

T-18 NEWSLETTER

January 2001



Amos Rank ~ N37AR ~ Independence, OR.

IN THIS ISSUE:

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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

Here it is, year 2001, and this is the years first attempt at a newsletter. In the last issue I made a plea for good technical information that I could use in OUR newsletter. With a minor exception, I haven't received a darn thing, so I will fill the pages with whatever I can come up with. I get many emails wondering when the next issue will be mailed, I get the impression that there are many of you that sit and wait for the next T-18 Newsletter, and anticipate all of the good technical info and goodies about building and flying our wonderful little airplane. I hope that these issues don't dissapoint any of you. It is really difficult for me to come up with twenty or so pages of good material without some help. There are several T/S-18 being built out there, and the interest in our airplane seems to be growing. For those of you that are building, I know that you have many good ideas and have overcome many obstacles to get where you are. Please send me those ideas and inovations that you have used to get past your obstacles. It will help others like myself, who are building, and are running into the same obstacles and problems that you have overcome. That is what this newsletter is all about, sharing your thoughts and ideas with others.

As always I will continue to try to publish this newsletter with interesting and technical information about our wonderful little airplane.

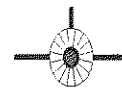


Burn-Out

I received several comments via email on the Burn-Out article in the last issue. I see that I am not the only one experiencing this problem. I think that this is a problem related to all aircraft homebuilding and not just us Thorp builders. Several of you commented on the how's and why's of your delayed

projects, and I think all of us can relate. I also found through your comments, that for most of us, it stems from some part of the project that we are having great difficulties overcoming, so we get frustrated and just decide to layoff for awhile and collect our thoughts. A few days become a few weeks, then a few months, and then suddenly we find ourselves caught up in other facets of life and can't figure out how we ever found the time to begin with. Building an airplane needs to become a habit. We need to get back into the habit of getting out there and doing it. I find that after I get started again and work every night for a week or so, that I begin to get involved mentally and get back into the habit. When your project become a main priority, those other things that always seemed to be in the way, are suddenly on the back burner. Building is a long, time consuming process, that can take forever if we let other things get in the way, but if we make it a priority and get in the habit, it will only last a short time. When I began building my T-18, I was told by more than one builder: "Do something on your project every day." I believe that is very sound advice, that way you never get out of the habit.

With much pushing from good friends and fellow T-18'ers I have slowly resumed work on my project. (I did have to take time off to write this newsletter) I haven't gotten totally back into the habit yet, but I'm working on it.



Newsletter Dues

Man is this a tough subject !! I want to thank everyone who sent their 2000 dues. I still have many of you that **have not** paid last years dues. I even show several unpaid for 1999, and several unpaid for 1998. **PLEASE look on the mailing label on the back of this newsletter.** Look above your name. If you see a "PD" then you are paid through 2001. If you see an amount, (ie \$25 or \$50) above your name, that is the amount you owe. Several of you sent your 2000 dues at the

cont. next page

Newwsletter Dues, cont.saftey, cont.

end of the year. I am not sure how the dues have been handled in the past, but I want to establish a policy for everyone. Beginning now, the newsletter subscription is due in January. So those of you who paid late for last year need to check your mailing label. If you have any questions, please don't hesitate to contact me. I hope we can resolve this issue, as I cannot continue to publish and mail this publication without operating capital.



Lets Talk Saftey

I commend Gary Green for the courage to report his S-18 spin incident, and Roy Farris for publishing it. I am, however, disappointed in Dick Cavin and other newsletter editors who knew of Gary's incident, and did not print it. Publishing our failures is just as important as our successes, because "it saves lives," and we all have the responsibility to do that.

In my opinion there two possible causes for Gary's experience. There are two airfoils used in the T/S-18 series aircraft, the NACA 63415A and the LS-1. The NACA 63451A is a fifteen percent thick Laminar flow section with the maximum thickness at thirty percent chord and a design cruise lift coefficient of .4. The "A" means that the trailing edge cusp of the original airfoil was designed out by numerical calculations and, although it was never confirmed by wind tunnel data, is supposed to have the same aerodynamic qualities as the original.

The LS-1 airfoil was designed by T-18 guru Lou Sunderlund. Although it is based on the NACA 63415A there is a significant difference. The forward thirty percent of the airfoil was replaced with the forward thirty percent of a GAW-2 airfoil. This change gave the larger leading edge radius and the upper forward camber of the GAW-2 to the NACA 63415A, in hopes of a gentler stall and better climb performance, due to reduced drag at high angles of attack.

cont.

This "grafted airfoil" was never tested in a wind tunnel, so the exact location and travel of the center of pressure has never been known, hence its characteristics in a spin cannot be calculated. This does not mean that the LDS-1 is a bad airfoil. It works very well indeed, but we need to know all this up front before we start exploring the outer envelopes of our aircraft. We are all test pilots. Unless you built the airplane, or the original builder remembers, it takes a trained eye to identify which airfoil you have. The aircraft model type is of little value. The T-18 series (narrow body--non folding wing), T-18CW (narrow body--folding wing), are supposed to have the NACA 63415A airfoil, but I purchased a T-18CW with the LS-1 airfoil three years ago. Technically, this aircraft is a S-18, but the plans said T-18CW. I have also heard of non--folding LS-1 aircraft. All S-18's should have the LS-1 airfoil, if not, they are technically T-18CW's.

The other explanation for Gary's experience may be wing root fairings. The size and shape, or lack there of have a critical effect on spin recovery. I have seen at least a dozen different types on T/S-18's. I am in no position to comment on which ones aid or hinder (or eliminate) stall spin recovery. Individual reports are always subjective to the reporter, but we all need input. So anyone who has experience with the different types or wing root fairings, please clue us in.

