ROTARY VEE ENGINE

As per usual, I'm slow getting the newsletter out. There just doesn't seem to be enough hours in the day to get everything done...or have you also noticed that? I don't think I take on any more projects than I did when I was younger, but I seem to take more time to get things done than I used to. By way of explanantion to the new ones in our group, I took on an associated editor job for Sport Aviation, Lightplane World, and Vintage Airplane a little over a year and a half ago and my assignments have really kept me hopping since then. I've had good intentions about getting NL #64 out for several months, but since #63 it has been pretty hectic. I'm sure most of you have read some of the stories, so I won't comment, except to say that the Rotary Vee engine development is moving right along. The boys are now on Engine #3, which is a further development of #2 engine (the 115 lb. 300 hp eng.). They have turned it as high as 5700 rpm and done some dyno testing. So far the dyno showed 90 hp at 3000 rpm. In the process of these tests they found pistons, which were made from extruded round bar stock, were not perfectly round, as they ha assumed. This caused leakage around the rings, costing considerable pow loss. They also found the size, shape, and location of the intake valv needed some small changes. Because sculpturing the valve changes are very time consuming, they decided to make a totally new engine from scratch. They expect to freeze the design if #3 works out. They had hoped to mak it to OSH with the engine, but it looks pretty iffy now.

The boys in Oklahoma were a little disappointed that #2 wasn't quite up to specs, but they have learned quite a number of very important things to date. The way I feel is that if they only get half of the 300 hp the design formulas indicated, they've still got a winner at the 115 lb. wt.

T-18 STORY

Another story you may be interested in will appear in Sport Aviation in a couple or three months from now is a more or less historical account of the T-18, the accomplishments of the builders, modifications, and the transition to the S-18 of today. The article also touches on the Matched Hole Tooling technique that John Thorp wrote about in 1962, when the design first came out, and that in terms of homebuilt designs, the T-1 qualifies as a Senior Citizen. We also made the point that to our knowledge there had never been an in-flite structural failure that was the fault o the design and it has only been careless, reckless, or inept pilotage that has caused accidents.

T-18 LANDINGS

I continue to get calls from non-builder owners that complain they are having real trouble landing their newly acquired T-18. I always ask them if they have the newsletters and if so, have they carefully read what has been written about flying the T-18 ? They usually haven't and little question or two reveals they are starting their flare too high. This goes clear back to their primary instructor that permitted them to get into a dangerous habit of changing their angle of attack (flaring) at some other altitude than the correct one. Every time they pull on the stick they are reducing speed, increasing drag, and increasing sink rate. The important thing is that when all this happens it determines the RATE that one will have to complete the rest of the flare. He's trying to play catch-up now as the nose is starting to fall thru rapidly. If he realizes what's happening and stops to prevent a full stall, he'll probably wind up with a first class ricochet and too high a bounce to salvage it without power.

(cont'd)

If you stop to think about it, the RATE you pull back on the stick determines what kind of landing you'll make. (That's assuming you are pointed straight down the runway and have fully compensated for any crosswind component you may have). I guess just about everyone has done a little experimenting on landings when you've had an extra long runway to play with. You come in with an extra 10-15 mph over the fence and you get it down about a foot high in good ground effect and you think you'll just graddually wear out that extra speed at your leisure and just slick it on and stretch the main gear rubber clear back to the tail wheel, etc. Well, how many of those attempts have worked out the way you planned? 5%? 10% ? That's about par for that course. What usually happens is the RATE of pulling that stick back was constantly changing, as it always does, but was almost imperceptible until that last second when it had to speed up radically. Then was when you dropped it in that last 3"or 4" -and it felt like two feet. Right ?

T-18 LANDINGS

To make a long story short, we can learn a lesson that's as old as when the first airplane flew. Remember the oft-repeated axiom of thousands of flight instructors, "A good landing is ALWAYS preceded by a GOOD APPROACH. A good approach is practically always followed by a GOOD LANDING". The part of the approach we are zeroing in on here is the absolute control of airspeed all the way to flare.

In airline operation the pilot flying is required to maintain his exact airspeed all the way to the threshold...with a tolerance of about two knots...a speed we call Vref. Thus the pilot knows where the A/C is going and he knows reasonably close to how RAPIDLY he pulls back on the yoke to get the same result time after time. If one concentrates and practices airspeed control on every approach they'll soon find that their landings are close to the same each time, too. I imagine all of you have heard this said many times, but when we are trying for precision we should always be our own worst critic. Right? The average T-18 with an average pitot/static sustem makes a good minimum float landing with an approach speed of 90 mph. I personally prefer to make the approach power off, but some of you will be more comfortable with a little power on all the way. The important thing, tho', is to do it the same way every time. You may want to review the NL where we talked about fixing the airplane's angle in the 3 point position firmly in your mind by referencing the point where the horizon cuts thru your cowl. That's the point you always stop a little short of on the flare. Now make a mental note on each landing of how rapidly you come back on the stick and you've just about brought the variables down to an irreducible minimum.

ACCIDENT

In case you hadn't already heard, we had an accident at the '86 Sun n' Fun affair. The T-18 involved was from Florida and there were two fatalities. Apparently (from eyewitness reports) the pilot attempted to turn back to the runway after a power loss shortly after departing the airport and the aircraft was too low to successfully make the 180 and was stalled in the turn, with a possible partial recovery. The airplane hit quite flat, indicating perhaps that the pilot was able to make a last moment change in the attitude of the airplane, but not able to halt the almost free falling descent rate. Both pilot and passenger had massive spinal injuries and died either enroute or at the hospital. Such injuries almost always indicate bodies being subject to loads of 40Gs or more. The sad part of this case was that the pilot had an adequate landing area straight ahead that he could have made easily. A prelim report said the engine was belching black smoke on the T/O and an unconfirmed report was that the primer was unlocked. More later on this.

