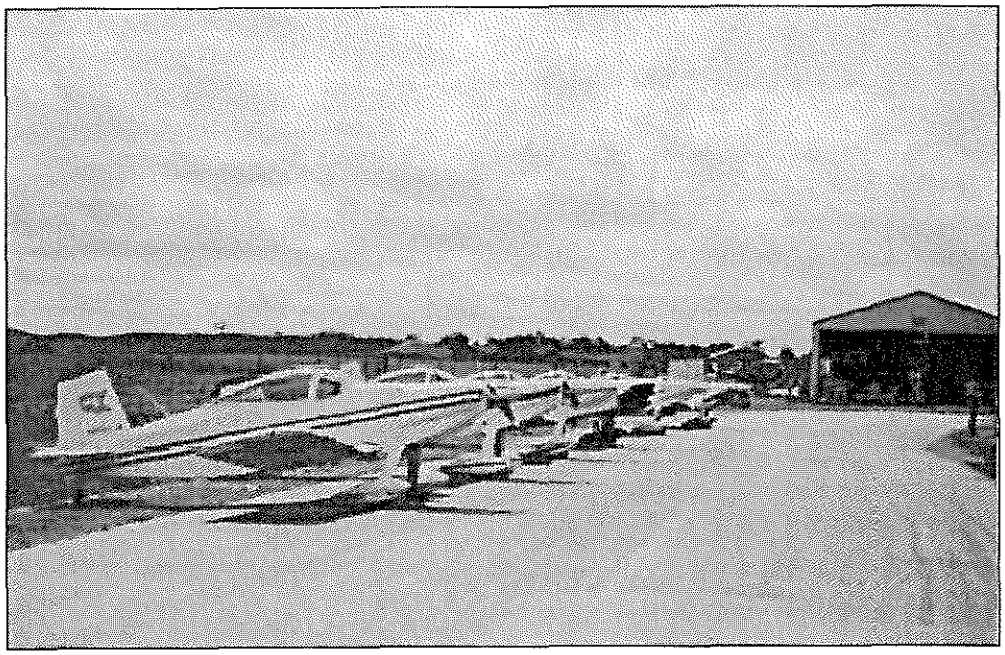
T-18 Newsletter

December 2003



Paso Robles Get Together ~ 2002

IN THIS ISSUE:

Editors Notes

By: Roy Farris

WOW ..... did someone open a can of hornets or what !!!!! For those of you that are members and monitor the ThorpList Email Group you know what I mean. For awhile there I thought that things were going to get way out of hand, but in the end it calmed down and I believe that some positive things will come from it. I want to throw my three cents in here and tell you all what and how I feel about the subject.

It all began with someone on the Email Group asking a question that has been covered many times on the group and covered in great detail in the T-18 Newsletters. The person asking the question was not a Mutual Aid Society member and did not have the newsletter for reference. He received a rather blunt answer that came across rather distastefully and basically was told to get off his backside, buy and read the newsletters, do his homework and stop asking dumb questions. That guy basically said to kiss off, and he no longer belongs to the group. His last remarks were something like ... if that is the kind off people that build and fly Thorps and this is the type of response that I get, then I don't want a Thorp or to belong to this group. Several others echoed his remarks ....

One of the things that drew me to the T-18 was the warm reception that I received when I first inquired about the T-18. The people that answered my questions and started me on the path to building and someday flying my own T-18 were always, and still always willing to go the extra mile or more to help me attain that goal. Heck for those of you that really know me, you all know that my constant ability to bum a ride is what keeps me going. We all talk about the reasons that the T-18 is not as popular as the Vans series of airplanes ... and we all wish down deep that it was a little more so. We all Love our Thorps and will defend them in a heartbeat against anyone or anything that threatens it. Most of us built our T-18, have read and studied the newsletters, and we know everything there is to know about the airplane. Some of us have trouble understanding why this newer generation don't know or don't bother to research their airplane before or after they purchase it, but the fact is that there is a new generation of Thorp owner who did not build the airplane and just bought it because it looked good and the price was right. Sometimes they are the third or fourth owner and don't even know who the original builder was. I give credit to these new non-builder owners for at least getting on the internet and asking questions ... how else are they to find any information about the Thorp they just bought or are flying? Some of them are not aware of the T-18 Mutual Aid Society, the newsletter, or the ThorpList until they stumble upon it while surfing the net. The T-18 website was created for the purpose of providing a media for people to find out about our airplane and the MAS, the ThorpList email group was created as a meeting place to ask questions and exchange ideas, as was the Newsletter. If our historic little airplane is to survive then it is up to us to promote it in a courteous and professional way. Most of us monitor the email list because we love the Thorp and like the exchange of information that goes on. Most of you guys have built the airplane and are in a position to answer a lot of questions. When someone new joins the ThorpList, lets make them feel warm and fuzzy and lets answer those questions, even if we have done it a million times, because the person asking probably needs to know. Lets help them be safe and learn the things they need to know. Lets promote the T-18 and the MAS in a positive way, and by doing so we encourage growth in the Thorp movement and the Thorp family. There will never be as many T-18's as there are RV's but then do we really care. Rv's are like Chevy's, (sorry EL) everyone can have one, but the T-18 is more like the Ferrari ... only the elite fly them. Lets all do our part to make the Thorp family kind and courteous, and the reputation of the MAS as an impeccable source of information.

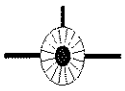
Some Positive Outcome

From the conversations on the ThorpList email group it was suggested that we come up with a list of what is considered mandatory modification for the T/S-18, and some of the safety concerns that we have learned over the years, and to publish it in its entirety in this newsletter and on the T-18 website. This information would then be easily accessible for those that are perhaps wanting to buy a completed and flying Thorp, or even for those just gathering information in hopes of building. In any event I believe this to be a wonderful idea and well worth the effort. I have already received some proposed information to be published and will look over it in the near future. I am planning to work with Richard Eklund at Eklund Engineering to make sure that the information is accurate and published in a professional manner. I would also like to include some information on some of the smaller changes that are made that sometimes improve on interior room or convenience ... like electric pitch trim, narrower tunnel, instrument panel moved rearward a few inches, etc. ... just little tidbits that we do to make our individual airplanes a little better.

Another item that was brought up is the fact that the old newsletter back issues are hard to read and that the pile of paper is enormous. I can't argue with that .. the old newsletters were not printed professionally and have been photocopied many times, their quality is less that perfect. They also contain a lot of subject matter that was interesting at the time, but has little value today. It makes it tough to sort through all the paper to find the good stuff .... BUT there is a TON of really good stuff in them. I have mentioned this several times before, and I am going to mention it again .... I would like to do a rewrite of newsletters 45 through 90 and put them in book form as Lu Sunderland did with issues 1-44. I am willing to do all the editing typing, etc. that is required, but I am no artist, I just can't do the drawings. I have ask for help before, but so far I haven't found anyone to take on that job. I need for someone to redraw all of

Some Positive Outcome

the pencil drawings and sketches in the newsletter so I can get them in a computer format. If someone can recreate them on a computer that would be perfect, but I could also scan a really good ink drawing and make it work too. I really need some help here guys !! If I can get this completed I will be able to offer the newsletter set at a better price than the large stack of paper that you get now, and I could also offer it in an Adobe format on a CD. I can edit out all of the non-necessary stuff and keep it to useful and technical information. If anyone out there is interested in helping me with this task, please contact me. My contact information is on the back cover.



Letter From a Member

I just want you to know I would not criticize you or anyone else currently supporting the T-18 for the fact that the drawings and other support documentation are not up to current standards. But the fact is that Van Grunsven and others have set a very high standard, and if people really want to promote the continuation of the T-18 in the homebuilt market, there needs to be a major update of the documentation.

