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

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

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

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

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

CONVERTIBLE WING ITEMS:

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

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

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

TIP ON ASSEMBLY, OUTER WING (W)

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

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

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

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

SKINNING THE OUTER PANELS

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

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

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

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

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

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

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

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

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

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

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

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

SETTING WING DIHEDRAL

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

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

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

FLAP RETURN SPRINGS

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

PUSH-PULL TUBE CUTOUT ON SKIN

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

MORE ON BILL JOHNSON HBJ2 AIRFOIL

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

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

(1) Draw leading edge full scale.

(2) Mark off vertical lines at one inch intervals. Make the intervals <u>less</u> than 1 inch near the nose (as required for clarity).

(3) Multiply X values by 1.29 to obtain X".

(4) Replot X points on the Y axis.

(SEE DRAWING PAGE 2A)

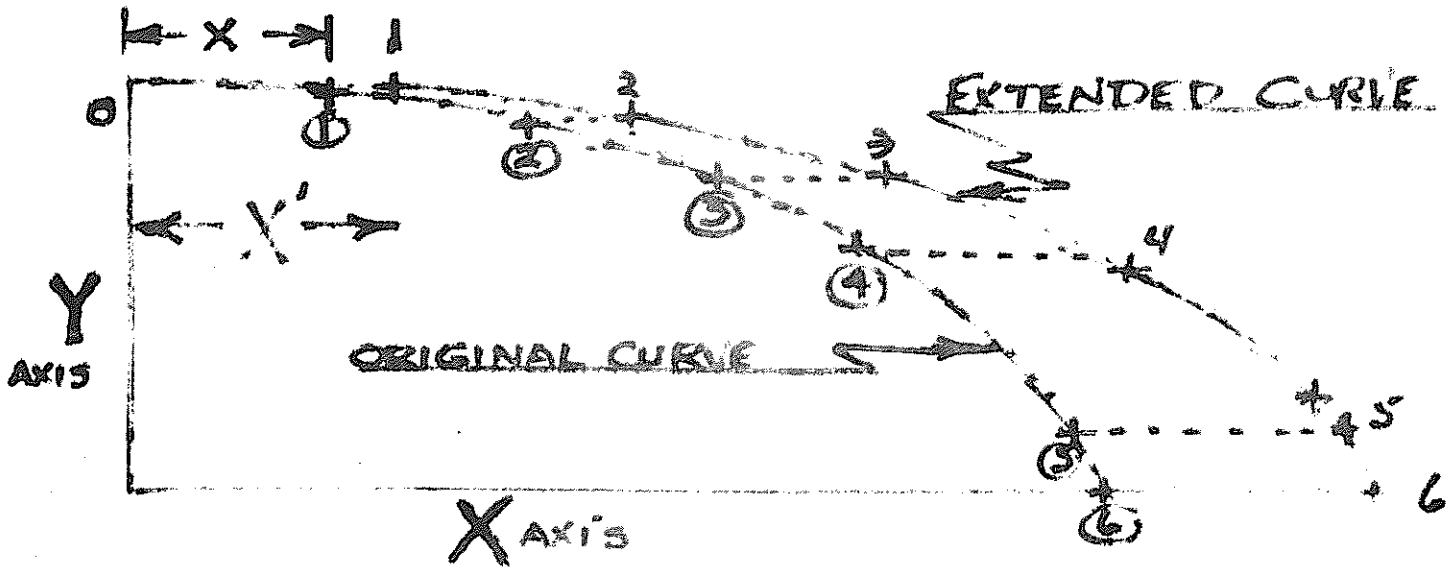
Bill also sent a copy of the ordinates for his HBJ-2 Airfoil and we are also printing them for your information.

