

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 Tippett, 298 S. Jackson, Waukegan, 60085

Wm. Teeters, 980 Koshare Trail, Elgin, 60120

Jerry Turner, RR #5, Box 132, Marion, 62959

Richard Secrest, 134 Matteh 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, 8232 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
	6	7	7	9	9	11	12	
Thread length adder (1/16" increments)								

EXAMPLE: Need a 5/8 inch grip 5/16" dia. bolt

SOLUTION: 5/16 dia. is AN5, therefore ~~use~~ use a thread adder of 7

Desired grip (with desired washers) $\frac{5}{8}$
 $+\frac{7}{16}$
 TOTAL $\frac{17}{16} = 1\frac{1}{16}$ inch

Round up to full 1/8 inch increment: $1\frac{1}{8}$ 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:

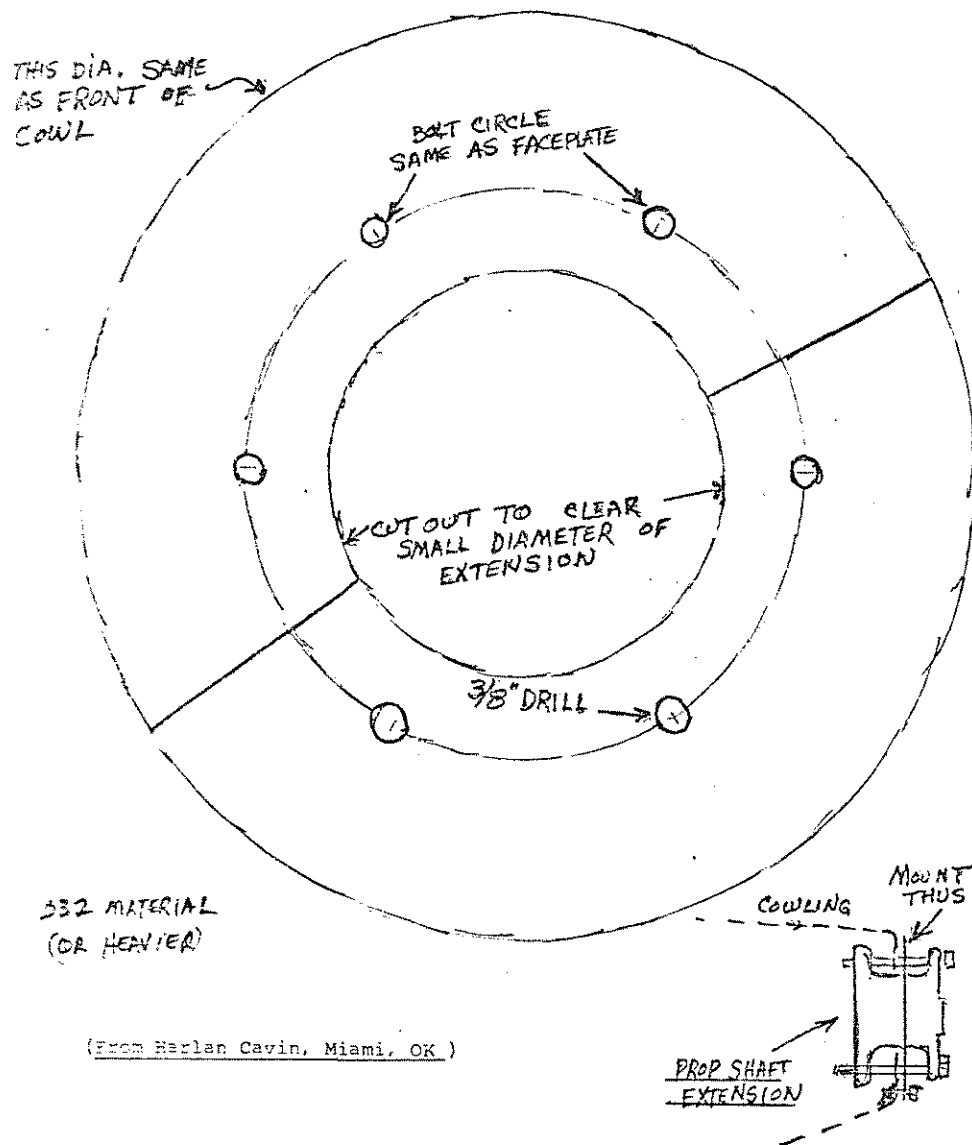
The AN bolt is then obtained:

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!!

- ☉ **COWL INSTALLATION TIP:** When installing the cowling 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:



- ☉ 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 st'd seat cushion first and just put a cushion on top of it until you have a chance to really see what you need.

- ☉ **O-290G News:** Don't count out the O-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 O-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 "wafiled" for strength and stellite valves are installed. Jugs are bored ten 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 O-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.

- ☉ **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 CoIG limits be, since they aren't called out on the plans?" Thorp: "The theoretical neutral stability point is 34% MAC, N299V (180 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%".

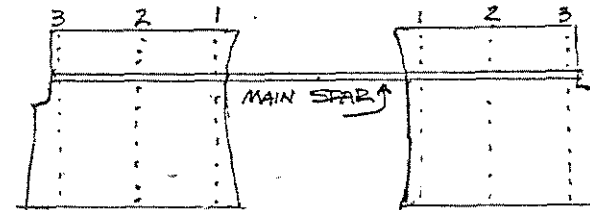
I would again like to emphasize that the accuracy of a CG computation can be severely compromised unless ACCURATE scales are used. Bathroom scales cannot be relied on. Note how much of an error you can get by standing too far forward or backward. If you positively cannot find platform scales in your 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 mark 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 62-61 inches (fuse. Sta. no.), aft CG about 70-71 inches, and Forward CG should be pretty close to 62.5 to 62.5 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 a builder 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. KERR, 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 \$5,500 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.

✶ Another FOR SALE: (May already be sold) LEO PERLAKY, 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.

✶ Eric 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 ^{has} 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 Rafay 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 desig- ned 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 glycol/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. We enclosed 3 photocopy pictures that are unsuitable for reproduction here, b but if we can get some good, sharp b & w picz we'll sure run 'em. All I can say after re-reading Ken's letter is that anyone that says that ERA 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;

CSURLE
A

Just a note on a ~~could~~ 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
	<u>5475</u>

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 - heliarced, 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 55422. (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.