I bought a partly built T-18 because it was much cheaper than Brand X, and because I have plenty of tailwheel experience. After owning a Luscombe, a Cessna 195 and a T-6, the T-18 is not a hard airplane to fly. I am willing to live with the cramped cockpit and mediocre low speed characteristics, and I prefer the feel of a T-18. But many people would certainly favor the RV-6/7. I recently flew an RV-6 and it was roomy, had amazing low speed capability (had the vortex generators on the wings) and good handling. With their highly prefabricated kits, Van has a big advantage over anything Archer or Eklund are likely to offer .

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Letter From a Member,cont.

Considering all this, the T-18 can not hope to compete unless the documentation is absolutely first class, in my opinion. And when I say "compete", I mean even on a relatively small scale. I have been helping a friend who is looking for an RV, and it appears to me that the used market for T-18s is close to half the price of comparable RV-6s.

I am sharing these thoughts with you because you are in a position to encourage dialogue on this subject. My tirade has apparently stimulated some action on creating a list of critical drawing mods, etc. I hope that will follow through and end up with something useful you can publish. Safety has to be the first priority. The second priority, in my view, is anything that will make the builders job easier.

Thanks for keeping the newsletter going. I know it can be a thankless task.

Ben Harrison
Flight Crew Operations
Flight Deck Engineering

Saftey Means Knowing your Airplane
My Coperstate Trip by: Skeet Wyman

I was very excited. It was to be my plane's (7077J) first trip to a fly in. And not just any fly in, Copperstate. I live in So Cal so it was an easy T-18 trip, a mere 287 miles. By my average speed it should not be any longer than 2 hrs max. And all the local trips I have made indicated a ground speed of 170mph average so it would be a real good first long trip. Plus my son would be accompanying me instead of my favorite co-pilot my wife as she had visitors who could not be left unattended. Now all my previous records and calculations showed that I burned 8.5 - 9gph@ 2500rpm. Back when I was having trouble with fuel flow I had drained the tank and was sure (I thought) that full was filled with 29 gal. So flying at that rate should give about 3.4 hrs flying time. My plane is equipped with a electric gas gage and I had done some flying down to the "E" mark on it and used a dip stick to measure what was left and I thought I had a good handle on what was what. But I was soon to learn that I should have been more accurate in this department. I had checked out the gps coordinates (for Copperstate) and read the arrival procedures, got a current sectional, reviewed it and felt fairly comfortable. I had been to Goodyear several times and pretty much knew my way. The plane was topped off the night before and preflighted. I had just installed new seats and this would be the first flight with them. There was definitely plenty of excitement on this trip and I was really looking forward to going. So the plan was to leave at O Dark thirty, since we would be flying into the sun I wanted to get a head start. Well Saturday morning came and we kinda laid in the nice warm bed an extra half hour. By the time we got the lunch made and ate breakfast and drank coffee... well you get the picture. Take off time tuned out to be 7:30. (so much for beating the sun) But as we took off the plane was running really good (cooler temps than I have flown in a while) and it was clear sailing to the destination. I climbed to 7500msl leaned her out and handed over the helm to my son and began too enjoy the ride. I hadn't sat as a passenger in my plane in a while and this was a treat. We reached Blyth (1st way point) and had a half tank. We had not had the typical ground speed I had seen so many times before. In fact we only made 155mph for the first hour! Wow! I started to pour over the sectional looking for other airports to stop at on the way (just in case). The closest was our destination. And while the gas gauge was getting low (I had run the numbers) I knew we should be alright. It was then that I scanned the cockpit and found my auxiliary fuel pump in the ON position. No wonder the fuel wasn't lasting as long as anticipated! Well time to listen to atis. Everything there was cool. Gps says were almost there, but the gas gauge is on "E"!!!!! But I ran the numbers!! Tune into approach now and don't show my son that I am panicking. (turns out I didn't have to worry he already was panicking)

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My Coperstate Trip by: Skeet Wyman, cont.

He later told me "dad I knew you could land it on that big race track if you had to" Gee thanks son for your confidence! And then all of a sudden I began to hear the swarm of bees. There must have been a thousand planes (well maybe 15) all trying to land here at the same time. And every time I heard another report before I could get a word in edgewise seemed like eternity as my gas gauge bounced off "E". And then I heard a group of 15 Kitfoxes reporting in!!!!. I finally talked to ground and ask for immediate landing because I was low on gas. His reply was I would have to go somewhere else as he had a flock of Kitfoxes coming in with a Cessna flying wing man. I DEFINITELY did not have enough gas to go anywhere else, and so circled the practice track with the other 10 planes waiting for the Kitfoxes to land and deciding which was the best place to land on the practice track if indeed I ran out of gas. So I climbed slowly and throttled back. (I sure love these Thorps) 1900rpm and I could still climb 200fpm. And yeah I busted ATC restrictions of 3500msl but frankly didn't care. I felt the altitude was a needed safety factor. I once again told tower of my more urgent concern for landing, and that I had spotted the parade of Kitfoxes. He then told me I could land first after the LAST Kitfox. So I circled one more time above the practice track, giving the parade a chance to get downwind, base and final. I started to head downwind left traffic AWAY from the airport, and I had to start losing altitude if I wanted to land in the same state. Now mind you all this is happening with at least 10 to 15 other aircraft in the same vicinity. As I was flying away from the airport I was told to look for the LAST Kitfox that was yellow. I didn't realize there were so many different color Kitfoxes on this planet other than yellow. I couldn't believe how far away from the airport it felt like I got, but finally I saw the yellow Kitfox. And there was the wingman Cessna. I tucked in behind the Kitfox only to discover, "Is that as fast as they can fly?" The last one was doing S turns already and I had to do a slow 360. But at this point I KNEW I had the runway made. I looked at my son and could see the relief on his face. I didn't EVEN look at the gas gauge. The landing was uneventful (the best kind) and I was sure we would run out of gas taxiing to parking. But we didn't. After parking and taking care of immediate business, I came back to asses the fuel. I had to wait almost all day to get the fuel truck to stop by (even though he filled the Thorp right next to me an hour before mine and said "it wasn't my turn") and when he did it took 22 gals!!!!! 11 gals an hour!! Well we certainly enjoyed the day and (I'm sorry I forgot your name but not your Thorp) the beautiful Thorp parked next to me of a tiger breaking out of its skin over metallic silver. Just gorgeous. The flight home was uneventful as I made sure the fuel pump did not get turned on and I leaned constantly. We got back and had only used 18gal. Much better. But since then I have done my home work. I now know what I know. My Thorp has a 26 (usable) gal tank. Which is one of the reasons I want to go to a aluminum tank. And after flying around my base airport (after dipping the tank) I know how far the gas gauge is accurate to. Technical we had enough fuel when we landed. But the lack of that exact knowledge led to mega anxiety that if I wasn't careful, I could have made some other stupid mistake that could have been more disastrous than running out of gas. "Fly the airplane" was definitely drummed into my head by my many wise instructors. And a most valuable lesson indeed!

So there you have it my latest blunder. I am sure more to follow. Hopefully not as bad. And hopefully clear enough that I will see them and learn. Cause another mantra that has been drummed in my head that is just as important to me, is, "from everything negative you can learn something
positive" I try to live by this.

Thanks for the story Skeet ... We all must remember that we don't remain in the air long with an empty fuel take ... but I just have to ask what having the electric boost pump turned on had to do with it ...

