21

April 6, 1967 T-18 NEWSLETTER NO. 21

L.D. Sunderlund, 5 Griffin Drive, Apalachin, N Y., 13732

CLECOS -- The days of the 9¢ each cleco is gone and recently we have been paying 20 - 30¢ each. Well, here is some good news for the first few dozen people who rush to the mailbox with orders. Spencer Aircraft, Dallas Ave., Seattle, Wash. have used 1/8" clecos for 12¢ each. You will need at least 100 and probably wish you had more. Cleco pliars are $1. each. These are used for installing clecos (sheet holders). They also have a good supply of sheet clamps which I highly recommend everyone should have several of. I don't know the name of it but it looks like a double jointed set of pliers with adjustable jaws. Price - 75¢ each. They also have a good supply of rubber shock mounts suitable for mounting the instrument panel for 20¢ ea. These have a square base to facilitate holding during installation. (I ruined one of my round ones while screwing on the elastic stop nut.)

PROPELLERS - Another source has dried up but I've found a replacement. Sensenick now refuses to sell cut down props less than 72" long. They say that since they haven't done complete testing on shorter props they won't risk their reputation on them. But Propellers Inc., 10625 E. Marginal Way, Seattle, Wash., 98188, Phone RO 21236 will sell them for $35. They say they are the biggest prop shop in the Northwest., This is an item you should start looking for well in advance of your project completion since the prop shops don't get too many props suitable for cutting down. Don't be impatient if they can't fill your order immediately.

FUSELAGE SKIN TEMPLATES - I now have two sets of skin templates making the rounds. They are available after May and will be in the Mid-W st at that time. If you want to use them, let me know and I'll put you on the shipping schedule and tell you about when to expect them. Each user pays $3. and shipping costs which are usually less than $10. Please don't Whitney punch or drill directly through the templates or they will very soon be ruined. It requires only a few minutes extra to mark the holes with a transfer punch, remove the template, and then punch or drill holes.

FORMING RIBS - One builder had trouble getting the rib flange to lay down flat. It curled up slightly near the edge. The problem was that the blank was cut too small and as the flange was stretched back, there was not enough of a vertical portion to hold it down. Cut the blank about 1" larger than the form block to allow plenty for the flange. It should take only 3 or 4 passes to stretch the flange the complete width of the rib form block. At this point a vertical portion about 3/8" high will remain. Before slapping this down with a solder bar, trim most of it off with shears. Otherwise, the rib flange will be distorted while this excess is being slapped down. Don't forget to leave at least 1/2" extra at the nose of the nose ribs. Trim to size after forming or you'll be sorry. Also, I have found that all flanges on ribs and fuselage frames occasionally have a habit of coming out a little short making the last rivet too close to the edge. This is espe ially true where joggles are involved. About the only way to correct a situation like this is to make a new part so I have developed a habit of making flanges a little too long (not wide) until after the rivet holes are drilled or punched. Be sure to come back and read this after you scrap your first fuselage frame for too little edge distance.

So many people have trouble forming the horizontal tail nose ribs because they try to stretch the flange all the way around the nose. This is not only unnecessary but nearly impossible without an intermediate annealing. Just trim off the flange at the nose similar to on the wing ribs. These ribs are duck soup to form.

T-18 IN SIX MONTHS - Publishing the Newsletter would have been abandoned long ago if it weren't for the enjoyment of associating with so many fine people through this endeavor. (I don't make any money and it certainly has held up progress on my own project.) But, people like Irvin Faur, Princeton, Iowa really make it worthwhile. He bought plans at the 1966 EAA Fly-In and, after a somewhat leisurely start last fall, just whipped out a T-18 in a few months and flew it March 10, 1967!! He might have flown a month sooner but he was held up waiting for a canopy. His numerous progress report letters have been most enjoyable. I'll include a few excerpts. This is the first ship to fly with a cut off hump under the canopy and it really looks nice. It has by far the cleanest nose since there is no carb airscoop. He used a Corvair air filter with the inlet in the nose piece just under the spinner. He used Lee Hamlyn's fiberglas cowl with a prop extension, a 160 hp engine, pop rivets, no flaps and Pitts wheel pants. He put only 2° dihedral in the wings instead of 3° for eye appeal only.

