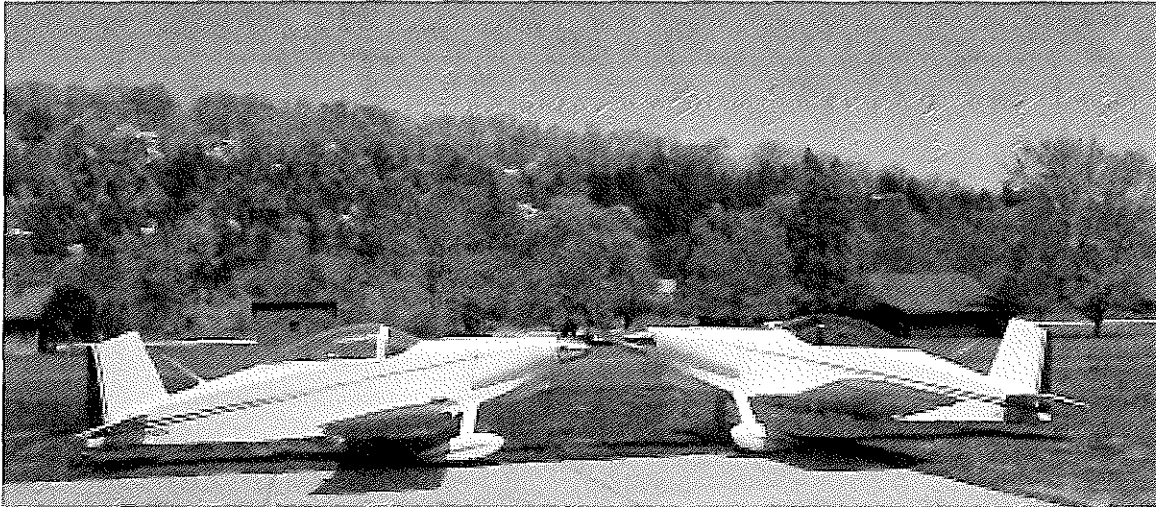


T-18 Newsletter

September 2007

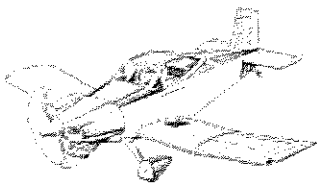


Gary Greens T-18's ~ N118GG and NX218V ~ Cotter, AR.

In This Issue:

Checkride in a T-18
Helpful Hints From Dick Penman
Fat Cat Flies Again
Jacking The T-18
First Flights
Cee Bailey and Canopies
Wingtips and Mounting
Accidents
Tailwheel Pant
Smoking Rivets

Notice: (Standard Disclaimer) As always, in the past, present, and future newsletters, we would like to make you aware that this newsletter is only presented as a clearing house for ideas and opinions, or personal experiences, and that anyone using these ideas, opinions, or experiences, do so at their own discretion and risk. Therefore no responsibility or liability is expressed or implied and is without recourse against anyone.



Editors Notes

By: Roy Farris

Its becoming increasingly more difficult to put these newsletters together. As I have said many times in the past, I am receiving practically no input these days with the exception of what I pull off of the ThorpList email group. I have some older stuff saved here on my computer and I pick through it each issue to try to find things that are technical and that have not been covered in past issues, but folks its getting pretty thin. I still find it dis concerning that people have become so self reliant and dare I say self important that they forget that we are a family. People now days seems to focus in their own little world and forget about what we can accomplish as a group. The wold of sport aviation is becoming more difficult each and every year. If fact if you haven't heard, the FAA is now looking closely at the 51% rule for us homebuilders. Of course the T/S-18 is no way near even being scrutinized, the homebuilt market in general is. For those of you that were at the T-18 forum at Oshkosh, we heard that from one of our own members. The FAA has stated that the 51% rule must be enforced, and if that cannot be accomplished, then the fate of all homebuilt aircraft could be in jeopardy. We all know that it is the super fast build kits, and the builder assistance programs that are threatening the 51% rule, not the plans built aircraft like the Thorp, but if things go bad it will affect us all.

I still get many emails and phone calls concerning building the T-18. There is still interest in the airplane, but as we have said before, its not the easiest airplane to build, and we have virtually no builder support except for the T-18 Mutual Aid Society. I am somewhat in the dark as to where our "Manufacturers" stand. I know that Eklund Engineering is in somewhat of a holding pattern and seems not to be making much progress. I know Richard has the best intentions and loves the T-18 as we all do, he just doesn't seems to have the inertia to move forward. I have virtually no contact with Classic Sport. I sometimes get inquires

about the S-18 and forward those to their e-mail, but I have no actual contact with them. Mike became concerned a couple of years ago about some content that was published in some of the newsletters and became so upset that he has basically abandoned the MAS. I really hate that and do not fully understand what the problem was. He and I talked a few times, but that didn't seems to get us anywhere. Classic Sport markets the S-18 kits, S-18 parts, and can supply most of the airframe parts for the T-18 on request. I know that they now have a Tri-Gear S-18 available, and I know that they were at work on a LSA version, but I am not sure where that stands.

My point to all of this is that we as a group of Thorp T/S-18 lovers are very disconnected, have no one point of focus, and have no plans to fix any of the problems. We need to pull the various Thorp organizations together (Eklund Engineering, Classic Sport, and the MAS) to form a tight bond with a good working relationship. We need to try to understand the problems of each group, and work together to alleviate the tension and to promote the T/S-18 to the fullest potential.

I may not be the most suited, but I am offering to do what ever it takes to get that job done. I offer my services to both Classic Sport and Eklund Engineering, and any other party necessary to work out whatever the problems are, to get everyone on the same page, and to hopefully better the relationships among all of us. Its something that we really need to do. How about it guys and gals? Let get started.



Private Pilot Checkride in a T-18

This is an old correspondence that I found lurking in one of my old newsletter folders .. Roy

Dear Roy,

I have received my April Newsletter and did not see any news of a fresh Private Pilot trained in his Thorp. Member Kim Nack built Thorp T- 18, N4264F and received his Private Pilot Certificate in that aircraft February 12,2005. The airplane was certified in late

Private Pilot Checkride in a T-18, cont.

1996 and was tested by another pilot. A few years ago Kim got started and received a solo check out the airplane. He flew mostly solo and last year he contacted me for training to secure a private certificate. He proved to be a diligent student and progressed well after starting over from the basics.

The Thorp is not exactly a primary trainer but I thought it would be feasible. We followed the FAA Practical Test Standards as a guide. Writing up a list of maneuvers and speeds compatible with the test requirements and the T-18 was helpful and we followed that closely. The wheel landings were the most difficult since Kim had not done those up to our training and the short coupled Thorp does not allow much pitch change attitude from a three point to wheel landing. But he was able to develop satisfactory proficiency and on to the flight check. That is history now and Kim received his license to learn and is enjoying his Thorp as a certified pilot.

We were fortunate to find a Designated Pilot Examiner who was tailwheel qualified and more important, one who was willing to give the check ride in the Experimental Thorp.

Frank Baldwin, CFI DAR
N6937



Recently I've gotten the impression that some of the people building and flying the airplane are unaware of the significance of the publication. Over the years since I became involved with building and flying the T-18 it has been a source of tips and tricks, accounts of successes, and failures, and helped me build a fast reliable airplane. I'll be forever grateful for its existence, as it helped me build, then fly a great airplane for 28 years. I'm proud and grateful that N851LT is still flying, providing good service to Lee Trlica, and his sons in Tehachapi, CA., and hope it can continue to do so for many more years.

I occasionally hear of, or read something having to do with an experience that someone has had with a T-18 that disturbs me. My experience as a Flight Test Engineer, Accident Investigator, System Safety Engi-

neer, etc., alerts me to potential problems that builders and operators face when they neglect to follow standard practices ordinarily observed by experienced pilots and A&P mechanics. The latitude in building and flying enjoyed by homebuilders carries with it an obligation to be extremely cautious when departing from the designers plans. Quite often parts from production airplanes are adapted, and sometimes shortcuts are taken to simplify the job of building a part. More often, a simple system is made "more complex and less reliable" (those two always go together) to add a desired feature. I've found in my many years of operating the T-18 that John Thorp was a brilliant designer of home-built aircraft. His designs have always been elegant in their simplicity and reliability. He had the innate ability to integrate design elements with operating requirements that created the simplest and most reliable designs needed to accomplish the purpose. Departing from his design without a good understanding of what the ramifications were, not following standard practices in preparing the aircraft for flight, then failing to conduct a thorough flight test, has sometimes lead to unexpected problems that "Newby" builders/pilots are ill equipped to handle. The hazards increase as subsequent owners without previous experience in building and testing high performance airplanes, such as a 180 HP T-18, take on the task of operating and maintaining an aircraft that has become one-of-a kind, generally without a maintenance manual, wiring diagrams, system schematics, or a comprehensive Flight Manual.

Organizations like the T-18 Mutual Aid Society, EAA Designee Program, EAA Flight Advisor Program, and others, all came into being to promote safe Homebuilt Aviation, and to prevent incidents and accidents that could result in curtailment or loss of our hard won privileges. Your continued efforts in disseminating good information supporting these goals are appreciated, and must continue. Thank you, and the T-18 MAS Editors that have gone before you, for all that you have done to help the T-18 become the easy-to-build, high-performance airplane it is today.