N711SH Gets New Wings
Bob Highley

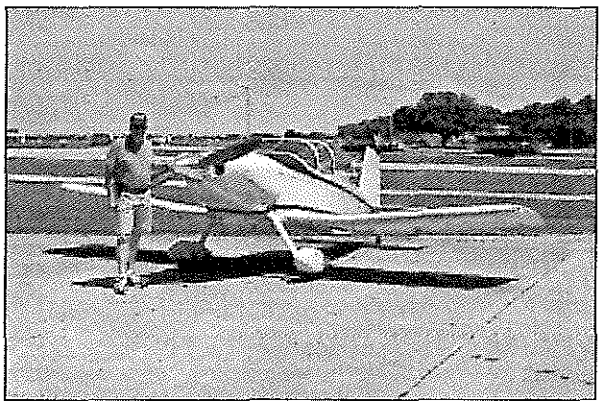

Photo by: Bill Williams

After 18 years and more than 1700 hours of flying, N711SH got a new set of wings. This started back in 1987 when Bill Williams, Les Conwell, and another guy began their S-18 projects. I wanted more fuel and the sealed Sunderland wings, as pioneered by John Walton, seemed to be the way to go.

We figured that with the four of us building, we could gang up on the projects and get them done in a reasonable amount of time. One of the guys dropped out. Bill Williams set out to prove you could build an all metal airplane as quickly as the glass ones that were so popular at the time. Les tried, with all of his might, to keep up with Bill, and the Air Force sent me to Saudi Arabia.

Bill and Les have flying for several years. Bill has more than 500 hours on N30WW and Les just turned 1250 hours in N818LM on his way back to Florida from San Diego. They each have additional fuel in the wings (62 Gals. total). Les's recent trip was only four 3 hour legs from Southern California to Central Florida.

Since we all travel together to Kentucky Dam and other events, I needed to get my wings done so I could keep up. Along the way, however, I decided to improve the already great design Lu Sunderland had developed. After talking to several people about feeding auxiliary fuel, I wanted it to all transfer into the main tank, rather than feed directly to the engine. Thereby, once the wing fuel fed out, I would be back to the basic airplane with full internal fuel.

Being a fighter pilot, cockpit chores had to be simple. I designed a system that transfers fuel by use of small Facet pumps into the main tank. Once the main tank is full, a circuit cuts off the pumps. Feeding is resumed once the fuel burns down. A time delay circuit keeps the pumps from excessive cycling. Float switches connected to "Fuel Low" lights activate when the wing tanks are going dry. Once both lights illuminate, I know I am down to internal fuel only. Practical tests show that twenty gallons of fuel will transfer into the main (provided there is room) in about ten minutes.

After flying several S-18s, I determined that the roll rate was not the same as the original T-18. I didn't know if it was the different airfoil or the shorter ailerons that was the reason. I decided to gamble and made 48" ailerons at the expense of the flaps. The S-18 has 41 ¾" ailerons. I based my decision on the fact that I knew Lu was trying to get more flap effect with his design. He was a Cub pilot and enjoyed operating out of a grass strip. When John Thorp recommended limiting the flaps to 30°, some people thought we lost some short field capabilities. Lu wanted to correct this in his design. Lu, also, thought the airplane had more roll than needed for normal activities.

As always, when you strike out to change someone's well-conceived plan, you quickly find that one change profoundly affects another. In this case, rib spacing was the issue. The S-18 flaps are hung on hinge plates that are riveted to the back of the aft wing ribs. My modification placed a flap end where there was no rib! I solved this by installing an additional aft rib for the purpose of hanging the outer end of the outboard flap. Riveting sequence is dramatically altered when you add more parts. Trust me. I really complicated an already complex situation here.

Another modification

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modification I incorporated was the use of piano hinge to hold on the wing tips. This was a lot of work and really falls in the "Gee Whiz" category. If anyone wants to explore the use of piano hinge to hold on parts, get familiar with the techniques the RV builders use. There are some tricks.

So, how do all these changes really work? In a word, "Great!" Roll rate is consistent with the T-18. The folded and shaped rear edge of the aileron retains the light pressures of my T-18 configuration up through red line. Stalls are almost a non-event (think Cherokee). Landing speeds are reduced with no degradation of touchdown deck angle. The airplane has a more solid feel and has shown to be about 4 kts. faster in cruise. I believe the speed increase is due to Lu's trick with the leading edge to more align the wing with the fuselage angle. Careful observation will reveal that he lowered the angle of incidence without changing the reference chord line.

You know there have got to be some downsides. Well, I gained about 25 pounds (the airplane, not me), and the complexity and time requirements were far greater than I had anticipated. I had, all along, decided to outfit my airplane as comfortable cross-country cruiser, but the weight penalty is catching up to me. The empty weigh is now 1040# including oil.

Would I do it again? That is a hard question. Building time is almost double that of the T-18. I enjoy working in the shop, so those challenges are OK with me. One must remember that I had a flying T-18 all the while that I was working on the wing project. For the future, let's see..I now have an extra set of wings and know of a project that has the fuselage complete on the gear. Just maybe a real lightweight VFR T-18....

Aviation Quote

Never fly anything that doesn't have the paint worn off the rudder Pedals.

Harry Bill

Technical Tidbits

Information on Rivet Strength

From Van's Rv email List (Who ??)
Submitted By: Stephen Peirce

Two days ago I got around to doing something that I had planned last year — actual pull tests on riveted aluminum coupons to see how critical it is to drive rivets to the correct height. All of us building or with completed RVs (as will those planning on it in the future) have had to wonder which imperfect rivets to drill out and which are OK. The answer is obvious when there is a severe cosmetic problem, but when strength is at issue, how much does a slightly under or overdriven rivet affect strength? How much does a grossly under or overdriven rivet affect it? Frankly, I had made the decision that the risk of damage from drilling out a flush rivet is greater than the benefit of doing so, unless an obvious cosmetic defect or really bad rivet is at issue. Now I have some hard data to go by.

What I did was to make up 10 test coupons. Each of these consisted of two pieces of .032 2024-T3 sheet 1.5 inches wide and 4 inches long. These two pieces were overlapped by 1.5 inches and riveted together with two parallel rows of 3 rivets each. Of the 10 total coupons, five involved the use of universal head AN 470 AD3 rivets and the other 5 used AN 426 AD3 flush rivets. In the latter case, both pieces of aluminum were dimpled at each rivet location, as is routinely done in Van's airplanes. In fact, the coupon construction is similar to the double rivet line where the lower outboard wing skin overlaps the lower inboard wing skin. This joint is loaded in tension normally for positive G flight and gave me the idea to mimic it for the pull tests.

