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T-18 NEWSLETTER NO. 17 June 3, 1966

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NEWSLETTERS - This issue welcomes builders through Nos. 427. You new builders can receive future issues of the Newsletter if you send me a $2. donation to pay for printing and mailing costs. If you like, you can receive back issues by requesting them.

This issue would have come out sooner but I have spent a couple of weeks in Europe on business, I decided to blow my T-18 reserve funds and take my wife, Marilyn, along. She took a couple of girl friends along to keep her company while I was tied up in meetings. We had a fine trip and the sun even shone in England. I bring one big message from our European cousins. "Tell the U.S. pilots and homebuilder's that they don't know how lucky they are." Private flying is almost non-existant because of costs and stringent regulations. For instance, in Germany 30 hours instruction is required before solo. Another 10 hours instruction is required to use a radio.

BUILDING INSTRUCTIONS - The printer is now printing a new batch of reprints from Sport Aviation of the T-18 Building Instructions. Printing and mailing costs are $2. You can obtain them from me. No COD orders please.

PAPERWORK - Since I answer correspondence and write newsletters while riding in the car pool, on airplanes, in hotel rooms, and while my wife is talking, it is easy to get mixed up. If you don't get an answer in a reasonable time, don't get mad, just write again. If possible, make questions general enough to be answered in the Newsletter. If you need personal replies, write questions on a piece of paper, leave room for answers and enclose stamped envelope.

MATERIAL KITS - Eleven orders were received for kits and all but one (Whitehouse's) has been shipped. Most of them were outside the Northeast area. Since the aluminum company shipped different types of material from different warehouses, as many as three separate shipments per kit were made. To save shipping costs for those who had to pay their own, I decided to collect everything and then reshipped each kit in one shipment. This turned out to be a real bag of worms because the packages were so flimsy they weren't fit to reship. So, John Shinn and I had to reinforce them with 2 x 4's - which took about a week. We are now getting quotes on kits with sturdy packages. Aluminum prices have increased 1¢ per lb. New prices will be in the next newsletter. All shipments will be direct henceforth.

FAA AND POP RIVETS - Our district FAA office recently sent a letter to the chapters under its jurisdiction regarding pop rivets manufactured by the Independent Nail Co. Here is what they said:

"This is to bring to your attention "Pop" Rivets manufactured by the Independent Nail Co. which have recently been found in the general aircraft supply market.

"Available Information indicates that there are two basic designs of "Pop" rivets; closed-end and open-end. Because the open-end type is open at the processed head end and, therefore, is susceptable to corrosion, we do not recommend it for aircraft use. The "Pop" type rivets (closed-end type) may be used for non-structural applications only. Additionally, "Pop" rivets do not comply with any MIL specification, so that there are no guaranteed minimum shear strength and bearing strength values for the various combinations of rivet diameter vs. sheet gage thicknesses such as those presented in the Military Handbook MIL-HDBK-5.

"Pop" rivets have been approved on aircraft for certain structural applications when approved as part of the type design. Such was the case of Aerofab, Inc., on the Lake Model LA-4. This approval, was on the basis of tests and special receiving Quality Control requirements by the T.C. holder. These rivets have been assigned part numbers. It follows therefore, that there unlimited use on amateur-built projects without tests could be dangerous especially in the area of primary structure."

I answered this pointing out that monel "pops" are stronger than AN's in shear and asked for clarification, receiving this reply:

"Our memorandum dated February 16, 1966 was forwarded for your information relative to the use of "Pop" rivets for structural application. The memo did not condemn these rivets but did caution homebuilders regarding their use. The use of "Pop" rivets for structural application in amateur built aircraft should be substantiated by load test or data. Pop rivets meeting or exceeding shear and tensile strength specifications of solid AN rivets should be satisfactory for use in any area the AN rivet is acceptable.

"In our previous memorandum we were referring to corrosion resulting from moisture entering structure through the openings in the rivets. All such openings which expose internal structure to the elements must be sealed. The use of epoxy to seal the rivet ends would be acceptable if the epoxy used has no corrosive effect on the rivet or structure.