Jim Borg flies

1st FLITE REPORT

The following three pages are an excellent example of a first flight in a T-18, construction features, and performance report by JIM BORG, 15800 Makah St., Andover, Minn. 55304. Jim has also included a fine sketch and writeup on fitting the canopy on the WB fuselage. Several builders have complained about this very problem, so this is welcome news. If any more of you have come up with another solution (or even the same one) PLEASE give us your report and do it now while it is fresh in your mind. For some reason no one wants to write about what they learned while installing the canopy on either the T-18 or S-18, yet almost all agree that it is one of the most difficult and time consuming parts of building the airplane. How did you cut it, drill it, fit it to the frame, adjust it, secure it, trim it, make a skirt, etc? How did you ventilate it, how successfully, install locks, what kind, etc.? Ditto the windscreen.

Ser. 987 Flies (rec'd Mar. '86)

Dear Dick:

I have now 64 hours on my T-18 and enjoying it more every-time that I fly it.

After reading your last newsletter, I thought it best that I write some information for the newsletter.

Construction started in the spring of 1976. I sure had the typical learning curve to overcome, but soon found sheet metal very enjoyable to work with.

In the early stages, I built all the ribs and bulk heads. Later, I started buying alot of pre-fab parts to save time. I was very happy with both price and quality and deliveries were quite fast. I bought most items from Ken Knowles, Sport Aircraft.

July 7, 1985 was the day that the first flight occured. Although the flight was safe and ended without mishap, one event deserves some attention.

As I lifted off everything was normal. I had told the control tower that it was my first flight and they graciously kept a close eye on me.

About 30 seconds after lift off, tower told me in a very calm tone that I was trailing lots of black smoke. I wasn't really panicked yet because I could smell no smoke and all engine instruments showed in the green.

As I headed back for landing, my friend in the chase plane told me the smoking had quit just when I reduced power. Subsequent experimenting with mixture control proved that I could control it by leaning.

Flight lasted for close to one hour with no other mishaps.

1st FLITE REPORT, CONT'D

Page 2 - Jim Borg report.

Back on the ground and I started investigating what caused the smoking. After some mods to the carb air box, the second flight showed no sign of black smoke.

I'm still not sure what caused it. Might have been the air box or possibly some residual oil left in the cylinders from storage.

Anyway the problem hasn't resurfaced since and the engine runs strong.

The Airframe is the wide body fuselage and standard wing and airfoils.

Instrumentation is about as simple as one can get. No gyros, but have cluster of 3-1/8 inch instruments as follows:

Airspeed
Altimeter
Tach
Electric Turn/Bank
Rate of climb
Manifold Pressure

Also a cluster of six 2-1/4 inch westach engine instruments.

Radio is Terra NAV/COM and has been working quite well. I still have plenty of room in the panel left if I want to add instruments later if I wish.

Some performance figures:

Engine	0320 E2A 150 H.P.
Prop (wood)	69" x 76"
Cruise	170 TAS 75%
Full Throttle	185 IAS 3000 Ft.
Stall	65 IAS Clean
	60 IAS flaps
Rate/climb	1500 ft/min solo
Empty weight	877 lbs.

I left the airplane all polished and painted the glass parts metalic blue.

The interior was done by my very talented and patient wife, Loretta.

The material is ultrasuede and is tough but very light in weight. The seats are done in diamond tuft with buttons. The inside of the airplane is my proudest part because of my wife's contribution.

When installing the canopy onto the wide body fuselage,

W/B CANOPY INSTALLATION

Page 3 - Tim Borg report

I noticed a problem that other wide body builders have also had. Because, the wide body is two inches wider at all points, the Gee-Bee canopy doesn't fit the same way it does on the standard fuselage.

The canopy frame that I purchased is also two inches wider at all points and this is where the problem is.

The problem is in the aft rail. This can be resolved by removing approximately 1,500 inches from this rail (see figure 1). This allows the bubble to be positioned farther forward and also allows it to set farther down on the sides, so that the side rails can also be lowered. Probably the most exciting event of the entire project was turning final approach at Wittman Field at Oshkosh.

Being part of something that I had dreamed about for so long made the project all worth nine years.

Sincerely,

Jim Borg

THANKS JIM FOR AN EXCELLENT REPORT.

STANDARD DISCLAIMER

*********STANDARD DISCLAIMER: ********* NOTICE!
In all past, present, and future newsletters of the T-18 and S-18 Builders and Owners Society (formerly known as the T-18 Mutual Aid Society) and Association, that from its beginning we would make you aware that these Newsletters are only presented as a clearing house for ideas, opinions, and personal experiences of both members and non-members in both building and flying the T-18 and S-18, and anyone using these ideas, opinions, and experiences, do so at their own discretion and risk. Therefore, no responsibility or liability is either expressed or implied and it is without recourse against anyone.
****

I had planned to include a page or two of T-18 photos this issue, but I ran out of time, (as usual). Hopefully, in the next issue I'll double up on photos. If you have a good sharp

Wide body canopy frame Modification BY JIM BORG

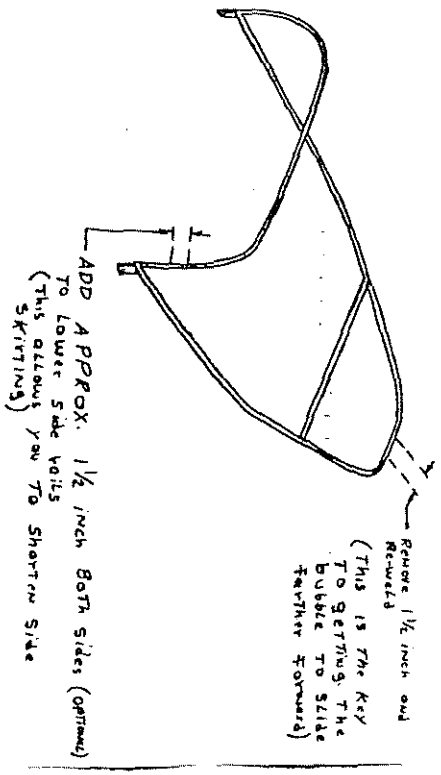


Fig. 1

SEE LU SUNDERLAND'S REPORT ON A NEW WELDING ROD FOR ALUMINUM ON PAGE 12 THIS ISSUE. Here's an excellent place to use the new rod.