Before getting into the results, let me ask you a question. Please think about the answer before proceeding. Just how many pounds of force do you think it would take to destroy one of the sheets used in making up the coupons? Remember this is .032, 2024-T3 sheet 4 inches long and 1.5 inches wide with no holes or rivets in it. Think about grabbing and

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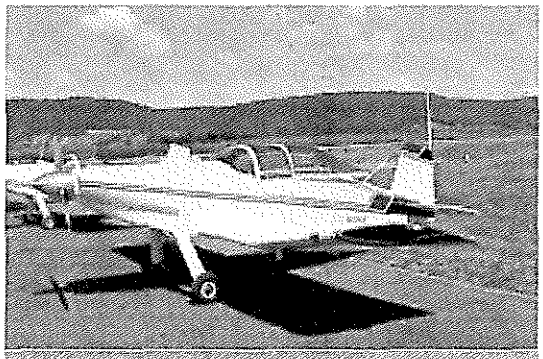
WEATHER GODS SMILE ON THORPIES

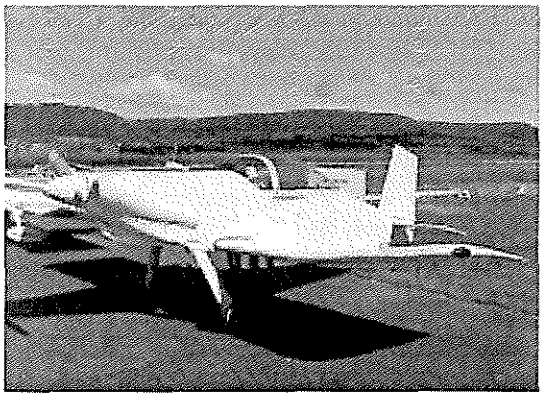
Submitted By: Jim Hockenbrock

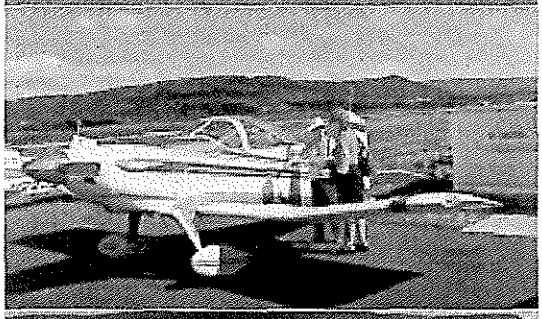
The week of August 17 was a terrible week for weather in Central PA with low ceilings and visibility or 3-4 mile. However the forecasters were promising good weather on the weekend. As forecast Saturday dawned bright and clear without a cloud in the sky. The Thorps were gathering and about to have a good time. Before the morning was over there were 7 Thorps on the field: Bill and Debbie Williams from Florida, Les and Margie Conwell from Florida, Jeff Miller from New York, Bill and Elmer Hyman from New Jersey, Rick Shoup and Eleanor from Virginia, Eric Teder from Delaware, Dave Jones from New York, and Ed and Alice Layton from Pennsylvania, Jim Tomaine from New York, and Jim and Carol Hockenbrock from Pennsylvania.

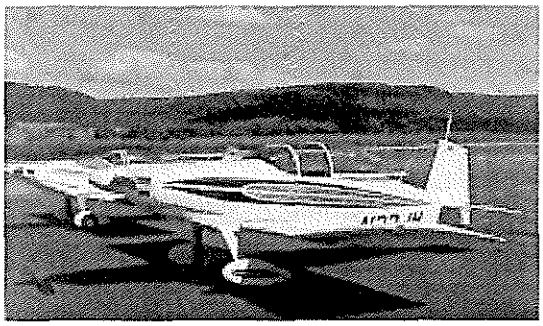
The group was well fed with a breakfast prepared by members of Chapter 518 and a picnic lunch at noon prepared by Carol Hockenbrock. Nobody should have been hungry throughout the day and some guys even took Whoopie Pies home to their better halves.

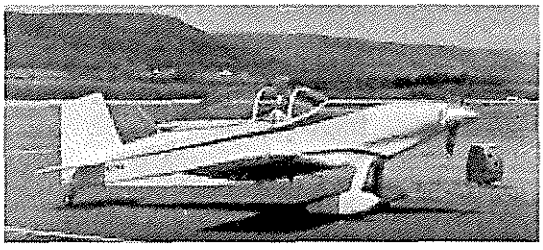
There was much good fellowship and many new friendships were made throughout the day, and hopefully we can all get together again next year.

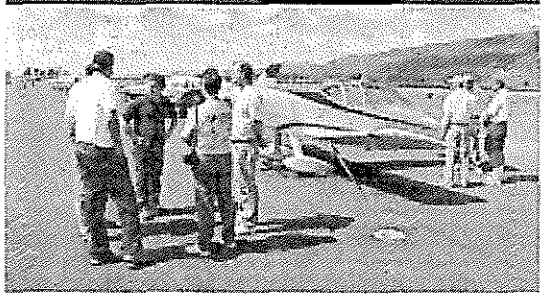


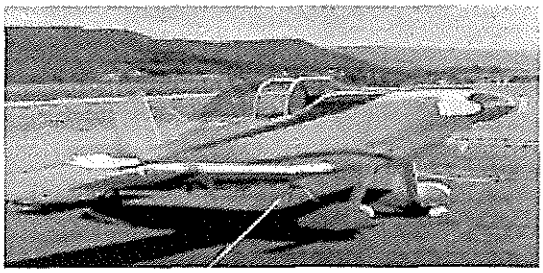










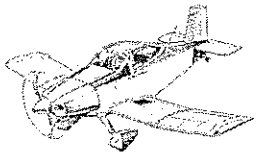


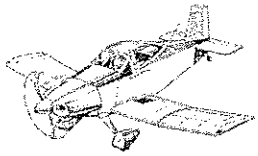
Pacific Northwest T/S-18 Meet

For the second year the Pacific Northwest T/S-18 Meet was not well attended (only 8 guys and two planes). Last year the weather got us, but the weather was superb this year. The Project Leader of the Me 262 Project, Bob Hammer (T-18 S/N #67), wasn't able to be with us on Saturday. Ralph Corbin (new T/S-18 a-building) hosted us with help from Tom Worth bringing the donuts. Those attending were Bob Anderson, Ralph Corbin, Bob Taylor (& father), Norman Pauk, Phil Mandel and Tom Worth. Paul MacMichael was to have been our Meet chairman, but his son chose to schedule a wedding that weekend in Idaho. Paul will choose a location and direct next year's meeting.

The Messerschmitt 262 plane had repairs completed from a gear collapse landing several months back. It was just headed for the paint shop and will receive more flight testing thereafter. All attendees had an opportunity to look at the other bird nearing completion plus 3 other airframes. Flyable models may be purchased for around $2 million (static ones much less).

Tom Worth





Pacific Northwest T/S-18 Meet

Technical Tidbits, cont.

suspending it at one end with some sort of clamp across the entire 1.5 inch width and then hanging weights on the other end from another clamp. How much weight would it take to break this .032 inch thick sheet? Would a 100 pound set of barbells do it? A 500 pound set? A 1200 pound small car? A gross weight RV8 at 1800 pounds? A gross weight Grumman Tiger at 2400 pounds? More than that? Come up with some sort of gut feel before proceeding. I was surprised by the answer. You may or may not be, depending on your knowledge in this area. Since some of you will cheat and read on, I'll hold the answer for a moment! Each of the 5 test coupons, both with the universal head rivets and the flush head rivets, was riveted to a different degree. One was grossly under driven, one was slightly under driven, one was correct per the rivet gauge, one was slightly over driven and the last was grossly over driven. The slightly under driven and slightly over driven rivets were such that you would probably need a rivet gauge to detect them — I did this because I suspect that most of the rivets in our planes fall

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October Gathering at Kentucky Dam

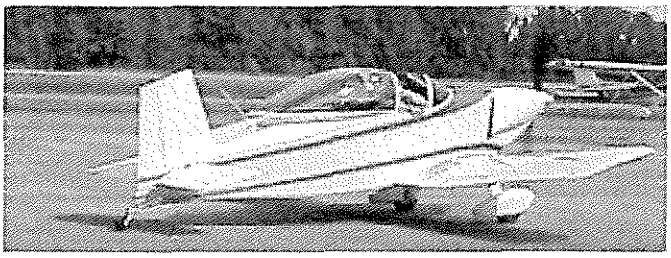
The weather on Saturday was beautiful at Kentucky Dam this year ... unfortunately it was not that good everywhere else. Bad weather on Friday and Saturday kept several would be attendees from getting there. several made the attempt but were grounded by the nasty stuff and had to sit out the weekend in motels thinking about the activities going on at Kentucky Dam. Several pilots and their airplanes made it, as did many of us that drove. We had a really nice time at Pattie's restaurant on Friday night, followed by a wonderful day of ride taking and formation flying. Sunday again brought the possibility of bad weather and most took off early to get home.