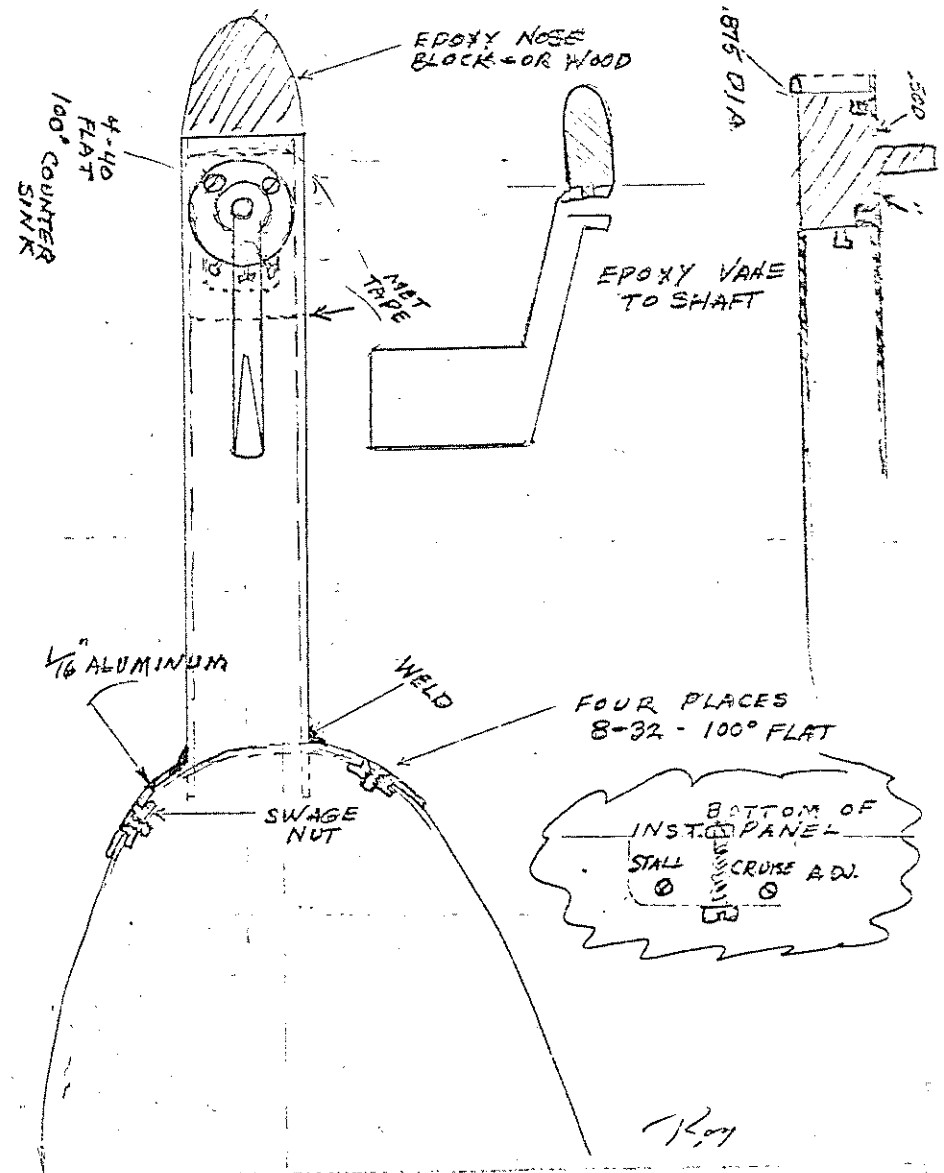
Last year I mentioned that when we have full fuel and just one aboard, that with the airspeed 90-95, we get a buffet on the elevator and a pitch down on the nose. We added 4 pounds to the tail to try to move the C.G. a bit aft. We cut an inspection hole below the elevator 3 1/2" X 5 1/2" and used 2 pieces 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 Rodman Young -