I am very glad Gary lived to fly with us instead of the angels. Someone else may not be so lucky. Be responsible..... Please write !!

Matthew E. Null
Ann Arbor, MI.

Editors Note: Matthew has some interesting points here, but in all fairness to past Newsletter editors, at a time when T-18 interest was low and growing slowly, printing articles that revealed a negative content about any phase of homebuilding or flying was considered detrimental to the hobby. Therefore most of them were not reproduced in print, but the T-18 community was always made aware.

Safety cont.

Here in the northwest, the weather is noted for occasionally having some rain. A T-18 which I recently encountered had been tied down outside with no cover. When I first saw it, I was told that it had been in the NW for many years and was previously owned by an acquaintance of mine. At this first site, I noticed that the propeller was in need of refinishing to better protect it from the rain and sun. The airplane was repainted shortly thereafter and looked good until one got up close and saw that it had not been stripped (an "over" paint job).

Recently the owner complained to the FBO shop foreman about the engine running rough. When pulled into the shop, the lower plugs were pulled and water was found. After that discovery, a further inspection of the carburetor air box showed that a drain hole was plugged up. When it was cleared, about a quart of water ran out across the floor. The engine then ran alright, but the foreman wouldn't release the airplane until the prop was refinished.

So, T/S-18 owners, if you are unable to hanger your airplane, for sure get a cover for it, and probably one for the prop too. In any case, a wood prop needs some careful attention with marine spar varnish (per Aymar-Demuth) to keep it from deteriorating. Re torque the prop at ten hours after installation, and at each oil change (or 25 hours).

Tom Worth
Edgewood, CA.

Preflight Inspection Item

After departing a nearby airport and while maneuvering at about 125 mph with low positive G loading (1.5-2.0) I suddenly found that I could not move the stick to the right beyond approximate neutral! This situation will get your undivided attention almost instantly. Aircraft control could be maintained with moderate right stick pressure which allowed the right aileron to move up very slightly due to slight 'spring' in the aileron circuit and left aileron and rudder application was available for yaw assistance. There is not much play

cont.

Safety, cont.

or spring in the Thorp push pull tube type aileron control system. Slow cruise speed seemed to allow best of marginal control.

By the time I got all this sorted out I made the decision to continue to home base. As I flew I could see the left aileron flex with right stick application from sun reflection and figured a jam condition at or near the tip. The approach would have to be precise to ensure touchdown at the optimum location (short and on centerline) on the 2200 foot strip This was done and a normal landing and rollout with no more surprises, fortunately.

Immediate examination of the left aileron showed minimum clearance between the aileron mass balance and fiberglass wing tip-aluminum skin had decreased allowing normal up movement of the aileron and down movement to about the neutral point where a jam condition occurred. This was caused by the geometry of the mass balance arm and the lead weight dug into the skin. The aileron drawing shows that clearance should remain a constant with control movement but in my case it appears to be constant but is not precisely so.

No significant aileron or other damage is apparent except hangar rash you might expect to see in 25 years of service. Corrective action was to increase clearance from about nothing to the present 3/16" between the forward mass balance weight and the wing tip aluminum skin. This was done by enlarging the underside wing opening. Mass balance was removed for inspection and no evidence of damage or distortion. There is no excess play in the control system or aileron hinge. The tip is secure to the wing with no movement.

I would advise adding a visual check below the wing tips for this mass balance to wing clearance during preflight inspection. Should you experience any such unusual in flight circumstances I would recommend an expeditious landing at an airport with a long and wide runway.

For your consideration my experience background is retired professional pilot, A & P and current CFI operating various light aircraft. I wish you safe and happy Thorp flights.

Frank Baldwin, T-18 ~ N6937

Technical TipsBrake Lines, cont.**Brakes and Brake Line Selection:**

By: Lyle Trusty, T-18 N851LT

A few weeks ago I read something that said plastic brake lines were a poor choice. The writer indicating that the ones on his airplane had grown brittle with age and had fractured. He was subsequently going to install hard lines with metal fittings and flexible hoses.

This prompted me to investigate the subject, because my brake lines are plastic, having changed over from hard lines with flexible hoses and AN fittings in 1984, after installation of a set of Long Eze brakes. (These brakes are made by Cleveland and have 3/8" thick discs and slightly larger and thicker pucks. They are a much better brake for the airplanes fitted with 180 hp engines, and are able to hold the airplane during runup, even when they get old, as well as providing superior braking capability during landing and taxiing.)

Let me digress. My first brakes in 1974 were the popular 500 X 5 Cleveland disk brakes that are pretty much the standard for homebuilts in the speed and weight class of the T-18. They worked adequately, but I had to pump the brakes a couple of times before landing to get a good pedal height. The same thing before runup. I found that the metal line to the calipers was defeating the self adjusting feature of the brakes, so I installed a flexible hose, with the attendant hose fittings, in the last 8 or 10 inches of the lines before the calipers. This improved their performance; however, it was still unsatisfactory because of the stiffness of the hose. Moreover, about the time I would get to the prescribed RPM for the mag check the airplane would start creeping away despite my best efforts to prevent it from moving. Installing Chrome Disks would help for 50 to 100 hours of operation, but then the creeping would begin again. I lived with the problem for several years; replacing brake disks every year or two with new chrome disks.

