LU'S VISIT

Yesterday I took Lu and Marilyn Sunderland out to DFW Airport for their return trip home. They had stopped over for a day in Dallas for Lu to appear as a guest on a radio show. They had been in L.A. before coming here, where Lu had appeared on two national TV shows. As you may know, Lu maintains a back breaking schedule in pursuit of his goal to get the courts and school boards to present creationism on an equal basis with the theory of evolution and he maintains the pace in spite of his bout with intestinal cancer. Apparently he's winning the battle, but has had some severe pains that don't appear to be related to the cancer.

He reports that there has been a big spurt in sales for S-18 plans since OSH and the T-18 article in Sport Aviation. I've had several letters from propspective builders asking my opinion as to whether they should build the S-18 or a RV-6, since I did a brief write up on the RV-6 for Sport Aviation. As an editor, it wouldn't be kosher for me to advise anyone either way. Especially so, since the RV-6 is in the prototype stage and any mention of deficiences or shortcomings at this stage certainly would not be fair to Van Grunsven, who I have great regard for. Most of the inquirers were puzzled at the considerable difference in RV-6 kit prices and parts cost for the T-18 or S-18. Without comparing item for item between the two, it would be like comparing apples to oranges. Actually, there is no available "kit" for the T-18 or the S-18. I haven't had a chance to add up the total of all T-18 parts listed in Leisure Aircraft, Ken Brock, or Phil Tucker's catalogues, but I've been told that it adds up to around $12,000 (vs $6800 for the RV-6 kit).

JOHN WALTON

I'm happy to report that JOHN WALTON's health problem seems to be better. John had a recurrence of his lymphoma (cancer) this past fall and has been undergoing chemotherapy and results look very good, as of this week. He's even been working on his two T-18s and hopes to be back in the air with his old 'un soon and he's looking forward to flying it with the O-360 engine and c/s prop (the eng. and prop he took out of the one he bought). He actually swapped everything forward of the firewall between the two birds, along with rectifying the damage to #1 that the tornado did to it. He has also replaced the Rattray cowl on #2 with a fiberglas Thorp type cowl he made in my molds. The top piece of this cowl is made of metal (.040), which is rolled in a sheet metal roller to match the 80% 2nd degree curves at the firewall corners. The front end is also rolled to match the semi-circular front piece.

COWL TIP

If any of you want to go this rout it's fairly easy...if you can find a roller with a little more than 36" capacity. Otherwise you'll have to "shoe shine" the curves in by hand over the edge of a wooden work bench, which takes effort and patience. The front piece is flush riveted to the top piece. The whole thing matches out well with the skin over the top of the tank. The nose piece is made out of .040 2024 T-3 also and is formed over a form block, with bend relief cut-outs about every inch. This leaves tabs of about 1" in width and they easily form over the form block. Don't forget to drill the relief holes well clear of the bend area, or it may crack as you bend it!

GREEN

GARY GREEN called the other evening and suggest we have another one of those great T-18 re-unions, like we had at Temple, TX, a couple of years back. His thought was to have every one meet at Texhoma Lodge on the 1st weekend in May and all have dinner at the Lodge dining room. It's a super nice facility, with a golf course across the street, a 3000' paved airstrip almost at the door, and Lake Texhoma a stone's throw away. (cont'd)

TEXHOMA

It's a very enjoyable place. I went in there in a Grumman Cheetah last year to an fly-in the American Yankee Ass'n held and later wrote a report on it for Sport Aviation. We can't call it a fly-in, because of the liability angle and we can't call it a drive-in , either, but Gary says he and Leroy Holt are going to be there to have dinner, maybe have a couple of cocktails, and talk airplanes and airplane people and if any of you would like to join them they'll set another plave at the table. Why don't you give Gary a call at 405/233-3186 or write him at 2007 Ramona, Enid, OK, 73703. (Yes, Gary is back at Vance AFB, instruct'g in T-38s (tough duty) again.

LEROY HOLT FLIES

LEROY HOLT, who lives at McAlester, OK, is flying his T-18 now and Gary says he's doing a good job with it, except for trying to flare it too high once in awhile. He says the airplane is so well behaved on the ground that you could almost land it with your feet on the floor. Leroy's airplane is a wide body, with folding wing and the new airfoil. It has a 180 hoss Lyc in it and a c/s prop. Gary test hopped it for him and has also checked Leroy out in it. Gary's T-18 has a 180 in it, too, but his has a fixed pitch prop and he is impressed with how quick Leroy's T-18 gets off and climbs, but cruise is about even. Landing roll on it is shorter, because of the braking action of the c/s prop in flat pitch. Gary says he can't tell a nickel's worth of difference on stall speed or stall characteristics (58 mph IAS on both) and no difference in stall warning. Maybe the new airfoil just cancels the extra weight of that heavy c/s prop, with its extra lift. IAS airspeed at the stalling angle of attack is well known to be unreliable in most pitot/staic installat-ions and certainly varies from airplane to airplane anyway and a lot of little things can affect stall speed. It would be interesting to evaluate a couple of dozen airplanes for comparison, wouldn't it? One thing I've learned down thru the years is that a lowered stalling speed and a higher top speed don't come easy. It takes a lot of effort on either end and you can depend on having to fight for even small gains. Anyway, we'll be looking forward to seeing Leroy's new bird and admiring it. It's been a long and rocky road to get there for him and we congratulate him for his perserverance. We'll also be looking forward to Leroy's story on his bird. He had more discouragements than you could shake a stick at, but stuck it out to the end. I think Leroy's airplane makes the 5th flying T-18 in Okla.

SPINNER TALK & TIP

SPINNER TALK: I constantly hear complaints about the high cost of T-18 Spinners (about $250 at last reading). I've seen enough made to know it's not easy and the reject rate is pretty high, too. However, I saw a slick little way to make a fiberglas spinner at a recent EAA meeting. A solid wooden male mold was made on a lathe and a length of tubing was insert on the aft end to hold it in a vise, with the male mold 3 or 4 inches above the vise. The mold was covered with what looked like silver colored duct tape. He then inflated a fairly large ordinary rubber balloon and tied it off with a rubber band. He said he put several plies of bi-directional glass cloth on over the mold, wetting each one out with epoxy as he went. Then to hold the fiberglas tightly to the mold he placed the inflated balloon at the upper tip of the mold and started gradually pressing it down as he gradually released the air out of the balloon. It went down so slick and easy and held the wetted glass tightly to the mold. He said he could have put another balloon directly on the mold instead of the tape (both of which would be sprayed with PVA mold release, of course). He then put a plastic garbage bag over all of it and pulled a vecuum on it to pull excess resin out. Said it balanced, too. (You'd need a big balloon for a T-18 Spinner)

(cont'd)

SPINNERS

I had a fiberglas spinner on my RV-1 that had over 1000 hrs. on it when I finally sold it and it never gave any trouble. I also heard of a fellow that used an old phono turntable to centrifugally cast a fiberglas object, so that the centrifugal force would evenly distribute the resin for perfect balance. Might be something you would like to experiment with for fun. Let me know if you do, etc. You'd probably need to get up to .040 to .063 in thickness, I'd guess.