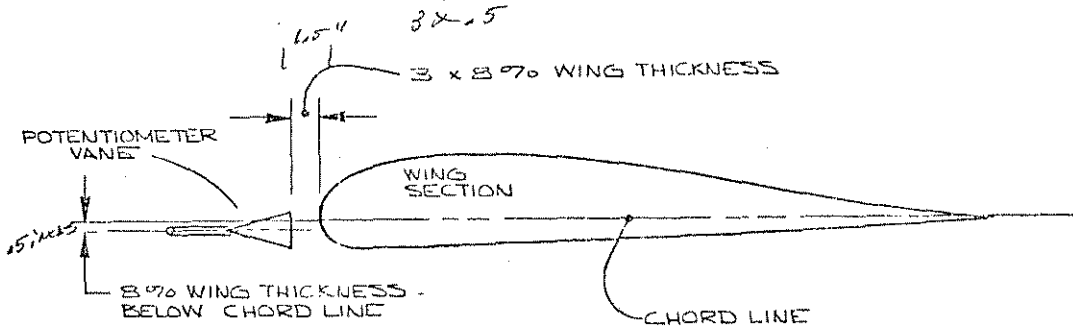
● AOA DIAGRAM



Roy

SEE SEPT. '75
"SPORT AVIATION"
FOR FURTHER DETAILS

T-18 NEWSLETTER #54



● INSTALLATION DETAIL
 FOR
 ANGLE OF ATTACK
 TRANSMITTER
 2 MAY 78

6
4.8

Page 74

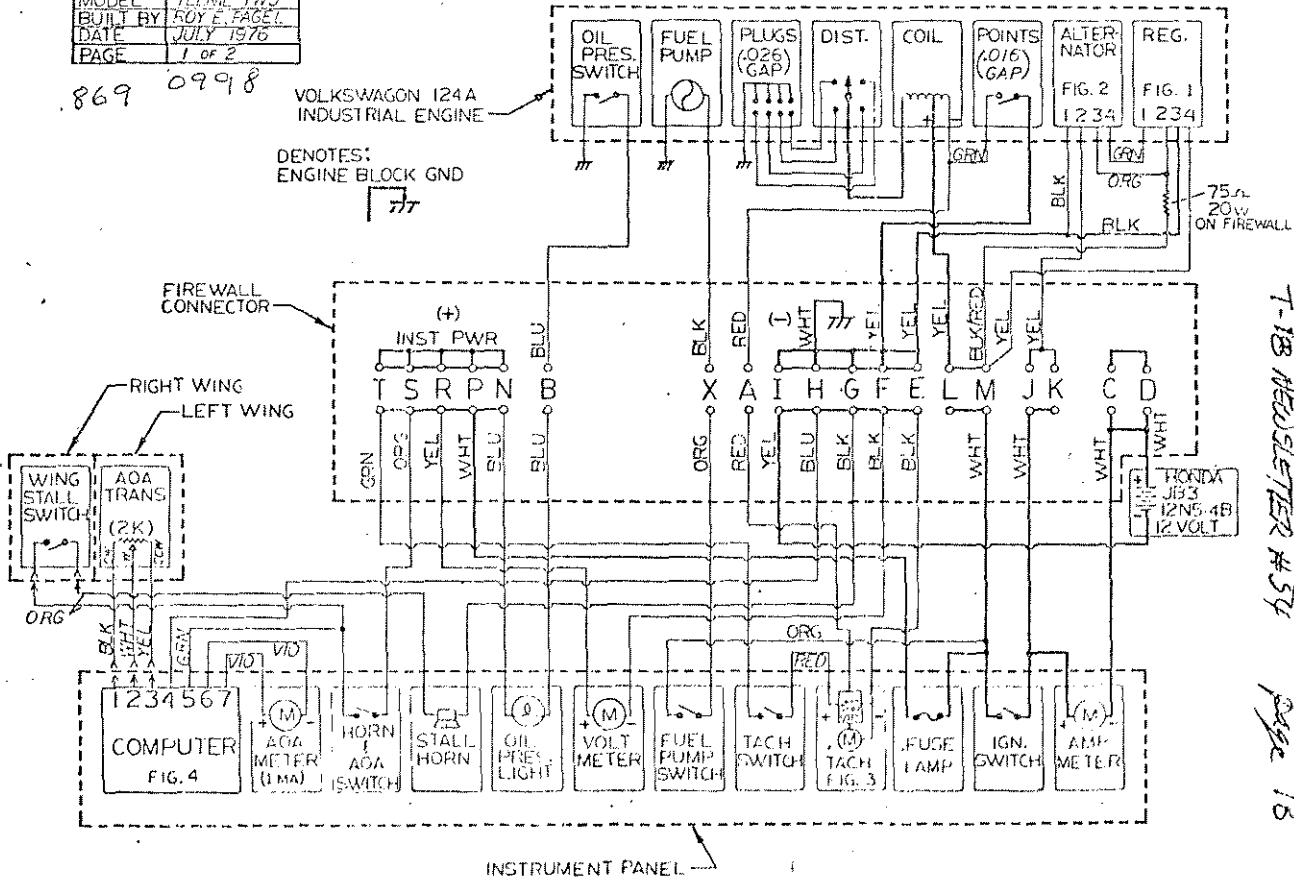
GLENN YOUNG

WIRING DIAGRAM	
MODEL	TEENIE TWO
BUILT BY	ROY E. FAGEI
DATE	JULY 1976
PAGE	1 of 2

869 0998

VOLKSWAGON 124A
 INDUSTRIAL ENGINE

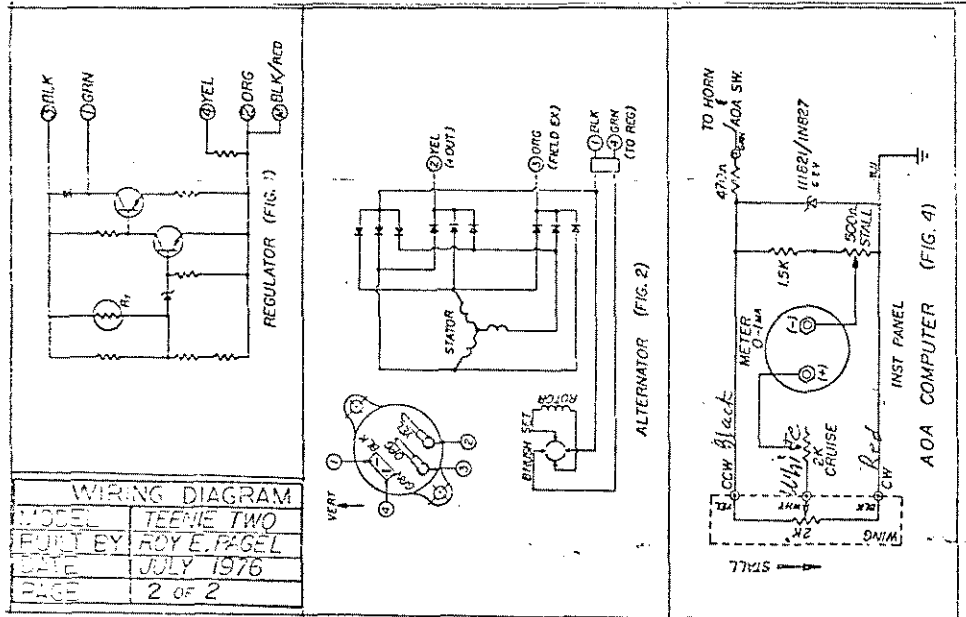
● DENOTES:
 ENGINE BLOCK GND



T-18 NEWSLETTER #54

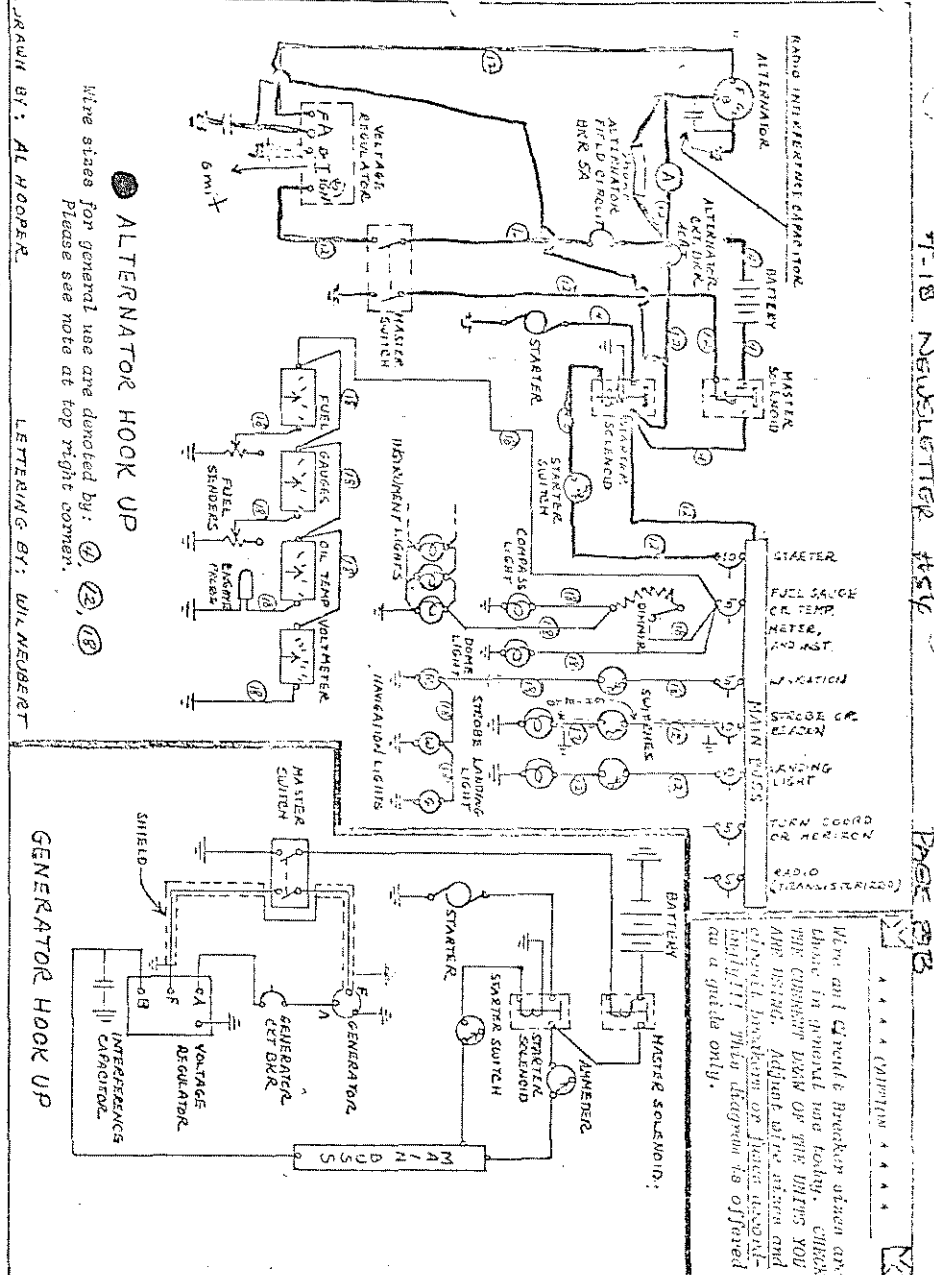
Page 78

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).