After moving to California and flying out of the Antelope Valley for several years, I was fortunate to be able to change the engine from a 150 hp/constant speed prop configuration to a 180 hp/fixed pitch installation. Now, however, I was flying from a 2,800 foot dirt strip at our

ranch, at high density altitudes in hot weather. The "Go Power" was very nice to have – but the "Whoa Power" was marginal. Then I heard about the so-called Long Eze Brakes, supplied by San Val aircraft parts in Van Nuys, California, by special arrangement with the Rutan Aircraft Factory. Looking into this, I found that the Long Eze suffered from the same symptoms I was experiencing with my T-18. I was convinced that Burt Rutan had solved my problem, as well as the Long Eze's. So I bought a set, and put them on my airplane. This time, however, I used 3/16" Go Kart brakeline Nylon tubing, with brass fittings and sleeves, for brake lines. The flexibility of the 3/16" lines allows a simple, direct routing right to the calipers from the Master Cylinder. No need for anti vibration clamps, strain relieving loops or bulkhead fittings. The installation was a snap, even though I have dual brakes, and there have not been any problems with them since they were installed about 1,100 hours flying time and 16 years ago. I just finished inspecting them and they look and feel just like they did 16 years ago. The performance of these brakes sets the standard for a T-18 class airplane, in my estimation.

If there's any fault, it may be that it's possible to stand the airplane on its nose under two circumstances. The first is that a fly-weight pilot with a full main tank could possibly raise the tail during a full power runup, even with full back stick, to the extent that he could strike the prop. That is also possible with the original brakes, if they are in good shape. The other condition occurs on rollout, with application of excessive braking on both brakes, when a light weight pilot is flying solo. I've experienced raising the tail a foot or so, when using the brakes aggressively, however it was very controllable, and the natural reaction is to quickly get off the brakes

Now to the nitty gritty; What is the right material, if you elect to use plastic lines in your brake system, and where do you get it?

The right material is 3/16 inch NYLO-SEAL TUBING, P/N 33-NSR, along with BRASS POLY-FLO NUTS AND SLEEVES, P/N 261UB-03.

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Brake Lines, cont.

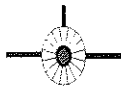
These items are readily available from Aircraft Spruce and Specialty Company. Look on page 115 and 117 of their 2000 – 2001 catalog. Read the specs for this tubing, and you'll see why other tubing is not suitable for brake system applications. This tubing has a Chemical Resistance and Physical Properties specification that makes it clear why there could be problems with other kinds of plastic tubing.

For Example:

NYLO-SEAL TUBING has a burst pressure of 2,500 psi at room temperature, with a working pressure of 625 psi. At 230 degrees F the burst pressure is still 1,400 psi, with a working pressure of 350 psi. All this at a safety factor of four. The heat distortion point is 302 degrees F at 66 psi.

POLYETHYLENE tubing has a burst pressure of 250 to 600 psi at room temperature, and a working pressure of 75 to 160 psi. At 140 degrees F this tubing has a burst pressure of 125 to 300 psi, and a working pressure of 37 to 80 psi. The heat distortion point is 107 degrees F at 66 psi. Do not use this tubing for brake lines under any circumstance.

Lyle Trusty



Starter Solenoid

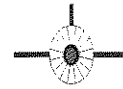
I had to once again replace the master solenoid on my T-18. This is at least the third one I've put on in 20 yrs. I know I have replaced it at least once before, and maybe twice. Anyway, I've discovered some things I either didn't know or had forgotten. I had heard of starter solenoids being installed up side down and then engaging the starter under high G loads. I hadn't thought about the reverse happening with the master solenoid as one taxied over rough ground or bounced in rough air, etc. I had my master installed upside down, so that when engaged, the electromagnet

cont.

Starter Solenoid, cont

had to pull the plunger up. I got to thinking about this the night after installing the new one, so yesterday, I went out and reversed it. It now has gravity assisting the magnet to hold the contact engaged. While talking to Kevin about this, he dug out three old RVators that discussed this very problem. The 3rd issue of '98 has an article on page 13 showing diodes on both the starter solenoid (which I have installed) and on the master solenoid (which I don't have installed). The August '94 issue on page 13 also shows a drawing of those diode installations.

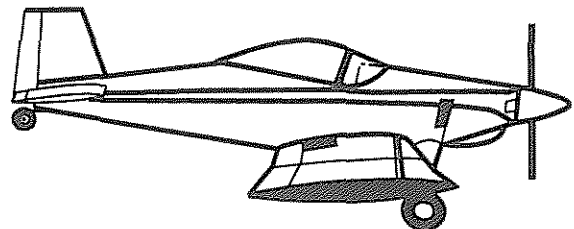
Gary Green
Grandbury, TX.



Jacking the T/S- 18

I just recently jacked up Jim Critchfield's N8TT to allow him to work on the wheel pants. I drilled a small hole in the cowling at the joint of the A frame at the horizontal crossbar and slipped a 3/8" grade bolt up thru the hole into the joint then jacked from there. It worked perfectly using the large wing jacks. He was able to work there, I was able to get in and out of the plane for various purposes and there is but a tiny hole in the fiberglass lower cowling that is not noticeable to the average person. Try it!

Best wishes, Hal Stephens



More Technical Tips

I jack my Thorp the very same way with fine results. I too have removable tie down rings which I built to screw into a fitting bolted to the main spar close to the dihedral break. I screw the ring in and use a hardwood block which aligns and constrains it and the end of a small hydraulic jack... it can't slip off. It's harder to describe the block than it was to make it. I use this set-up for routine maintenance. I use my engine hoist (cherry-picker) to lift the whole front end if I need to, and use a nylon strap to lift from the apex of the A-frame/engine mount at the top center of the firewall.