You might want to balance your prop and spinner separately as a unit, adding lead washers on the back plate flange if needed.

FOR SALE

FOR SALE: I have a note from Lyle Fleming, 46035 20th St. E., Lancaster, CA, 93534, 805/942-2481 who says, "I have a standard T-18 landing gear and a standard fuselage that is a real good one except for the aft bulkhead, for the vertical tail needs some repair. I also have a set of T-18 blueprints to go with it. In addition, I am also thinking of selling my standard fuselage, folding wing T-18, with full IFR panel, including a Loran C, encoding transponder, and an O-360 engine, all 90% completed. Make offer for these." Lyle wrote the letter in late Oct. '86, so a telephone call might be in order as to current status. He gave no reason for selling. A picture of his #1 a/c is enclosed.

ED ROGERS

F.E. ROGERS: Formerly of Sioux City, IA, has moved to Phoenix, AZ, and he wrote the following: "Have completed move to AZ and in the process and in the process have left 71ED with the Sioux City Museum, a difficult decision after 10 years building and 8 years flying. The lure of our family and grandchildren prompted the move so we could spend more time with them.

The Thorp T-18 has shared our affection for many years and I still feel it is one of the finest, if not the finest of the homebuilts. It saddens me to see the trend toward assembly of kits, rather than the actual construction of the various parts from raw stock. Altho' I am no longer a T-18 owner I want to keep abreast of all the latest developments and information offered in the newsletter. My files contain all the newsletters and I frequently thumb thru them to refresh my memory of the enjoyment I had building and flying the T-18. Please keep up the good work on the newsletters. Our hope and prayers are with Lu for a speedy recovery from his current ailment." Sincerely, Ed.

Thanks a lot, Ed, for the kind remarks and good luck for your lifeahead in Phoenix. (I added this letter as food for thought for some of you that may be facing the same problem one of these days.

LIABILITY

Under our present liability system in the courts the original builder of an aircraft can be held liable for mistakes, deficiencies, etc. that allegedly might cause an accident, even tho' there have been several other owners in the interim. This means you might want to discuss your alternatives with a competent lawyer before you sell. We'll go into this subject in depth in the next newsletter. In the meantime, if you have any thoughts (or possible solutions) on the problem, I would encourage you to write them down and send to me. If you have a lawyer friend you may want to discuss it with him and record his opinions on how best to escape liability. This is an extremely serious problem that ALL builders of an amateur built airplane must address when they or their heirs sell the airplane. It goes without saying that you should write to your lawmakers about the dilema.

CUTTING TRAILING EDGES - MONROE MAXHIMER

10202 N. 46th Ave
Glendale, Az. 85302
October 22, 1986

DEAR DICK,

I must apologize for not getting my dues in on time, but the time sometimes slips away when you're trying to get an airplane done in two years. Enclosed is the $10 of my dues. If I owe more please let me know.

At the present time I am in the process of getting my fuselage ready to rivet. By the time you get this I should be well on my way. I have my flaps, ailerons, fin, and rudder finished. I found the rudder to be the most difficult to make. The hints in the news letter was very helpful in doing everything so far. I must say though that there is some misguided advice that must be sorted out and discarded by the individual before starting a particular task. ?

I made my own landing gear also. I welded it up with a DC arc welder. I talked to one of the "people" at Oshkosh before doing it and they said it should be as good as heliarc if done correctly. Personally I think it turned out very good. The worst part about making the whole thing was making the jig to hold everything in place.

When making my flaps, ailerons, and rudder I found the secret to making straight trailing edges is to "not" cut the trailing edge with tin snips, and squeeze the rivets. The way to cut the trailing edge is to either shear it or scrape it in half with a sharpened hacksaw blade, as described in a earlier news letter. The writer called it a poor man's sheet metal shear. Of course you must also hold the edge straight with a piece of angle on each side while riveting, which was also described in a earlier news letter. I guarantee you will be satisfied with the results. In all the fly-ins I have attended in the past two years I have not seen but one T-18 with trailing edges as straight as mine.

For a power plant I am using a Ford V6 with the Javlin conversion if I ever get conversion unit from Blanton. I have had it on order for 15 months, but he has had some production problems. I am using the 1.6 to 1 reduction which he has yet to test. According to the information I get from Blanton there are several others considering the Ford V6 for their T-18. If they are reading this news letter I would like to hear from them in regards to how they plan to mount the engine since it needs a four point mount. Also where are they going to mount the radiator, and how are they going to route intake and exhaust air to the radiator.

Yours truly,

Monroe Maxhimer

Monroe Maxhimer
serial # 612

Thanks, Monroe, for the tip on the trailing edge and the little shearing tool. Also, appreciate the comment on the Javelin engine. We need more letters like yours!

ALIGNING SPARS AND STAB'R TUBE

6 Oct 1986

Dear Dick,

Enclosed my dues with gratitude for every word in every newsletter. I started # 888, I think, in 1972 with a lot of on's and off's. I definitely have a T-18 in my garage. I'm getting ready to lock in place the horizontal tail tube. I started (using Ken's parts) by mating the center main wing section, on a good level surface with the 601 bulkhead and the 602 fittings. The main center beam was finished so I placed the attach bolts through the main beam fittings, the 601 bulkhead and 602 fittings, locked everthing together, carefully marked the 602 fittings to the 601 bulkhead, took everything apart, drilled and riveted the 602 fittings to the bulkhead, placed the 601 in the fuselage and finished the job. I used the wrap around doubler on the 601 bulkhead, but since the 602 fittings were in place, the first row of rivets is impossible to buck, so I poped the first row and used an's for the second row. It seemed to work very well and everything is straight and level. Now to the horizontal tail tube. I intend to leave the main center wing beam in place and with the horizontal tail tube also in place, align the tail tube with the main wing beam using a Hewlett Packard digital transit. I have a great engineer operating the transit and I'll probably get more error in alignment by trying to drill the first holes in the lugs on the tail tube than I will in the initial alignment with the transit. My, this is wordy. I hope you won't consider this overkill, but it's going to be fun trying to make it perfect.

Thanks again for the newsletters.