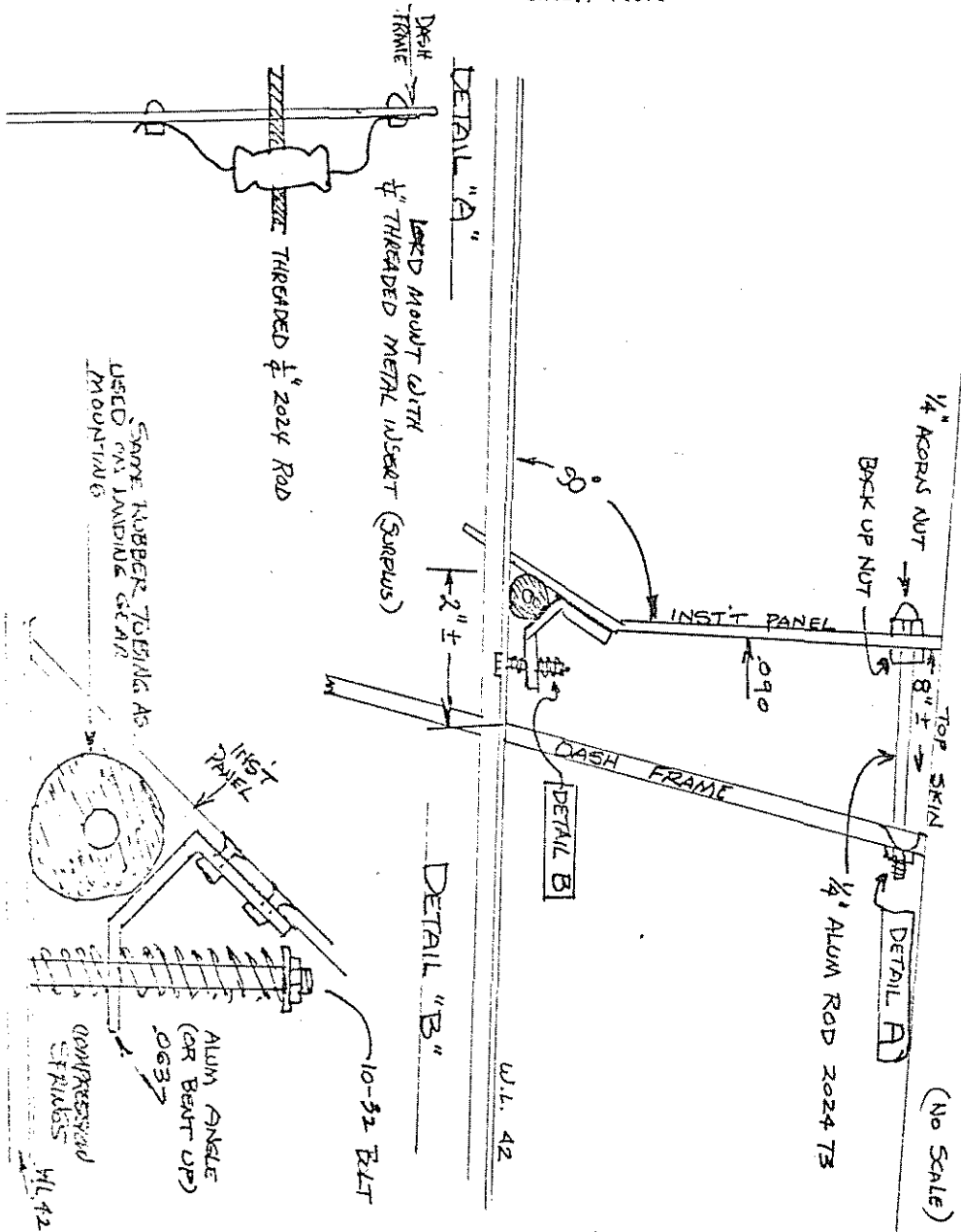
SENT IN BY STEVE HAWLEY, SKIATAOK, OK.



How can I spend a breaker when any show in general use today. Check the circuit diagram of the BHP's 300 and see what. Adjust wire sizes and overall problem of wire size and length. This diagram is offered as a guide only.

T-18 NEWSLETTER #54

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".

Q

A's

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 fin). 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.....

- Minium 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:

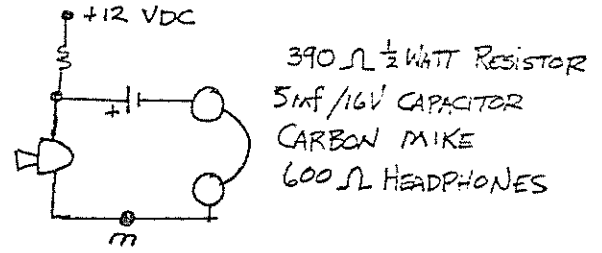
"While preparing for a trip to OSH in a Cessna, it became apparent that we would be more comfortable if we could communicate without shouting, so I started with this basic idea: If I can put audio from my carbon mike into the other 600 ohm headset, and vice versa, I can make a simple intercom.

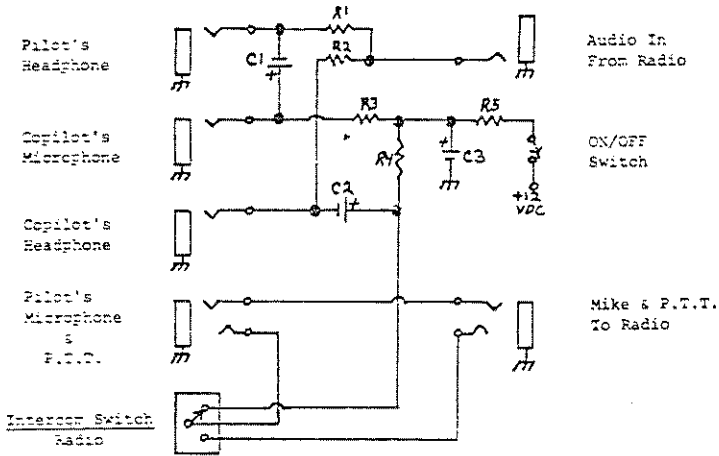
It would be nice to be able to switch the pilot's mike to normal radio function nad have rec'd audio in both headsets. This also allows audio from an AM/FM radio to be piped in, which is nice on a long XC.

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 flite. 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.



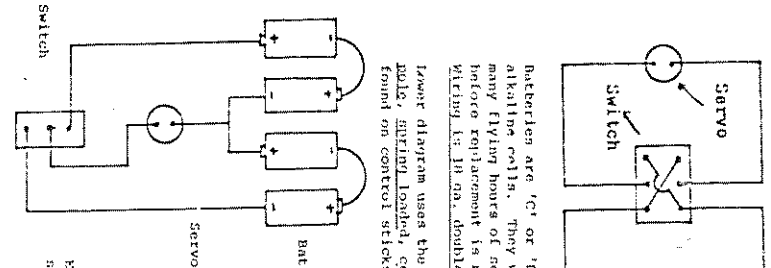


- C1 = 5mf/12V
- C2 = 5mf/12V
- C3 = 2000mf/16V
- R1 = 820 Ω 1/2 Watt
- R2 = 820 Ω 1/2 Watt
- R3 = 390 Ω 1/2 Watt
- R4 = 390 Ω 1/2 Watt
- R5 = 12 Ω 1/2 Watt

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 hull on 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.