There were 10 T 18's at Kentucky Dam. I am sending you pictures of 8. I did not get a picture of Gary Cottner's airplane or Bob Affleck from Canada.

There were 34 at the dinner at Patti's and 44 at the dinner at the Lodge. We had at least 2 airplanes and several people who left before dinner on Satuday. Masons and Frechette left.

Airplanes at Kentucky Dam 2003

1- Bob Highley N711SH
2- Les Conwell N818LM
3- Bill Williams N30WW
4- Tim Mason N9JG
5- Gene Turner N992PE
6- Gary Green N118GG
7- Dan Wolfe N18CR
8- Bob Affeck C-GEMP
9- Gary Cotner N57GC
10 Eddie Frechette N33EF



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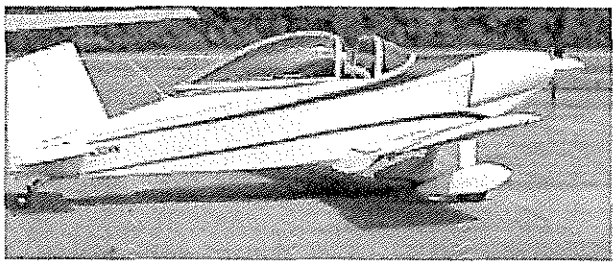

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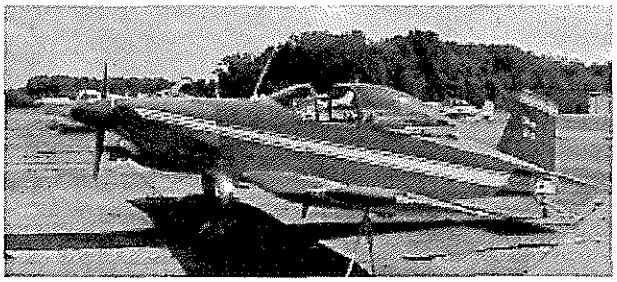

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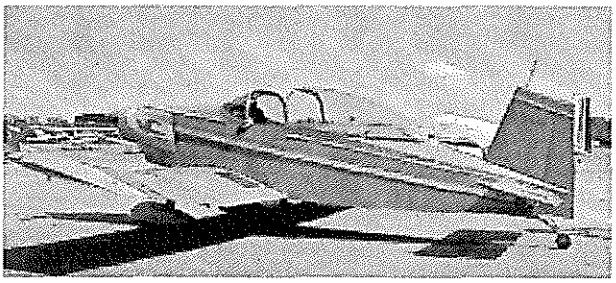
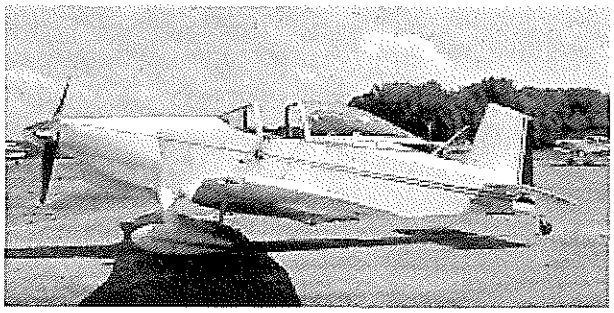


N9JG

Cont. pg 11

October Gathering at Kentucky Dam, cont.



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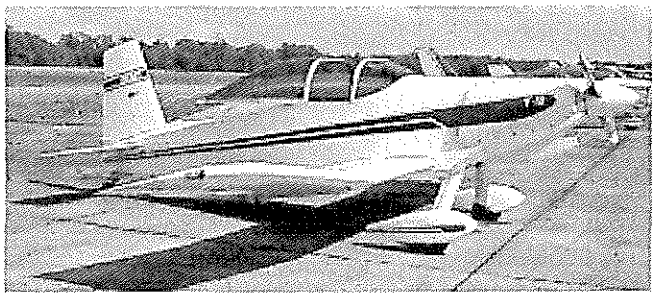
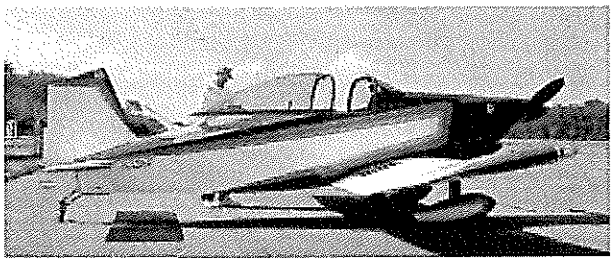


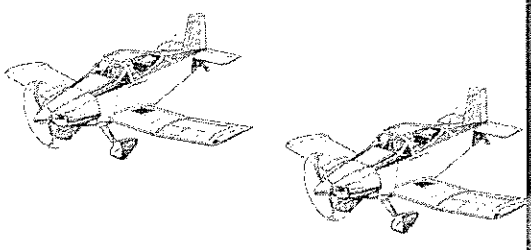
N18CR

Thorp T-18



N33EF

As you can see the weather was great and all of us had a relaxing day. Maybe next year will bring better weather for all of those who wish to attend. The dates for next years Kentucky Dam Get-Together are Friday October 8th through Sunday October 10th. Mark your calendars.



into this category. The grossly over and under driven rivets were really gross. The over driven were squashed nearly flat and the under driven were barely set at all. I did this to see just how poorly a joint make of this sort of gross error would hold up. You would easily see these and know there was a problem immediately. You'll find the results interesting..... The idea was to put each coupon in a pull test machine and expose the riveted joint to a slowly increasing force until it yielded. This was done at a structural test lab in Paramount (Southern CA city) that works mostly with civil engineering construction materials. A stress/strain graph was running and we monitored it to see the first indication of joint failure as indicated by a decrease in force required as the coupon stretched, cracked, broke in two, sheared or tipped rivets, etc. I was interested in the force required to cause the initial failure, as well as the nature and appearance of that initial failure; ie, what actually happened first. We agreed to stop the machine at the incipient indication of failure, thus preserving the coupon in its early failure state without destroying the joint completely. I was very curious as to how things would fail and really had no idea other than the thought that the dimpled, flush riveted joint would probably be stronger than the undimpled one with the 470 universal head rivets. In contrast, one of the owners of the lab came in to watch and thought the opposite would be true. In his 50 years in the business, he had never seen this test done. What do you think would hold best?

That said, here is the answer to my prior question. A force of 2300 pounds was required to break the test material with no rivets or holes in it. It failed catastrophically shortly after some initial stretching was noted. I had no idea that a cross section of this 2024 T3 sheet, .032 inches thick and 1.5 inches wide, would sustain anywhere near that load. Frankly, I was surprised when it passed 1000 pounds and still going strong.

Before showing you the numbers, I will give a brief summary of them:

1. The dimpled, flush riveted construction was

Technical Tidbits, cont.

stronger, but not by as much as I had thought. However, and this is really important, initial failure of the dimpled construction was generally not catastrophic and occurred as rivet tipping and rivet head distortion. In contrast, initial failure of the AN 470 undimpled construction was generally catastrophic by rivet shear. I am really happy Van uses the flush riveted, double dimpled joints throughout most of the airplane!

2. Slightly under driving or slightly over driving a rivet makes an observable and thus measurable difference in the joint strength.