Irvin H. Faur - February 20, 1967 - "Just got the bird out of the basement yesterday. Painted it today in about 27° to 35° temp in the carport. Just can't get Broderson to send the canopy and windshield. It is ready to fly after inspection. Sensenick did me a good turn by sending my check back.. I got two fine props from Maxwell airplane Service, Crystal Airport, Robbinsdale, Minn. for $75 each. One is 68" x 76" and one is 68" x 80". I've had a prop at Whirlwind Prop Service in Chicago for three months and he won't even send it back. Boy, there are a lot of people that don't even want business with all this government spending. Notice the flat wings, only 2°, sure improves the looks to me. Also note carb scoop. I take the air just under the spinner. The fellows here like the looks of the nose. I did a lousy job painting and preparing the pop rivet heads. If I rope it off so you can get no closer than 30 feet it may look ok.

Irvin H. Faur - March 12, 1967 - Well at last the T-18 has been in the air. Have made three landings only, and use more runway than a big jet. I got licensed on the 4th but had to wait for canopy. Finally got it about the 7th (ordered Dec. 15, 1966 with cash enclosed in letter). Flew on the 10th. Anyhow, it just flies wonderful. So far seems like no heavy wing, nose or tail, and of course in 35° temperatures it takes off very short. Sure surprised the watchers and really climbs - even with a 66" x 72" prop. Can only turn 2500 level and full. Don't know how correct air speed is but indicates 150., and the fellows think it really moves. It is real quiet inside, 2" of aircraft insulation all around and no heater. It's a pretty airplane with no airscoop, and only 2° dihedral with Pitts wheel pants. I don't know how the 3° fly but this one so far is just like a baby. Is very touchy on all controls. Just a little goes a long way and very light on all controls. Just no fight no place. Thorp thinks I should go 165 with that prop.

Irving H. Faur - March 23, 1967 - About the canopy from Compton - Since I've got six hours now I'm getting so I look around some. Noticed today those sheet strips of aluminum we put around the lower edge of the bubble pull out about 1/2" from the fuselage when you get moving. Like little wings out there I guess. Hope someone comes up with a bubble to fit soon. That should add maybe 3 to 4 mph. I'm gradually getting more mph. Can turn 2900 now on the straight. Going to get the engine timed by an A&P soon. Do believe I'll be doing 180 at sea level soon. My airspeed is close by my timing over a 2 mile stretch, and I've already indicated 180, and that is sliding the ground underneath fast. Have used your seat deal and sure is very comfortable. Kluegard saw it and is going to change to that also, so he said. Flew two hours today and not cramped at all. P.S. My wife finally made me start fishing!

Irvin H. Faur - April 1, 1967 - Am sure you get sick and tired of my raving on about the little T-18 but that is the way it is. Now I had everyone try to impress me with flaps and of course I ignored some. But they are needed for sure just to slow down the landing role to keep from using so much braking. That is absolutely my only fault with the little bug and flaps will be on mine in '68. Have now flown my T-18 just over 180 mph on straight and level. This is not hogwash or guesses. That thing moves. There is no doubt by Rockford time I'll be doing at least 190 - same prop 66 x 72. Only went to 100 oct. fuel. Have the gear to cuff. and a few other details. Turned 2925 on this run. Noise level about normal - vibration about normal - speed fast. John says the dynafocal mount will further reduce vibration. Now have the plans for same. Don't believe I have the vibration Bob Knergard has but, boy, his workmanship is really good.

SHEET AND TUBING KITS - I no longer will handle any kit orders. Sport Aero has matched our price so I'm very glad to let him handle the kits. A complete sheet and tubing kit is $300 with no excess. This is more than our partial kit but less than the complete kit which had a lot of excess material. He will include all plate stock up to 1/2" for a total of $350. The only problem with the kits is that to get this price he needs eight orders at a time so you might have to wait awhile. He will pack the kits well so there should be less trouble with shipping damage. A kit can be shipped to the West coast for about $20 so it is well worthwhile. He will also handle the flex shaft. I have only 3 sets left. My wheel retainer bolts are now all gone.

FORMED METAL PARTS - Jack Lane, 3029 S. St. Louis St., Ft. Worth, Texas, 76110 will make any formed sheet metal parts for the T-18. He says they are first class. Tank $75, Wing tips $100., all tail tips $45., cowling and bucket seats also available.