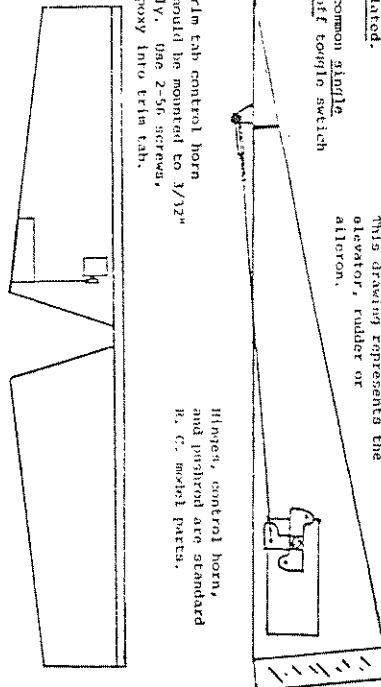
An alternate method of ELECTRIC TRIM is presented below.



Lower diagram uses the more common single pole, double throw, center off switch found on control sticks.

Elevator trim tab should be at least 2 1/2" x 6".

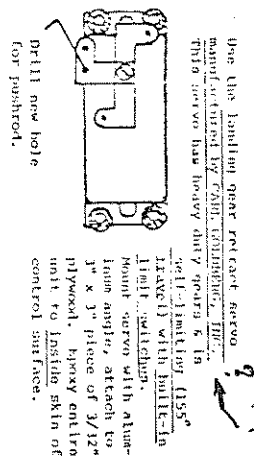
(Thanks to Prop Fisher for much assistance.)



Trim tab control horn should be mounted to 3/12" ply. Use 2-5c screws, epoxy into trim tab.

Horn, control horn, and pinhead are standard R. C. metal parts.

This drawing represents the elevator, rudder or aileron.



Use the landing gear retract servo manufactured by FAIR INDUSTRIES, INC. This servo has heavy duty gears & is self-latching (155°) with built-in 1/4" servo horn. 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?

Here are some notes to get you started.

WIRING DIAGRAMS

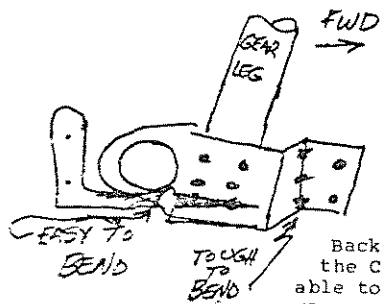
ELECTRIC TRIM FROM YOUR KIT OR COPY INDEPENDENTLY BUY BATTERY FROM FAIR INDUSTRIES OR MANUFACTURER. WIRELESS TRIM, Hobby, Ontario Canada

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 (3005703/3154453 at \$20.00 ea., and 4 of the finer filigree type 3328632 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 .090-.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 a 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.

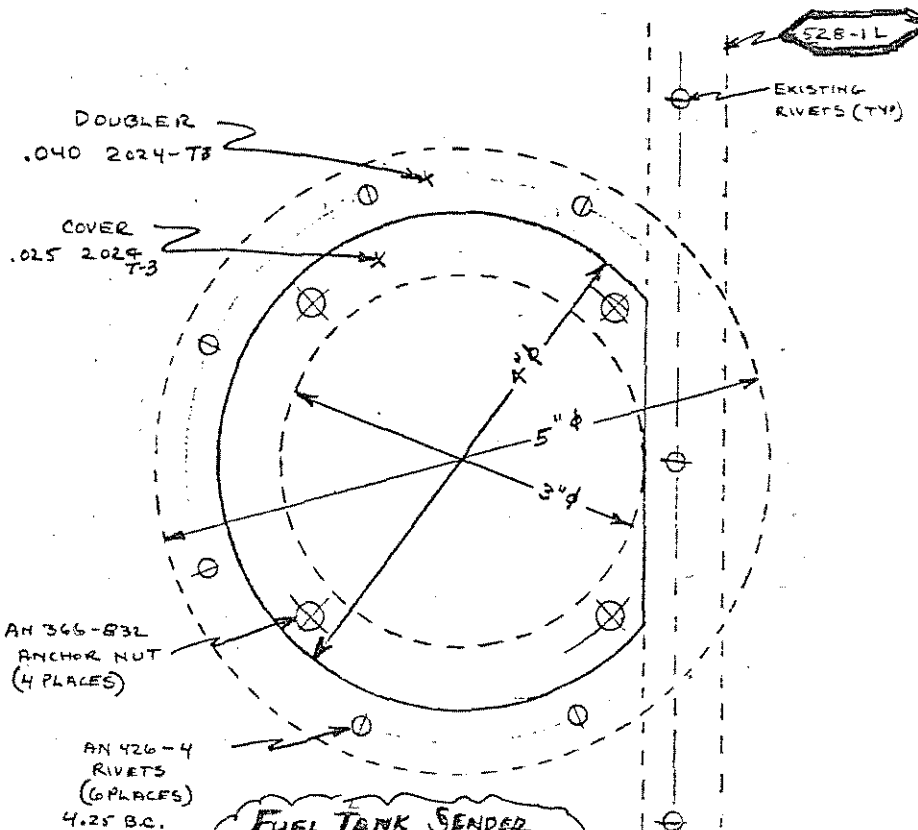
On the induction system: Do you know of anybody making the #75I seal for the carb air box? (Ans. NO. Do any of you?) Is the Thorp induction system still the recommended way to go? I assume the carb heat is pulled in from the top of the valve area without a definite plenum or shroud around the carburetor? 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.G. CRAGIN
12-15-81
34 SMYTH ST.
NEEDHAM, MA. 02192



POSA CARB 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 CARB. 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-I 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.

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. I2.2497) 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. 3.6497, 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)

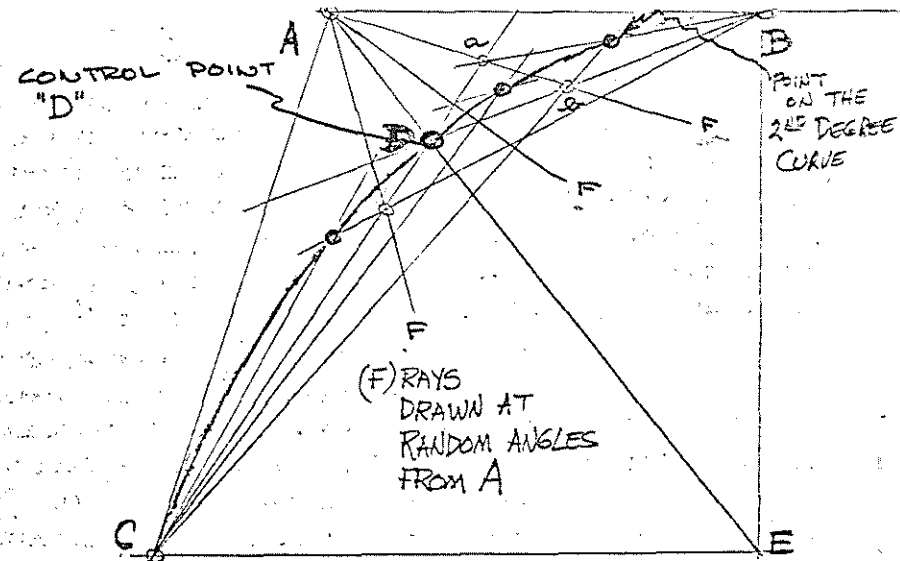
Draw line a-B

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.