"If you use the rivets specified in the Thorp drawings you should have no difficulty obtaining FAA approval."

LETTERS FROM THORP - "The new trim system is working very well on Hanson and Thenhaus' T-18's. Jim Roberts took Dick Hanson's T-18 to 210 m/h, so that the red line can be 190 m/h with the same margin over flutter that a part 3 airplane has. With two people, low fuel, and 92# of baggage, Dick Hanson's T-18 is just about neutral in static longitudinal stability. Part of its problem is high pivot friction as the elevator hinge binds. Trim is adequate for all loading conditions and is most effective. The "bent" drive shaft works o.k. The sloppy KS6L bearing static tests o.k.

"The flap problems (forming skins) bother me. .020 skinwould be good enough for the flaps, but I made them .025 so as to use up scraps rather than introduce a new material item. I suspect that rivet hole cracking is due to over driving of rivets. We have even encountered this on frames (.025). I wouldn't want to make all frames .032, so we need to see what it takes to not have cracks in .025. Careful deburring will help and possibly the rivets were old and hard. Anyway, I don't have a pat answer.

"I agree that a longer prop would be more efficient. We have used 65 and 66 inch diameters but I don't knkw of any at 67. Since there are no special requirements for homebuilts we can ignore the 9" min. ground clearance up to the point that we start digging up runways with props.

"I show a 63" prop with a 3/4"/g stiff gear and 9" clearance. 67" will reduce the clearance to 7". Your softer gear will reduce it still more. I don't know what we can get away with but I wouldn't want to even try anything bigger than 67". If you want to, it's your neckle.

"What is the difference between the $85. and $125. Sensenich props? (Answer: $85. for reworked props and $125. for new rejects but good condition for experimental.)

of 1/4" plywood. Lay out a line parallel to the chord line a convenient distance above it - say 6", the airfoil section is cut out and the plywood cut so the upper edge is parallel to the chord line. 3/4" strips of wood are glued to the plywood along the top edge and also the forward and aft cutouts on both sides of the plywood.

"Because the upper surface of the board is parallel to the chord line we can check for twist by placing the "incidence board" on the wing and a level on the top surface of the board. The position and direction of the level should be marked on the board to eliminate any errors.

"The above method can be used on the horizontal tail equally well and by using a bubble protractor - available in any hardware store - it can be rigged with accuracy. The top of the "incidence board" is always parallel to the chord line regardless of the angle of the horizontal tail.

"I have used the above method with great success when rebuilding damaged wings of manufactured aircraft without the use of jigs. The wing skins can be opened up on the upper side for riveting - the lower surface is best done first and then the top skin working from the spar aft - and because the wing is supported on the lower surfaces during both riveting sequences, no twist will occur. Once the wing is closed together and levelled on the sawhorses, there is no need for moving it during the riveting.

"The above method can undoubtedly be improved on, however, I know it has been a big help to me."

LAYOUT AND ENGINES - Lt. Paul Miller, 106 2nd St. W., FPO San Francisco, Calif., 96637 - "I've made copies of the full size prints with the use of an Ozalid machine. They don't come out with much contrast but the lines are distinct. I cut the outline allowing a quarter inch for shaky hands, then spray the back side with spray adhesive. I simply stick the layout on whatever metal I'm using for the part. Rivet locations, break lines, etc. are all there without my having to draw a single line. If there is an error involved I'm sure it is insignificant and would never approach normal drafting error.

"An added benefit is that while the stock is covered by the layout, it is protected from handling and tooling scratches that never should have gotten there in the first place. Efficient layout is also possible because the layouts can be jockeyed from place to place easily to reduce wastage. Granted, most people do not have the free use of an Ozalid machine, but there are others beside myself who do I'm sure. I think this procedure will reduce my layout time 90% and eliminate much possibility for error. Where full size prints are not shown, I merely redraw the part and make a copy of it. It's much easier to draw on paper than on metal and its less cumbersome. I make the Ozalid copy in case I foul up so I don't have to redraw the part, just re-copy it. Using this procedure I never have to draw a part more than once and I'll still have a master set for further use when I'm finished.