NEWSLETTER INDEX - Louis Wing, 698 Peralta Ave., San Francisco, Calif., 94110, has prepared a 5-page index for the T-18 Newsletters. He got tired of searching for info on various subjects so made up this fine time saver. It is available free if you send him a self-addressed business size envelope. However, I'm sure he doesn't realize what it will be like to fill 500 orders so I suggest you send him 25¢ to help bribe his kids to do the work.

SERIAL NUMBERS - I know what filling orders means because out of the 500 questionnaires, at least half of those returned required some sort of reply. I learned that many of you don't know your plans serial number which is what my filing system is based on. You will need this number when you apply for a registeration number for your T-18. It appears next to your name on the Newsletter address label. Please, please, write this number on the upper left hand corner of all correspondence, especially on change of address notices. My daughter, Lisa, got so tired of searching through the 17 pages of names to make address changes that she has threatened to quit. Also, on questionnaires, please fill in your complete address, not just your street address. If any of you order anything from me and don't receive it within a reasonable time, please send a reminder, for things do get lost.

SPORT AERO - Lucius Bigelo, 17 Crescent, Sumter, S.C., 29150 says that he has ordered 50 sets of main spar extrusions which will be delivered in March. 25 sets are already sold so get your order in or you might have a long wait.

GAS TANKS - A little advice on the filler neck. You will be disappointed if you use the filler neck as shown in the plans protruding through the top skin. It is a little extra work, but well worthwhile to use a shorter neck and an access door. With the internal gas cap you will need a drain for sloppy gas attendants. Lawrence Larson, 137 N. Union St., Delaware, Ohio has some good ideas on tanks.

"Have a suggestion on the mounting. Use automotive window channel tape which is available at automotive shops and comes in various thicknesses. It has a cloth backing and is very durable. I drilled small holes through the gas tank saddles, applied the bath tub sealer (available at plumbing shops). The sealer beads through and makes an anchor for the tape. Used a gas tank gauge and sender from a 190 XT Allis-Chalmer farm tractor, which fits the tank perfectly. These gauges and senders are available at any Allis-Chalmers dealer. The gauges are marked with a red line which is very convenient for aircraft application." This tape and GE silicon adhesive really work well. I also used it. The gauge sounds fine too so now we have at least two to choose from, this and the VW type.

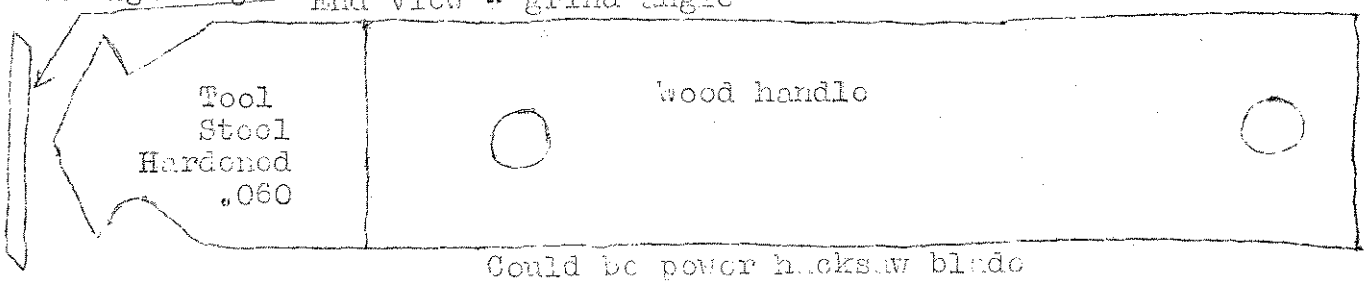
Bob Kaergard - January 15, 1967 - The story goes like this - last Nov (66) I couldn't take the cold weather flying in the open cockpit so I removed the wing and brought my bird home for winter storage and to add the canopy. I had to remove the tail feathers to enable me to keep my wife's "Falcoon", my VW, and the "Komet" in a 22' x 24' garage which is also my shop. At any rate, when i removed the metal fin tip which is the first step in the disassembly, I nearly fainted! The rear end of the fin tip rib was cracked in each bend radius of each flange going forward from the rear end of the rib and about 1-1/4" on each side! The end of the fin beam that is bent back and rivets to the rib and rudder hinge was completely broken from the end of the beam. There were only the two rivets on the forward end of the rudder hinge plate keeping the plate in place. How long the condition existed that way I have no way of knowing but it was started when my tail wheel spring came loose in October, 1965. H w much longer the thing would have stayed together is also hard to guess at, but the least that could have happened it seems to me, would have been loss of the upper rudder hinge plate - in the air - curtains! - on the ground - no sweat. So now I'm pretty religious - at least grateful nothing happened to louse up our homebuilt record. Every T-18 that flies, or for that matter, any of our homebuilt aircraft, should be subjected to almost constant inspection. We have to be so suspicious of our work and the material we have used! All of EAA is on the block, so to speak, if we have accidents. My fuselage has been cut down now and the new deck installed with the stainless steel canopy track, shoulder harness attach points, and a couple of stiffeners under the deck John suggested. Perhaps I should have the new Hamlyn nose cowl installed before I fly next summer but I thought it would be interesting to add the "goodies" just one at a time to get some numbers and evaluate each part of the clean-up.