John Evens

The aircraft came with removable tie down rings (male thread) to the spar. I took a similarly threaded bolt and ground it off to a rounded shape and placed into the female threaded socket.

My hangar partner had made a frame to hold a small hydraulic jack for his RV-6 and made an extra frame for it. By removing the extra frame, I used the jack to pick up the wing (T-18 is lower than RV-6) to change a tire. A piece of wood (doughnut shaped disk) with a small hole in it was placed on top of the jack pad. Of course the opposite main wheel should be chocked. Carl Daughter's idea for a framed box for the tail wheel is a good idea also.

When lifting, be aware that the lift side wheel will cause some shifting, so use care and be prepared to lower and relocate jack stand if necessary (and beware of jacks that leak some).

Tom Worth

Be careful hoisting any airplane via the engine lift hook on the backbone of the case. It's OK for lifting the engine by itself, but not with an airframe attached to it. Look at a case sometime when it's apart. Ain't much mass there is there? I have heard of the case breaking out during such lifting attempts. If that happens, it ain't repairable. You're gonna need a new case.

Gary Green

Technical Tips, cont.

I use an engine hoist with strap around prop or if cowling is off a lift eye installed on the engine case. You can put a saw horse at empennage belly to stabilize. Tires or brakes can be serviced at same time.

Tom Worth

Note: Use caution with this method! It has happened that the bolt has actually ripped out the side of the case when lifting more than the weight of the engine in this manner!!

Carl ~ N647C

Uneven Tailwheel Wear

A question from Omaha: Is it 'normal' to have uneven wear on a Lang tail wheel system on a Thorp? I'm not sure if it is due to the tailwheel axle being supported on one side versus the typical bracing on both sides of a typical Scott tail wheel?

I'm not sure if it's the tailwheel, a bent tailwheel spring, or improperly installed tailwheel system on my Thorp. Have had uneven wear through several tail wheels. Candid advice and comments appreciated.

Pete in Omaha

The "typical" 6" Scott tailwheel IS supported only on one side, just like the Lang. It is not unusual to have either a little twist in the tail spring or a slightly out of square casting or other assembly on the tailwheel itself. If this bothers you, as it did me, it is easily corrected with a thin shim between the tailwheel assy. and the spring. This is one of the advantages of the flat spring design. I've seen many production aircraft tailwheels shimmed this way.

John Evens ~ N71JE

Landing the Thorp

Editors Note: The following were replies to a question asked by a new Thorp owner.

Don't rush it. Get used to the ground handling without doing high speed taxiing. The danger with high speed taxiing is the transition through the rudder effectiveness through to the tail wheel control occurs twice and can be further aggravated by the change in engine power and prop wash.

How much tail wheel experience have you had? If zero then it is important to be taught the principle of the tail wheel aircraft. It is better to do this on a slow light trainer where things will happen slow enough for you to identify them and respond with the correct control inputs. C 120/140 Aeronca Chief or the like.

Is your tail wheel experience on very light control input (with short control inputs). The Thorp responds to light inputs on aileron, elevator and rudder. Do not attempt to wear a size 12 boot when flying the Thorp. Remember that different Thorps may not fly exactly the same. My Thorp (s/n 931) is a T-18 with the original wing section as opposed to that of the S-18. The length of my main landing gear is such that the Thorp touches down in the three point attitude at flying speed. (There is no such thing as a stalled landing). This can cause a problem or two for the newcomer. There is only one way to land my Thorp. It is the right way. Let me talk you through an approach and landing. There is nothing scary about it if one follows the rules.

Chose a very smooth grass runway or dirt. It must be long and wide. 3000 feet should do. I say very smooth because a hump in the wrong place could cause porpoising and pilot induced oscillations. Once I had my Thorp bounced high into the air at below flying speed. I was lucky to catch it with a good handful of manual flap input and checked it and "flew" down the runway in ground effect at an altitude of about 2 inches. The flap lever then became my new elevator until the Thorp accelerated to 80 mph with zero flap. Sorry there are two important things you need to know. (a) where the ground is or how high the main gear is above the ground, and (b) the look of the aircraft when it is in

Landing the Thorp, cont.

the three point attitude. If you get a hot landing aircraft too slow too high above the ground you could bend it. Now, where was I? Assuming you have a long wide runway, let me continue. If the runway has a tar or asphalt surface then you need to ensure that your main wheel are not too hard. Slightly low inflation pressure on a tail dragger will stop it being skittish on the runway. It is better to make your short final approach at a slightly higher speed. Say 85 mph instead of 80 mph. (add 5 mph for high altitude airfield.) This will give you the time to do a good flare/round out, stop the descent of the aircraft, and get it flying parallel to the runway at a height of six inches to two feet. If you made a lower final approach you could do the same but it all happens in two seconds. (i.e. check descent, close throttle, identify correct height above runway, identify three point attitude, put it down) Leave that sort of high work load with no room for correction for air show demo flights. Back to 85 mph. Trip the pressure off the stick. As you come in and you see that you are not going to undershoot, close the throttle, dive off the 20 or 30 feet of height and set the Thorp on a path parallel to the runway. From now on you need to keep both eyes out of the cockpit and looking straight down the runway. You are now flying entirely on attitude with NO reference to the ASI. With small elevator inputs set it up at about 2 feet above the runway. Keep it at that height and watch as its speed decays until it is on the three point attitude. As it gets to the three point attitude let it slowly lose height. The plan is to be about one inch off the runway when it gets to the three point attitude. You will get to this after some practice. In fact you will get to looking for the runway with the tail wheel while keeping the main gear at one inch. Most times you will make a three pointer but if you are a little too fast or slow you will not notice.