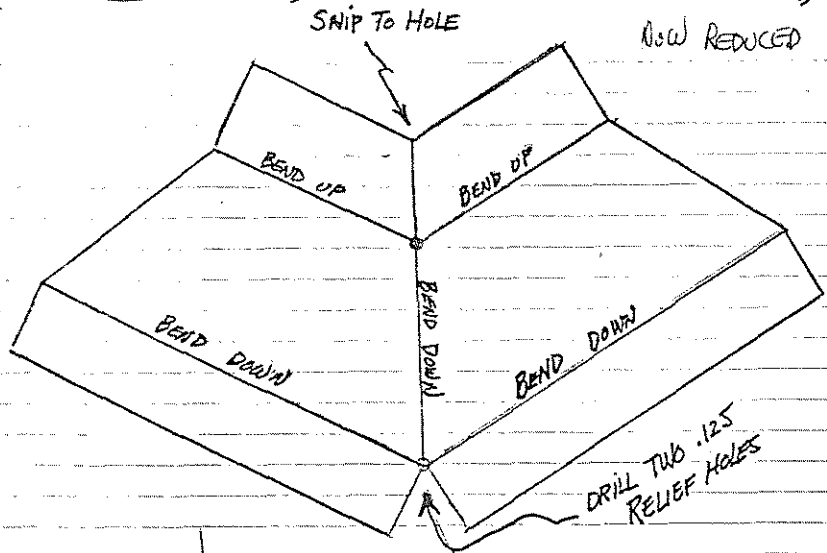
That's been a problem for builders from the very beginning, as most of us had only vaguely heard of a second degree curve.

I will 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.

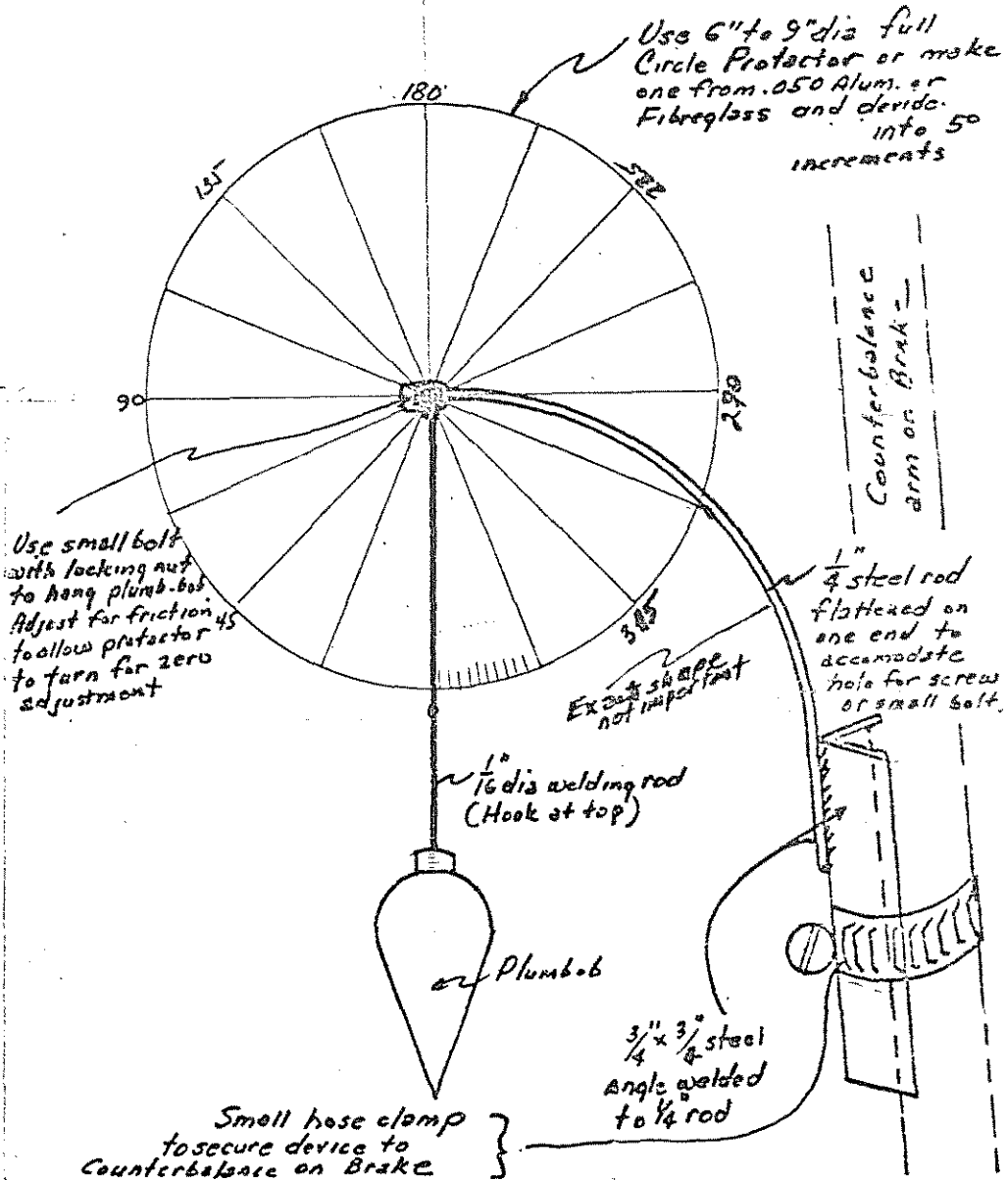
COMMENTS ON RUDDER BUILDING: from Geo. Durkota, 629 Wilcoxson Ave., Stratford, CT, 06497: "A few days ago I was finishing up my rudder and I was having trouble with the #585 rib. I couldn't get inside it to buck the ribs... that is I couldn't until I got your newsletter suggesting that I use that rib. It REALLY works!

I was worried 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 EQ.)~~



Gauge for Bending Angle on Sheet Metal Brake



Use 6" to 9" dia full Circle Protractor or make one from .050 Alum. or Fibreglass and divide into 50 increments

Use small bolt with locking nut to hang plumb bob. Adjust for friction to allow protractor to turn for zero adjustment

Exact shape not important

Small hose clamp to secure device to Counterbalance on 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 such developments with great interest.... This is one of the things that I like to see out of the EAA people. Someone in the group is always pushing the envelope something or other back a little... and sharing that experience.

Bill Cassidy (PACESSETTER 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 Pacsetter 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 un aspirated 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.

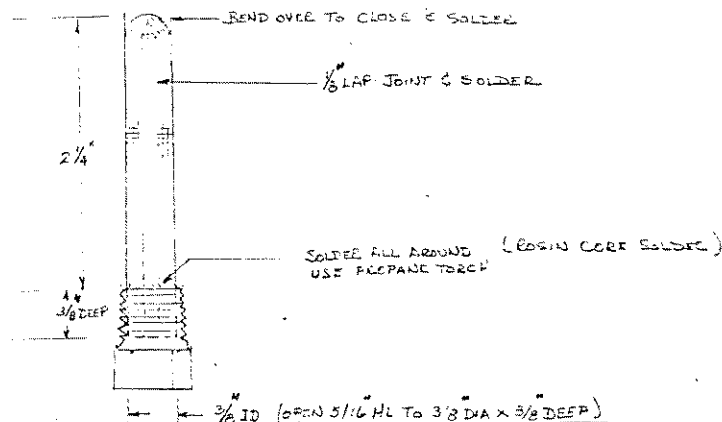
It's always the "little" things that get you into trouble in an airplane and one of those little things that so often is neglected is the use of a finger strainer in the fuel tank. It's a MUST to install one. It doesn't take much to choke off that fuel outlet and FAA's accident files are full of reports 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 3/8" 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 Q-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 66LV16 wood prop with plastic tipping and a Dix crossover exhaust system. I have installed a converted GMC alternator - by Vic 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 carlocks.