(SEE ORDINATES PAGE 3)

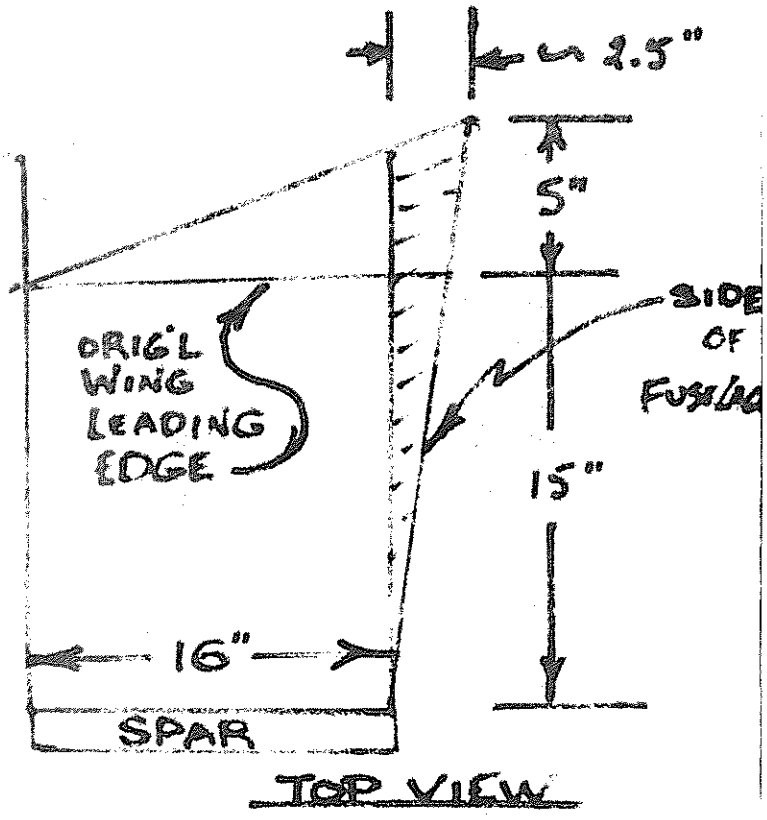
Thanks, Bill, for sharing your most informative experiments with us.

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

METHOD TO EXTEND LEADING EDGE: BY BILL JOHNSON



N	x	Y	x'
0	0	2.2	0
1	1	2.1	1.29
2	2	2.0	2.58
3	3	1.7	3.87
4	4	1.2	5.16
5	4.8	.5	6.19
6	5	.0	6.45



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

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

HB (J) 2

(STATIONS AND ORDINATES GIVEN IN PERCENT OF AIRFOIL CHORD)

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

L.E. Radius 1.440

Slope of radius through L.E. 0.072

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

BUILDING THE OUTERWING MAIN BEAMS (CW)

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

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

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

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

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

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

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

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

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

WIDE BODY NOTES

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

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

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

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

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

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

WE NEVER GET TO OLD TO LEARN DEPARTMENT

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

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

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

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

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

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

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

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

One more little item on the folding wing: FLAP RETURN SPRINGS*
Earlier in this N.L. we discussed the anchoring of the flap return springs at the rear. Ken Knowles anchors his to the bottom part of the flap actuator fitting on the vertical member of the fitting. Simple and effective, easily inspected, or installed, so that disposes of that problem.

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

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

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

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

T-18 FLY-IN

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

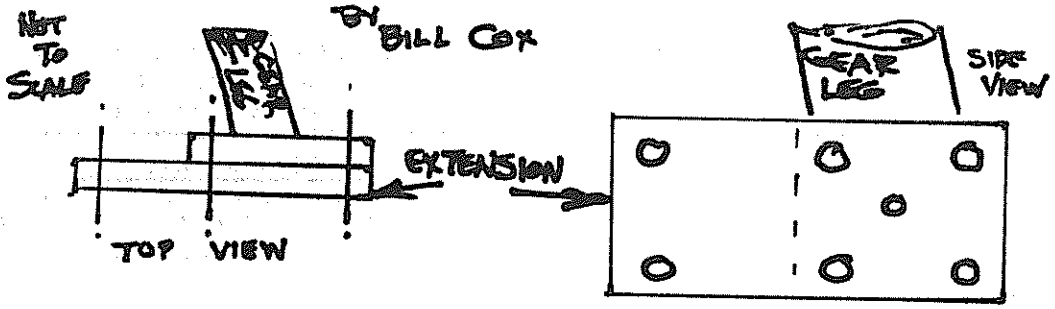
The subject of liability soon came up and it looked obvious that an insurance policy was mandatory unless some "left handed" way could be found to circumvent liability.