The following from Hank Steiginga, Lancaster, CA. Thanks, Hank.

March 17, 1986

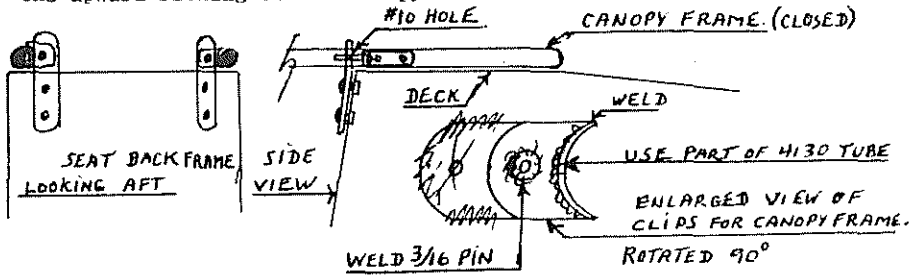
T-18 Mutual Aid Society
10529 Somerton
Dallas, TX 75229

Dear Dick,

Finally got in a flight with Dan Dudash in between rain storms here in sunny Southern California.

I'm wondering if Pete Beck has pinned down the cause of the loss of his canopy. His article was very well written. Some T-18 owners have experienced an upward flexing of their canopy frames during flight. This flexing is approximately midpoint of the canopy frame, that is just aft of the seat back. During flight, the canopy actually produces a lot of lift. On N512S, I installed a 1/8 x 3/4 x 2 inch clip on each side of the seat frame. Also, a clip with a 3/16 inch steel pin is pop riveted to each side of the canopy frame in such a manner as to engage the clips that are riveted to the seat back frame when the canopy is closed and latched. This system completely eliminated the upward flexing of the canopy. See sketch.

CANOPY LOCKING TIP



A simple suitcase latch was used at the top center of the canopy frame. During flight with the canopy unlatched, it would open 1/8 inch. To close and latch required slowing to 80 MPH.

I do miss N512S very much. To pass time, I've started a Star-Lite project, but honestly my heart is not in it.

Will be looking forward to the next newsletter. I enjoy them very much. Enclosed is a check for my "86" dues.

THANKS, HANK, FOR AN EXCELLENT TIP! WE APPRECIATE!

Sincerely,

Hank Steiginga

By Henry Steiginga

The following 3+ pages are from John Walton:

TO: T-18 MUTUAL AID NEWSLETTER

SAFETY-OF-FLIGHT

It is extremely important when building a T-18 that the plans are carefully followed. If deviations occur, a suitable level of knowledge and judgement must accompany such decisions, But, when one gets into the engine installation and cockpit work we really have by then left the plans and are at our own peril. At this stage it is important to have access to the resources of knowledge and assistance necessary to enable the completion of these installation in a safe and air worthy manner.

We all share a responsibility in this. Please consider that anything which goes wrong with a T-18 reflects on all T-18's. Let's do everything possible to get or make available the necessary help to builders and maintain T-18's in a safe, airworthy condition. Use your local experts, newsletters, publications or any other possible good source.

I recently had occasion to extensively examine a T-18 which has been certified by the FAA as airworthy and had flown for approximately 100 hours. This particular aircraft was completed by an individual who was not the original builder of the airframe. He was neither an EAA member nor a T-18 Mutual Aid Society member. He had never built nor worked on airplanes prior to acquiring this airframe and engine. The resulting airplane was in my opinion, grossly unsafe.

I am listing below the items I found in looking over this aircraft which I felt were incorrect, unsafe or in some way contributory to a less than adequate aircraft. Hopefully, listing these, they may be reminders or helpful during your construction or annual inspections.

UNSAFE ITEMS FOUND ON INSPECTION

NOTE!

1. The fuel line from the gascolator to carburetor was an unrestrained automobile quality 3/8" hose on one-way slip over fitting(s): no clamp on one end.

2. The above fuel line passed very close to an exhaust cross-over pipe which passed behind the carburetor near the firewall. Under G loads it could contact the exhaust pipe!

3. Throttle and mixture controls were restrained with muffler clamps to the above exhaust pipe. The terminal ends on each was fitted with an AN3A bolt and fiberlock nut. (No pivot bushings.) The heat had relieved the elastic lock feature so both these control attachment fasteners were virtually finger-tight.

T-18 MUTUAL AID NEWSLETTER
page 2

UNSAFE ITEMS, CONT'D

4. The four carburetor air box bolts (1/4") attaching it to the bottom of the carburetor were not safety-wired (one was backed off 1/8"). !
5. The air box was fabricated with 1/8" soft pop rivets. Mandrels were loose in the rivets. (Not punched out nor sealed.) !
6. Wiring from the alternator was unrestrained. It could contact the forward exhaust cross-over pipe. !
7. Brake Caliper drilled bolts (2) each side were not safety-wired.
8. The constant-speed propeller governor oil line was wearing against the engine mount frame. !
9. One of the engine baffling tie-bolts was wearing into one of the cylinder rockerarm aluminum oil return lines.
10. The air box was wearing into the bottom of the cowling. !
11. The alternator through bolt/nuts were in original auto configuration; not safetied nor converted to metal locking nuts. !
12. Propeller governor control linkage. AN3 bolts were used for clevis pins on the control end. The cotterpin was bent in a double C. Could work out. !
13. EGT Probe. Positive (ungrounded) leg not insulated. Could ground on nearby baffling.
14. Fuel Pump. Attach bolts to the engine were not safety wired. !
15. Rudder. Upper and lower pivot cap screws were loose on their fiber bushings. Both should turn with the rudder. Neither fastener was safety-wired. !!
16. Rudder and tail wheel cables. Cable ends were not clevised. The builder used AN3A bolts and elastic stop nuts instead of castle nuts and cotterpins. No bushings. !
17. Tail wheel springs were tension-type with open hooks. These had come off in service. Builder never converted to the compression type as frequently recommended in the newsletter. !