GEAR MOUNTING BUSHINGS -No. 406, Lloyd Tall, Box 303, Hazen, Ark., 72064 has enough 1/4" neoprene to make 50 T-18's. He found that it can be rolled to make the tubes also. He will sell you enough for the 4 washers and two tubes for $2.

3/8" PLATE - P.D. Gonzales, 1318 Server D ., Colo. Springs, Colo. 80910 has located some scrap 1/2" plate from which a number of fittings can be made. I've lost the price, but is reasonable.

TIPS FROM AUSTRALIA - Peter Nedgens, 136 Curlewis, Bondi Beach, NSW, Sydney, Australia sends these tips along with a photo of his beautiful Emeraude.

1. Cutting sheet alclad up to .025 for spars etc., place sheet on flat table and clamp straight edge along line, use the cutting tool drawing of which is included. Takes a bit of hard work but produces good clean straight edge.



2. To make male fibreglas spinner mold construct wood frame allowing 1/4" for plaster cover with burlap material tacked on, and then lay on 1/2" of plaster in one lot, first paint thin coat on burlap to stiffen it. Let plaster dry and then turn in lathe to required contour. Sandpaper finish, seal with two coats shellac, then use auto primer.

3. When making wing tip mold, etc. after preparing the male plaster mold including parting agents, draw a heavy soft pencil line at half-way point. Lay up fibre glass female mold using clear resin, let set till firm and then cut to pencil line with Stanley trimming knife (line can be seen through lay-up). Do same with both female halves. When laying-up finished wing tip halves in female mold, trim exactly to top edge with knife, join two halves by taping together with masking tape and two or three layers of cloth and resin inside.

4. To flip half template about center line, make 1/4" wider and use two 1/8" holes on center line. I figure this is a better method than straight edges as John suggests.

Ron Lee, 1423 Trenton Drive, Anaheim, Calif. - Flies - Received a nice photo from Ron showing his nice looking T-18 which is now flying. Am anxious to hear more about performance, Ron.

More on Herman Rassler, 98 Constitution, Henderson, Nevada - Dec. 29, 1966- I just flew my bird October 19. It weighed in at 920 lb. with cg range of 18.5 to 31.5. It has a Flotop prop - 65 x 68 to which I credit most of the good performance. The engine is an O-290D2 with G jugs. All my minimum test altitudes here are above 4000. I get a max. rpm of 2950 and at 2800 rpm a ground speed average of 172 mph. Rate of climb is 850 ft/min at 10,000. It is flush riveted with filler, has flaps with electric actuator, electric trim, crossover exhaust, full panel with gyros, no center console, 15-600 6 tires, canopy and side doors, 36 gal. gas tank, Falcon air filter and Corvair cooler. To say I am completely satisfied would be an understatement. It is a very honest bird. Plenty of burble on the stall and straight forward. The only thing I might not like is the sensitivity on trim. To equalize from solo to dual I had to trim ailerons to hold right for solo and left for dual. I'm trying now to dream up a two position aileron trim. Any suggestions?

The only "fly in the ointment" is my operating restrictions. The 50 hours local was bad but now I'm restricted to days only and avoid heavy air traffic, cities, towns, villages, and congested areas. I have sent in a letter of protest but as yet have had no answer.

Herman Rassler - 1/10/67 - Just received your letter of Jan. 4 today and will start an answer.