What can go wrong:- Remember, I said my Thorp lands at flying speed. The Thorp's tubular main gear is round in section therefore has to be ridged enough to prevent it flexing too much backwards and forwards. This is a disadvantage. If you drop the Thorp onto the ground it will bounce like a golf ball. A rectangular section landing gear spring as found on a Cessna

cont. on pg 13

Thorp Fly-In 2000

Porterville, CA.

By: Hal Stephens

The ninth Annual Thorp Fly-In was again this year held at Porterville (That's Porterville, not Placerville) California on the labor day weekend of 1, 2, 3rd. Up to the last minute the weather was cooperating but then on Friday, when many of the Thorp drivers are committed to do it Mother Nature sent some nasty clouds down from Canada so a number of the pilots stayed on the ground or drove to the site. Just the same by Saturday afternoon over 20 Thorp T-18's were on the tarmac/lawn at Porterville.

We, as usual had a good lunch prepared by Frankie Archer following a get acquainted opportunity out on the ramp. Burgers over an open fire with all the good stuff that makes them juicy and tasty was served. Cleanup was accomplished and then Lyle Trusty began his annual Forum bringing forth all the latest changes and modifications that are practical for the Thorp. Mike Archer talked about the new Tri-Gear Auto Engine design that he is making happen. As with most of the airplanes that start as tail draggers.....the T-18 is undergoing a transition for those who prefer to refrain from fighting the "conventional" gear fly it to the hangar problems. Surprising how much interest was shown for this evolutionary process. The larger "long eaze" brakes were discussed as well cooling in the cockpit thru Dean Cochurn's side vents. A review of the latest cad/cam work done by Richard Ecklund was discussed and now certain parts are being made available for the standard T-18 series.

After the Forum the pilots were given the opportunity by Carl Daughters to fly a cork. The winners shared their libation with the onlookers and then it was off to a wonderful dinner of "deep pit barbecued" beef, again done by the Archers. Everyone there was stuffed when the sun went down.

By Sunday morning shortly after the sun arose, the flight crews had gotten by a good breakfast, compliments of the hotel and were headed for home to be able to spend one of their labor days with family. The ladies are given an opportunity each year to choose the most appealing airplane on the ramp and the lucky prize winner, receiving a crafted clock from Jim Critchfield, builder of N8TT, was Mr. and Mrs. Phil Key of Sacramento.

Next year is the 10th Annual and plans are underway to make the Fly-in even better. More gifts and a scrumptious dinner as well are in the planning. We are thinking of a weekend in September again as good weather is the usual fair. Best wishes and good flying..



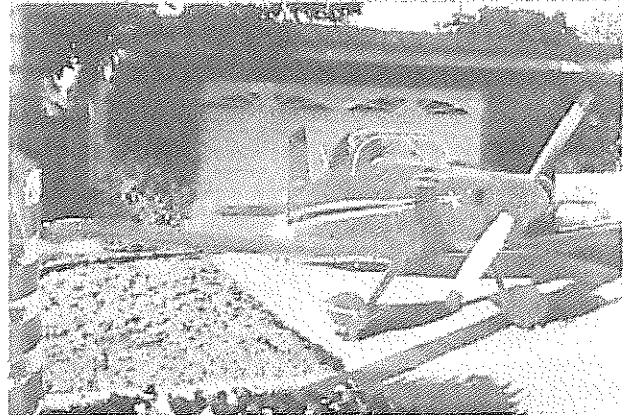
Ramp at Porterville Fly-In ~ Photo by Mac Booth

Porterville 2000 Fly-In

Photo.s by: Mac Booth



On the Ramp at Porterville 2000 Fly-In



Mel Clark ~ Huntington Beach, CA.

I want to thank Hal and Mac for taking the time and effort to share this event with us. It looks like the Fly-In had a great turn out, and I am sure that everyone who attended had a great time. These events set us aside from many other groups. T-18'ers are the greatest bunch of people in the world, and I think we have the most fun. Everyone needs to make an effort to attend a Thorp Fly-In or event this year. Check page 19 for a list of events for 2001.

Roy Farris



Mac Booth ~ N1488 ~ San Jose, CA.



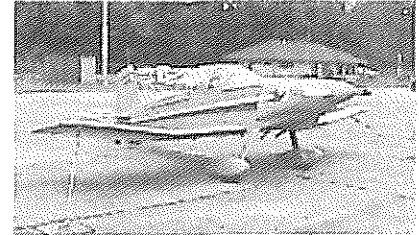
Mike Archer ~ Classic Sport Aircraft
Springville, CA.

Kentucky Dam 2000 Fly-In

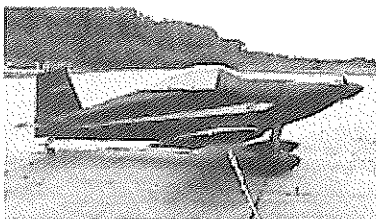
Gilbertsville, KY.

Photo's By: Tim Mason

This years Kentucky Dam Fly-In was held, as usual, in early October. Several arrived on Friday afternoon, and a few straggled in late that evening. Every year, our Friday night ritual begins with a trip to Patti's restaurant, located between the twin lakes that make up the Kentucky Dam Lake resort area. I am not sure how many attended the evening meal, but I would estimate around twenty five or so. Patti's is a wonderful place to eat and we all gorged ourselves, as stories of airplanes and flying filled the air. It's really a great time. We all head back to our rooms at the lodge, and a few rooms become the settings for more flying stories and discussions of how's and why's of building our airplanes.