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page 3

UNSAFE ITEMS, CONT'D

18. The Maule tail wheel unit was attached with a single 5/16" nut/bolt in the non-standard steel spring; but was loose in the 3/8" hole in the Maule assembly. !
19. Dynafocal Engine Mounts. All 4 bolts were too long. Thus, the nuts bottomed out before snugging up on the 2.1" spacers. The engine was loose on the mount. !
20. Instrument panel. Many terminal and mounting screws were loose (no lock washers on most of them). The electric wires were routed in cobweb-fashion, frequently contacting other parts and structure. !
21. Fuel tank. An external metal part wearing into the tank's skin. !
22. Fuel tank strap supports (2). Turnbuckles (2) holding the tank in place were safety-wired. !
23. Left main wheel axle shimmed for alignment with hardware store washers. No tappered shim, no relief from resultant hard spots. !
24. Wing Spar. Outer wing panels (standard wing) Bolts were too long. Castle nuts were used over a stack of several washers. There were no cotter pins in any of the four bolts. 3 of the 4 nuts were loose. !

There may be some items I missed on my list; but the above should be example enough that we should not depend on just ourselves or the FAA to insure that our aircraft is safe.

Perhaps it would be good for us to switch off and examine each others aircraft at fly ins. Certainly, during the building stages; it is important to do all we can to encourage builders to get the necessary knowledge to execute properly.

Now, a story on myself. My T-18 was severely damaged in the tornadoes which just about wrecked David Wayne Hooks Airport in February. In tearing apart the T-18 to rebuild it I am executing a virtual O&R overhaul. I had prided myself that in all this work I had found nothing surprising which could have affected safety. Then I removed the gasoline tank. There, not hidden, but in plain view, was a deep wear cut caused by the braided metal shielding on a foot brake line -- through about .035" of the tank's .040" thickness! !

T-18 MUTUAL AID NEWSLETTER
page 4

CONT'D

When you do your annual or talk to someone about his project, go to the extra effort to play the devil's advocate. You may not like what you find or hear, but you could save someone's life -- perhaps even your own.

JOHN G. WALTON
5726 BOYCE SPRINGS DR.
HOUSTON, TEXAS 77066
5/20/86

Thanks, John, for such an illuminating report. We need more articles like this. I well remember in the late '60s when a lot of people got fired up on the T-18 and jumped in and started building one without proper information on building. Some of the metal work was horrible, yet they were telling prospective buyers that it was built exactly to plans, etc. I've seen a couple in recent years that were licensed and flying and they were scary...truly an accident going someplace to happen. I worry about some of the new people that are buying T-18s, many of which are not too mechanically inclined. They need to find a GOOD A & P and go over every square inch of the airplane and the engine, not assuming that every thing is A-OK just because the airplane has flown with whatever is in question.

FOR SALE

FOR SALE: A last minute note from John Walton...He has an "extra" T-18 and he can't fly but one at a time. The "extra" one is a standard T-18, st'd fuselage and wings (wings have integral fuel in the outer panel). The engine is a Lyc. O-320, 150 hp, with Thorp cowl and Brock spinner. Prop is a Santa Monica tested prop. Engine has 640 hrs. SMOH of TLC. The aircraft is currently disassembled for rework of cockpit and the panel. Airframe has only 100 hrs. on it and John says the metal work on it is one of the best he's seen. (If John says that, you can believe it! Also, you can bet that when he gets thru with this bird that it will be a creampuff in every way!) Give John a call (evenings) at 713/440-8093 if you are short a T-18. He'll give you the full run-down.

FOR SALE

FOR SALE: Vern Peppard told me at OSH that he had sold his Citation jet and bought a turbo Bonanza and is having so much fun flying it that he can't find time to fly his T-18 much anymore, so he's decided to sell it (he thinks). I don't have all the dope on it, but you probably would recognize it as "Little Kong", as it's painted almost the same as Kong. He has an O-320 in it, a new canopy, new upholstery, a constant speed prop, an aux tank (10 gal) behind the cockpit, and he has an autopilot, intercom, and just about everything you'd want in the way of radio and instruments. It's IFR certified and he often files IFR in it. If you are interested you can call him at his plant at 214/578-0571. If he isn't in you can leave your number with his secretary and he'll call you back. P.S. VERN ALSO HAS AN EXTRA LANDING GEAR (LONG) FOR SALE. CALL FOR DETAILS. PRICE DISCOUNTED.

The following from Lu sounds like something aviation has been waiting for for all these years. There are several areas on the T-18 that this product would be a great help on. I'm anxious to order some of it and give it a try. Would appreciate hearing from any of you that have the opportunity to try it out.....

CANOPY FRAMES - NEW WELDING ROD!

CANOPY FRAMES (L. D. Sunderland): One of the most helpful things I learned at Oshkosh 1986 was a new way to fabricate aluminum assemblies. The Cascade 701 aluminum repair rod is the greatest new development since they invented wheels on roller skates. This fluxless rod melts at 728 degrees F and can be used to join any aluminum alloys. Aluminum melts at 1100 to 1200 degrees. Its tensile strength is 40,000 psi, so it is stronger than 6061 base metal. It is far easier to use than any soldering or brazing rod than I have ever tried.

You simply clean the base metal with a stainless steel brush, and heat it with a propane torch while rubbing the bare rod on the area to be "tinned." When the base metal heats the rod to 723 degrees, the will flow uniformly over the cleaned area. Once tinning is achieved, Cascade 701 will bond to itself very easily, and you can build up a fillet. Even sizeable holes can easily be bridged and filled.

We just made a butt joint from 3/4 inch x 0.035 inch 6061 canopy frame material, using 701 rod. When the joint was tested, the aluminum tubing broke outside the edge of the fillet. This certainly is an impressive fabricating material.

