Items, cont.

Ammeter - \$50.00 All like new.

Cessna 3-in-1 Gauge (oil press, oil temp,cht) 125 hours since rebuild by Pacific Southwest Instruments. Perfect cond. \$150.00  
Phone: (909)315-9888 or email: [N89BJ@aol.com](mailto:N89BJ@aol.com)

Byron Janzen

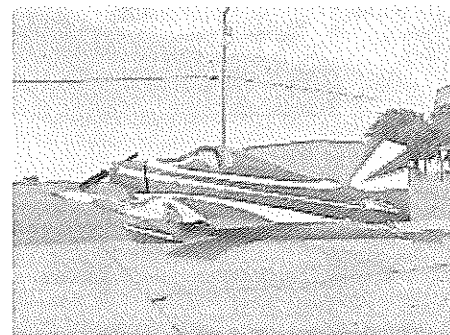
## T-18

My name is John Dors. My friend, George Truver, passed away recently. He was an avid member of the Thorpe set. He has a pristine T-18 that he built and many extra parts and jigs. Do you or anyone in your organization know anyone interested in any or all? The airplane is (was) polished with one gold stripe. All rivets squeezed or bucked, no cherry max. It even has metal wing tips. He also has ten extra sets of tips and the forming jig. The T-18 has a Lycoming factory new 0-360 with constant speed prop. It has only flown 5 hours then George got sick. It has been sitting in the hangar for about 18 months. Please inquire by email.

John  
[ios@adnc.com](mailto:ios@adnc.com)

## T-18

I am selling my extremely clean, light, 135hp T-18 for \$25,000. Email for pictures and spec sheet, or call Glenn Smith  
209-848-4648  
Cell-209-605-3248



Glens T-18

For Sale Items, cont.

I have several GPS units for sale. The units are the hand held Trimble Flightmate Pro. These units work well and can be mounted in a Thorp or any aircraft. So if anyone is looking to get into using a GPS receiver real cheap now is the time, I see these same units selling for \$195 on Ebay and we're asking just \$135 each. If interested contact me at [Rotortime@Aol.com](mailto:Rotortime@Aol.com) and I'll be glad to send you one or just relay additional information.

James N2NE

I have a prop extension for sale. Contact me at: [n98bj@aol.com](mailto:n98bj@aol.com)

Jim Critchfield, builder of N8TT, was asked to reprint his GPU Overhaul Manual which he did for a couple of guys.....who then said they got one elsewhere. So Jim has three (3) reprinted manuals for sale. \$19.95 each. His phone number is 530/621-1584 or [critch2@earthlink.net](mailto:critch2@earthlink.net). Contact him for details.

Hal Stephens

More T-18 Friend's

We live north of Anchorage, Alaska and own a T-18 built by Glen Patsch in 1976. In one of the Newsletters you encouraged members to volunteer their homes for Thorp owners visiting different parts of the country. PLEASE put us on the list. We live on Wolf Lake Airfield which is less than 5 minutes flying time west of Palmer, Alaska which is about 50 miles north of Anchorage. We are in the Alaska supplement, but not on the Anchorage Sectional. Wolf Lake is a residential airpark with a paved 3800' runway, paved taxiways, two FBO's, fuel, a lake with float plane slips and hangers. I have most of the fish named in the lake so one does not have to go into the bush for good trout fishing. We have two extra bedrooms with baths. We live mid-field on Wolf Lake across from the fuel pump. Our yard is one acre of lawn with plenty of room for aircraft parking. We recommend coming up in late May - June as that seems to be our best flying weather. We would love to have anyone in the Thorp family stay with us !!

Lane Olson ~ (907)745-8392

**Thorp Events for 2002**

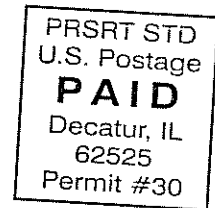
**Airventure 2002** ~ Oshkosh, WI. ~ Annually at Oshkosh, at noon on Friday, we have a lunch/forum get together in the Nature center. I will post more information as soon as I get it.

**Porterville** ~ Porterville, CA. 11th Annual Fly-In , Likely we'll do another P'ville Thorp Gathering as we have done in the past ten years. We have used the Labor Day week end as late as it doesn't conflict with the Reno Air Races which took our former weekend. You can post it as a tentative as I have not conversed with "the committee" a dedicated group of Thorp people who work with me as the organizer of the event. Hal Stephens ~ [aerohal@earthlink.net](mailto:aerohal@earthlink.net)

**Kentucky Dam Fly-In** ~ October 11-13, 2002 at the Kentucky Dam State Resort in Gilbertsville, KY. For more information contact Teresa Scola ~ [btscola@aol.com](mailto:btscola@aol.com)

T-18/S-18 Thorp Newsletter  
Roy Farris  
P.O. Box 182  
Noble, IL. 62868  
Phone: (618)723-2594  
email: rfarris@wworld.com

May 2002



Please check your mailing label for the "PD" entry in the upper left corner above your name. If you don't see the "PD" entry, then you have not paid this years dues. Please send the dollar amount listed on the label. Any amount over 25(US) or 30 (outside US) indicates that you have failed to send previous years dues. Please be kind and send your dues now.

## THORP T-18 MUTUAL AID SOCIETY ----- DUES

Please continue your support of this valuable exchange of ideas, building tips and safety information covering John Thorp's greatest design. Please make checks payable to: Roy Farris P.O. Box 182 Noble, Illinois 62868. Make check for \$25.00 US, \$30.00 for outside.

Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Email address: \_\_\_\_\_  
Notes: (building, flying, thinking about it, etc): \_\_\_\_\_