Ben Mason's T-18 ~ Effingham, IL



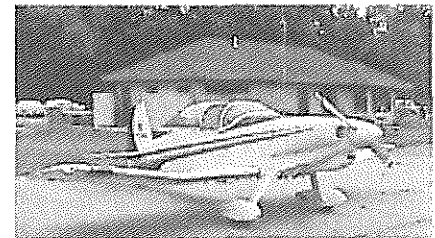
Steve Hawley's T-18 ~ Tucson, AZ

Saturday morning finds faithful Thorp pilots and builders gathering around the breakfast table in the lodge restaurant. We all enjoy a nice breakfast and then head out to the airport for more airplane stuff. There was a definite chill in the air on Saturday, and the temperate never got up to what one could consider warm, but the sky was clear and thats all we needed to go flying. Saturday at Kentucky Dam is the day for T-18 rides, and many were given again this year. I guarantee you that I was right there in front of the line. The group got a seven ship formation up and made some real nice fly-by's, even with the wind beginning to pick up.

Saturday evening finds us all together again, for a meal at the lodge, and a business meeting. Again I am not sure how many attended the dinner meeting, but I would estimate around sixty to sixty five. The lodge provides a nice buffet and the food is always good. During the short business meeting following the meal, several items were discussed, mostly concerning the future T-18 Fly-In's. The meeting was adjourned and we all gathered around the television set in the lodge, and watched video tapes of the days flying activities. We then adjourned to our rooms to get a good nights sleep.

Sunday morning found the temperature down right cold, and with a stiff wind, the windchill was unbearable. After the morning breakfast ritual, we headed for the airport. The weather just wasn't conducive to pleasure flying, so some packed up and headed for home, while others milled around not really wanting to leave. Everyone feels like family at this fly-in, and it's hard to say good-bye. No one wants to leave such a good time and head back to the same old daily grind. But all good things must come to an end, and eventually everyone was gone.

I am usually the last to leave, as I hate to miss even one of the farewell fly-by's Another Kentucky Dam Fly-In goes down in history. All in All we had a great time and did quite a bit of eating and flying. That's what its all about.....Isn't it !! We have it planned again for next year in October, Why not plan to attend.



Jim Paine's T-18 ~ Hendersonville, NC

Roy Farris

photo's cont on next page.

Pictures from Kentucky Dam Fly-In 2000

Pictures By: Tim Mason



Bill Williams S-18 ~ Lakeland, FL



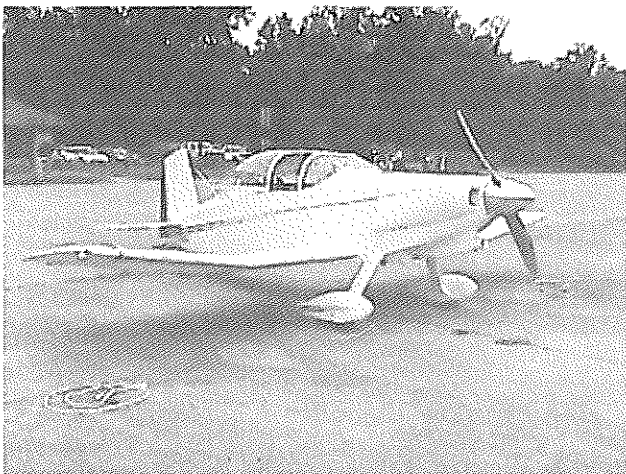
Les Conwell's S-18 ~ New Port Richey, FL



I'm sorry I didn't get your name.



Ken Morgan ~ Grandbury, TX



Gary Greens T-18 ~ Grandbury, TX



Jerry Sheetz ~ Ft. Meyers, FL.

Landing the Thorp. cont.

has more movement up and down than back and forward. It is for this reason many experimental aircraft use rectangular section spring gear. If you “drop” the Thorp onto the runway it could bounce you up to a height, nose high, where you run out of airspeed and ideas at the same time. Remember, an aircraft one inch above the ground cannot come to any harm. If you decide to go around. Take power and keep the Thorp about six to ten feet off the runway as you slowly bring the flaps up. (This is where a manual flat lever comes in useful. Let me know if you have electric flaps.) Once you have the aircraft flying properly and climbing at about 100 mph you can adjust the trim then give the tower a call. There are three reasons why you could “drop” the mail gear onto the runway. The first one is that you let the Thorp lose height too fast as you descend down onto the runway. This can cause you a problem even if you are in the three point attitude. The second reason is you let it descend unchecked onto the runway during the flare. The third reason is that you held the Thorp off the ground too long and let the tail wheel drop way below the main gear. As you descend onto the runway, the tail wheel touches first, breaking the angle of attach and the wings lose all their lift, resulting in the main gear descending even faster. If this happens you will not normally be bounced too high as you have not got as much lift at this lower speed. In most cases it is better to just ride out the storm and check on everything when you arrive. You might find damage to a wheel spat or two.

Darrell Miller
South Africa

Put the Thorp down with power, then you don't loose tail authority

Frank Roncelli

Landing the Thorp. cont.

I go down the “downwind” at about 110 mph, “base” at 90-95 mph and then on “final” I use 84 mph and once “over the fence” I use about 75-70 mph with an indicated stall at 64 mph. I use no more than 20 degrees flap and as was mentioned add just a tweak of power before touchdown in order to get the nice air flow over the rudder. Wheel landings are sweet if just a bit of nose down trim is applied on final so the aircraft has a tendency to “stick” upon squeaking onto the tarmac. Personal procedure.....do what you like.