The entire airframe structure, wings, and tail surfaces were coated with Dupont's Imron 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 EGP and GHT 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 Terry'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 pulley. 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 spanwise, leaving a lap joint, to be either filled or ignored, just under the leading edge. I believe I would run the splice chordwise 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 Feb 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.

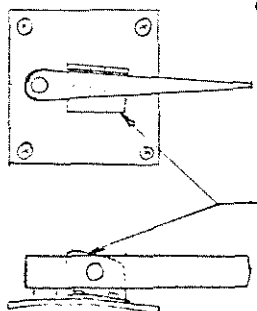


Dean L. Adams RM 91184
16575 S.E. Sager Road
Portland, Oregon 97236

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.

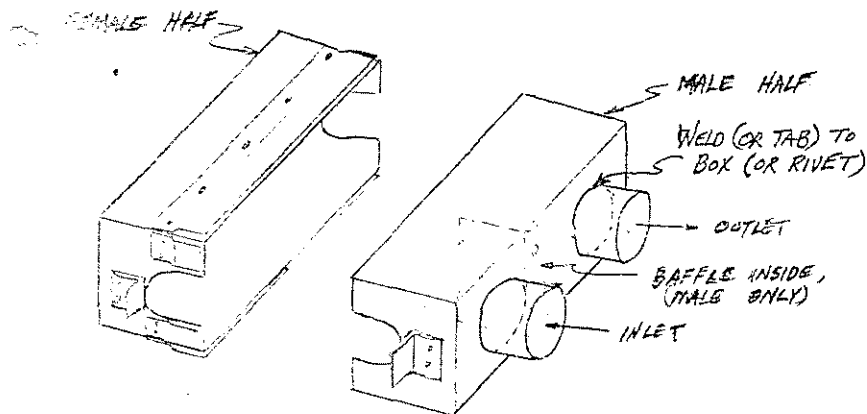
● CANOPY LATCH



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

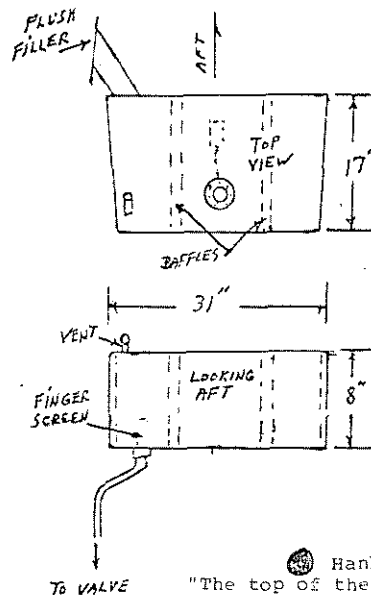
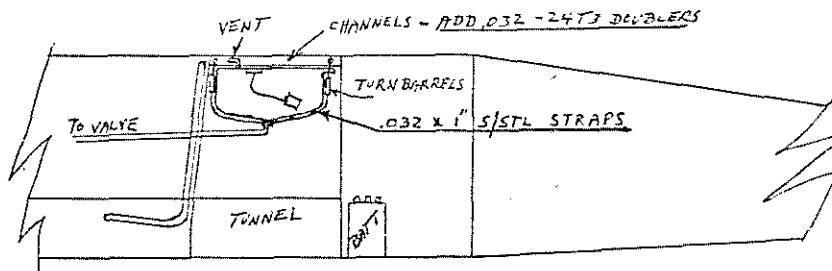


Cabin heat box (about 3 x 3 1/2 x 8" in size). Baffle forces air around and over exhaust pipe. Both halves assemble over pipe and seal on asbestos seals cut from hydraulic hose fire sleeve material. The assembly is held together & secured to pipe by 2 hose clamps over angle clips riveted to each end. (Hope it works) (It will-Ed.)

Submitted by DEAN ADAMS, 16575 S.E. Sager Rd., Portland, OR, 97236

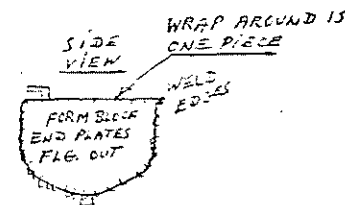
Thanks, Dean, for an excellent report. We appreciate it.

T-18 N 512.5
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 ~~exit~~ 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 SUBSID

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 1/2" 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-1 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 20 1/2 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 replace 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?

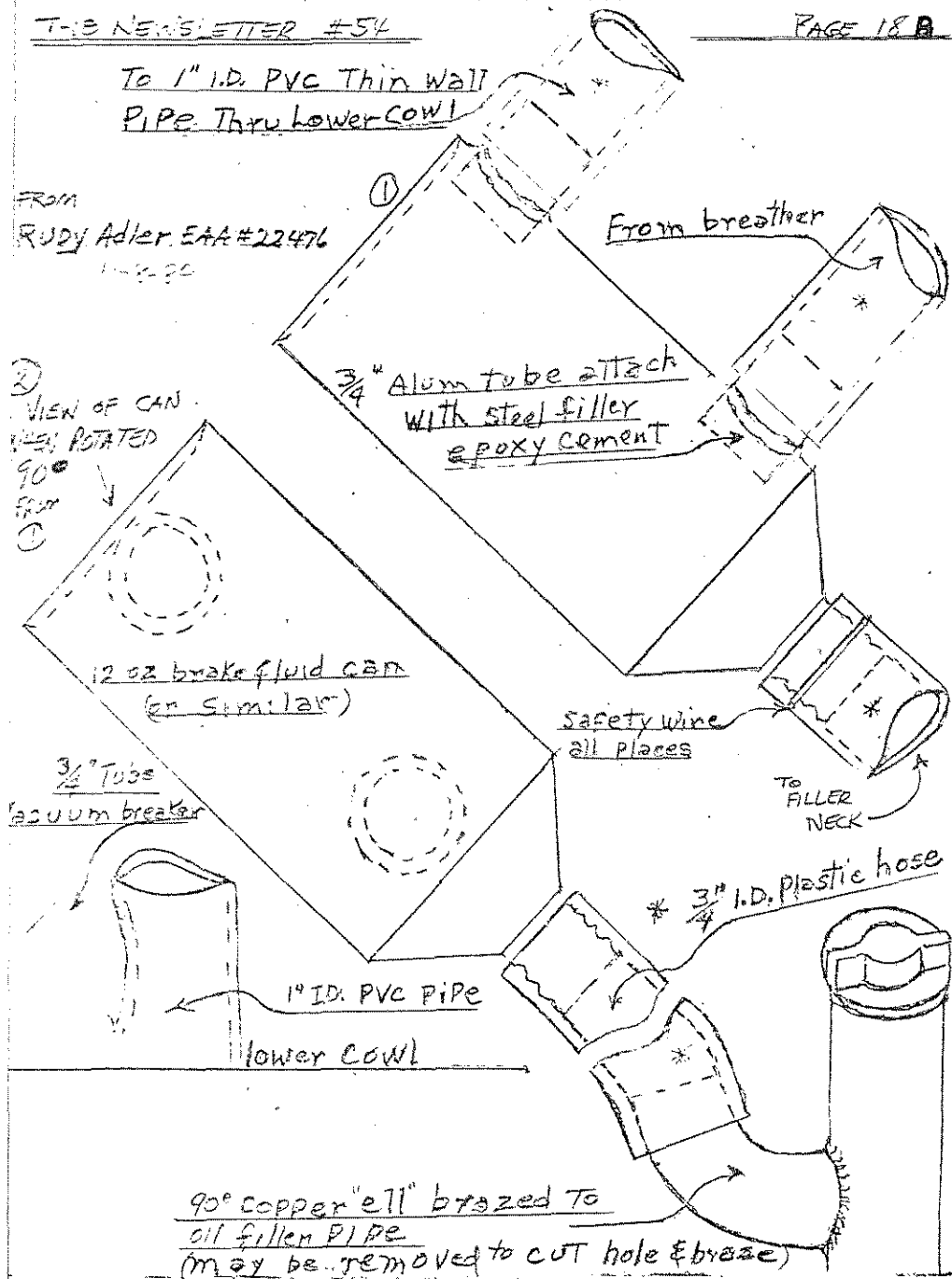
The oil vapor recovery system looks pretty good. It's certainly something needed. I've seen some people run a line from the breather down one of the gear legs, but there are drawbacks to that method, too. Some have even run a line all the way back to the tail wheel, but that's a lot of trouble to go 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