3. Slightly over driving is stronger than slightly under driving and results (in my opinion) in an insignificant difference in strength as compared to properly driven rivets.

4. In the one test of slightly over driven AN 470 rivets, the joint was actually stronger than with properly driven rivets. This may have just been the luck of the draw for this single sample, so I wouldn't put any real faith in it.

5. A joint made of grossly over driven rivets is stronger joint than a joint make of grossly under driven ones.

6. A grossly under driven AN 470 joint is much weaker than a grossly under driven AN 426 joint.

7. No joint was as strong as the parent material itself.

To summarize the summary, try for properly driven rivets but realize that minor over driving is preferable to minor under driving and results in nearly the same strength as does the condition of properly driven rivets.

AN 426 AD 3 Table

Condition	Force at failure	Nature of Failure
Gross under	1650	Rivet tipping, head distortion
Slight under	1775	Same
Correct	2025	Same
Slight over	1975	Same
Gross over	1825	Sheet tear at rivet line

cont. pg 13

AN 470 AD 3 Table

Condition	Force at failure	Nature of failure
Gross under	1100	Rivet tip plus one sheared rivet
Slight under	1600	5 sheared rivets!
Correct	1625	6 sheared rivets!
Slight over	1750	6 sheared rivets!
Gross over	1500	Rivet tip plus sheet tear at rivet line

Anyway, those are some real numbers for an area we have undoubtedly thought about at one time or another. My opinions, FWIW: I think an occasional rivet that is slightly under driven or slightly over driven is utterly no big deal and can safely be ignored. We all have some of these flying in formation in our airplanes. A line of them would be another matter. Even an occasional grossly over driven rivet is probably OK, especially if getting rid of it could cause damage. And if underdriven too much, just whack it again. Hope you learned something from this. I certainly did.

Bill Marvel
(From Rv Email List)

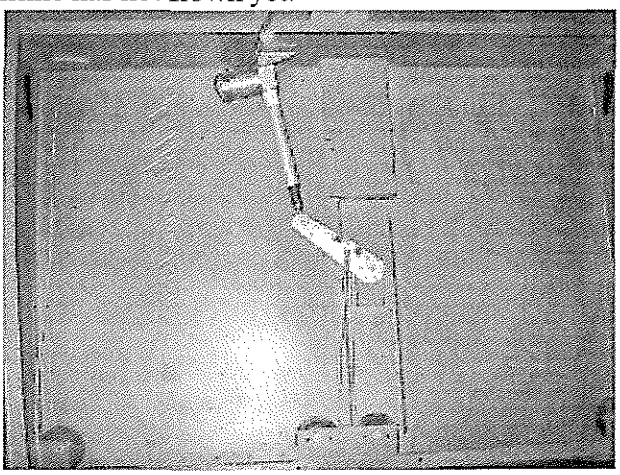
Editors Note: Sorry about the mention of Brand X in this article, but I thought the info was interesting.

Electric Flap Actuator

Submitted by: Ben Harrison

The attached photo shows the flap drive in my T-18. My mechanic helper worked for Glassair, now spends his time working on RV projects. He says this linear actuator was originally used by Glassair, then adapted by Van's. My original builder was using a power window motor, which was much heavier. There was a recent post by someone who had a similar actuator, with a fairly elaborate bellcrank and pivots. I kept the photo, but seem to have deleted the E-mail. My scheme

would seem to be simpler and lighter, and can be installed without altering the stock cables. I think it will also allow a lower baggage floor. The lever arms are set so that full travel on the actuator gives 30 degrees flap. But be advised mine has not flown yet.



Ben's Flap Drive

Editors Note: I haven't seen it done this way before in a T-18, but it is similiar in concept to the one Gary Cotner uses. Gary's works good .. Ben, please let us know how this one works.

Rear Canopy Vent

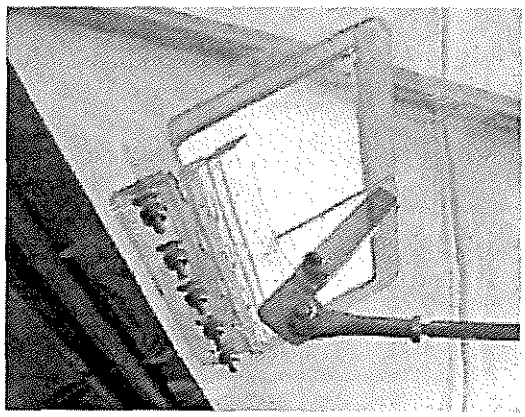
Just for reference, the email posts stated that the vent in the rear of the canopy should be about the size of a one dollar bill. Following are some comments and some really nice pictures of Chuck Bordens canopy vent.

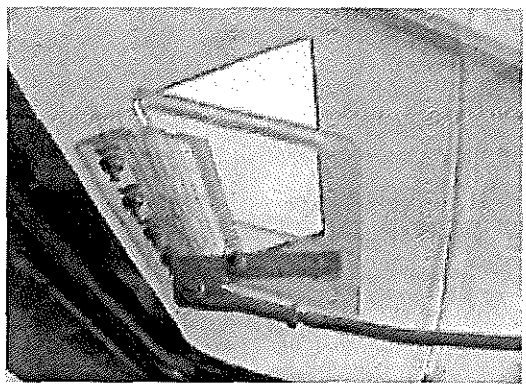
The Editor

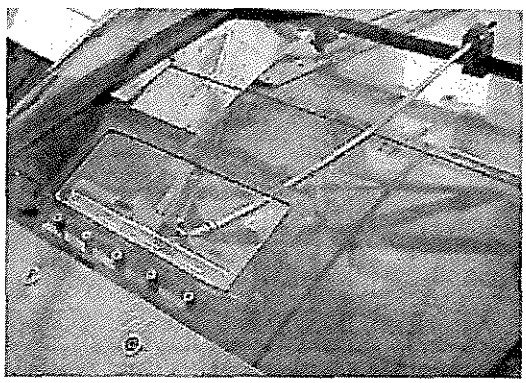
Roy Medan (CA) has a neat vent operating system. He used a motorcycle cable and a 2"x2" bell crank (L shaped) piece in the middle of the canopy cross member. That way he can open or close the vent from the left side of his canopy. That National Fine (NF) thread mechanism takes a long time to turn for opening or closing the vent door. By the way, the dollar bill I have is 2-9/16"x6-3/16". Tom Worth cont. pg 14

Technical Tidbits, cont.

More On Canopy Vents
Photo's From: Chuck Borden







Technical Tidbits, cont.

A Question About Prop Extensions

This question was directed to Sam Tilleman from Saber Manufacturing Inc.

Why is the extension 1" thick at the engine end and 5/8" on the prop end?
Why are the bolt holes aligned (instead of off 1/2 hole center for wrench use)
Do you sell any prop sleeves 7/16" OD x 3/8" ID so I can use a Pacesetter prop I acquired on my O-320? The prop has 7/16" holes and my current extension has 3/8" bolts.

Tom Worth - N295RS

1) The reason I make the E flange thicker is: to give sufficient material under the bolt head — after counterboring to clear the engine lug engagement. That is, we must counterbore .6" deep to clear the lug of the 0320 (and other engines). And we like to see about .35" of material under that, to support the bolt head that is being pulled INTO the engine lug.

2.) The reason the Prop lugs and the engine bolt holes are aligned is to allow me to press the prop extension threaded lugs into the prop flange by pressing through the engine bolt hole.