I also made a test sample joining a piece of 6061 with 0.025 2024-T3 alclad sheet with a butt joint. It worked beautifully. This means we can make aluminum heat muffs and solder hose nozzles to them made from aluminum sheet rather than fabricating separate hose-attachment-fittings from stainless and riveting them to the aluminum.

At an Oshkosh booth I bought 15 701 rods plus a stainless steel brush for $22. At another booth we got 32 rods for $20. You can contact Cascade Sales, 3316 East Smith Road, Bellingham, WA 98225 (206)592-5970.

WING SKIN BENDING NEWS

08-28-86

Thanks, Lu, for those words of wisdom. Thank you also for your report on spin testing on page 13.

UNBENDING WING SKINS: A local builder, Roger Dengler, recently made a wrong bend on the center wing skin of his S-18 center wing, due to a misunderstanding on which line of holes to use to index the bend on a Ken Knowles skin. This put the leading edge bend in the wrong position, which ordinarily ruins the part. To try to save it Roger turned it wrong side out, clecoed it together and bent it this way, which straightened it out ok. Now he started all over and bent it right this time and he said it came out with a perfect fit on the rib nose. It feels and looks super smooth, so if one of you new builders makes this same mistake you no longer have to cry those big tears. Thanks, Roger, for letting us in on this little gem of info. (Wonder if this technique might work as a NORMAL SOP when bending wing skins?)

Pay close attention to the follwing from Lu:

Spin Testing

SPIN TESTING (by L. D. Sunderland): Just had a visit with John Thorp and discussed a number of things including spin testing. At Oshkosh someone reported having done tests on a T-18 with a wide body during which he had to hold full nose down stick and opposite rudder for some time to effect a recovery. His engine had quit during the spin. No data is available on the cent of gravity location of the particular aircraft or whether it had a cut-down Ken Knowles rudder. (I just discovered that Ken Knowles has been selling T-18 rudders that are 1 1/2 inches narrower than the standard rudder. Neither John Thorp nor I approve of this modification.)

John Thorp advises that spin testing on any new aircraft is a serious business and should not be approached lightly. The spin characteristics of a particular airplane are affected by such things as cg location, wing twist, uniformity of leading edge bend, and control surface size. Spin characteristics of individual T-18s vary considerably. John says that it is possible to get the cg so far forward that the airplane will not even spin. The further aft the cg is moved, the airplane will spin in a nose-high attitude. Most of us have airplanes that will recover from a spin simply by neutralizing the controls but this does not mean that every airplane will have this characteristic.

Anyone who is knowledgeable in spin testing new aircraft will tell you that it should not be done without a parachute and provision to release the canopy quickly in case of an emergency. Each successive spin should be held only a half turn more than the previous ones, and any tendency for the nose to rise during the spin towards a flat attitude should be noted. Neither John Thorp nor I recommend that spins be done in the t-18 or the S-18 because of the complexity of the testing program required to insure quick recovery.

Again, Lu, we thank you for these two reports.

OSH '86

OSHKOSH '86 REPORT: As per usual, OSH was a mind boggling experience. It's like trying to see what's going on at a six ring circus, with all the rings going full blast at the same time. Our T-18 Forum was most ably conducted by John Walton and Lu Sunderland. One interesting little tidbit I remember came out of it. Ed Burke was reluctant to put all those nut plates around the forward floor (to make it easily removable), so he measured himself and found he could squeeze thru an opening 14" x his shoulder width. This allowed him reduce the number of nut plates by half and attach that section of the forward floor to the fore & aft anles. He will draw a sketch for us for the mod..soon. Anyone that's had to get down under that panel to work on brakes or fuel tank automatically gives three cheers for an easier way. Our annual T-18 Dinner on Tuesday nite was a sellout again and an evening thoroughly enjoyed by all. Our after

'86 OSH Dinner

cont'd
dinner speaker again was Frank Kingston Smith, who held forth in his own inimitable way. As usual, Frank's witticisms held his audience spell-bound. He truly has a talent for captivating his audience with his stories and recollections. Lee Skillman again MC'd the event in his usual smooth manner until he made a Freudian slip while introducing Frank K. as Frank "Kingsford" Smith. He realized the slip when he made it, but he knew by then that Frank had him...and he did!

We had intended to list all the T-18 builders that brought their birds to OSH this year, but Lee didn't send me the list in time. I did remember one family that brought 2 T-18s to OSH...Cecil and Fanny Hendrix flew formation all the way from Seattle. Fanny flew the T-18 that Cecil's father, the late Ford Hendrix , had for several years. Cecil says she does a good job with it, too.....I'll try to print the entire list in the next NL, if possible. We had about 25 T-18s there this year. This includes a couple that were parked down in the aircraft camping area. We also paid tribute to Gayle LeCount, who had brought his T-18 to OSH for 14 straight years! I also remember seeing Jim Alexandre's silver beauty there from Canada, as well as Bob Highley's.