Flaps: My flap actuator works smooth and easy. The only prints I have are of the flaps themselves with a 1" OD tube extending into the fuselage. I ran a 1" x .049 stainless steel tube all the way through and mounted a 1" ID "T" shaped fitting at center line to which an actuator (surplus 24V, 6-3/4#, $10.95)is rigidly attached to hold center. The bay from seat back to Sta 119 is all luggage comp, so I had to build a tunnel high and wide enough to clear the torque tube and rudder cables. The area under the tube is just right for an actuator and the tunnel reinforces Sta 119 enough to anchor the other end of the actuator with an extension of about 4" added. The actuator has built-in limit switches to set the length of travel and the extension has adjustment threads to adjust location. I haven't had too much time to test the flaps as my home port (Poulder City) has one gravel and one blacktop runway, bot at 6% slopes. All landings are uphill (if it's not too windy to fly) and the T-18 flares for an instant and then stops so I never use the flaps at home. I have made landings at our dry lake so do have impressions but no definite figures as yet. It stalls 5-6 mph slower with full flaps. The roll is about 2/3 normal although it seems shorter. It will three-point but the flare is about as quick as at Boulder. Partial flaps (they stop at any variable) don't seem to have very much effect either landing or take-off. My actual impression is that they make very good dive brakes or drag brakes which ever is the right word. I'm glad I have them installed because they do help slow her down and recommend them for short fields. It takes about 2/3 power to maintain level flight with full flaps at 100 mph so that should give you some idea of the drag. I got a queer feeling making turns with full flaps. Nothing I can explain but just uncomfortable. I have an old timer test pilot who is going to check it out for me and explain it. The 24V motor runs at half speed but the power due to the gearing is much more than adequate. The same goes for the trim actuator although it is a small unit (1 lb., 15 oz.) It just happened to be the right length to mount vertically behind the stabilator arm. At the top it's bolted to a cross-over arm similar to Thorp's print to give 1" travel and the bottom to an angle across the bottom longerons. It was a very simple installation but if that little motor ever quits it will be a major operation to repair it. The fellows should give some thought to an inspection plate in that section or a two piece top cover. You just can't see into that compartment and a good inspection will require removing fin and rudder. Chritionson plans a regular round inspection plate on each side. I got the extra space for the fuel tank by moving the panel aft about 3" on top and 3" on the bottom. Made the tank of glass, just as wide as possible and as close to the instruments. Instead of a continuous curve from firewall to top aft I have a straight vertical line down for about 6" or 7". I have a Sky-crafters radio which just clears the tank but with glass construction a dent would have given me another gallon if I had known for sure just what radio I was going to have. If anyone copies my panel layout tell them to group the instruments a little tighter vertically. My panel just does clear my long knees at times. There is about a 1/2" above and 1" between the flight instruments which could be worked out.

I used AN flush rivets and back drove them wherever possible. Riveted the side panels to the longerons on the flat and those panels are drum tight. The body filler is Martin-Senour's "Payday" - a polyester filler applied to clean bare metal. I didn't know the trick of using the rubber hammer to bring the rivet back up after driving so I still have slight depressions along the rivet lines but most people can't see them. I used about 4 lb. of the Payday but at least half of it was waste due to it setting up to a crumbly consistency before I could get it spread.

A fresh mix spread with a piece of .090 plastic sheet wiped on with very little sanding required. In fact, where it was back-riveted, I don't remember sanding at all. Sure makes an amateur rivet job something to be proud of.

Pro P.

I must have got my pitch numbers mixed in my last letter. The prop is marked Flotrop 7668-11 which means 11" cut off a 76 dia. to make a 65 diameter-68 pitch. It comes from the factory as a 76XX-2 for a small Beechcraft. The cord length at about the center of the blade is 5-5/8" and at the tip is 4-1/4". It looks to be more of a work horse than most of the blades I had checked before. I'll send photos of the engine installation with the cowl sides down which should show all the goodies. Eventually I want to mount an extension and get more slope to the frontal area. Also Lee's cowl is wide enough for a 180+ and quite a bit of area could be saved there. My air intake may also be slightly small, although not as much undersize as the books say, and I could use a little more ram air for manifold pressure. The cowling ports are 1-1/2 times inlet plus 1/2" clearance all around the exhaust stacks. I tufted the air flow and it seems near perfect on the sides. The tufting on the canopy all lays flat and straight too. My big problem on that greenhouse was getting fresh air to the face and shoulder area. The windshield area is all high pressre so I have a Mickey Mouse trap door with the roll bar brace in the center and it difuses the air perfectly with very little noise. I plan to unshroud the heaters and use those tubes for more air in the summer. (Nevada gets hot!) I used 1/2" high density fiberglas insulation around the fuel tank area and 3/4" under the carpets on the floor boards. The rest of the cockpit and baggage area is lined with 3/16 sponge rubber stair runner purchased from Wards. Everything is glued to the outside skins with air conditioning duct insulation glue. This glue is a yellow rubber based stringy, sticky, about like rubber to metal cement, but much cheaper. Just slap it on thick, get the material on while it's still wet and take a bath in gasoline to clean up!