Respectfully,

Robert Clayton
1783 Harvard Ave.
SLC, UT 84108

Thanks a lot, Bob, for your report. Every new builder should know about those pesky rivets in the 601. Just remember to not rivet the fittings on 1st & there's no problem.

The next few pages are from our indomitable T-18 builder in the U.K., Jim Waller, and I know his account may likely increase your appreciation for the relative freedom from bureaucratic pomposity and xxxxx that we enjoy here . (Canada)

JIM WALLER'S REPORT

"Fairhaven",
Shirrell Heath,
Southampton SO3 2JN
(0329) 832754

Mid August 1986

Dear Luther,

Herewith flight test schedule for my T-18 G-BLIT. Perhaps you'd like to send them on to Dick Cavin for the Newsletter.

Thanks to your letter of 23rd Dec. things got moving again. However, not having heard anything by mid March I assumed our CAA was corresponding with you. Anyhow, I took a day off work and went to see the Engineering Officer of the Popular Flying Association (our equivalent of your EAA) and G-BLIT had its first flight that day, 17th March, remember I phoned you. Since I have only been flying the mandatory 5 hours required to keep my licence, apart from 3½ hours in a Chipmunk late last year, I got a friend, Barry Dyke, Chief Flying Instructor, Western Air Training to do the test flying although I flew it from the right hand seat from 24/5/86 and when we were doing the tests.

The first flight was traumatic. The canopy catch failed on takeoff and Barry flew G-BLIT with his knees whilst holding the canopy closed with one hand. Note the modified catch drawing which I have enclosed. Now the fun began in earnest since Barry Dyke fell out with Western Air Training and went to another airfield to start his own school. The Permit to Test stipulated that G-BLIT could only be flown from Thruxton with B. Dyke in command and he had moved to Old Sarum some 10 nm. away. What with the foregoing and continuous wet weather until the end of June to say nothing of Old Sarum being, despite its nominal 900 metres length, marginal, I only soloed G-BLIT for the first time on the 18th July. What with my having a week away in Scotland it was only last Sunday, the 10th, that I was able to get down to the serious business of starting to learn to fly it.

Old Sarum has a hospital to the north, the city of Salisbury which homebuilts are not permitted to overfly to the south and Old Sarum Roman fort dead in line with its E to W single runway. It is within the R.A.F. Boscombe Down Military Air Traffic Zone and a large Danger Zone (Army Range) lies due east. What a daft place to put an airfield. Not really. The airfield has been there for a very long time and just about everything apart from the Roman bit, seemingly always swarming with sightseers, just grew up around it. Old Sarum does have two other setbacks, though. There are three or four places where apparently ditches have been dug and filled across the runway and it is ~ shaped. There is no problem for aircraft with well sprung u/c's capable of a steep approach but the Thorp loses out on both these counts. Most of us here are used to short grass strips where you make a glide approach, high for safety, and sideslip off excess height

A couple of sad things, though. Thanks to my misreading some wording on the Permit to Test we missed a chance to fly to the PFA Cranfield Rally, the biggest in Europe and equivalent of your Oshkosh, by one day. I know G-BLIT would have been a sensation there. The editor of our equivalent of Sport Aviation was hoping to do some air to air photography on us at another rally. Domestic arrangements fouled that one up. Last Sunday the anti-cyclone which should have developed instead turned thundery with very poor visibility so I lost out on another PFA rally. However it was almost a flat calm so I got in over two hours of circuits and am now confidently landing G-BLIT in well under half the length of Old Sarum without heavy braking or bouncing. Takeoff is no problem. Anticipating the swing and not overcontrolling is the answer. I ease the tail up as soon as the control column feels light at about 40 kts. indicated, nudge her off at about 55 kts. and hold her down until she indicates 80 kts at which speed at 65 to 70f. with two up she climbs at 900 ft/min and solo 1,200 ft/min. Old Sarum is just 300 ft. AMSL.

I have only calibrated my ASI by the manometer method given in the NL's and I have my pitot forward of the Sbd. wingtip (see photo of Vale of Pewsey) but there aint no way I'm going to be getting much more than 130 kt. fully laden. I'm using a wooden prop made by a friend. When I can afford it I'll have him make me another but I think I've dropped on lucky first time with the ideal combination for conditions here. He designed it 66" dia. x 76" pitch and my Lyc. 0320 E2G of 150 h.p. swings it at 2700 rpm on takeoff.

Old Sarum's one advantage is its circuit height of 600' (so that R.A.F. machines can pass overhead on their eastward approach into Boscombe Down). When I first started flying approaches in G-BLIT it took me a long time to get used to the long flat approach needed. I put on the first click of flap at 80kt. and allow speed to decay to 60kt. over the fence after which I'm far too busy looking for a bump free spot to touch down and holding her tracking straight to know how fast she is travelling. Solo she seems to float for miles. I have only and will only ever use full flap with two up. Surprisingly it doesn't seem to make a lot of difference but gliders and non radio aircraft use the field. G-BLIT climbs happily with half flap on the overshoot without much change of trim. When landing there is a sharp pitch down when applying full flap. I suspect that a full flap overshoot could be interesting to say the least. I'm tempted to blank it off.

The radio aerial mounted centrally between u/c legs seems to work well and after many landings its rubber tip is still not scraped. The VOR with Ken Knowles wingtip mounted aerial also performs well. If I remember to take a camera I'll send some photos of what she looks like with the cowlings off. Oh, before I forget. First flights were not pleasant due to an intense whining. This I traced to a tiny paper-thin gap between canopy & windscreen. Now cured by addition of window seal foam strip.

Must stop. Thank John Thorp for a fine plane for me. Best, Ian Waller

SUPPLEMENTARY FLIGHT TEST SCHEDULE.

Engine and Fuel System.

NOTE: SPEEDS ARE IN KNOTS ADD 15% FOR MPH

(1) Engine cooling on climb - the aircraft should be climbed at full throttle for five minutes, or to 5,000 ft. above take off point, whichever is less, and the following data noted:-

Time	Ht.	Cylinder head temp.	Oil Temp.	O.A.T.	I.A.S.
0	500	425 f.	100 f.	65 f.	80 kts.
1 min.	1 400	430	140		80
2 min.	2 300	445	160		80
3 min.	3 200	450	180		80
4 min.	4 000	445	185		80
5 min.	4 800	445	190		80

On completion of test the engine installation should be checked for any signs of overheating, abnormal discolouration of components, signs of chafing or rapid wear due to vibration. During climb any undue vibration that may be present should be noted.

Remarks:- Before commencing tests the Pitot/Static/ASI installation was checked for leaks and accuracy using a manometer. No leaks were present and the readings (over 30) were consistently within 5% of theoretical.