OSH '86

This year I had very little free time to look in detail at the T-18s or talk to T-18 people, much to my chagrin. I was busy from early morn to dark time each day doing interviews, getting air to air photo hops set up, etc. This year I covered ultra lights, ARV homebuilts, and other homebuilts. Got a chance to go along on a foto hop in Dick Van Grunsven's latest, the RV-6, and to fly it some when fotos were done. It's a very nice flying airplane in most respects (see future story in Sport Aviation). Jack Cox gave me the supreme test as to whether I really was one of the worst of the die-hard "Tin Benders Forever" clan when he gave me a really tough assignment, to cover, the Glasair that was adjudged Grand Champion of the Kit Builts! Seeing that I somehow got thru the interview without even once asking the builder what thickness metal he used, he then had me cover a four place Varieze (the Two Easy) and later a French couple that were honeymooning at OSH in their Varieze! Some of the staff thought he had lost his reason when he had me cover those birds, but he knew what he was doing. (He knew my "T-18 History" hadn't gone to the printers yet and he had me boxed). Casting all caution to the winds he even had me cover three more composites (the Legeti "Stratos", the Gambit, and the AMD-SII), plus a little all-wood tandem two place twin engine, the "Culex". Later, seeing my weakened state, he said, "Well, okay, go on down there and cover Chris Heinz' little all-metal STOL". I also covered still another composite, the Sun Ray, and a very interesting little two place tandem that used the Rotax 532 liquid cooled engine (65 hp). It's about 95% the size of a J-3 and is called the RANS S-7 'Courier'. I guess all those stories are going to be my punishment for promoting the dissemination of metal building techniques in my monthly column in EAA's companion mag, Lightplane World (called "The Tin Bender's Corner"). The column takes it step by step thru the building of a mythical all metal, called the "Tin Pup" and a lot of the material will parallel material in the T-18 Newsletters, plus a lot of very primary info for rank beginners. In case you didn't know, you can add a Light Plane World subscription to your Sport Aviation tab for only $15/yr. more. The mag is now transitioning to ARVs and 51% homebuilts, rather than ultralight coverage strictly.

Anyway, I guess you can see why I didn't have too many opportunities to visit with my T-18 buddies and ogle all those beautiful T-18s. Maybe next year.

EXHAUST SYSTEM NEWS

The following is from Light Plane Maintenance magazine, the Aug. '86 issue:

EXHAUST SYSTEM INSPECTION GUIDELINES:
Exhaust systems, let's face it, give a lot of trouble in aviation. In high output engines installations, especially , exhaust systems are a constant threat. Something always pops, corrodes, leaks, cracks, vibrates loose, and/or disintegrates before the engine makes it to TBO. The trick is to catch it before it becomes a real problem.

If you read exhaust system ADs pertaining to turbocharged twins you'll note that they tend to require only VISUAL inspection of components, seldom dye penetrantants or other methods, a point worth mentioning. Most life threatening exhaust system flaws can be spotted with the naked eye. So use your eyes. Open the cowl and look the system periodically (often) at least once between annuals or any time the cowl is off for other reasons. Light brown, grey, or greenish exhaust stains are a tip off to problems naturally, but not all exhaust cracks are leakers. Sometimes it takes a very sharp eye to spot the problem.

Stains, incidentally, are often remote from the actual leak site. Occasion -ally a jet of exhaust gasses will shoot past a clamp and stain an adjac- ent riser, or vice versa. A bad exhaust gasket will let a jet of gasses stain an adjacent stack clamp, etc. Look for the true source of the stain, not just the nearest culpable component.

In dealing with clamps, it is best to remove the clamp, shift it slightly, rotate it one way or other, and..starting with fresh nuts and bolts... reinstall it to the PROPER TORQUE. Merely over-tightening a leaking clamp or gasket may not get you anywhere.

Be alert for bulges in stacks or risers. Bulges usually conceal cracks (which may or not be leaking yet). Don't throw away bulged pieces, tho'. A good aircraft welder can work magic on defective exhaust components, even when compound curves are present. Repair of burned out areas usually costs $25 to $45, new flanges installed for $31 ea., ball ends $39-$50, and new f flame cones installed in mufflers about $71 (at Custom Aircraft Parts, 619/276-6954 (DG0).

When components are accessible from the inside, get out a spray can of WD- 40 and fog the inside of the component. The penetrant will leach to the outside of the metal wherever a crack is present, making cracks too small to be seen highly visible in a matter of minutes.

To check for larger leaks, with the exhaust system installed on the air- plane, obtain a vacuum cleaner that will BLOW clean air and plug it into the outlet of the tailpipe (wrap rags around it as necessary to get an air tight seal). Remove one spark plug from a cylinder and rotate the prop until that cyl. exhaust valve is open (find the compression stroke the usual way with your thumb against the hole, then continue 180°). Insert a direct reading compression gauge in the spark plug hole. Then power up the vacuum cleaner and adjust the laekage until the system is pressurized to between 10 and 15 psi.

Next, get yourself a trigger spray bottle of soap and water and go over the entire exhaust system, starting with the exhaust ports of the cylinder and ending with the muffler or lowest stack. Any frothy areas, of course, indicate leakage.

MORE ON EXHAUSTS

Typical areas for cracks to form are any of the weld areas, around slip joints, and around flanges. Weld beads absorb a lot of heat and cracks sometimes begin forming around them from the outside first. These cracks often progress very slowly. Nevertheless, these should be attended to promptly. Again, this type of damage can generally be repaired by a good welder.

When exhaust flanges gaskets (at cyl. flanges) have been found leaking it is essential to effect a repair quickly, rather than continuing to operate the engine, since exhaust gasses a re hottest at this point and tends to erode the aluminum cylender head material quickly! After removing the affected riser, examine the gasket seating surface on the cylinder. If metal is gone (leaving something less than a flat surface) the jug will certainly will have to be removed for weld repairs, if in fact it is even repairable at all! The exhaust pipe flange will also probably be warped, but this is an easy component to fix.