"There are over 60 GPU's still in use by the Air Force in the Far East. They are being phased out at present but I do not know what procedures are involved in procuring them. I am in a position to coordinate their sale if they will sell them. The sale should be at Tachikawa AFB. Perhaps some Air Force people could give me some info on how the supply system works so we eliminate the scrap dealer from this merry-go-round. I'm sure these GPU will never see the states if someone doesn't get them. Shipping costs to San Francisco are about $20. apiece."

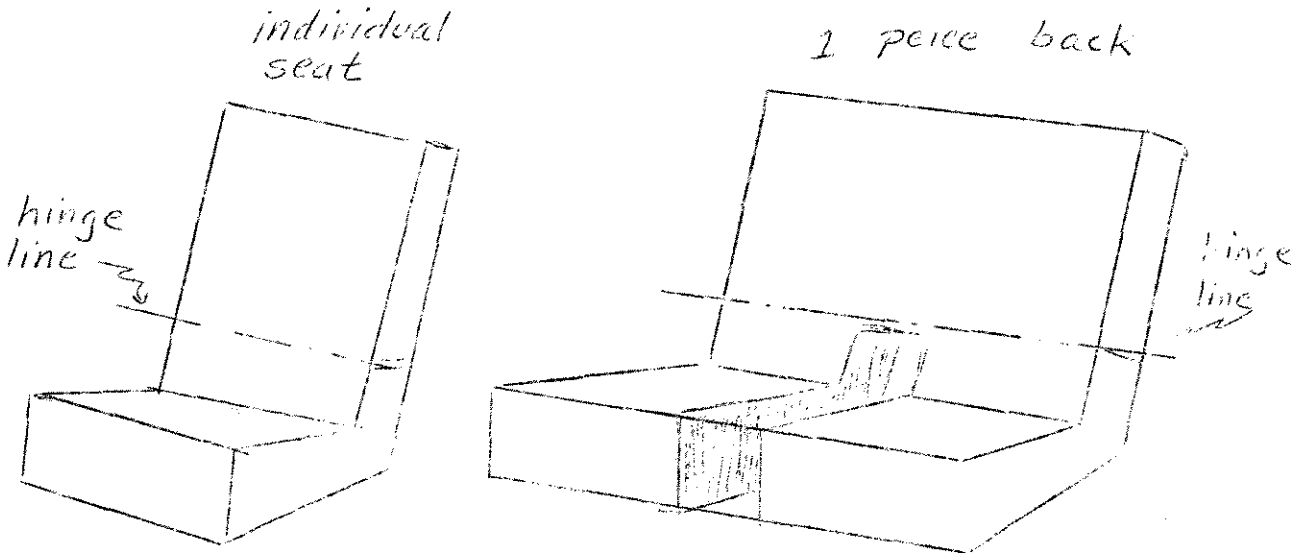
SHEET METAL BRAKE - by Robert Hammer, 13530 SE 37th, Bellevue, Wash., 98004

"Enclosed is a sketch of a homemade brake which will produce a flange equal to any commercial brake. Mine cost between $5. and $6 and has proved

SERIAL NUMBERS - Occasionally people obtain used plans but don't know the serial number. It sure helps me keep filing and bookkeeping straight if you always use your SN in all correspondence. You will need your serial number also when applying for registration of your T-18. So you don't loose your number, please write it somewhere on the plans. In case you sell them, the next guy will know his number.

SEATS - by Floyd W. Maples, 69 W. BelAir Blvd., Clarksville, Tenn., 37040

"Here is a rough sketch of fiberglas seats that I am using in my T-18. They fit real well, and allow upholstery in varing thickness to fit the particular builder. I have molds for these, but no price as yet in the event any one desires them. I hope to have a set at Rockford this year along with one of the fiberglas fuel tanks. "



ANODIZING - by Bernard Thalman

"If anyone is interested in doing their own anodizing, it's easy. Just put the part in a weak solution of sulfuric or chrome acid (preferably chromic as any surface defect will show as a brown line). Around it place a piece of Al. foil, TV Dinner plate, etc. and connect it to the negative of a 2-4 volt DC source, (battery, battery charger, etc.). Connect the part to be anodized to the plus side, use alum. wire only, and apply current for 15 to 30 minutes. To check the finish first rinse them thoroughly dry and check with an ohmmeter or battery and light bulb, no current will flow across a good surface. The surface is porose and will take coal tar dyes nicely."