The noise level is about the same as a 172 really winding up. That is a real busy sounding engine at the higher rpms. Mufflers might help some but with the cross-over system and the heavy insulation on the floor I don't seem to hear much exhaust. I would rather get some high freq. insulation for the firewall and cowling to cut down the prop noise. I haven't located any around here yet. I have a buddy in Phoenix trying to get some there. I have the standard gear from Tubular Products with 15-600-6 tires. On normal runways I like the stiffness but on rough strips I think it could even be dangerous. I went into Furnace Creek at Death Valley which was rough surfaced and also alkali heaves - about 4"-6" high and it was a real fight right down to taxi speeds. As short coupled as that bird is and with all that rudder, it is very easy to over-control normally without being bounced around in the cockpit. The gear came from Tubular with toe-out which I corrected to neutral with skins. The toe-out was alright down to about 20-25 mph while the rudder had plenty of control but then it seemed to want to dart (maybe I should say drift) to the sides with more and more rudder jokeying to keep straight. The only sod we have around here is golf courses and football fields but gravel and dry lake beads aren't any different than blacktop. Youre busy but that's to be expected.

Now about that first flight. I'll never do it again! After inspection on the morning of Oct 19, the inspector told me to take it around the pattern and then he would sign it off for test flying. I had done quite a bit of taxiing so had rudder under control but other than a few gentle lift-offs without watching any instruments I had no experience of the other control movements. I took off, circled, lined up with the runway, made the transition from downhill to up, slowed down to 75 indicated, flew

into the side of the hill, bounced, stick forward, bounced harder. After three progressive bounces I finally realized I was in trouble so I shoved the throttle in and went around. Next time around I slowed to 70, made every movement as easy as possible, finally touched and rolled to a normal stop. The inspector signed her off so then I took her up again to see just what kind of a wild beast I had sired. Thorp said it should stall at 68 (which it does) but my airspeed said 35. I made the next landing approach at 45, flared at about 40 and had no problems until the final rollout with the toe-out gear. I figure I was trying to land at about 110. After trying a dozen ways of modifying the static system, I finally gave up and am now using cabin static which is 2 mph faster than ground speed with the vents closed, 3 slow with them open at 4000 ft. Maybe I have these figures reversed but there isn't enough difference to worry about a fancy static system at these elevations. According to my figures standard sea level should also be close for indicated and true. While at Death Valley I made a high speed run at sea level to see what max rpm would be. Thorp said it should be 3000 and for 75% start at 2700 sea level, add 25 per thousand feet to full throttle at 2900 at 8000. I developed 3025 at sea level with an indicated speed of 193, two people, half tank gas and no baggage. Maybe someone with a slide rule will say I'm all wet! I find it hard to believe that top speed myself. Most of the flight was at low levels and 2700 or more rpms and fuel consumption was slightly over 10 gph so I must be pulling much power out of that engine. I'm going to Phoenix this weekend and hope to make at least one way at over 10,000'. Should have better cross-country figures to add to the end of this note. I would recommend anyone testing this bird to stay up on the first flight and really get to know it before that first landing. Check that gear close (for toes) and make those tires very soft for the first few landings. My test pilot friend says his impression of it is about the same as military only faster response due to the light weight. The name "tiger" might be a little strong but it's no "pussycat". I made the crossover stack system out of standard auto pipes and U-bends. Tacked in place right on the engine, removed to weld with x braces on the flanges to hold warpage. After welding and light sandblasting, I used a 1/4 pint of heat resistance paint, sloshed it around inside (what a mess) and sprayed what was left on the outside. After air drying I cured the paint with a butane torch. Just let the flame blow up the stacks. There is no good point to support the rear lengths of the pipes as you will note from the photos. After about 15 hours they cracked at the 3 to 4 junction. I re-welded that and welded a sleeve brace over the joint. It is showing a little rust in that area, otherwise they show no sign of deterioration. If that paint doesn't get scratched I don't believe they will ever give out. This area is easy on metals anyhow.