The balance of the article concerned mufflers. Since most T-18ers don't use mufflers, I'll defer the rest of the article until a future NL, or until some of you drop me a card requesting it. They make mention of Wag-Aero's muffler repair dept. and an exhaust sytem catalogue that they have for the asking (I think). Anyway, the above tips on inspection are ssmething that affect each and every one of you that have airplanes that are flying. Some of my hangar pals laugh at me for frequently removing my entire cowl and going over everything with a bright light and often a big magnifying glass, but this paid off several times. I firmly believe that every new homebuilt should go thru this procedure about every 15 hours the first 100 hours and from then on every 25 hours. You well know what a welding torch will do to metal in a short time. Consider what a small hole in an exhaust pipe might do to adjacent parts, lines, and fluids, if the very hot gases direct a focused blast at them for say an hour or two. A very experienced mechanic I know and respect once told me backs exhaust system nuts off every few hours and then re-torques them on airplanes under his care. He also uses a mirror to inspect backsides of items not readily visible and he very seldom has any problems arise in between inspections as a result. He says the torque wrench is one of the best inspection tools you can have and that you must be certain you know how to use it in an approved manner! In May this past year EAA sent me to Canada to the Rotax engine distibutor"s five day clinic, which not only includes lectures, but also is a hands-on course in tear down, inspection, repair, and re-assembly of all five of their engine models that range in hp from 28 to 65, both air and liquid cooled. They devoted a significant amount of time teaching all of us to properly use torque wrenches...and all of us thought we knew how before, too. One important thing I can pass on is...Never hold the wrench with your other hand when pulling on the handle. Incidentally I was quite impressed with the quality of the Rotax engines and Ron Shettler's Kodiak Research operation. I'd now never worry about flying behind a properly installed, maintained, and operated Rotax engine, after going thru that clinic. (Ron is the distributor for North and S. America, Australia, and New Zealand for the Bombardier Corporation engines, the line includes a large number of other type engines mf'd by this huge multi-factory, multi-type products, with their products ranging from locomotives to aerospace and electronics). The Rotax story will soon appear in either Sport Aviation or Lightplane World. Kodiak also produces thousands of the most beautiful wood props you've ever laid eyes on and we did a story on their operation in the August '86 issue of Lightplane World.

FOR SALE

More FOR SALE: James Brayshaw, Jr., 635 South Michigan Blvd, East Pasadena, CA, 91107 (818/354-2746 business or 818/449-6487 home) has several T-18 parts for sale (not listed), but he has ONE standard size Thorp ALL-METAL cowl for sale. Was built in John Thorp's Sun Valley shop by Freddie....., his sheet metal craftsman. It has never been used. Assembles in four sections with cam locks, which are included. The lower section has never been cut to fit a carburetor or engine. The workmanship is immaculate. It's up for auction. Best offer over $1000 takes it. Mop up the drool, gents.

FINGER STRAINERS

JIM FRENCH, of Wimberly, TX, called the other day to tell me about an "incident" (that came close to being called an accident). Knowing he was getting a little low on fuel on the way back from OSH and observing scattered showers ahead, he decided to land at Georgetown, Tx, and refuel. His home field at Wimberly was around 50 miles away, but he didn't want to get in a holding situation with fuel on the tight side. After refueling he taxied out and started the Takeoff. Just a moment or so after breaking ground he had an almost immediate flameout. He was able to stop in the remaining runway, but after roll out he tried to restart the engine with no luck. After they got the airplane up to the ramp he started checking the gascolator, thinking he had gotten a big slug of water in the gas. Not only was there no water, there was also no gas. He couldn't get gas to flow out of the tank at all!

He call ed a couple of days later to say that the gas line checked out ok, but something in the tank had blocked the outlet. They put air pressure to the line and got fuel to flow, so they drained the tank and looked inside. They found a couple of hunks of the silastic material (that had been used to make a scupper dam around the tank neck) in the bottom of the tank, but they still don't know how or when they got in the tank. Possibly the hose nozzle did it during refueling, maybe not.

After they got the pieces out of the tank they looked again and there was nothing in there.....and that's the moral of this story!!!....THERE WAS NO FINGER STRAINER IN THE TANK! This story could have had a tragic ending if the flameout had come a half minute or so later.

We haven't established who made the tank, but that isn't the real point. When a builder installs a new tank he has a responsibility to inspect the inside to see that there is no foreign matter in it, yes, but even more important....He should check to see if a finger strainer is in the tank. If not, it is a MUST that one be installed! If you are ordering a new tank from one of the suppliers it would be wise to specify that you want a FINGER STRAINER installed. It's little things like that that can get you killed. Rarely is it the big things.

DANGER ITEM! FINGER STRAINERS

Now I hope that ALL of you that have airplanes flying or under construction will immediately check your tank and I also hope that if you don't have a finger strainer that you will ground your airplane until you do have one. PLEASE don't try to rationalize and say, "Why I've been flying my T-18 for three years and 350 hours and I've never had any trouble, etc". That's in the same DUMB class of remarks we used to hear from a few of the builders a few years back, that refused to make the mandatory mod to the horizontal tail. Then they would bray, "I NEVER go over 180, so I don't need to go to all that trouble and expense, ad nauseum". I sincerely hope this type hasn't sold his T-18 to some innocent unsuspecting buyer. All of us should seriously consider what might happen down the road. Any deliberate non-compliance with known and documented hazards could come

FINGER STRAINERS, cont'd

come back to haunt you if it ever came to a court case and there was an issue of liability involved. If deaths are involved, there could be charges of criminal negligence brought if it is proven that someone sold an airplane with a known dangerous defect.

FOOD FOR THOUGHT

Just in case you don't have a finger strainer, they are available from supply houses, like Aircraft Spruce, etc. If your tank has a 1/4" outlet you'll have to bore and tap it to 3/8" for the strainer. It's a big job to remove the tank, but it CAN be done on the airplane if you are very careful. With the tank drained and dry, you can put several short strips of duct tape on the end of a stick (sticky side out) and use it to pick up any aluminum chips that come thru with the drill or tap. Have someon hold the stick in position as you drill. Flush and inspect before you pu the finger strainer in....(Any comments on this item will be appreciated

MORE FOR SALE

For Sale: Ron Bostick, Dallas, has had financial disaster hit him and is forced to make a distress sale of his project. It's a widebody, on the gear, with Cleveland wheels & brakes, Maule t/w, dynafocal eng. mt, tank in & plumbed, roll bar and canopy frame installed, Cessna seats installe tail group complete, controls, no instrumenst. Wing is st'd wing, complet with tips, nav lites, paint (wing bought from John Walton for $3000 & fl for 250 hrs). Over 11k invested, but can be bought for 5k if right away, otherwise will go in Chapt. 7 assets. Call him at 214/690-1620.

JOHN PHILLIPS, of McAllen, TX, has TWO T-18s that are surplus to him. On has been flying a couple or three years, the other is about 60-75% done. Prices on both are a bit below market, but I don't have the info at my finger tips at the moment. Call him at 512/ 682-9050 for details.