(2) Engine cooling at max. continuous power - the aircraft should be flown at Max. Continuous Cruise Power (or in the case of aircraft designed for air racing, at full throttle) for the maximum duration of the aircraft, less a reasonable reserve of fuel. The following data should be recorded:-

Time of flight. 3½ hrs.
Max. Cyl. Head Temp. reached. 450 f.
Max. oil temp. reached. 190 f.
Total oil consumption in flight. About 1 pint (?)
On completion of test the engine installation should be checked for any signs of overheating, abnormal discolouration of components, signs of chafing or rapid wear due to vibration. During the flight any undue vibration that may be present should be noted.

Remarks:- This and all other tests were conducted with two 12½ st. occupants & full fuel - i.e. within 50 lb. of maximum permitted all up weight.

Stalling.

(1) Level Flight (In attaining stall the airspeed should decrease at not more than 1 mph/sec.)

(a) Power Off V_s =50 kt. I.A.S. clean. 1st stage flap: 48 kt. Full (40°)flap: 45 kt.
Tendency of either wing to drop:- Slight left
Is there any natural warning of the stall?= Buffet
At what speed does this occur?= 55 kt.
What is the control effectiveness at stall?
(i) Aileron = Still effective
(ii) Elevator = Good
(iii) Rudder = Good

Check that the throttle response is satisfactory = Yes, good pickup

Estimated loss of height during recovery = 100'

(b) Power on V_s = 45 kt. I.A.S.

Tendency of either wing to drop:- Right wing drop

Is there any natural warning of the stall? = Buffet
At what speed does this occur?= 50 kt.

What is the control effectiveness at stall?
(i) Ailerons = Good
(ii) Elevator = Good
(iii) Rudder = Good

Check that throttle response is satisfactory = Yes

Estimated loss of height during recovery = 100'

(2) Dynamic stalls - checks should be carried out at Full Throttle and intermediate power settings in both turning flight (60° bank) and in pull out conditions.

Speed and conditions at which stalls were carried out:-

(a) Power on. 50 kt.

(b) Power off. 55 kt.

Behaviour in stall:- Opposite wing drop

Recovery:- Immediate response to rudder & elevator

Is there any warning present? = Buffet

Rates of Descent.

(i) Measure rate of descent power off at 1.3 V_s (65 kt.)

= 800 ft/min.

Sideslips.

(i) Power off at 1.3 V_s 65 kt.

(The aircraft should be sideslipped at the appropriate power setting and first the rudder should be released and then the stick should be released. These actions should be carried out independently of each other.)

Directional stability? - Does aircraft turn out of sideslip? Yes
Remarks:-

Lateral Stability - does wing tend to rise, stay steady or increase bank?
Stays steady

Remarks:-

(ii) Power on at 1.3 V_s at 60% T.O. Power.

Directional stability? - does aircraft turn out of sideslip. Yes

Remarks:-

Lateral stability? - does aircraft wing tend to rise, stay steady or increase bank?
Remarks:- Stays steady

Max. Speed Tests V_{ne}

Aircraft should be dived to 'Never Exceed' Speed and the following points noted:-

V_{ne} = 173 kt. I.A.S.

Check aileron effectiveness:- Very sensitive

Tendency for control reversal? No

Stick Forces.

* Measured using equipment borrowed from makers of the Edgley Optica observation aircraft.

* Estimated stick forces in flight conditions.

	Max. Speed.	At Overshoot.	At Cruise.
Estimated stick forces per 'g'.			
Aileron (lb.)	2	2.5	2.5
Elevator (lb. per g)	2	2.5	2.5
Rudder (lb.)	1	1	1

Simulated Forced Landing.

With aircraft trimmed power off at normal approach speed carry out simulated forced landing.

Note:- Visibility from cockpit - can the approach be viewed without recourse to manoeuvres which cause undue loss of height? Yes

Is approach unduly flat so as to make entry into small fields hazardous? No (good flaps)

Can fuel cocks, ignition switches and canopy release be reached when tightly strapped in cockpit? Yes

Take Off.

Is there any tendency to swing? Slight left

Unstick speed? = 55 kt. I.A.S. Very stiff u/c. Tends to bounce off rough ground.

Landing.

Landing at $1.3 V_s$ = 55 kt.

Tendency to swing on touchdown? = No. Very controllable

Tendency to Float ? = Yes but not excessive

Tendency to overturn when using brakes? No

Can an overshoot be made safely during all phases of the approach and landing without recourse to any trim change or unusual manoeuvre? Yes

Behaviour of Engine.

Tendency to overspeed in (i) Level Flight? No
(ii) In dive or ½ throttle? No
(iii) Overshoot? No

Longitudinal Stability.

Check stick free longitudinal stability - trim at normal cruise speed in level flight and measure stick force v I.A.S. 2½ lb.

General.

Cockpit layout.

Can all instruments be read without difficulty? Yes

Can all engine and flight controls be operated without difficulty when properly strapped in? Yes

Visibility from cockpit - Remarks:-
In flight? Very good

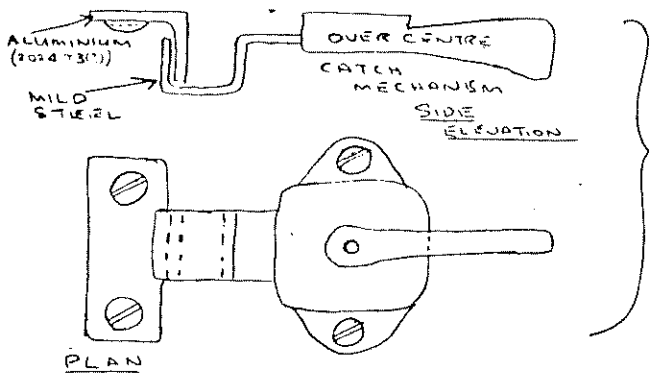
Taxying? Good

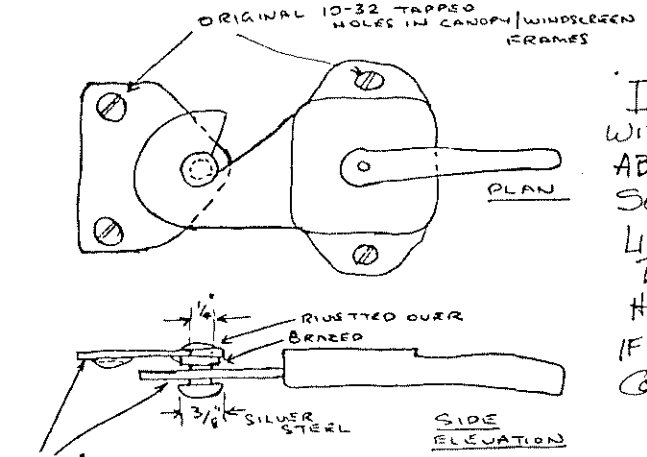
Any special features? Quite a marked nose down trim change when lowering second stage of flap at 80 kt. This will be placarded as limiting speed.
Stick force 1st stage: 2½ lb.
Full flap: 5 lb.