The seat backs are 1" foam on 1/4" plywood with an angle stiffener at the center side. The bottom cushion is 3" coils with 4" foam rubber on plywood base. They are heavy (11 lb. each) but very comfortable. I strapped myself into cruise position for three hours and read a book for testing. I didn't want to suffer from TB (tired butt) on long trips. The cushion sets on a dustpan shaped tray which swings up for storage below. Room for landing light, tools, tydowns, and other standard equipment. Desert survival for here. FAA answered my protest of restrictions with a new operation limitation. The high density, cities, towns, etc. has been deleted and this substituted: flight tests are prohibited. Also they advised me that on the installation of a rotating beacon they will lift the day only VFR. For once it payed to howl although I don't know what they mean by the flight test restriction because #4 says: Any major changes to this aircraft shall invalidate this certificate.

One thing I would advise everyone to do is drop the windshield down

to 42 WL. The front trim strip will then be a straight strip. That area is where most of the ground viewing will be done especially if the canopy turns out grainy as mine is. Not bad, just not crystal clear like the windshield. Those small windows in the doors are useless other than helping the overall lines. The view angle is too low. The door latch interferes with my shoulder. In fact, doing it again, I think I would make the seat tunnel high enough for an arm rest and do away with the door entirely. The seat belt arrangement I have prevents the tunnel biting into my hip and more heigth should make a better step with just a tighter seat. Christiansen is making a solid canopy with Mercedes type swinging doors and plans to do away with the tunnel entirely by mounting the wing permanent, using a bell crank on the torque tube and pulleys on the rudder cables. It sounds like a good idea. The only problem I can see is working the flap actuator around the bell crank area. His turtledeck and cabin area looks very sharp with the only compound curves in the doors.
1/15/67 - Just returned from a semi-fly-in at Phoenix on the invitation of Roger Weselmann. He is an engineer at Bonanza Airlines. He explained the flap action which had bothered me as a natural effect, nothing to bother with. He thinks most of the buffeting sounds are the quarter panels on the rear deck. They just can't be made tight and he could see them vibrate at certain attitudes. Those panels should have some kind of a radius built into them. The top panel can have a center angle riveted in the flat which will stretch it into shape just like the sides. Mine are that way and very solid. Just two rides in my bird sure built a fire under him. I held her at 2800 both ways, burned 8.8 gph at 11,500 and 9.6 at 8,500 and got an average ground speed of 168 for the trip both ways. My pilotage wasn't the best due to too much winds and mountain ranges. Had a GS of 188 down and 150 back by holding an indicated 150.

O-290-G Conversion and Overhaul - Although many words have already been written about converting the O-290-G for aircraft use, you might be interested in hearing of my experiences. I found the manuals and articles very informative, but they never seemed to cover all the little items you really need to know. First, in buying your engine you must realize you are getting a pin-in-a-poke. Your engine might be brand new, one with a fresh major, or it might be a run-out. If you can inspect it before purchase, you can tell something about the condition, but you really won't know the whole story until it is completely disassembled. It is fairly common for the oil passages in the crankshaft to clog up, due to the dusty ground environment, and cause the front main bearing to sieze. This condition if severe, can be detected by discoloration of the case. Condition of cylinders can be determind by inspection through the spark plug holes. An engine which was recently overhauled will have visible circular hone marks and very little carbon deposits on the pistons. Vertical (longitudinal) scratches mean longer wear. Condition of exhaust manifold gaskets also indicates time since new or overhaul. Drain out some oil and check for metal particles which are a danger sign if present. Of course check compression by pulling it through and check for damaged cooling fins. The best bet is to buy your engine from a reputable source who will check it for you, but as scarce as these engines are becoming, you can't be too choosey. Sport Aviation and Trade-a-Plane list current sources. My only advice is, buy your engine now since they are getting scarce. (Continued in next Newsletter)

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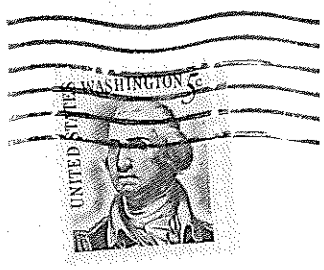

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