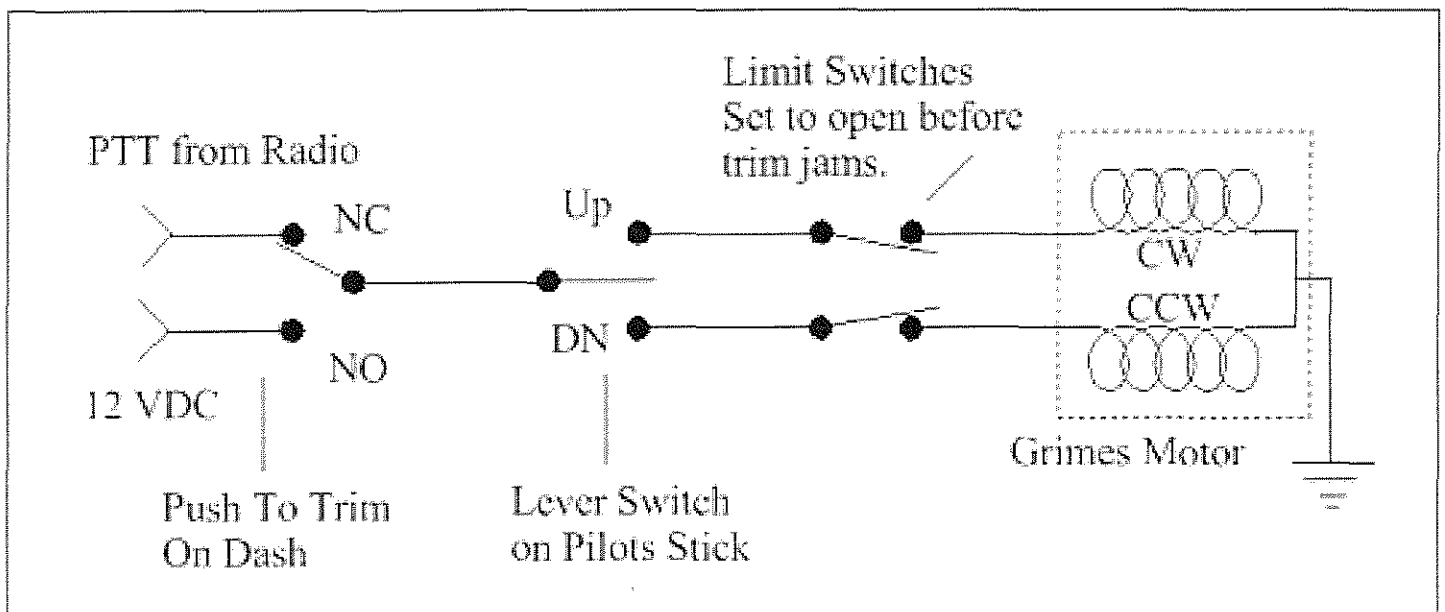
Sincerely,

Lyle Trusty

One Members Way To Prevent Runaway Electric Trim

On runaway trim, this is caused by poor electrical design. Full up or down trim in a T-18 will not be dangerous but can be very annoying. Most small planes that have electric trim are protected from runaway trim by four methods. First a double pole double throw trim switch, Second by a push switch on the dash. Third by pulling the circuit breaker and Fourth by the Master Switch. You can see by this method the first system is automatic and the next three are all dependent on the Pilot to do something. My T-18 N291 1 for the past 35 years has a very simple trim system that is activated by a lever switch on the pilot control stick, up or down, and with a push to trim switch on the dash next to the throttle. When just the lever switch is pushed it is my radio transmit switch and the both are pushed it is Trim.

The only trick in this system is using the Grimes light motor for the trim motor. This motor has two windings, CW and CCW, therefore the motor can be used to complete and grounding circuit to the radio transmitter. Included is the wiring diagram.



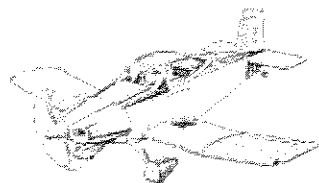
Benard Thalman

Brake Informational Website

There was quite a bit of banter a bit ago concerning breaking on the Thorp. I ran across this site which will provide some information on the subject.

www.groveaircraft.com Try searching brake pedal geometry. It may answer some of the questions that were posed.

Regards
Paul MacMichae



Ball Lock Pins

I lost one of the four quick-release pins for securing seats to the airframe, and would like to get as close a replacement as possible. This is a T-type pin and seems to be 1/4" diameter by 7/8" length. Aircraft Spruce carries a Y-type, but not anything close to this length. Does anyone know an off-the-shelf source where I can get this pin or one close to it. ~ Roger

<http://www.mcmaster.com> This is the McMaster Carr website. They have 96 of them listed, inch and metric sizes.

Terry Adams ~ N51079

Some Helpful Hints From Dick Penman

Roy,

Following is my small contribution to the T-18 newsletter and I know it is long overdue. I have had these exhaust pipe fairings installed on my T-18 for about 10 years. They look good and are easy to make in about one hours time.

Step One:

The jig can be cut from a piece of ¾" scrap wood. This will determine the top profile width and length of fairing.

Step Two:

Roll aluminum around a round object. This will determine lower radius. (.015 soft aluminum from hardware store works well)

Step Three:

Insert part into wood jig. Mark trim line leaving about .75 flange. Remove and trim.

Step Four:

Reinsert part into jig, clamp in position and work flange down gradually, using a soft mallet, working from back to front. These fairings can be produced in any size for push rod applications, as well.

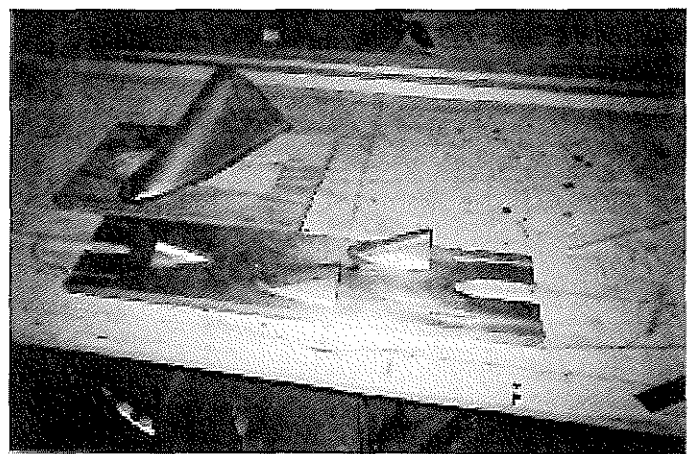
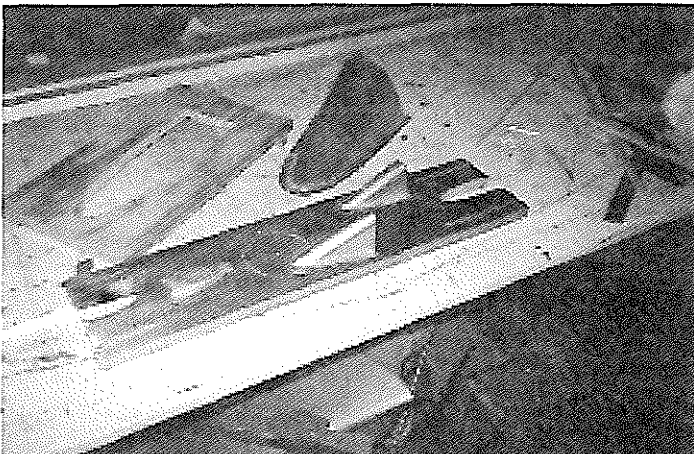
Also, to seal the flap torque tube opening, use a soft piece of foam rubber and install as shown in sketch.

Keep up the good work on the newsletter. I know it's greatly appreciated by all of us in the T-18 group.