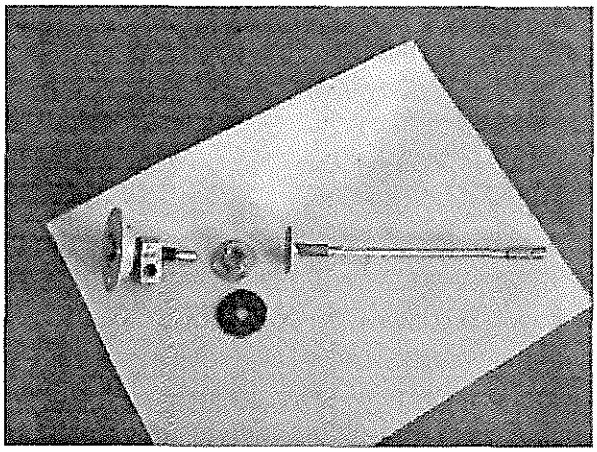
3.) The way I would go about it, is to change the 3/8" prop extension lugs out for 7/16" lugs (the Lug OD is the same for 3/8 and 7/16). Drill the crush plate to 29/32" and use 7/16" bolts. As hard as it is to imagine, I have the replacement lugs, extended thread bolts and crush plates at Saber Mfg..

Thanks
Sam Tilleman
N34AR

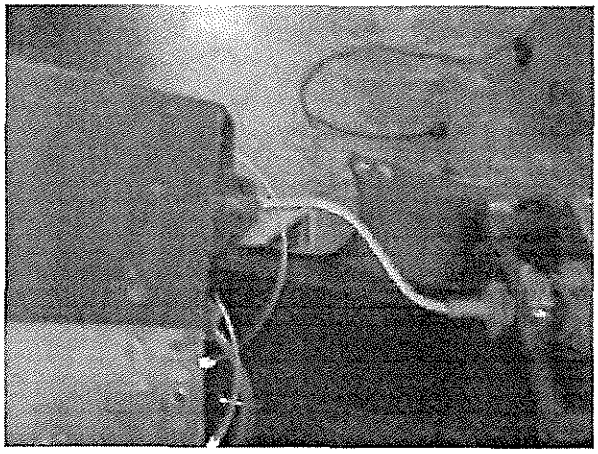
Technical Tidbits, cont

Hurant Karibian's Stab Trim

This electric trim worked so well on my first T18 that I'm using it again on my next one. There is no indicator but I can overpower the system and you can always hold the stick neutral and look back to adjust the trim for takeoff.



Parts Necessary for Electric Trim



Trim System Installed in Hurant's T-18

Hurant Karibian

Editors Note: Hurant did not provide me with any details but it appears the system works on the idea of a friction clutch. It looks simple and would overcome the problem of twisting something off in the event of the trim system hitting its mechanical limits with the drive motor still running. This looks like a really good theory ... maybe one that we should pursue more.

Safety Is No Accident

Accelarated Stalls Revisited

Dear Thorp Guys,

I spent this last Sat. at Porterville. The forum was lead by Lyle Trusty. One of the discussion topics was accelerated stalls. Lyle pointed out that to maintain a 60 degree bank angle and a constant altitude , you are pulling 2 g's. The stall speed of the plane increases to approx. 95 mph. Lyle pointed out that this maneuver at altitude can result in some drastic reaction in your plane, but normally you would have no trouble recovering from the stall. HOWEVER if this occurs close to the ground ..as in turning to final, the results can be fatal. As many of you are aware, this has occurred on several occasions. Getting the maximum performance out of the T-18 is on many peoples minds..and flying within the envelope of the aircraft isn't exciting to think or talk about until an accident occurs. At the fly in there was discussion of three accidents due to pilot error. Maintaining control of the aircraft in all phases of the flight from start up to parking were discussed. Flying into a Fly-In...offers it's own set of issues as those who have gone to Sun-N-Fun or Oshkosh know quite well. You are tired when you get there. There are 20 pages (or more) of arrival instructions and checkpoints that you can't find and a flock of aircraft. E.G. when I arrived last year at Sun-N-Fun there were approximately 40 aircraft circling a lake. In effect I was flying in trail in wake turbulence at 100 knots within a few 100 feet of other aircraft. When we did get released to fly (again in trail) to Lakeland, a Mooney cut me off as I entered downwind. Then as I landed I saw the remains of the wreck on the main runway that had closed the field. Plenty of distractions to say the least. And then there is the "urgency" factor. They are getting ready for the airshow. Closing the field. The controller wants you on the ground. Gotta get down...now. Well, sitting at your desk without the pressure of the situation it is easy to say..

cont. pg 16

Saftey Is No Accident, cont.

..."that would never happen to me.....". But..very high time pilots continue to crunch T-18's in the landing phase.
We are the one in charge. IF a controller asks you to expedite your landing you should not wander out of the normal envelope of operation of two things.....Your Plane...and YOURSELF.

Tom Hunter
N18XT

Check That Rudder Deflection

When I read about the brake/rudder pedal clearance problems on page 3, it occurred to me that maybe someone could learn from my rudder troubles. I bought 831 GR in Sept of 99. Being my first taildragger, I thought my poor landings were my own fault. During my conversion to Lyle Trusty's tailspring, it became apparent that my rudder deflection was too much. I had 28 degrees right and 32 degrees left travel. That made for fantastic slipping on final, but poor ground control. That's because my Maul and my new Spruce tail wheels are both designed to caster at 16 degrees. Our deflection is designed to be 15. Stick with that unless you have a tail wheel that can stay steerable above that amount. I can tell you that landing in a crosswind with a castering tail wheel is a lot of work.

James Grahn

A Tip On Drilling

There is little tool that one can purchase at most good hardware stores. It's called a " Unibit" or " Step Drill ". They come in a couple different size ranges: 1/8 - 1/2 inch, 1/4 - 3/4 inch etc. Cost is about $25.00 each.

They will make the nicest, cleanest round hole you have ever seen and can be used in a drill press and hand drill.

cont. pg 17

There is a constant flow of new T-18 enthusiasts mixed with us old guys (I cut the first sheet metal on mine in 1971). It is frightening to find airplanes with unsafe props, unmodified tails and the like, and to find pilots who are afraid to slow the airplane to 1.3 Vso and make a proper deadstick landing, but I have personally found many.

Perhaps we (long timers) could help by sharing a list of "advisors". We do it now on the web, but we could do it regionally with more visibility.

I make myself available to T-18 newbies in Minnesota. I have met with new owners to inspect their airplanes, and after my squawk list is cleared up, I have gone out fly it to the corners of the envelope with them. I have also put new or prospective T-18 owners into the left seat of N10TK to teach them the unique flight character of the T-18. This is not a Skyhawk, if a pilot is to fly it well, there is a lot to learn. With coaching a pilot can learn to deadstick the airplane into a small space safely, without it may take years.

My spare time is very limited, but I cannot say no to a new owner who needs a day of my time when I know how far I can push that owner along the learning curve.

Any volunteers?

Tom Kerns
T-18 and Pitts builder, Aerospace engineer, former experimental flight test engineer, former CFI, 21 delightful years flying N10TK.

Tom has the Thorp Family Spirit and the attitude that we need to promote the T-18 and to promote the Goodwill and safety that we all feel is important. I believe that we all share Tom's enthusiasm for the T-18 and for flying ... Lets all strive to help those out there that really have an interest and want to fly a Thorp.