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

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

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

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



Here are further excerpts from a recent letter from Bill:

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

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

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

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

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

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

***

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

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

Hello Dick,

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

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

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

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

My airplane reacts this way:

1) With one 170# pilot aboard, no bags and more than half fuel which gives me a total weight of 1351 and CG of 63.2 In. Rapid downward pitch upon application of full flaps (30°).

2) With two people on board, less than half fuel (and some baggage preferred) no problem with full flaps, meek as a lamb. This loading gives me 1397 total weight and a CG location of 66.1 In.

3) When the CG is something between the two above conditions, full flaps may be applied at a slow speed (80 MPH or slower) but will pitch down if the speed is increased. Stick buffet is the clue. If the stick buffet's with a forward tug, better get the flaps up or have a very tight seat belt and be ready to ride through the first half of an outside loop.

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

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

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

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

***

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

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

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

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

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

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

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

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

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

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

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

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

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

***

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

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

Hi Dick:

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

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

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

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

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

At this point a full blown flutter investigation was initiated by JOHN THORP. STAN ROSMUSSEN and SANDY FREZNAR 9(vibration experts) were summoned to do the testing. Strain gauges were mounted on the spar tube and the tape readout unit strapped in the right seat. I performed the first series of flight tests, which were done off the coast at Malibu.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Sincerely, Jim Roberts ***

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

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

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

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

T-18S AT OSH

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

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

MONDAY 12 NOON to 2:00 PM

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

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

SPECIFICATION DATA May 25, 1976

THORP T-18 N2751 SN 300

Engine:	Lycoming 0-360-AIC
Fuel:	91/96
Rated Max Cont.	180 HP @2700
Oil Pressure	60 - 90
Max Temp	Cyl Temp 500° Oil Temp 245°
Prop	Sensenich 76DM (Modified) (Metal, Fixed Pitch)
	Length 68" Pitch 83"
Wing Span	20' 10"
Length	18' 6"
Height	5' 1"
Tread	63"
Fuel Quantity	27.5 Gal
Empty Weight	872# EW CG 60.7
Datum	Wing Leading Edge Stat. 55
Mac:	50" Leveling Means: Stiffener on Side of Cockpit
CG Limits:	61.0 to 71.0
Gross Weight	1468
Started	1965
Completed	1976
Purchased	3/78 from Jim Fleming, Builder

***

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

M.A.S. COST INCREASES

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

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

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

John G. Walton
5726 Boyce Springs Dr
Houston Texas 77066

April 28, 1980

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

N.L. #50

Dear Dick:

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

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

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

N. L. #50

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

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

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

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

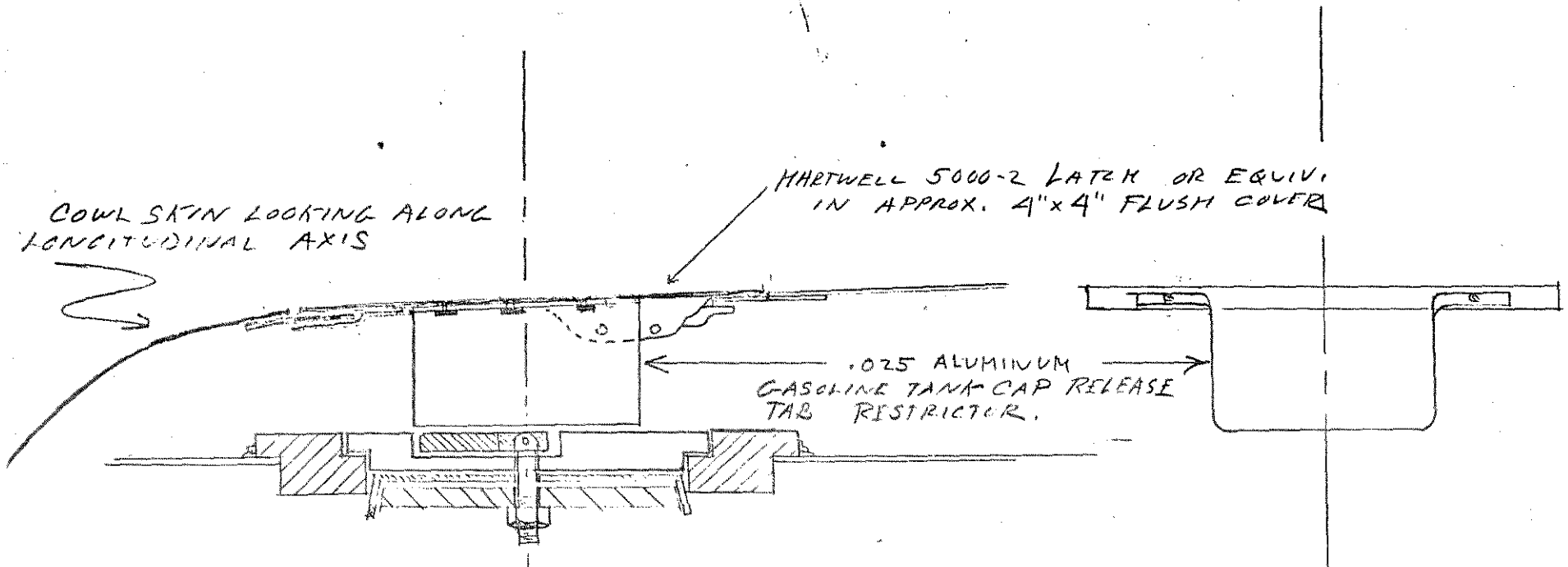
What do you think?

Sincerely,

John G. Walton
T-18 46

JGW:db
Enclosures

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



N.L. #50

DRAWING NOT TO SCALE

JGWAITA

4-25-60

LTR. TO RCALM ENCL.

KEN KNOWLES WIDE BODY PANEL
SHAPED TO FIT
STANDARD BODY
.032 DOUBLER
BONDED TO BACK
AS STIFFENER

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

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

ALL FITTINGS
MADE FROM
ANGLE STOCK

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

SIDE VIEW →

STA. 69.926

3 EA-AN 426 AD RIVETS
OR

HINGE PLATE

470-5

LORD MOUNT
#8-2 HOLE

W-L 42.0

STOP LINE

STOP

470-4

2 EA AN 426-AD 4-6

EXISTING

LEFT SIDE FUSELAGE SKIN

RIGHT SIDE FUSELAGE SKIN

RIGHT SIDE BRACKET SHOWN

STA. 70.25

SCALE: FULL
NOT PRECISE

COMBINATION SHOCK MOUNT & HINGE INSTRUMENT PANEL - THORP T-18C	
DESIGNER	FRANK SNEDEKER
DATE	APRIL 23 1980
WEIGHT 8 oz	TWO REQUIRED

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

latest info on metal cowlings:

FOR YOUR INFORMATION

Dear Dick,

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

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

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

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

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

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

Very truly yours,

Marc Bourget

Marc Bourget

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

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

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

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

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

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

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

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

PLEASE RE-NUMBER ALL PAGES IN THIS ISSUE

Dick

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