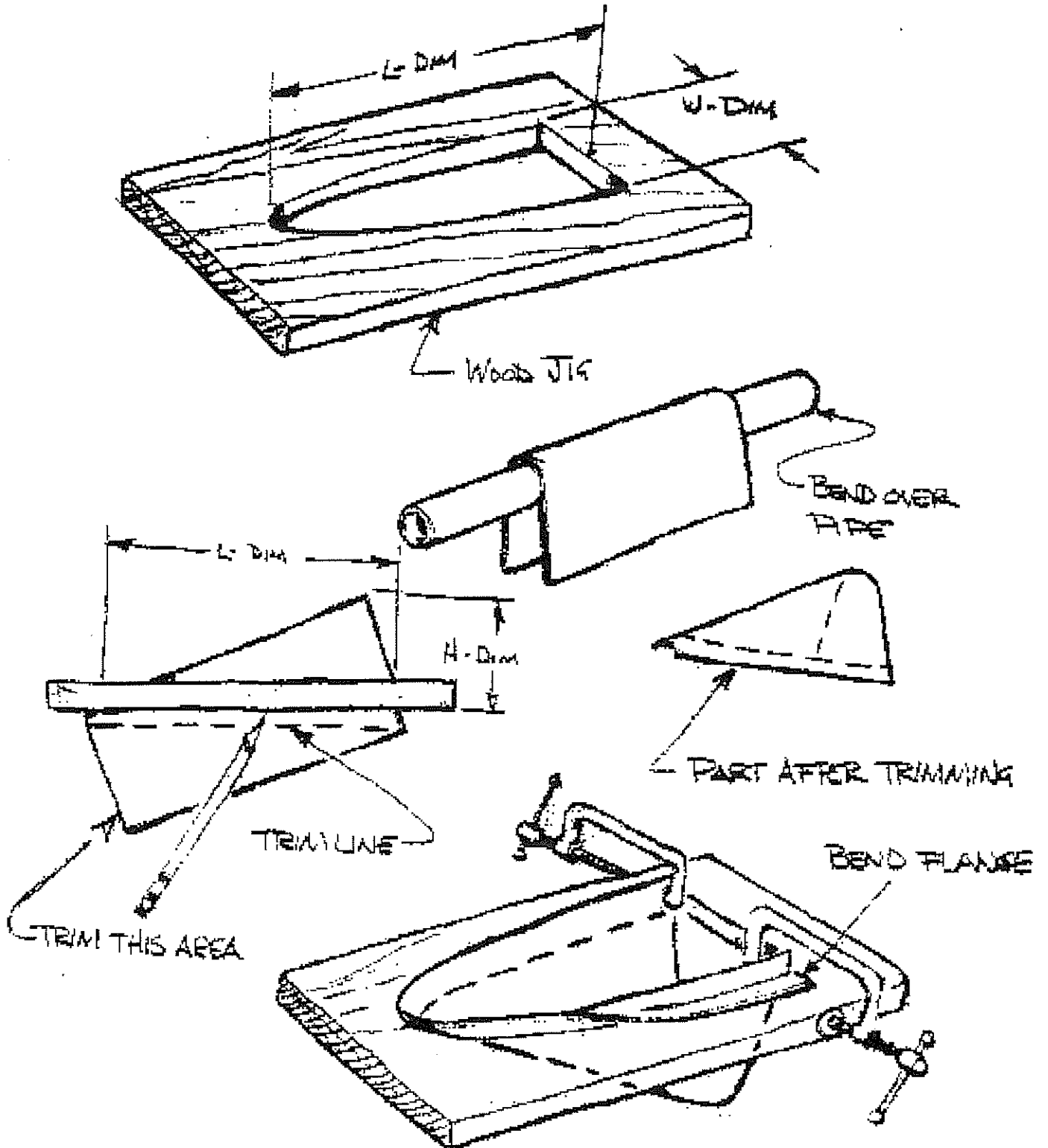
Regards

Dick Penman
N199DP

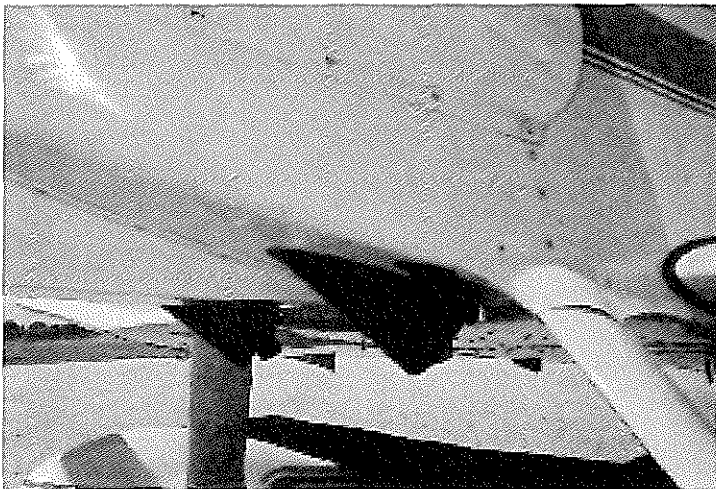
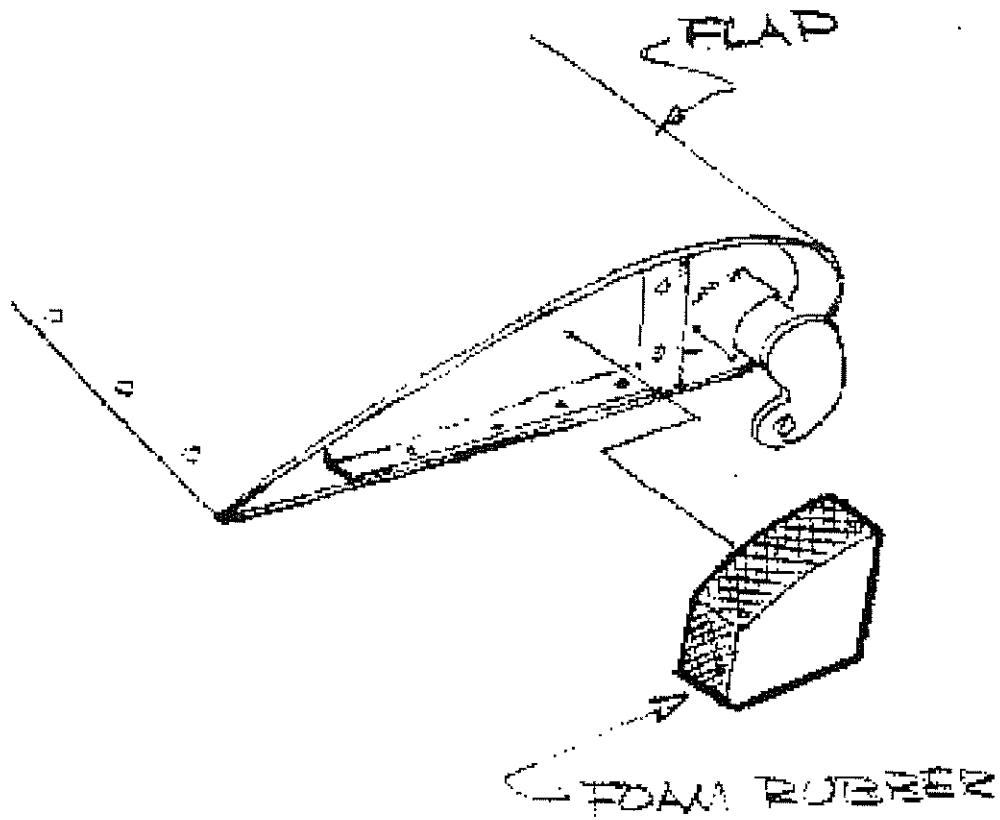
(Drawings on next two pages along with more pictures)



Some Helpful Hints From Dick Penman. cont.



Some Helpful Hints From Dick Penman. cont.



FAT CAT FLYS AGAIN

My wife and I wanted to share our story about giving our homebuilt a second chance and getting her back to the air with the experimental homebuilt flying community.

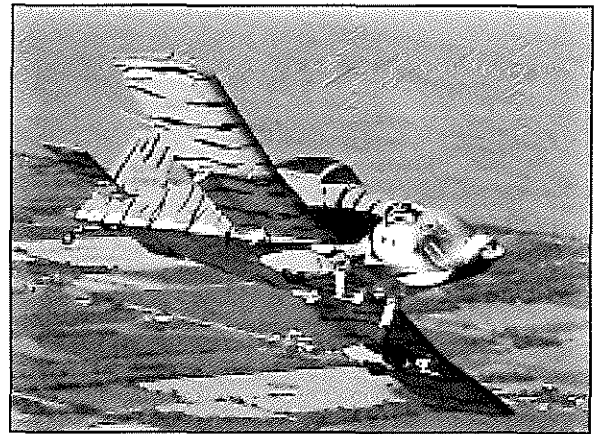
Some years ago, while employed at Lockheed Missles & Space Co., I decided to scratch build a T18. I began doing just that in my garage located in Sunnyvale, California, and traveling to OSH each summer. After seventeen years, she was completed at Half Moon Bay, California. She was test flown in January 1996 by a friend and extraordinary pilot, Robin Reid. He checked me out, and I completed the testing.

I discussed the overall paint scheme with my son, Erik, who was running a graphic arts business in Sacramento, California. We decided to paint my airplane as a tiger. Erik worked very hard at designing the stripes and overall look. Once that was on paper, my wife found the aircraft painter, Don Copeland of Arizona Aero-painting in Eloy, AZ.

We had to name her 'Fat Cat' with that paint scheme and her wide body. After years of enjoyable flying, in February 2003, I sold Fat Cat. The buyer had Robin Reid ferry the airplane to Klamath Falls, Oregon where she was hangared. I lost all contact with Fat Cat. To scratch my aeronautical itch, I decided to get involved in radio control airplane designing and flying. I'm having fun. Even a Thorp can't do a square loop or hover.

During April of this year, 2007, I received a call from Bob Moehlencamp saying that there was a message in the T18 classified section of the T18.net website. I didn't even know that there was a web site. Someone located in Klamath Falls at Kingsley Field was trying to reach me and that it was urgent. I thought that maybe Fat Cat had a new owner, but that wasn't the case. Fat Cat had been left for 4-1/2 years and was abandoned in a flight school's hangar. The hangar owner wanted his rent!

After spending so many years of my life building a T18 and loving this airplane, I began looking through old papers and found the buyer on the East Coast. I immediately offered to buy my T18 back and the buyer accepted. My wife and I drove to Klamath Falls and got busy getting Fat Cat airworthy. Ken Gooch, a mechanic on the airport who was instrumental in getting the ad on the website helped. After 8 days of work, I signed off the annual condition inspection. She was flown to Placerville, California by a friend early in June of 2007.



I needed to find a person who would fly Fat Cat again and cherish this airplane. Fat Cat has now been resold to a retired Navy pilot, retired Delta airline pilot, country singer, and airplane collector, (all one person, Alex Whitmore) located at an air park in Denton, Texas.

The new owner flew Fat Cat to Wickenburg, Arizona where my wife and I viewed our airplane flying overhead and landing. I realized that this was only the third time I had seen Fat Cat flying from the ground. She is pretty. Or am I biased? We shared lunch together, answered questions about Fat Cat. Alex then flew away to Texas. She's home now, really home, the new owner has been flying her and sent a pix of Fat Cat in front of his hangar, with his dog, Lucky, sitting in her.

There's a country song on the radio that goes: "When I die, if I can't go to heaven, then let me go to Texas, 'cause Texas is as close as I have been." Thanks to the entire T18 Thorp community for sharing our story, and to all the people that worked so hard in making this happen.