Aircraft can be trimmed out if necessary.

(Signed) Barry Dyke X739
Chief Flying Instructor
Wiltshire Flying Club,
Old Sarum Airfield,
Salisbury.

CANOPY CATCH MODIFICATION





I OFTEN FLEW MY T-18 WITH THE CANOPY OPEN ABOUT 1" AND KNEW OF SEVERAL OTHERS THAT DID LIKEWISE WITH NO PROBLEM EXCEPT A HIGHER READING IAS (HIGH IF STATIC SOURCE IN THE COCKPIT. (ED.)

We are indebted to Jim for an excellent and interesting report. If you carefully read the Air Registration Board Supplementary Flight Test report you can see that they aren't really such ogres after all. Their flight test syllabus is complete and well thought out. You would be well advised to copy the report for your own use in the future

1376 San Miguel Way
Merced, California 95340
December 5, 1986

T-18 Mutual Aid Society
10529 Somerton
Dallas, Texas 75229

Dear Dick,

Enclosed is $20 to maintain the flow of newsletters. I had thought I was caught up on dues and that you had stopped publishing the newsletter. I am missing issues 61, 62 & 63. The arrival of issue 64 was a surprise.

About 18 months ago I sent a long letter about my experiences building and flying a T-18 for about 100 hours. No newsletter was received after that. Were my observations that bad?? (LETTER NEVER RECEIVED, WAYNE!)

You were unable to attend the 1984 OSH meet the first year I completed the T-18. We met briefly in 1985 when I was director of the Merced Antique Fly-In. Time did not permit talking T-18. Your SPORT AVIATION article on the '85 Fly-In was greatly appreciated. Our 30th event in 1987 should be the largest ever. Last year I persuaded the judging people to give a greater proportion of prizes for homebuilts. We sent invitations to all the EAA chapters in the five western states and have had a significant increase in the homebuilts attending.

The T-18 forum at OSH this year was a disappointment. If I were a builder doing a Thorp the topics discussed would be of little value. For those with flying airplanes the content was of a little more interest. (The south Texans long account of learning to fly his newly purchased Thorp probably scared off some potential builders.)

PROP EXPERIENCES

I have had an unhappy experience with Bernie Warnke of Almost Constant Speed Propellers. The metal Sensenich cut and repitched to 68 x 73 by Santa Monica Prop is too fine a pitch for my O-320, 150 hp Lyc. I ordered a wood prop from Warnke asking for a 68" dia. and pitched to give me 170 TAS cruise at 7500' DA. The prop received was a 73" pitch and it still oversped to 12,000' DA and was no improvement over the metal prop. I sent it back on his promise to carve in more pitch. Upon return months later the prop was not noticeably different. It was sent back again and he promised to rework it again. It was promised for July 86 in May of 86. In a recent telcon he now is beginning work to repitch it. I have no confidence that it will be much better. He refuses to refund my money. (Just prior to departure for OSH I few the bird to Bakersfield prop in CA. I removed the prop and carried it to the shop. It was repitched to 78" in an hour. I flew home that day and to OSH and back in the next two weeks. That pitch gives 170 TAS at 75%.)

You could perform a real service by publishing the insurance carriers who will insure T-18's for a reasonable premium. The first 1½ years I was insured fully for $950 by AIU West in Reno. They were touted by the EAA. Last April, four months into a second year, I was cancelled because I flew a homebuilt. The broker found another underwriter and I have been paying $650/yr for 1M/100K for PL & PD only. Full coverage would have been $2100/yr. Please ask the Thorp folks if anyone is getting good coverage at a reasonable premium.

My bird now has 71 hours and runs great on auto gas.

Sincerely,

Wayne Irwin

SORRY, WAYNE, I HAVE NO KNOWLEDGE OF AN INS. CO. THAT IS REASONABLE. DO SOME OF YOU OUT THERE?

December 16, 1986

Joe Brooks
20913 Halldale Ave.
Torrance, Calif. 90501
213 320 1398

Dick Cavin
T-18 Mutual Aid Society
10529 Somerton
Dallas, Texas 75229

Dick,

JOE BROOK'S LETTER

I purchased most of my parts from Ken Knowles in January, 1983. I received the parts by spring. Work started shortly thereafter. With the T-18 Newsletter and Sport Aviation, most subjects were well covered. To date, the plane is on the gear and 90% complete from spinner to tail wheel. The engine baffles are of my design. The engine is an O320 E2A with fresh chrome major. The prop is a Sensenich mod. 76EM8-68-74 which Santa Monica Propeller cut down, repitched, and had tested by Specialized Testing Service, 10758 Burbank Blvd., North Hollywood, Ca. 91601, (213) 877 7317. The C-W has its hang-ups for sure.

FITTING CANOPY

The canopy is one. There seemed no slick way to get the standard conopy under (?)(1) the widebody frame. Sliding the plexiglass fore or aft just left a mismatched look and poor fit. Finally I bit the bullet and cut out two tringular notches (6") from the rear corners and the bubble slid in place. The canopy skirt was raised to cover the notches.

(1) BELIEVE - JOE IS REFERRING TO FRONT END OF CANOPY.

* EVEN A #40 DRILL (REGULAR) CAN GRAB. BETTER TO USE A #40 SHEET METAL GRND.

JOE BROOKS - BAGGAGE COMPARTMENT - DRILLING PLEXIGLAS

Cutting and drilling the plexiglass was a pleasure with the proper tools. Small tooling clamps were used to hold the canopy straight while the pilot holes were drilled in the plexy and frame with a #40 drill* and then clecoed. A hole pattern was used for drilling these holes (skirt hole pattern). Trimming and drilling from then on was by grinding. A 5" cutoff wheel and a 3/8 "bullet" stone were used exclusively. No cracks have yet appeared.

The baggage compartment is of my design. A spar was made to carry the load to the frame. Side pannels hang from the longeron to support the sides of the floor. The rear spar is supported from the frame and the rear blukhead The floor is two parts (split fore and aft). The rear bulkhead is in two parts also. The trick is that both the floor and rear bulkhead are held with camlocks to ease removal. With the battery behind and the electric flap motor under the baggage compartment, they will be removed more than enough to warrant the extra effort of camlocks. The baggage compartment weighs 10 lbs. Access to the tail is easy, even for me.