Hal Stephens,
Placerville, CA.

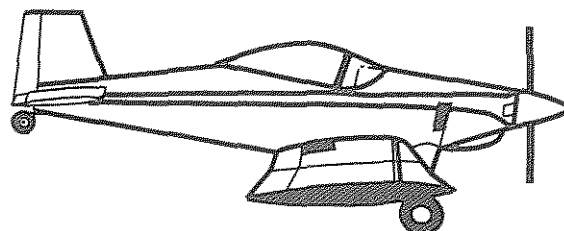
You can land SHORTER in the 3 point attitude. The T-18 lands very nicely either way. With a wheel landing (“2 point”), the touchdown speed is slightly greater and there is less airframe drag. The angle of attack is less. I wheel land mine 90% of the time. Either way, forward visibility is great with the Thorp, as opposed to many other tail-draggers. Good luck.

John Evens ~ N71JE

I find the airplane on landing will float once it is in ground effect. I have no problem with a power off approach if I maintain a 1.3 Vef.

Have fun! It is a good airplane

Roger



Mandatory Mods. cont.More on Mandatory Modifications

A couple of safety items that you need to be aware of: This applies to any new Thorp owner who might not know the particulars of the T-18.....especially the older airplanes. There are 3 mods to the horizontal tail that are mandatory "flutter" mods. Thorp drawing C-595, revised 28 Feb 69 adds a lead tip weight on the outboard rib of the horizontal tail (shaped like a bullet). Thorp drawing A-517L revised 30 Jan 69 adds a .015 stainless steel strap on the horizontal tail tabs. See drawing B-502, assembly, horizontal tail, revised 3 Jun 68 to verify that the 502-7 sleeve is installed inside of the 502-3 spar tube. If the other two mods are verified, it is most likely that the spar tube is also...it's a little harder to do, but we can give you several ways to check it. The easiest of course is to check with the builder and have him attest to the completion. The other critical item, if you have a Sensenich metal prop..check to make sure the prop is NOT an M-74 blank. It must be a M-76 model. Your GPU WILL shuck a blade if it is an M-74. If it is a M-76, make sure it has been vibration tested by Specialized Testing Service to determine your safe operating ranges on the cut-down prop. The paperwork with the airplane should have a plot of the test results, if it was done. We have needlessly lost some fine people who failed to heed John Thorps excellent advice. If these items are taken care of, you will have a very safe, proven airplane. If you need help with any of these items...just holler. All of these items are covered extensively in the T-18 newsletters, but they go back over 30 years and are difficult to research. The Thorplist makes it much easier to get any info you may need. Again, welcome and happy landings.

Howard Ginn ~ N22DU
Camp Verde, AZ

Editors Note: The Newsletters contain an index that makes looking up old technical items fairly easy.

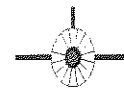
Thorplist Chatter

The following information was taken directly from the Thorplist Email list. Nothing has been edited.

More on Jacking the Thorp

There is no real good place to jack up a T-18 unless it is added during construction. I almost always have the cowl off when I'm changing tires or working on the wheels so I always put the jack on a wooden stool I have and then place the jack under the large area steel washer that the 3/8" bolt goes through on the lower gear attachment. I always let the plane down at least once to equalize "spring" so there is no side load on the stool or jack. Has worked well for 21 years. I always have a solid 4'X6' solid block ready to slip under the axle as soon as the wheel is off and I then let 90% of the weight of the plane back down on the axle. Much safer that way. I think that a Goodyear Flight Custom II tire is about as good as you can get. I compared them on a "cost per landing" basis and they end up being more economical than the cheap(?) McCrearys. I really can't imagine any T-18 requiring a 10 ply tire. These are just opinions and as every one knows, every one has at least one!

Steve in Tucson ~ N9008Z



I just joined the thorplist and read some letters on engine mounts. I just picked up some new LORD engine mounts for my T-18 at Herber Aircraft. They have a web page.
<http://www.herberaircraft.com>
The prices were better than Aircraft Spruce. Hope this info is to some value to the group.

Randy Noyes

ThorpList chatter, cont.

I switched from my original Prestolite geared starter, which I had for almost 10 years, to a new Sky-Tec #149-12LS a few months ago. It works beautifully, and seems to turn the engine over twice as fast, and weighs approx. 8 lbs. less. I've found that my #4 AWG copper cable works just fine. My battery is located behind the baggage compartment, and the total run of cable to the starter is less than 10 feet. #4 is good for over 150 amps with less than 1 volt drop at this length. If you're using the aircraft structure for the ground conductor path (I used the heavy extrusion at W.L. 26.10, and then #4 cable from there to the engine block) a couple of details will help to make that a trouble free installation. First, wherever you make a connection on the aluminum, shine the contact area with a Scotch-Brite pad (or similar) and clean with acetone, lacquer thinner, etc. immediately before bolting the terminal end to the aluminum. Next, coat that connection with a sealer of some kind. I used a printed circuit board coating compound called silicone resin lacquer. The paste compounds made for using with aluminum wire would also work well, I'm sure. The idea is to keep air and moisture from the connection to prevent oxidation and corrosion... aluminum oxide is a very good insulator. I am using a "gel-cell" (Power Sonic #PS-12330) which is rated at 33 AH. My last 2 have lasted over 5 years each. It is important to check the output voltage from the regulator, to make sure it is optimum for the gel-cell type battery, for best results and maximum life. I have an Electrosystems #VR600A regulator, which is physically the same size as the Ford S.S. regulator. It is adjustable and has built in over-voltage protection. Here is another tip... if you use a standard starter switch with "turn to start", and magnetos with left mag only impulse coupling, there is the possibility of starter or gear damage if the engine doesn't fire on the left mag when you release the switch. A severe back-fire can result if it fires at that point on the right mag (the right mag is un-grounded automatically when the switch is released and turns to the "both" position), which can actually break the end right off the starter. The solution is to use one of the switches

ThorpList chatter, cont.

with the "push to start" feature instead, or use a separate start switch and magneto switch, and start on left only then switch to both. The damage is potentially greater with the newer starters since they turn the engine at a greater speed.