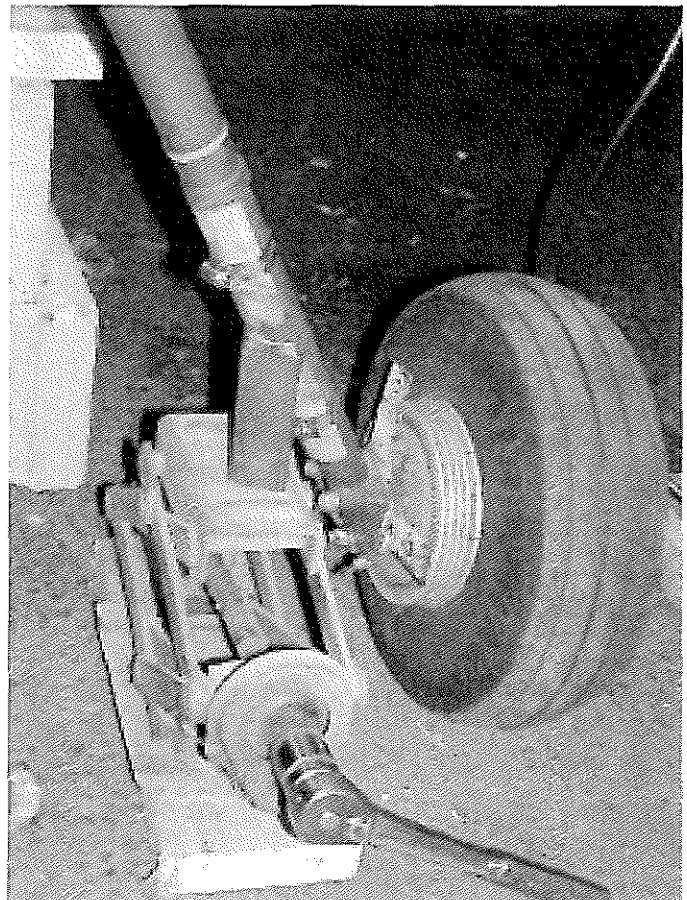
Harvey & Stephanie Mickelsen
Sun City West, Arizona

There were some recent discussion on the Thorplist about jacking up a T18. I took these pictures last spring when I had to pull the engine for service. Thought that if you were short of material, they might be handy for the newsletter. I also included two of my past posts related to jacking the plane which could provide some text.

Last year I replaced my rubber "disks" with disks made from belting material which has worked quite well. The belting was 3/16 thick, so I fabricated aluminum 0.060 washers with the OD equal to the clamping washer and the ID slightly larger than the metal bushing to make up the thickness. I supported the plane on a wooden beam under the spar. The beam was made from 2 2x4's glued together with a bevel cut to match the angle of the lower spar cap. The beam was supported on cinder blocks. Keep in mind that with the engine installed the CG is forward of the spar so you need to either weight the tail or lift up on the engine. I used my engine lift to lift up slightly on the engine which worked very well.

The method that I have used to support the plane for removal of the gear is a bit different from the others. I jack my plane by clamping a fixture to the gear leg and lifting with a scissors jack. I jack up each side and place a 2 x 6 under the tire. I then remove the belly close out panel. I made a beam out of laminated 2x6's with the upper surface tapered to match the angle of the spar cap with the ground. This beam is placed on cinder blocks and shimmed to contact or almost contact the bottom spar web. You can then let air out of the tires allowing the spar cap will come to rest on the beam. The 2 x 6's can then be removed leaving the plane supported very securely for the removal of the gear. Obviously this method works best with the engine previously removed so that the CG is significantly aft of the spar. I plan to use this method for replacement of the gear bushings. I will use an engine crane to lift the engine & gear slightly for replacement of the aft bushings. As an added benefits the crane will prevent any possibility of the plane tilting forward as the engine and propeller will still be in place.

Hank Beamer
199MP



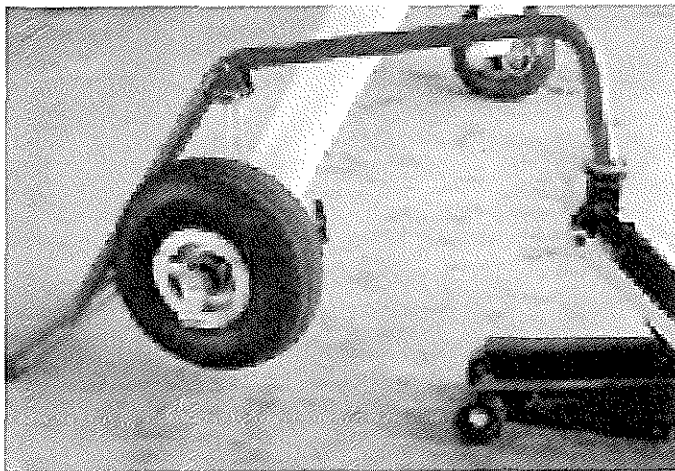
More on Jacking

Here's an idea if you can weld or assemble from hardware store plumbing pipe, fittings & nipples. Take a look:

<http://www.averytools.com/pc-913-80-the-handy-jack-eldorado-aviation.aspx>

Charlie England

The Handy-Jack (patent pending) was designed by RV Builder Don Crum to safely lift any small aircraft with an empty weight of 1800 lbs or less for safe and easy removal of wheel & tire assemblies. Handy Jack has been tested on the RV series of aircraft and found to work well with either the tubular or the steel spring-leaf gear legs. Instructions included. NOTE: Requires a floor jack to raise Handy-Jack. (Floor jack not included).



NEW EMAIL ADDRESS NOTICE

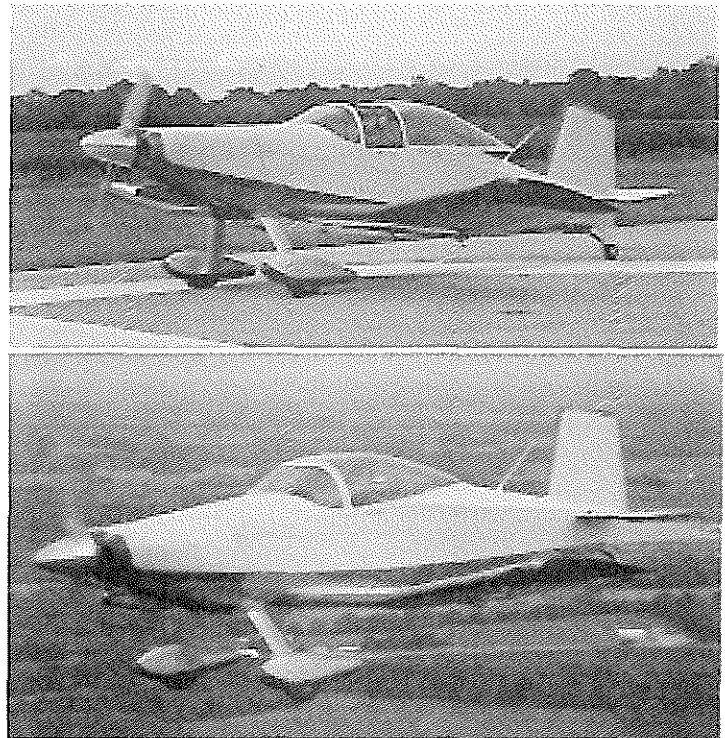
My darned Internet Service Provider is giving me a lot of grief, so I am switching. My current Earthlink account will be active until October 15, 2007.

MY new email address is: royfarris@insightbb.com
Please update your email address book and begin using the new insightbb.com address for any future contacts.

Roy Farris

New First Flights

David Read ~ Olney, IL



To see a video of Daves T-18 as he escorts me out of town on the day of the first flight go to:
http://www.t18.net/718dr_video.mpg

Stretch Batchelor ~ Auburn, Ca

Stretch did not send me any pictures but he posted a video link on the ThorpList, so I included it here if your have not yet had a chance to see it.
http://www.carlist.com/dev/mmp/cbt_first_flight.wmv

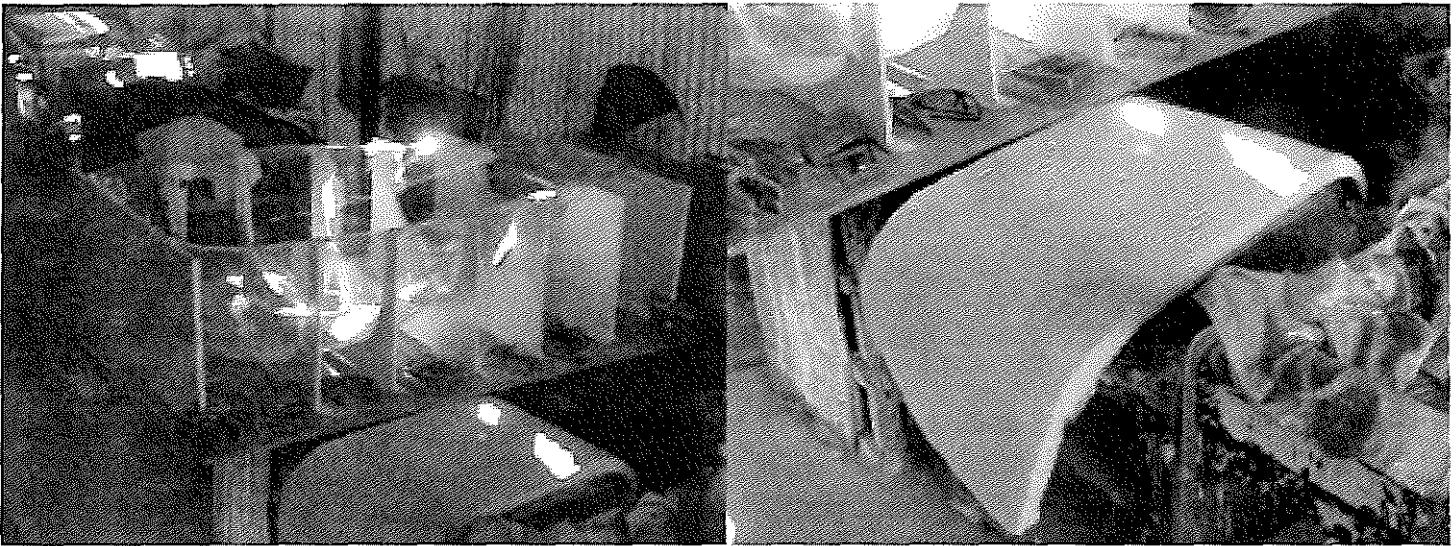
Jonathan Levi ~ Fallbrook, CA

It is with small amount of regret that I announce that after 13 1/2 years of build my Thorp, I announce the I leave off building. I now join the ranks of Test pilots and tinkerers. My plane was signed off last Friday and Glenn Smith (MMP2) took her up for her first flight on Saturday. AS the proud PAPA I report that it flies beautifully.