Dual brakes were fitted simply by welding tabs on the right side like the left. Supports for the right cylinders mimic the left. A remote reservoir was mounted on the

(AIRCRAFT SPRUCE & SPECIALTY CATALOGUE HAS GOOD LAYOUT DIAGRAMS FOR DUAL BRAKES).

JOE BROOKS - BRAKE SYSTEM - WHEEL PANTS -

firewall. The cylinders were from piper (pn.95061). The bases were cut down to fit the brackets, and the shafts were turned down and threaded for clevises. A second set of rudder pedals were procured and the masts moved to align with the "right hand" side. Aeroquip 303-4 hose and 491-4 fittings were used as well as a fortunes worth of "AN" aluminum fittings. Stainless steel tube was used down the gear leg. More "AN" fittings and Aeroquip goodies finished the setup. (Mandrels for the 491 fittings were easily made from aluminum shaft turned down on a lathe and fitted in AN-816 fittings of the proper size.)

The wheel pants were also fun. The pant was marked for center lines and raised to clear the wheel. A cutout pattern was made and centered on the side of the pant. The original brackets pulled the pant outboard too much.

A new bracket was made with offsets to hold the pant centered on the wheel. A outter bracket was bent up to finish the installation. (The pants add class to the plane just sitting there.) The cuffs are a poor fit at best.

Under the hood, the oil cooler was mounted on the firewall. "AC" makes a remote oil filter bracket used on the Cessna 421 that is available in salvage yards. This was also mounted on the firewall. The gascolator was from

SEE PREV. NL ON MOUNTING OIL COOLER ON FIREWALL

RE: NOISE (ENG.) TRANSMISSION TO COCKPIT

ENGINE ITEMS

a Cessna 172. (I like the remote drain feature.) Fuel flow in mockup from a near empty tank was two quarts per minute. Fuel hoses, lines and fittings are all 3/8 inch. The fuel shut off valve is in front of the firewall and cable operated. No fuel pump or vacuum pump was used on the engine. The baffles are "pressure" type with tight fitting fin shrouds. These shrouds were stretch formed ala ribs from soft aluminum. Flat wraps were riveted to the skirts. Making up patterns for the baffles proved that it would have been cheaper to buy them. (But they wouldn't have fit so well.)

JOE BROOKS - BUILDING THE C WING

Building the "C" wing has been enlightening. Matched hole tooling worked for most of the parts from Knowles. The outer wings... not quite. The spars are fun if you like to see straight angles warp from cutting tapers in them only to find that the center wing ribs are joggled for untapered cap strips. The most fun was the "tennis-elbow" from riveting the spars by myself. (It took six months to shake off the pain.) Since the skins came pre-punched, the holes were drilled #40. The ribs were lined-up on the spar and drilled. All center ribs line up with the holes on the skins except for the fourth one out (where the skin splice is). The skin was clecoed to the center ribs and the fourth rib was drilled from the hole pattern of the skin. The spar[1] was drilled after all else. The

(SEE N.L. WRITE-UPS THIS SUBJECT)

[1] RE: THE LINE OF SKIN RIVET HOLES ON TOP OF SPAR. (See NL write-up)

JOE BROOKS - BUILDING THE 'C' WING

nose ribs were drilled for the spar after being fitted to it. With the skin clecoed to the center ribs and the wing jigged flat on the table, the nose ribs, one at a time were fit and drilled to the hole pattern of the skin. My nose ribs needed as much as 0.180 inch shims between the front of the spar and the rib. Oh yeah, the skin was bent before-hand as per all the good scoop in the Newsletter (and the procedure works!). The inner skin was riveted (3/32 soft flush) to the fourth rib. The outer skin was clecoed to the outer two center ribs. The last nose ribs were shimmed and drilled one at a time. The clecoed outer wing is straight as a die. With the wing in clecos, the inspection holes were cut as was the aileron pushrod slot. My pushrod hit the rear spar before full "up" aileron. This required a 1/4 inch shim under the mast (bellcrank). The mast needs about 1/4 inch more offset (hinge pin moved forward) to aid this problem. A piece of 1 inch angle was riveted inboard on the bellcrank rib to stop the outer bellcrank from going over center (even tho it may seem unnecessary). The wing is sitting in the garage collecting dust as I try to shrug off this cold that started last Sunday. (While I was trying to dope out a fairing to cover the humungus gap in the skin for the aileron push rod.)

A photo album of Polaroids (270 so far) has been kept

(EXCELLENT IDEA!)

JOE BROOKS (CONTD)

of the progress and dates. Sometimes a picture is worth a thousand words.

I think that I'll kick back with a hot toddy and let the world turn for a while. Enclosed is a check for $25.00 to keep the fund going.

K.T.F (Keep Thorps Flying)

Joe Brooks

Joe, I've gotta say that that was one of the very finest reports on T-18 building that I have ever read. About the only way it could have been improved on would be to have some sketches. In particular, you might have included a simple sketch of where and how you cut the 6" triangle cuts out of the canopy. The WB canopyseems to be a source Of trouble for everyone and anyone that has any tips along this line I'd sure like to hear from 'em. Thanks, too, Joe for typing up the report. That saves me a lot of time, since I'm a two finger typist. Again , Joe, thanks a million.

COPY NEEDED

To belabor a point I brought up in NL #64...We DESPERATELY NEED COPY FOR THE NEWSLETTER! ! !I've all but run dry on what to write about. We have covered almost everything at least once, but there are still a few items we haven't covered in any detail. Canopy installation can still use more write-ups, ditto wheel pant installation, gear fairing details, brake system installation, electrical system details, baffles, intake system, cowling installation, control rigging and measurement, fuel system details with wing tanks, upholstery inst'n, windshield inst'n, instrument panel layout and hook-up details, engine control routing and inst'n, instrument plumbing/wiring details, rudder and brake pedal inst'n, fitting and alignment of wingtips, tailtips, more info on electric stab trim, electric flap inst'n info, etc.....you get the idea. Just pick one of those subjects, take pen or typewriter in hand and go to it! Now if YOU keep putting it off there will be no more T-18 newsletter after #66! I've got just enough material on hand for one more NL, so amigos, IT'S UP TO YOU NOW....You all responded superbly when we sent out a call for dues in NL #64, some of you contributing more than the yearly dues, and we now have enough funds on hand for probably four more issues.....But in all that pile of replies I got only TWO stories! So, again guys, PLEASE help. Each of you owes a lot to the help you got from the newsletters when you started and now's your opportunity to show your appreciation in a way that really counts.....I want to keep the NL going from now on if possible, so now the ball is in YOUR court!