1-8-80



'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 HoGgens 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 FinerGlas 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 putting 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, 512 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 N.E. 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 power ful 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 that 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 Hodggens, 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 statistical 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 place 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		
	IO	360	CI4GD
	IO	540	A41A5
	IO	360	A3B6D
	PREFIX	DISPLACEMENT	SUFFIX
L	— Left Hand Rotation Crankshaft	Cubic Inches*	A or AA — Power Section & Rating
T	— Turbocharged (exhaust gas driven)	*Note: (541) - A displacement ending in "1" indicates a specific engine model which incorporates integral accessory drive.	3 — Nose Section
I	— Fuel Injected		B — Accessory Section
G	— Geared (reduction gear)		9 — Counterweight Application
S	— Supercharged (mechanical)		D — Dual Magneto
V	— Vertical Helicopter		(Subsequent changes to models are reflected in the suffix.)
H	— Horizontal Helicopter		
A	— Aerobatic		
AE	— Aerobatic Engine		
O	— Opposed Cylinders		

FROM NOV. '81 AVCO LYCOMING "FLYER"

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 in-

dicating 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.

FOR SALE PAGE (ALL ITEMS ARE FROM MEMBERS OF THE T-18 MAS ONLY)

From Frank Lanier, P.O.Box 195 Colorado City, Colo.:
O-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-I50 seats
instrument panel, C-I50 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
holding 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 nad make some changes. It
will appear in NL#55, so watch for it. It's outstanding.
Re JOEY 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
\$.33, 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.

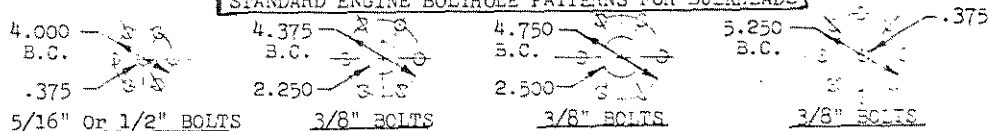
DURGET CALLING ABOUT FOR SALE ITEMS AS THEY MAY HAVE ALREADY BEEN SOLD

FOR INFORMATION PURPOSES ONLY!
E. Fenshing Larsen
7059 N. Moselle Avenue
Chicago, Illinois 60646
(NO LONGER IN BUSINESS)

EXPERIMENTAL AIRCRAFT SPINNERS MATERIALS

BULKHEADS-----6061-T4 bare (not a clad) aluminum sheet spun to shape.
SPINNER SHELL---6061-O 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. Fenshing Larsen
7059 N. Moselle Avenue
Chicago, Illinois 60646

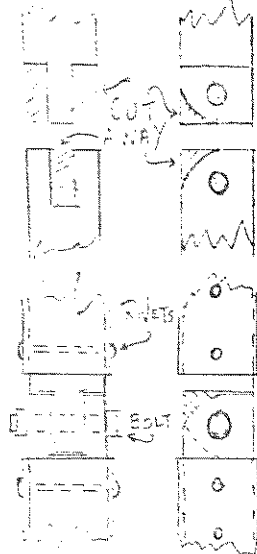
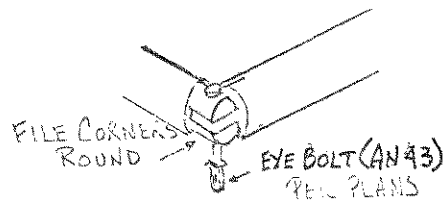
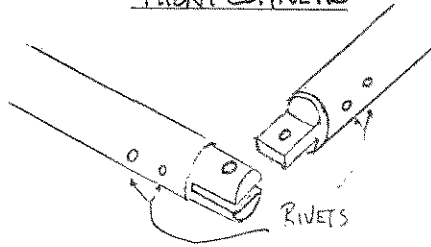
MAKE OF AIRCRAFT _____
ENGINE _____ MODEL DESIGNATION _____ H.P. _____
PROPELLER HUB THICKNESS _____ (make and model not wanted).
SPINNER TYPE _____ UNpolished[] Polished[]

COUNTERBORE BULKHEADS FOR DRIVING LUGS[] DIAMETER _____ (decimal).
\$10.00 minimum deposit with order, specials must be paid
in full before work will be started.

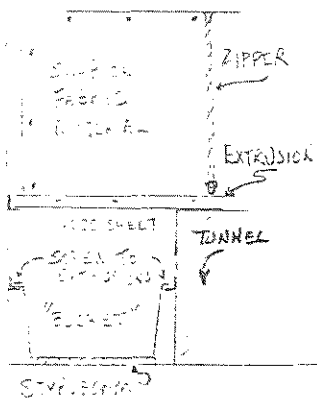
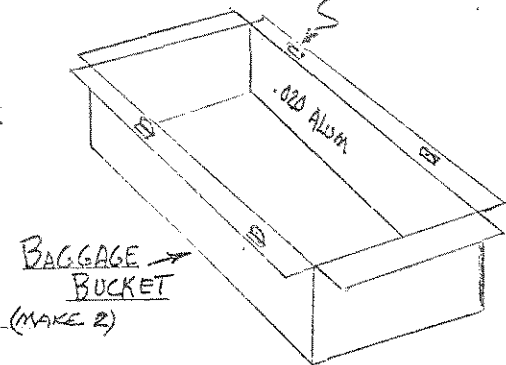
NAME _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____

OBSOLETE

HARDWARE FOR SEAT
FRONT CORNERS



HINGE FOR FOLDING SEAT



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 "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"

Jaimé 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 Spinson 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 In 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 Eyetek 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)

Dick Cavie