Cee Bailey and Thorp Canopies

I wanted to advise you of the sale of the Gee Bee tooling to Cee Bailey. I have visited Cee Bailey 3 times and taken pictures of the new process of forming T-18 molds. Cee Bailey is NOT making canopies and windshields from the original Gee Bee Molds. They made one canopy from the Gee Bee mold to serve as a "pattern" for their "drape mold" process. The drape mold process introduces less stresses into the plastic that makes the canopy. The drape process reduces spontaneous cracks, reported in the early newsletters occurring while trimming excess, or "flange" plastic and provides a more consistent material thickness. I'm making this comment from the view point of a manufacturer of plastic parts. I own a plastic injection molding company and for 3 years made parts used by TelCom companies for fiber optic communications. The lowered stresses obtained by the drape forming process helps avoid the "age cracking" experienced with 18JT, and a couple of the T-18s at Sun-n-Fun. This is the reason why I was one of the original owners to order a "new process" canopy from Cee Bailey. For more info go their website at: <http://www.ceebaileys.com/>

Marc Bourget

New First Flights,cont.

He said it flew hands-off. The flight was about 30 min and was completed uneventfully. He gave me one squawk, that was that my trim was binding. I fixed that yesterday, so the next big step is for me to fly it this weekend. I didn't put on the gear leg fairings or wheel pants since that will help create drag while I learn to fly it. My son took a video which he is editing and adding music. Then I will post it to the net. My only disappointment is having to drive to Porterville again.

N165JL (now a legal airplane)
Fallbrook, Calif

Control Cables

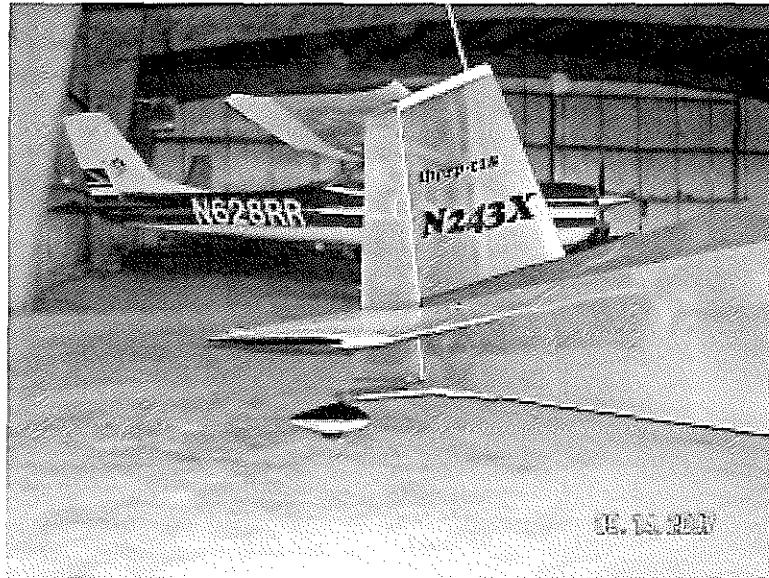
For those of you that follow the ThorpList email group, you know that I have been working on installing my throttle and mixture cables. I was not happy with the amount of slop or end play in my installed setup. I am running a left side mounted throttle quadrant and the cable routing requires a couple of bends to get to the control levers on my Airflow Performance Fuel Injection servo. I researched the major cable manufactures, ACS, Cablecraft, and Teleflex Morse. My research showed that Cablecraft cables are superior in every way and have the least amount of lost motion and backlash. They are twice as good as the ACS cables I have now. To purchase Cablecraft cables go on line to the Cablecraft online store at: https://shop.tuthill.com/Cablecraft/shop_home.asp

Roy Farris

Tailwheel Pant

Hello every one I have been out of the loop for some time now. "I'm Back" First of all I would like to say that I just installed a Tom Hunter tail wheel fairing. It took less time to install than do the painting. See Photo I just read an article by our old friend Skeet Wyman, Sport Pilot May 2007, Boy have I been gone a long time. I am impressed. Love your airplane. Also Your Quote "If you want a lot of something for not a lot of money, developed a taste for what nobody wants"

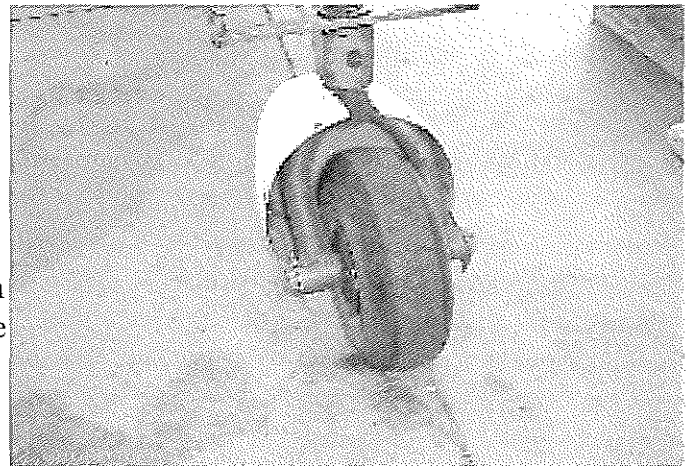
Chuck Borden



Instructions for Installing tail wheel Pant on Aviation Products tailwheel

By: Tom Hunter

The Tail Wheel Pant is designed to fully enclose the 6 inch Aviation Products Tail wheel. The pant is designed in two parts: The front which mounts to the tail wheel. And the rear, which mounts to the front. In this picture, you see the front half mounted to the tail wheel with two brackets that attach to the outside of the axle bolt. These two brackets are bent with a joggle so they mate to the sides of the front half of the pant. The approximate location of the mounting holes is marked on your pant. The front half has been trial fit prior to shipment, so you should be able to cleco it in place. In the next picture, you see the back half sitting behind the nose section of the wheel pant. The tools shown will help you in alignment of the wheel pant. What you want to accomplish with alignment is two things: you want the wheel pant to be facing forward parallel to the wheel and you want it to be sitting at the proper angle in relationship to the main wheel pants and the aircraft at rest position. You can use a protractor to determine that angle by using the outside doubler that makes up the roll bar shear panel as your reference. On a long gear T-18 that angle is approximately 10 degrees, so that is about what you want your tail wheel to sit at. The two brackets that mount to the wheel axle and the cut out at the top of the front half form a triangle that will retain the front half of the nose wheel in the proper position.