ALSO SEND PICTURES OF YOUR BIRD —
NOTICE: WE SAID YOU — NOT "THEY"!

TONY BINGELIS' BOOKS

TONY BINGELIS' latest book, SPORTPLANE CONSTRUCTION TECHNIQUES, is really super. It's the third book in his series and is 366 pages of info that's really vital for anyone building an airplane. If you don't have all three of Tony's books and are building an airplane, you are depriving yourself of something that's worth its weight in gold. Much of the material first appeared in earlier issues of Sport Aviation (no longer available), updated for techniques and materials. We all owe a big debt to Tony for his writings, so I strongly urge you to add his latest book to the other two.

Incidentally, Tony is now building an RV-4, would you believe? After all those superb all-wood airplanes, he's having a go at an all-metal bird. Would you believe that he built FOUR trim tabs before he got one that suited his standards? As of this writing he has completed all tail group parts, plus his ailerons and flaps. You can rest assured that it'll be a cream puff. If he keeps up the present pace we just might see it at OSH in '87. TONY ALSO HAS A SET OF T-18 PLANS (SINCE 1965)

GREG HALVERSON'S TIPS

GREG HALVERSON, 2533 NE 11th St., Portland, OR, 97212, was one of those that answered my SOS in NL #64. Here's his letter:

"Dear Dick: Just rec'd the recent NL and thought I'd add a few ideas I found helpful.

First, and I think most important is a comfortable work area. Ideally a large, well lit, and reasonably warm work area where entire assembly could take place. I have a full basement in my home, which makes it very convenient to "tinker" at any time I wish. It has really helped to speed up my project. Any money a person puts into a workspace and tools will be repaid over the course of the project.

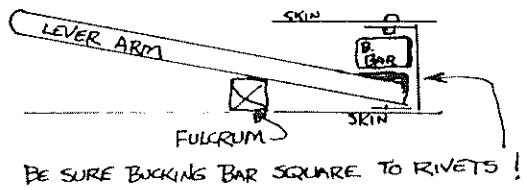
Another item I found helpful was using a many compartment fishing tack box for rivets. I could segregate the rivets by type and size an d carry the box around to where riveting was to take place.

In drilling the canopy I purchased a set of brad point or spur bits at local tool supply store. In drilling the canopy holes I used a small 2 x block as a backup block and drilled partially thru the plexi from one side and then used the pilot holes for a center and again using the bac up block went in from the opposite side until completely thru. It worked nicely.

For getting at some tight riveting areas (in stab'r ribs, etc) I made a wood lever with a bucking bar at one end instead of trying to get my big hard in and holding the bucking bar."

That bucking bar tip was a real winner, Greg. (see sketch below). We all are very grateful for your tips and we thank you sincerely.

The wood spur bit Greg spoke of is almost identical to a sheet metal grind bit described in previous newsletters.



BE SURE BUCKING BAR SQUARE TO RIVETS!

SPUR BIT - (CUTS DISK DOT) - WON'T GRAB

P. O. Box 195
Colorado City, CO 81019
September 27, 1986

Mr. Dick Cavin
10529 Sommerton
Dallas, TX 75229

Dear Dick:

Sorry to take so long putting pen to paper, but six years and 14 moves leaves little time especially when you're not sure about most of the details of construction. N18FL is finally on gear and wired and the wing has been mated to the fuselage. Hope to get airborne in the next 4-6 weeks and I'll give details of engine and construction at that time.

Read about loose bolts in landing gear and would like to pass on a trick about opening up the gear A-frame 5/16 holes. The heat-treated 4130 will ream out if you use a cobalt drill or if you harden a carbon drill by heating the tip cherry red and dipping it in mercury--do this outside or with good ventilation as mercury is toxic! I was able to ream through the pad, short gear extension and wheel pants bracket and got a good tight fit. Also, followed your advice about not cutting threads on gear bolts--cutting the threads showed a lot of bad areas when examined under a magnifying glass.

No words* can convey my gratitude to you and all the other builder-contributors to the newsletter--you're a great bunch and you've made these six years a real fun education.

Sincerely yours,

Frank J. Lanier
(303) 676-3889

P.S. Anyone interested in any of the parts I've listed (see enclosure), please write even if you call--I'm always in the shop. (smile)

FRANK LANIER GETTING CLOSE

PARTS ARE: 781-3 COVER, 782 WELL, 751 SEAL (NEED 781-2-4, 781-1 SHELL & ASSOCIATED PARTS). FRANK ALSO HAS QUITE A NUMBER OF SURPLUS T-18 PARTS. DROP HIM A NOTE & A S/SA ENVELOP FOR LIST & PRICES.

* BUT WORDS CAN! ALL OF YOU CAN EXPRESS YOUR GRATITUDE WITH AN ACCOUNT OF YOUR PROJECT.

(A re-run of the "new" airfoil coordinates) S-18 CW

LDS-4-212 AIRFOIL COORDINATES

	X	Z_U	Z_L
1	0.0	.0661	+-.0661
2	0.100	.4737	- .2742
3	0.250	.7290	- .4377
4	0.625	1.1364	- .6554
5	1.250	1.5750	- .8641
6	1.875	1.8881	-1.0125
7	2.500	2.1363	-1.1340
8	3.750	2.5242	-1.3305
9	5.000	2.8248	-1.4860
10	6.250	3.0693	-1.6130
11	7.500	3.270	-1.7184
12	8.750	3.440	-1.8060
13	10.000	3.583	-1.872
14	12.500	3.800	-1.968
15	15.00	3.938	-1.995
16	17.440	4.016	-1.9710
17	19.960	4.009	-1.8950
18	22.480	3.940	-1.7787
19	25.000	3.7871	-1.6294
20	27.515	3.5635	-1.4669
21	30.03	3.2814	-1.2988
22	32.54	2.9503	-1.1335
23	35.045	2.5793	- .9710
24	37.525	2.1808	- .8101
25	40.04	1.7539	- .6497
26	42.535	1.3176	- .4888
27	45.025	.8792	- .3268
28	47.51	.4456	- .1636
29	50.00	.0	- .0

NOTE: TO LAY OUT THE AIRFOIL, SCRIBE A STRAIGHT LINE 50 INCHES LONG ON A PIECE OF ALUMINUM SHEET. MARK OFF THE STATIONS GIVEN IN COMUMN X ALONG THIS LINE AND DRAW PERPENDICULAR LINES AT EACH STATION. Z(U) DIMENSIONS DESCRIBE THE UPPER SURFACE AND Z(L) THE LOWER. FOR CONVENIENCE, STATIONS FOR BOTH UPPER AND LOWER SURFACES ARE THE SAME. NOTE THAT THIS AIRFOIL EXACTLY FITS THE S-18 SPARS. RIB FORM BLOCKS MUST BE MADE SMALLER BY THE AMOUNT OF RIB THICKNESS.