FIBERGLAS TIPS - by Lt. Peter Beck, 410th Supply Sq., KI Sawer AFB, Mich.

"Thought I might pass on some comments about fiberglas tips. I started off with the tail tips as they were smaller and easier to handle. I used fine grade potters clay available in most any arts and crafts store for the male master. I did this by using a chord section template, cut to include skin thickness, and then errected on it perpendicular templates from John's prints. This was then filled in roughly with odd blocks of wood to minimize the amount of clay used and the amount of possible shrinkage. The remainder is filled in with clay and is splined over at least three templates. Final dressing is quick and easy as it can bedone with a sponge. It took me about 5 hours to produce a decent master. If one must work on this over a couple of evenings, it can be done ok by simply draping the work with a wet towel to

keep the clay moist and inhibit shrinkage. Once the master is finished, female mold can be made as you describe. Since the clay master cannot stand the handling that a plaster master can, I cast the female mold from plaster in two pieces. One must keep the first few coats of plaster pretty wet and runny. This makes for fewer air bubbles and ensures that there will be enough water for proper hydration. If the plaster is too dry, it will draw water from the clay master, shrinking it, and producing ridges in the mold around the templates. Once the mold has been cast and built up, it can be covered with a hard paste wax after a light buffing with steel wool and the fiberglas and resin can be laid on. I have found that several good coats of paste wax, with care to buff out all ridges and build ups, does an admirable job of filling any very small holes.

"I also had a suggestion. I realize that most of us are probably die hard do-everything-yourselfers, but I know that it takes a tremendous amount of time to build up these molds and make the fiberglas tips. The horizontal tail tips alone took me about 30 hours, and that doesn't include the manufacture of the tip itself - just the mold. Under such circumstances, there may be a good number of us who would have no objection to a division of labor. Perhaps someone with a set of molds would be willing to knock out a couple of tips for anyone who would be willing to swap a duplicate set of whatever they are working on at the moment. Costs of shipment in such a case may well be offset by the time saved. Whenever I finish my molds, I will be open for negotiations. Unfortunately, my military assignment is at present in a state of flux, and I'm not sure when I will finish."

BENDING STRAIGHT FLANGES - by John Austin, 5640 Rt. 60 E., Huntington, W. Va.

"In bending the flanges on the bulkheads, it is a simple operation to turn the flange over the form block by hammering on a 1" x 2" soft board to spread the impact over a greater area. Otherwise very light taps with the rubber hammer are necessary to prevent localized stretching which results in a wavy flange. This technique gives a perfectally straight flange which can be joggled into cuts in the form block with a plastic wedge shaped hammer. While this point is minor it will help keep the skin smother, making for better air flow.

MORE FROM THORP - John has completed his 5th and final design on the flap control system. He won't be able to release them for a while for he is now tied up on a big job for Piper. He says that if the flap drawings are really holding you up, he will send you what he has upon request, But since a complete mailing will cost him $2,000., he asks that you don't request them unless absolutely necessary since the drawings, when completed, will be again mailed to everybody.

HINGE STOCK - J.P. Foy, 299 Edith Dr., West, St. Paul, Minn. 55118 - finally got the hinge stock through customs. Three pieces ea. 52.5" long are $5. postpaid. Lord engine mounts are now $23.00 postpaid in USA. Both are a very good deal.

WHEEL RETAINER BOLTS: L. D. Sunderland

I have 60 AN bolts 7 1/8" long for the main gear axles. They are $.70 per pair including postage.

BENDING ANGLES - Larry Larcom, Delaware, Ohio (#194 T-18) made a set of rolls for bending the fuselage angles. Three junk bearings approx. 2" in diameter were bolted to a 1/4" steel plate. One bearing is adjustable to increase pressure on the angles. He says compound curves can be put in as easily as curves in one plane. Each plane takes one trip through the rolls.