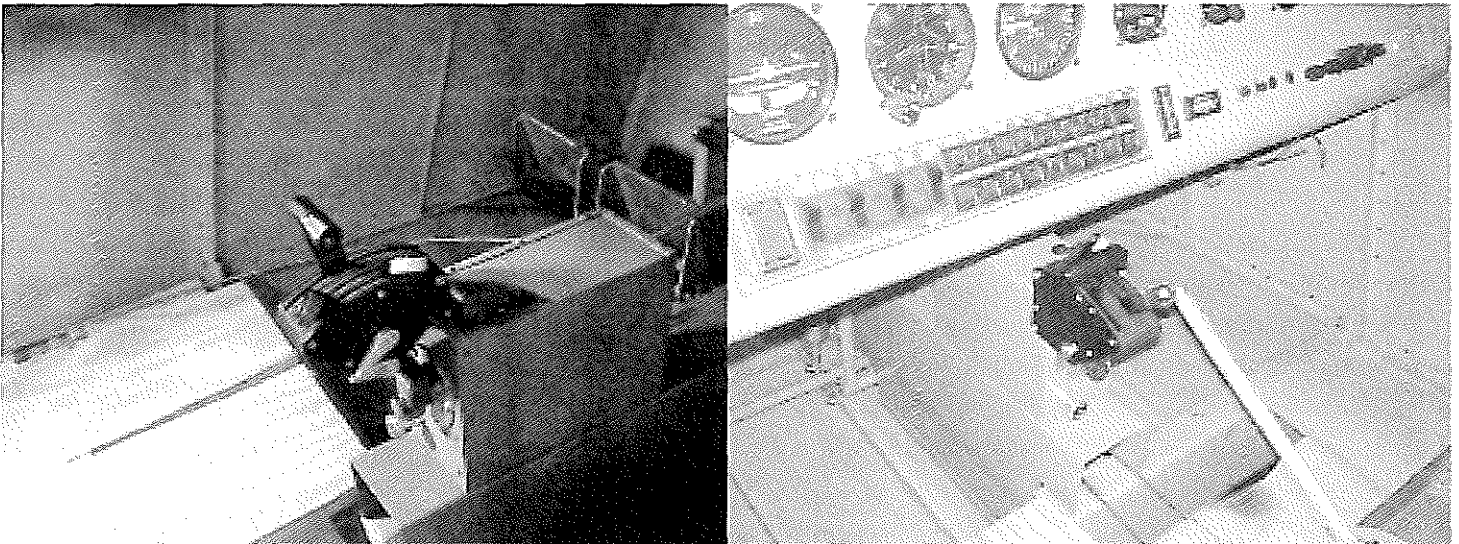
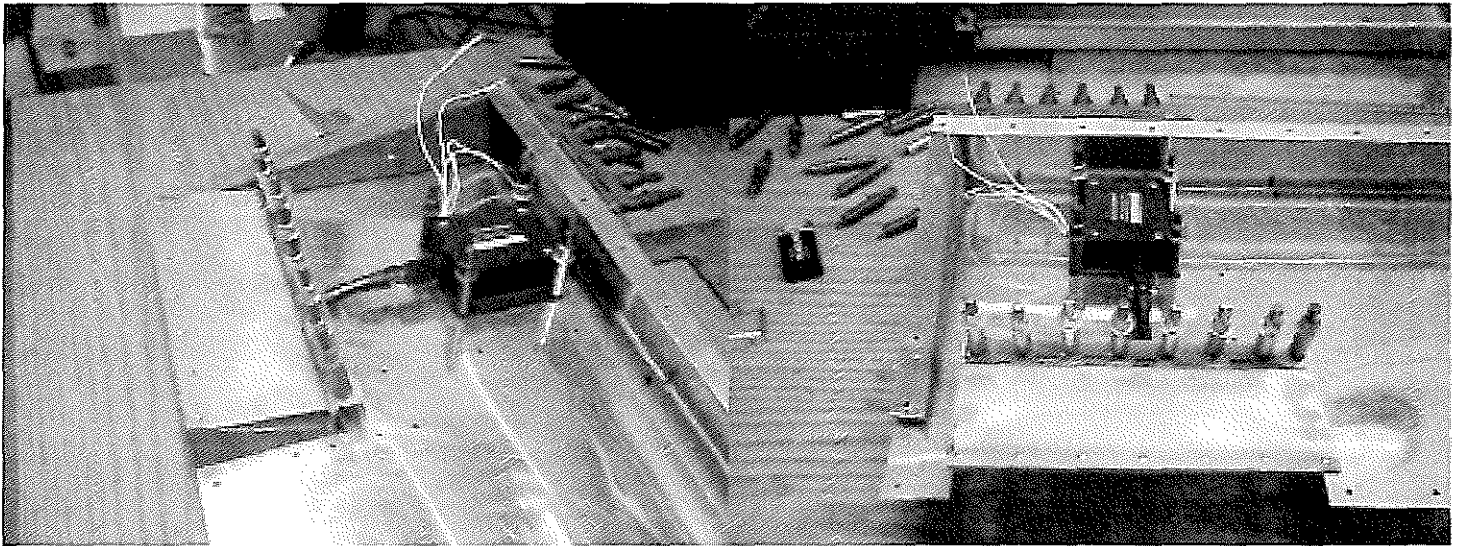


cont pg 16

Comments From Rich Brazel

With all the talk about where to put the throttle, mixture, etc. This is how I plan to do mine. It is composed of a throttle quad. fab. out of a solid piece of acrylic (Piper style quad). The three levers are made from mild steel bar. The throttle has a "T" top, which feels very natural. The red and silver knobs were obtain from surplus and are made from alum. Everything was powdered coated, except the silver knob which is for the carb heat and the acrylic housing which was sprayed painted with wrinkle paint. The quad is attach to a alum. computer chassis box which is mounted on top of the foward tunnel. Also attached to the computer chassis box is the guarded switch for Van's electric primer, Andair fuel shut off valve and a control to regulate cool/warm air to the two eyeball vents. There is plenty of room to operate the flap handle and the quad was placed even with the left side of the fwd tunnel to minimize interference with my right stubby leg. I have also included some pics of my RAC aileron trim which will be in the left aileron. Made the tab slightly larger than a dollar bill (as suggested by the group) and the servo is attached to an access plate should R & R be necessary. I did have to put in additional limit stops as I felt there was too much travel. The inst. panel is all electric (no vac. pump, reg, filters, hoses, etc).

Regards,
Rich Brazell



Here Is Something To Consider

Best time and great economy rarely go together. Miles per gallon go up dramatically when the airplane is flown somewhere near the best L/D and relatively low power and properly leaned as well.

My 150 HP Thorp, Metal Sensenich propeller can stay aloft at 120 IAS, 16 Inches of Manifold Pressure and just under 5 gallons per hour for just about 5 and a half hours, covering 700 Miles for a 25 Miles per gallon. I have standard 28 Gallons total available. It is a Typical S-18 with no special features that make it better or worse. It is typical of this model.

GPH	TAS	Manifold Pressure	MPG	Dist on full tank (No wind)	Hours endurance (No Reserve)
7.8	160	22	20.5	574	3.6
6.2	140	20	22.6	632	4.5
5.5	130	18	23.6	662	5.1
4.8	120	16	25.0	700	5.8
4.4	110	15.5	25.0	700	6.4
3.7	100	14	27.0	757	7.6
3.8	70	13	18.4	516	7.4
4.3	70	16.5	16.3	456	6.5
4.2	70	17	16.7	467	6.7
4.4	65	17	14.8	414	6.4

The data I collected at 80 and 90 TAS was not a good fit so I discarded it.

Looking at this information, you would want to fly at 100 TAS to get 27 MPG and fly for 7 plus hours but only John Johansen and his globe circling RV4 are willing to do that.

This data was put together in one afternoon, using GPS and Fuel Flow instruments so it is not totally scientific. This is merely representative of the concept that if you want to go far, you got to slow down.

Might be interesting if others did the analysis so we could compare notes? With AVgas near \$5 per gallon, it doesn't hurt as bad to go slow.

Joe Gauthier
N22607

I put a material called Shield Zone on the leading edge of my Sensenich woody (72/66). Less than .016 in thickness. If installed properly it will not come off unless you purposely peel it off. Used on helo rotor blades. They will cut anything to your specs. I had two pieces 20 x 2 for my prop. Cost 40.00. You put it on using a light solution of baby shampoo and water. Apply to both sides, lay it in place and work it down. Any little bubbles will work out by themselves in a couple of days. I haven't tried rain because I only fly if I can see the sun. Really easy to clean off bugs, seagulls, and pelicans which we have in abundance here in Utah. Go to: www.shieldzone.com

Accidents ~ Sad News

The pilot of a home-built aircraft and his wife died in a crash just moments after takeoff Sunday morning, less than a mile from the landing strip in the fly-in community where they lived.

Scott Schlender was piloting the two-seat, single-engine Thorp T-18 aircraft when its engine stalled as it climbed away from the strip, Sheriff's Deputy Harold Harper said.

http://www.sun-sentinel.com/sfi-flp-plane0820pnaug20.0,6023461.story?coll=sofla_tab01_layout

**Watch Those Helicopters**

I flew yesterday afternoon and upon landing at our unicom'd airport, I was rolling out just after a wheel landing when the plane went hard right - I managed to save it just before the ditch, but it required hard left rudder and brake and immediately activated my cheek vise - after I got off the runway and took some deep breaths, wondering why the hell that happened, as the winds were negligible/calm at the time, the channel two news jet ranger came air taxiing down the right side of the runway - either I missed the taxi call from the omelette maker, or there was no call. I am convinced the rotor wash smacked my airborne hind end and damn near sent me into the weeds at 50 MPH. As my previous home base had some Guard helos, I am pretty aware and cautious around them, but I did not see or hear this one. Made me appreciate hugging the center line of the runway when I land, and maybe I will now add "check for helos" to my "On final" checklist, and if there is one there, at least three point the landing, but will probably go around.

I know I'm not the first to experience this, but thought it was worth posting as a reminder.

Still Puckered Fraser
886Y
Draper, UT

Smoking Rivets

I have almost 500 hours on N22607. No aerobatics or other hard use. Never landed on rough runways. Always flown at the recommended weights. This is an S18 that was built to print using tools, materials specified and with skills acquired over the construction of three metal airplanes before.

My question to the group is related to a comment on the website made by DL Prince on the rebuild of his Thorp N55RC where he mentions "Smoking rivets" on the main spar.

My Thorp showed symptoms of rivet problems on the spar caps inboard wing, top and bottom, within less than 100 hours when it was new back in 1996. I was worried and asked folks about the condition. My conclusion then after sifting thru the many and varied answers was, "Wait and let's see how bad this gets".

Now after 12 years and 500 hours it is only a little worse than it was at the beginning. There are no actual smoking rivets. None of the rivets leaves a trail of grey/dark stain that is characteristic of a rivet that is loose in the hole. It appears that the rivets are tight in the spar cap but have insufficient clamping force on the skin to spar faying surface allowing the skin to flex a bit. If it were not for the paint cracking that occurs around the rivet head, I would have no clue of anything at all. I have seen "smoking" rivets on other airplanes and I know what they look like.

I did try drilling out a couple and replacing them with driven and or Cherry Max rivets and that solved nothing. Recognize that bucking rivets in a completed stub wing assembly is not the most effective way of getting a perfect set on the rivet but I have no excuse for the Cherry Max rivet result.