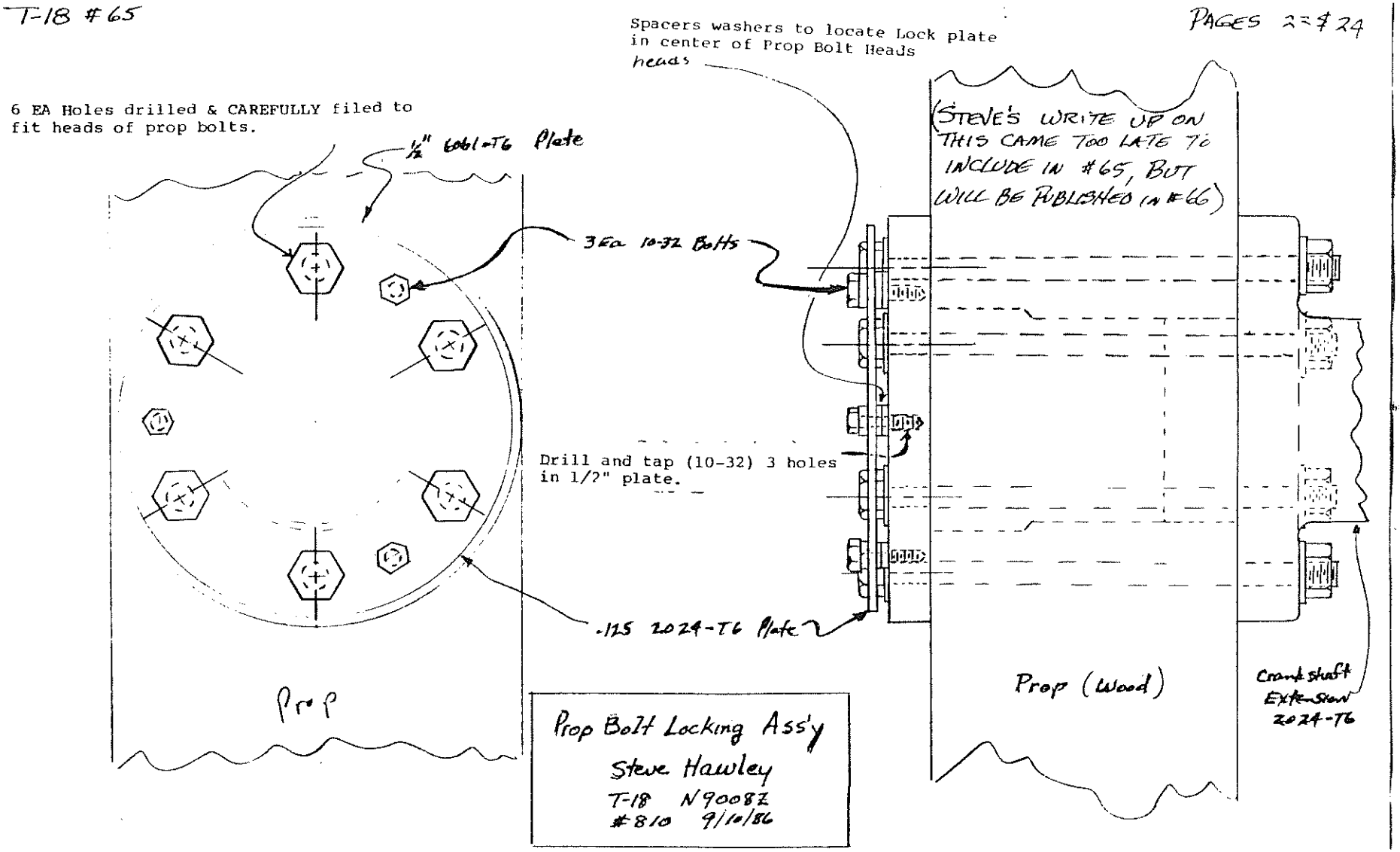
SA Sunderland Aircraft
5 GRIFFIN DR. APALACHIN, NY 13732

"NEW" AIRFOIL
WING PROFILE

DWN	LD Sunderland
DATE	29 Oct 85 SCALE
NEXT ASSY	
MODEL	S-18
	108

T-18 #65

PAGES 2-#24



Prop Bolt Locking Ass'y

Steve Hawley

T-18 N9008Z

#810 9/10/86

Steve's letter of explanation WAS here all the time and I found it at the last minute, but DON'T disregard my remark about steve sending in a write-up on the prop and some accounts of vapor lock problems he has had. If any of you have had engine stoppages because of fuel systems PLEASE send in immediately (If you don't want your name used, just advs.)

September, 16, 1986

Dick Cavin
10529 Somerton
Dallas Texas, 75229

Dear Dick,

Sorry to take so long between correspondence. Yes, I'm still around flying the T-18. I'm getting fantastic performance with the "Warnke" propeller.--200 mph. TAS at 2500 rpm at 2500 feet. I would guess that the top speed (2710 rpm) is around 216 mph if the air-speed is linear. I don't really care because I can't afford to buy the gas at 2710 rpm let alone at 2500. I have never had the tachometer calibrated so that may be off.

A friend asked me to draw a sketch of the prop bolt locking assembly I have installed on the T-18. It was rather time consuming to fabricate but is absolutely positive. If a wooden prop is used, it is <u>absolutely</u> essential that the torque be checked prior to flight. As the weather changes, and especially the humidity, the bolts will become loose and <u>very</u> bad things will happen in a hurry! It hasn't happened to me and I don't think it ever will.

To check the torque on the prop bolts, the head has to be restsrained while the nut is checked. Unfortunately, we have all buried the heads of the prop bolts under a shiny spinner with about a jillion screws. I soon established the fact there had to be a better way, hence the locking device.

As ever,

Steve

Steve Hawley

THAT'S IT FOR THIS ISSUE, GENTS. I HAD A PAGE OR TWO MORE OF MATERIAL (SOME OF IT FOR SALE ITEMS) BUT MY ELECTRIC TYPEWRITER CRATERED, SO IT'LL HAVE TO WAIT 'TILL #66. NOW IT'S OFF TO VERN PEPPARDS PLANT TO GET #65 PRINTED UP AND IN THE MAIL.

DICK