NO, YOU DON'T HAVE TO BUY YOUR PROP FROM VAN'S

If you are a Thorp T-18 builder or owner and meet the following criteria, Eklund Engineering will sell the Sensenich 70CM or 72FM series propellers delivered to your door.
1. You must have a traceable serial number for a plans set sold by John Thorp or Eklund Engineering.
2. You must have an up to date set of plans for the T-18.
We will introduce the 70CM series (150 & 160 hp) propeller at $1800 plus shipping (typically $50 or less)
The 72FM series (180 hp) will cost $1810 plus shipping. For sales in California there will be 7.75% sales tax added.
Until the Sensenich web site updates their "THORPE" listings to THORP and more favorable pitch recommendations, use the RV 6 recommendations on the VAN'S web site. We will have some further recommendations soon. Check with us for spinner recommendations. The Sensenich RV spinner is 13 inches dia. versus the standard Thorp 12.5 inch dia.
Richard Eklund
Eklund Engineering, Inc.
P.O. Box 1510
Lockeford, CA 95237
thorpt18@jps.net
209-727-0318
Fax 209-727-0873

Tips On Drilling, cont.

One can cut the neatest holes in the thinnest aluminum/steel to about 1/8 inch and leave no bur. Works equally well on plastics and is a very safe way to drill holes in Plexiglass. Try one, you'll never let it out of your sight!

Bob Pernic
N966RP

Thorps For Sale

T-18

1987 T-18 0-320 E2D TTAF 440 hr. TTE 2290 hr. SMOH 350 hr. wood prop, folding wing, KY 97A com, king xpndr, intercom Asking $25,000

Greg Sheely
(208)725-5876

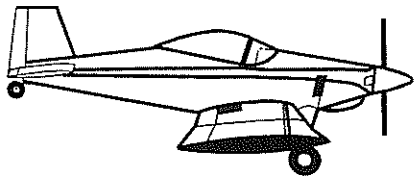
S-18

My age and lost medical force me to sell my award-winning S-18 (Ladies' Choice). After winning an insurance claim from a prop strike, the crankshaft was pulled and overhauled by Performance Aero .. Ended up with 2 new constant speed Hartzell blades and overhauled engine. It's a new fuel injected Lycoming 160 HP engine.

I would like the buyer to be a current T-18 pilot. 551CM has never spent the night out of the hanger. It is completely covered while in the hanger. Total time on the airframe is 106.2 hours. Ken Knowles advised me on the entire project.

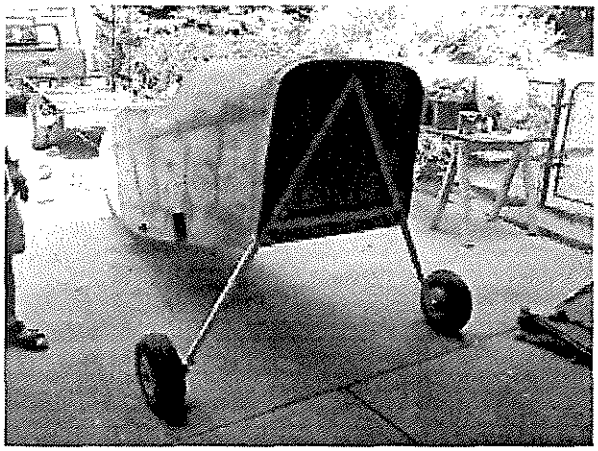
551CM has a full IFR panel with JPI instruments with fuel flow, Sky Tech starter (8.5 lbs) that starts on the first rev of the prop. Has flip-flop radio, Lowrance portable GPS and an ICOM portable radio. The airplane is located at the Chino airport. Asking price is $49,000

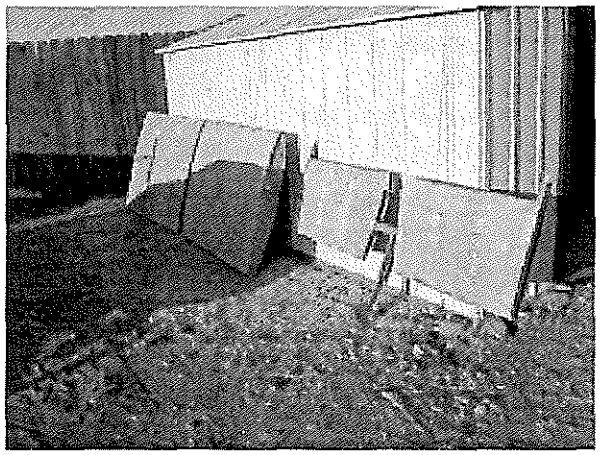
Mel Clark, Owner and Builder
6561 Halifax Drive
Huntington Beach, Ca. 92647
(714)897-3370



Thorps For Sale

I have a completed airframe: Spinner to tailwheel, wing tip to wing tip. Flush riveted and ready for assembly. Nice workmanship.
Less the canopy. Down to $6500. FOB Reno NV (775)-424-2273.





Thank You,
Stan Campbell
scrambellreno@yahoo.com

Selling 407HK

I will be selling 407HK. It is in serious need of a paint job and interior refurbished. It has been over on its back after a brake lock that required new wheel pants, wing tips, vertical fin, 3/16 windshield, canopy with the split canopy, right rear inboard spar and right outboard leading edge rib with skin patch between that and the next inboard rib back to the spar. It has been to Oshkosh five times since being repaired. It has a venturi operated gyro horizon, directional gyro, Brittain wing leveler with combo vacuum/electric turn and slip indicator, an ancient Narco and new Sporty's portable radios, a Lawrence 600 GPS (5 satellite)and a Lycoming O-320, out of an Apache with 595 since overhaul and 2013 since new.
In spite of all that I"m looking for $26,500.00. Aircraft is located at 75FL in Panama City, Fl.

Hurant Karibian
hkaribian@yahoo.com

N467JF is back on the market

O-320-E2D Lycoming - 150HP
Just under 1950 TT airframe and strong running engine.
Ted Hendrickson wood prop 68x72
King KY-97A VHF Com
Narco Nav-11 VOR
Terra TPX 720 Transponder
Sigtronics SP-4 intercom
Vacum DG & AI
Electric T&B
Air vents for each seat
Center panel console
Garmin 89 GPS
Rebuilt altimeter

Asking $22,000. Based at Hillsboro, Oregon (HIO).
Photos available.
Regards,

Philip Mandel, CFI
8321 SW Lori Way
Beaverton OR 97007

Subscription Renewal Notice

This is a notice to all T-18 Mutual Aid Society Members and Newsletter Subscribers that your membership and subscriptions will expire on December 31, 2003. Just for your reference you can always look at the mailing label on the back of each newsletter to see when your subscriptions expire. Look just above your name for the information. The yearly subscription rates will be the same for 2004. The rate will be $25.00 for United States memberships, which includes the printed hardcopy and access to the web based version which you can download. For those of you living outside the United States you have two options. For $30.00 U.S. you can have both the printed hardcopy and web access to the downloadable version on the T-18 website, or for $25.00 U.S. you can choose to have the web based version ONLY.

Please provide the information below with your renewal or go to the T-18 website at: http://www.t18.net/membersignup.htm and fill out the form. Don't forget to click on the "SUBMIT" button when you have completed the form.

For those of you interested I can now accept credit card payments through PayPal on the T-18 Website. You must be a member of PayPal, but it is a free service and easy to do. If you are interested in trying this new feature just go to the T-18 website at: www.t18.net and click on the MAS/T-18 Newsletter link from the homepage.

PhotoCopy this form and send it to me with your payment.

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Please send all payments to: Roy Farris P.O. Box 182 Noble, IL. 62868

For more information contact me at: (618)723-2594 Email at: rfarris@shawneelink.com
or visit the web at: www.t18.net

T-18/S-18 Thorp Newsletter
Roy Farris
P.O. Box 182
Noble, IL. 62868
Phone: (618)723-2594
email: rfarris@shawneelink.com

December 2003

How's this for perfect crosswind control ??
James Peran ~ Victory, Australia