Bear in mind that this is my theory based on my actual observation and other opinions will exist.

My only reason for raising this on the list is to find out how many have a problem like mine and if any have been successful fixing it.

Your comments please.....
Joe Gauthier

I am refurbishing my old wings to use on another project. They had about 1700 hours on them when removed

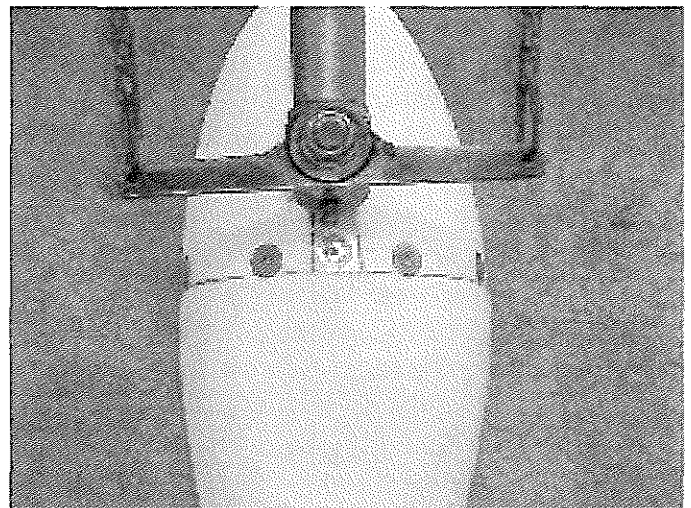
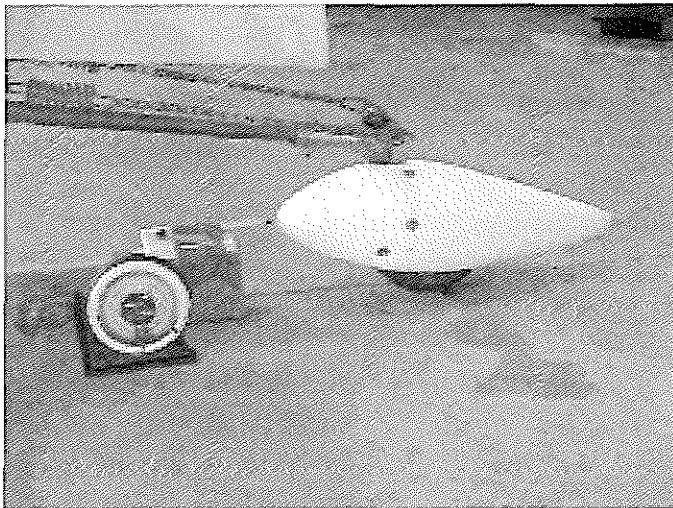
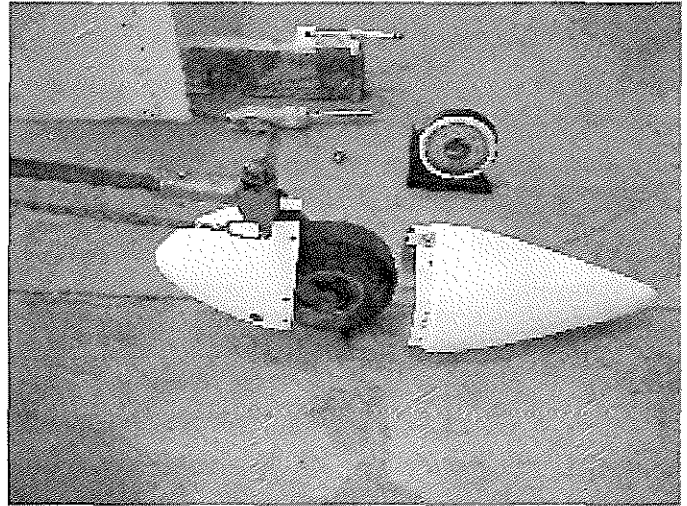
Instructions for Installing tail wheel Pant on Aviation Products tailwheel. cont.

Once you have the front half “locked” into position, the wheel pant will not move once the locking tab is installed...refer to the picture to see this tab.

The locking tab is a .032 2024-T4 aluminum strip which you will find included with the full kit. If you have purchased the fiberglass components only, you will need to make the tab. The purpose of the tab is to retain the tail wheel so that when a force is applied to the trailing edge, the now will not move up or down from the position that you have determined provides the correct angle of attack.

Some effort may be required to push the rear tail cone onto the front half of the wheel pant. While the back half of the two mounting brackets that are secured by the axle bolt are very short, there is the possibility that they will interfere with the rear half. Solution is to shorten them, or bend them inward at the bottom edges.

The two brackets mount as shown on the front section. However, since the front is round, and the brackets are flat, care must be taken to insure that when the brackets are tightened down, the fiberglass is not deformed. I suggest that you make a little shim and epoxy it on the inside of the nose section where the bracket contacts the fiberglass to avoid deforming. As an alternative, you can form the bracket with a curve on it to match the curve of the nose section. You will need to locate the mounting holes in the two brackets. You want to do that with the bracket in the final position...i.e. in contact with the sides of the nose cone, or against a flat shim. The reason you want the bracket in its final position, is to avoid deforming the fiberglass when you install the two mounting screws. You may find it helpful to make an indexing mark on the nose of the front half of the wheel pant. In the picture, I made a simple jig out of a block of wood, duct tape and a pen. With a mark on the nose, I could locate



the mounting holes in the correct position, install the nose and then check and adjust as necessary. Once you install the aluminum locking tab at the top center, the tail wheel pant will be firmly mounted to the tail wheel. **FINISHING:** You will need to do a minimum of prep work in preparing your tail wheel pant for paint. While the two halves have been matched prior to shipment to you, you will want to inspect and sand as necessary so the joint is to your satisfaction. You will also find some imperfections in the gel coat which in some cases will need a little body filler and sanding. Also a good grade of primer filler should be sprayed on the parts followed by sanding and final paint.

for the S-18 wings I built. I removed the end ribs to replace several smoking rivets as there is no good way to buck them with the ribs in place. If I had it to do again, I would leave the rivets alone. I share the opinion that the real phenomenon we are looking at is the flexing of a relatively thin sheet on the heavy spar. This, over the years, has not become a valid problem, but only one of cosmetics.

As an aside, I had a conversation with John Thorp about this issue. I had built my inner wing without the second row of rivets at the inside end of the spar. He said I could add them by drilling and countersinking rather than dimpling since my inner skin was .032. I did this and both style showed the same amount of "smoking."

Bob Highley
N711SH, #835

cont pg 19



Making Your Own Wingtips

I made my own wing tips by making male plugs and then making female molds over the male plugs. I added 1 in. to the span. That first inch is a straight extension of the wing so that when the tips is attached, it lays flat. If the tip begins to curve at the point it is screwed down to the attaching strip on the wing, it wants to buckle or warp. The RV wing tip attachment method solves that problem.

I made the male plugs with a solid core of foam and then covered the rough form with fiberglass. I had the out board wing in a jig with the ailerons attached so that the wing tips would match the cruise profile.

This took a lot of time but the finished tips pulled as one piece out of my female molds are very smooth. I went thru this exercise since my airfoil is quite a bit different than the "standard" airfoil. The trailing edge is kicked up about an inch and a half.

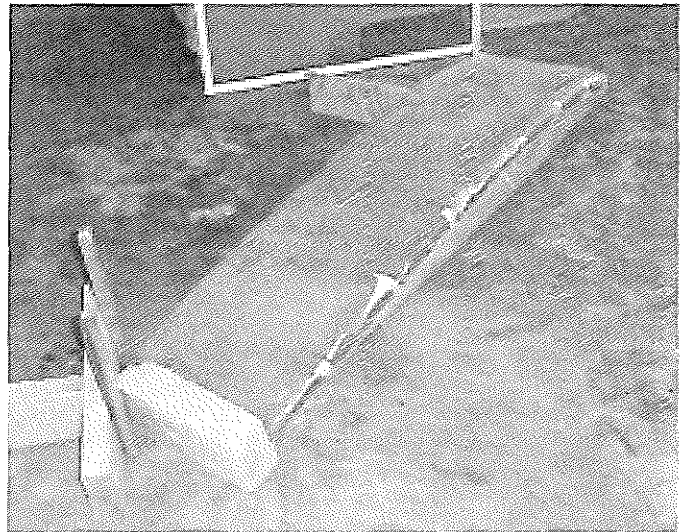
Anyway, I just wanted to comment that making Wing Tips is a lot of labor. Getting the rough shape of the tip was minor it turned out to all the time it took to get a "perfect" finish on the male plugs.

As an aside, the female molds were built to production standards by the guy who made all the origi-

nal John Thorp Derringer fiberglass parts. He has a company here in Paso Robles that makes most of the Robertson Helicopter fiberglass parts.

Tom Hunter
N18XT

Here is a picture of my own design wing tip that has no specifics yet, but hopefully within a year. The camber edge is rounded (almost like a tube) to fair into a flat end and then rounded again to fair into the bottom profile. I wanted a straight leading edge for easy installation of landing and taxi lights. And yes - Anytime you increase the flat plate area, you increase drag.



Hurrant Karibian

Just to keep the conversation going, I will add another undefinitive tidbit. Van's aircraft has used all manner of wingtips over the years. Those currently in vogue are designed by Sam Bass who has some expertise as a fluid dynamist. His design looks a lot like the one shown in the T-18/S-18 plans. My conversation with him revealed that the real secret to high speed tips is leaving the mold line on the outside edge. He claims that a small ridge (about 1/16") running the length of the tip serves as a place for the vortices to form as the spanwise flow exits the wing. The RV-8 uses these tips and, as we know, is Van's idea of the ideal airplane.