If any of you are seriously interested in buying a flying T-18 or an uncompleted project, give me a call any time after 9 am CST and I'll pas on any I hear of. I have some others, but now out of time & space.

NEWS ON LU

In case you don't know, our good friend, Lu Sunderland, underwent colon cancer surgery just before OSH. At the time they thought all of the cancer had been removed, but a specific blood test later indicated a possible return of cancer. Going back to surgery verified the spread of the malignancy, so he's now undergoing chemotherapy. I am sure he would appreciate your get well cards or calls, but especially would appreciate your prayers for his full recovery. Lu is a fine Christian man, that has tirelessly given of himself in our behalf and has a lso been a national leader in the crusade to eradicate the monstrous unproven theory of evolution, giving hundreds of lectures and TV appearances to scientifically disprove the Big Lie of man's origin. He's an inspiration to all of us and we pray for his return to health.

One final reminder, amigos. WE CAN'T KEEP THE T-18 NEWSLETTER GOING MUCH LONGER IF WE DON'T HAVE MATERIAL TO WRITE ABOUT AND THAT MEANS IF YOU DON'T THINK THE NL IS OF MUCH VALUE YOU'LL JUST CONTINUE SITTING ON YOUR HANDS AND NOT SEND ARTICLES IN. Every T-18 is a story in itself, every project is also a story. Type it if you can, but if you can't, just writ it and I'll get it types....(I'm really not exaggerating, gents. PLZ don' put it off...). THE INFO WELL IS ALMOST DRY, GENTS.

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February 25, 1986

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Here a relatively new owner sets down his thoughts on his T-18. It would be greatly appreciated if ALL you new owners would send us a report like this, even if you cover exactly the same things Jim did.

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Mr. Dick Cavin
10529 Somerton Drive
Dallas, Texas 75229

Dear Mr. Cavin:

Enclosed is a check for $25.00 for membership in the Thorp T-18 Mutual Aid Society. I recently purchased a T-18 and the seller included all the newsletters from No. 1 thru No. 63, only No. 17 and 18 are missing. I would appreciate having copies of these two if they are available. I really couldn't find any recent reference as to the amount of your annual dues, please let me know if it is more. If it is less consider the extra as a donation to help support the newsletter. Believe me, the file of newsletters has been a very valuable aid in checking myself out in the airplane. The information in the newsletters was a big help in compiling the V speeds and writing a checklist for the airplane. I'll be glad to share the checklist with you as soon as I have finished familiarizing myself with the airplane.

The plane I bought is N2319C Serial No. 62 originally built by John Ferko in Whittier, California, and licensed in 1967. It started out with a Lycoming 0290 G. The plane was owned by Wil Neubert from October 1973 to October 1974. J.R. Michaels of Sandusky, Ohio bought the airplane in 1974 and installed a Lycoming 0320-E2D 150 H.P. engine with a Sensenich 66 LM-72 wood prop. I purchased the plane from Steve Sawyer of Mount Vernon, Illinois who had owned it since August 1985. My check out consisted of the cross country flight home from Mount Vernon, Illinois to San Marcos, Texas in the right seat doing the navigating. This airplane was Steves first tailwheel airplane and he had only had about 25 hours in it. The trip home included a landing in Georgetown, Texas with a 20 knot crosswind. From the ride home I had the impression that the T-18 was a real handful on take off and landings. My first two trips to the airport consisted of long taxi runs starting with keeping the tailwheel firmly planted on the runway and increasing the speed to about 60 M.P.H. Next came getting the plane up on the main gear at about 75 M.P.H. The third day, Sunday February 23rd dawned clear and calm, and the drive from my home in Wimberley to the San Marcos airport 20 miles away gave me ample time to change my mind several times about whether to solo or wait for Monday when Harold Perdue had time in his schedule to ride with me. The weather was absolutely beautiful with a light wind right down runway 17 and not a cloud in the sky. N2319C and I took to the sky cautiously feeling each other out. I had my checklist and V speeds on index cards

Page Two

with me and I had rehearsed the take-off and landing procedures and speeds mentally over and over. Directional control in both take-off and landing was no problem what so ever, and I made a reasonably good three point landing the first time. What I was not prepared for was the acceleration, rate of climb, and steep attitude on climb out. None of my previous airplanes with the exception of a 1970 Money Ranger, even came close to the T-18. The rest of Sunday consisted of take-off and landings at San Marcos and then short trips to New Braunfels and Lockhart. At Lockhart I made the ramp turn off at 1000 feet without any heavy braking with plenty of room to spare. On take off from Lockhart my ground run was approximately 650 feet with 20 degrees of flaps.

My experience in tailwheel aircraft includes the Aeronca 7 A-C, Stinson Stationwagon 108-3, Citabria 7 ECA, Cessna 120, and Cessna 170 and totals approximately 1500 hours of tailwheel time. My observation has been that tailwheel airplanes are generally much easier to land in the three point attitude. This evening I tried my first wheel landings in the T-18 and to my delight I discovered it is much easier to do a nice wheel landing in the T-18 than any other tailwheel aircraft I've flown. I can't imagine an airplane which could be more enjoyable to fly.

As delighted with the T-18 as I am, I can see some room for improvements. The 72 pitch Sensenich will only let the engine turn 1950 to 2000 R.P.M. static. The 150 H.P. Lycoming should turn 2200 to 2300 R.P.M. static for optimum take off. I have talked to Bernard Warneke and the Great American Propeller Company this week and hope to have their recommendations for a different prop shortly. The airstrip where I live in Woodcreek Resort, Wimberley, Texas, is approximately 2000 feet long. While the present performance is adequate, I think I would appreciate a little more margin of safety for take-off performance.

I look forward to meeting some of the other T-18 owners at the EAA fly-ins in this part of the country. Please let me know if there are any T-18 functions.

Sincerely,

James W. French, P.E.

Thank you, Jim, we appreciate it.