Bob Highley ~ N711SH

cont pg 18
17

Attaching Those Wingtips

Here is a couple of nice pictures of David and Karen Read cutting foam for their wingtips.



Any suggestions on wing tip attachment...I would like to pop rivet and fill to a smooth finish....whats the best way to fabricate the strips on those outer ribs?

Jim Tomaine

When I put the outer rib in I also riveted in an inch wide strip of .032" al. It was put on the inside of the rib so it was skin plus rib shy of the wing surface. This was enough to allow the wing tip to but nicely to wing. Rivited on with csk alum pops (to make easy to get out if wanting to take tip off) Filled rivit centers before painting. Been on now for 15 years and never taken them off, can get access to nav lights externally.

Tony Schischka
ZK-VMS

Regarding wingtips, I don't advise riveting. I did mine 27 yrs ago and although it looked good, I have always regretted it. some time you might want to remove the tip..Lights, strobe, antenna, or different tip shape. Also if you fill and smooth over the joint it changes the airfoil in the area....This is my personal opinion....

Bill Cordoza
N118BC

As someone stated, hard riveting the wingtips will probably be regretted later on. The best way is to rivet an attach strip, under the outside rib, leaving about 1" of material for nut plates. Use #6, or #8 SS flathead machine screws with tinnerman washers. Spacing should be about 3 1/2 to 4 inches. Do not paint these screws and tinnerman washers, they look great unpainted and are readily removable. Also, make sure the rear wingtip is properly aligned with your ailerons. Just my personal opinion.

Ken Morgan
N118TX

More Wingtip Information

Here is some information reprinted from a summary that was in a issue of Sport Aviation.

Based on a Formula V racer with 75 ft. sq. of wing.

" The effect of wing tip shapes on the speed and climb of light AC is negligible in comparison to very small changes in many other variables available to designers such as wing area, aspect ratio, streamlining, power, etc..

	Stall mph	Max speed	Climb ft/min
Square	55.5	146.3	1136
Round	57.7	148.0	1107
Hoerner	56.5	145.6	1126

The next time you get on a commercial jet look at the top of the wing. If it has not been washed during a regular maint. cycle or if it has not been repainted lately...you will see smoking rivets. Before I became the Maint. Officer for a Navy DC-9 Squadron I thought it was some type of a small fuel leak as they were almost in the wet wing area. As it turns out after talking with the folks that do the major re-work during our C/D checks...this is normal and to replace the smoking rivets in the wing would involve a MAJOR maint. effort. Unless the rivet is actually loose they may cover the rivet with silicone to reduce the effect of the "Smoking". Having flown brand new Air Bus A/C at USAIR...first flight after factory delivery you would start to see "Smoking Rivets" on A/C about one year old... turb. hard landings, etc. During pre-flight you would see them on the side of the fuselage and on the bottom of the wing. You will see the same "Smoking Effect" around the fuel pump access panels that use C/S screws. When I rivet my wing I am looking at using an adhesive (T-88?) to bond the skin/rivet and rib to lock the whole thing in place. Every so often I would get questions from passengers...what is that black streak on top of the wing...my response. GREASE from the flaps and slats! When I use Cherry Max rivets I pull them with an Air Hydraulic Riveter... a much tighter rivet operation than using a hand riveter. Just my 2 cents!

Regards,
Rich Brazell

I noted you mentioned that you are thinking about an "adhesive" to secure the whole thing together to hopefully reduce "smoking" rivets. In my case I used pro seal on the inner wing (standard wing). After 400 hours I have no "smoking" rivets.

Second where you can in the process of riveting also draw the rivets. This insures that the two surfaces...ie the skin and rib, or skin and spar....are contacted as tightly together as possible. I don't think this has any application when you use Pro Seal however, since you have that "paste" between the two surfaces. In fact one know it all offered the observation while I was assembling the "wet" portion of the wing, that the pro seal would NOT allow the rivets to pull the wing parts together and the rivets would all start to work.

And if you go to the trouble of using Pro Seal, you might as well make a wet wing, so you kill two birds with one stone.

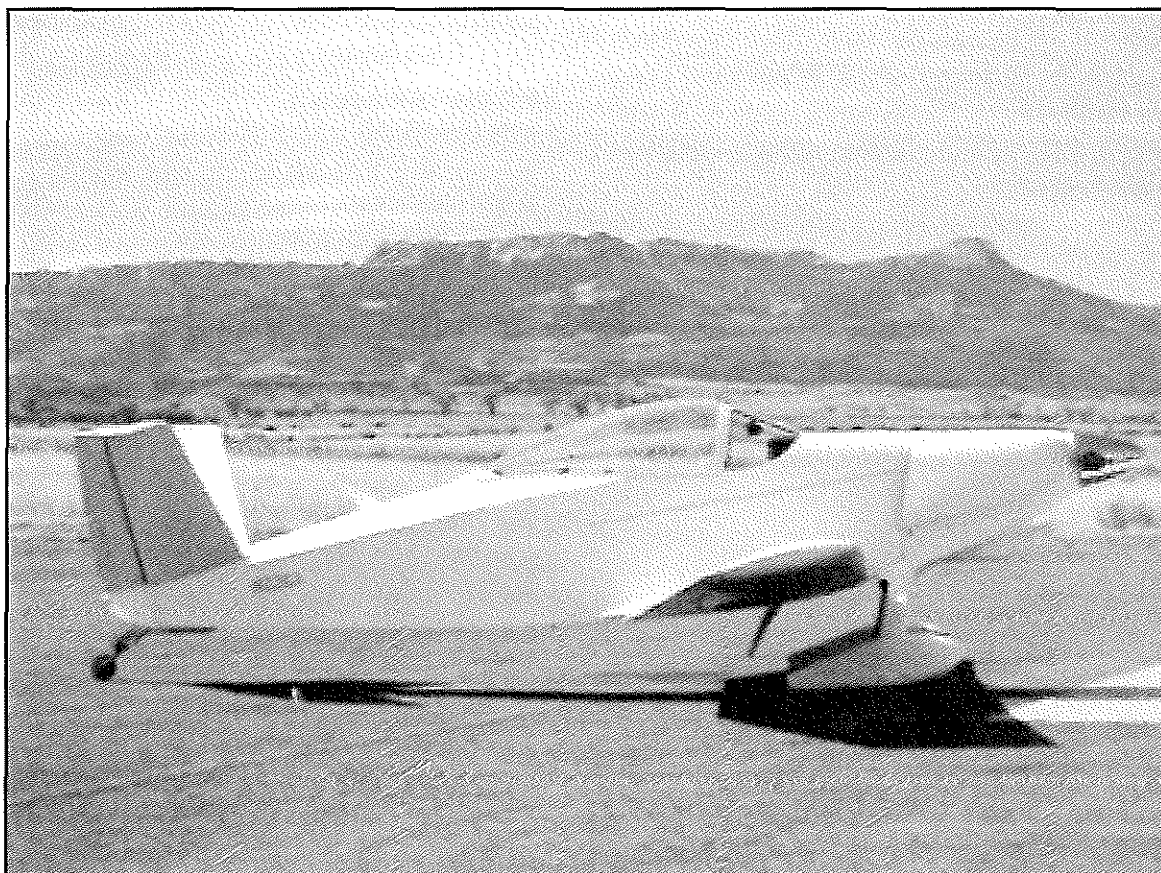
Tom Hunter

I've had lots of "smoking" rivets along the main spar/skin line on my 1200+ hour airplane. We've had the discussions in this forum about why this happens along the main spar/skin rivet line. It's problematic to repair because I have the thinner inboard skin which has been riveted by countersink and dimple, which I'm sure most are. It's not as simple as going oversize on the rivets and replacing them- the skin is too thin and how do you to you dimple and countersink under an existing skin?. Even though my "smoking" rivets haven't really failed by technical specifications, it looks like crap on my white airplane and I personally don't like it. Short of rebuilding the wing, I needed a better solution. After replacing some of the #4 flush rivets and having them "smoke" again, I did some research with some of my Air Force engineer buddies that work at one of the depots, and came up with a solution that seems to be working. Cherry Max makes a semi-flush product that is designed for thin-skin applications- the CR3245 series (oversize only). The oversize number 5 fit the existing #4 dimple/countersink after it is drilled out to the oversize #5 rivet diameter. It fills the countersink/dimple but also has a bit of a head like a standard non-flush rivet which helps pin the skin against the spar (theoretically). We did some tests and it seemed to work well, so I've tried it on my airplane with good results. Not one of them is "smoking" after about 50 hours. Long term results TBD- I'll let you know. It does have a very slight head to it and does not look as good as a nice flush rivet. The rivets are expensive and you have to go to a big aviation supplier to get them (my A & P ordered them through Aviall I think)....Spruce, etc. don't carry them. My Cherry Max pneumatic puller that I got off of Ebay for \$200 is worth its weight in gold. You can keep even pressure (no side-loads) on it in the pull and it takes seconds to set the rivet (I bequeathed mine to my A&P for all his help). I highly recommend borrowing one from someone if you want to pull more than just a couple of Cherry Max Rivets (I think they are around \$1000 new- ouch!).

Glen Corell

T-18/S-18 Thorp Newsletter
Roy Farris
1220 Stellar Drive
Franklin, IN. 46131
Phone: (317)736-8903
email: royfarris@insightbb.com

Newsletter No. 137
September 2007



Richard & Kathy Brandiger Thorp T18 #176 & the Green Apples V Tail