John Evens ~ N71JE



Everyone has an opinion and here's mine: I strongly favor mounting the oil cooler vertically on the left side of the firewall, with the top about level with WL 42. The inlet and outlet fittings face inboard. One must fabricate a scot hose and plenum chamber feeding air to the cooler. I also had to put in a flapper valve in the scot tube fitting on the back of the left baffle to choke off cooler air in moderate temperatures. I don't like oil coolers on front or rear baffles. In most of those installations, one is constantly battling cracked baffles or leaking oil coolers due to the high vibration levels. You really have to beef up structures to mount one on the baffles, front or rear. Then modulating the flow of air through it in those locations is more complicated.

I also used a Mac servo for my aileron trim. I placed it inboard on the right aileron simply because the right side was closer to my work bench when I started working on it. I placed it inboard because it was easier to run the wiring since my wingtips are not removable (fiberglassed on... mistake, Make 'em removeable.) The trim tab is about 2" x 8", I'd guess. It works great. I wish it was on the left side though, so I could see it from the cockpit while flying. I did not rebalance the ailerons after adding the servo and I've inadvertently had it up to 240 indicated on more than one occasion.

Gary Green

More Chatter from the ThorpList

I used stainless steel hose clamps on the exhaust pipes to hold 1/2-inch wide stainless steel strips bent, twisted and drilled to bolt onto heavy rubberized strips to provide vibration isolation. These, in turn, simply bolted to adel clamps on the motor mounts. The system has held up well for 3 years with no sign of cracking in the exhaust and no excessive play in the pipes. What's more fabrication was cheap and quick.

John Sullivan

The following were in response to a query about building the T/S-18 with pop rivets.

I think Chuck Bordens analysis was great - you get what you pay for. If you like pop rivets, by all means use them. Most people looking to buy a T-18 will prefer the 470/426 variety but remember the T-18 was designed to be built with pops if desired. Here is a little story that is true. I was fortunate to be one of the guys who worked in John's shop back in the 70's and he told this story one morning while we were having coffee at Mr. C's (I think that was the name) A man named Russ Bayse built a T-18 back in the late 60's. He lived in Fresno and I knew him well. It was a tricycle gear retractable with a Lyc 180 and a CS prop. He flew it to Rockford and won top honors there. One day soon after it was completed he flew it down to Whiteman Airport in San Fernando where John had his hanger to let John see it. I know John was never enthusiastic about all the modifications Russ had done but it truly was a beautiful airplane. While Russ was there and John was looking the plane over, another T-18 came in from Lancaster CA. It had an O-290-G engine in it and was put together entirely with pop rivets. When they left (this was before Whiteman was a controlled field) they took off together and the pop rivet plane out climbed and outran Russ's plane. The real moral here is not type of rivets, but weight. I am a real believer that light airplanes are efficient airplanes - and safer too.

Steve Hawley

More Chatter from the ThorpList

My Thorp is assembled with mostly monel pop rivets. While you can build it that way there are some considerations:

1. Don't substitute stainless for monel. When you need to drill out the rivets stainless are near impossible to drill without turning, monels on the other hand are similar to aluminum and the rivet doesn't turn when you start drilling.
2. Monel rivets work OK for areas like general skin riveting, but I recommend using regular bucked rivets in high stress areas as the joints usually are tighter with more even load distribution rivet to rivet. The end result is you don't have rivets coming loose.
3. For wing skin to spar attachments I had monel rivets that always smoked. The flap brackets came loose, rivets around the firewall came loose. Rivets on various brackets came loose. Same thing - Monels work well in low stress environments, but not as well in highly stressed applications.
4. Monels have a different countersink angle - Be careful that you use the correct tool for dimpling and countersinking, which I had difficulty in getting.
5. Monels have open area where the shank goes - You need to fill this before painting, which is a job!

Those are my thoughts - My airplane uses them and for the most part they work well, but you can't use them everywhere. And don't substitute stainless for monel - If you damage the airplane it basically will be scrap, that's how difficult it is to drill SS rivets.

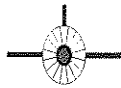
Rossair@aol.com

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ThorpList Chatter, cont.

I put a scupper in my tank. After making tank made up a aluminum box approximately 4" square and 4" deep. Welded in the tank fitting (to take screw in neck for cap) this assembly is welded into tank inset sufficiently to keep tank cap below fuselage skin. The portion above tank surface is trimmed to match contour of skin and this can have a rubber seal on it to seal to skin. I welded in a 3/16" pipe into bottom of scupper for spill collection and goes out through tank wall forward with plastic hose attached and runs down and out bottom of fuselage with tank vent line. Sounds like a bit of work but it was quite simple and has worked OK.

Tony Schischka

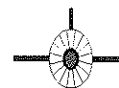


There have been many T-18's built with .035 side skins (mine being one). I've seen many butt joints and a few lap joints. Actually, you probably see a lot of details, like butt joints, as least as often on fine aircraft like the T-18 as you do on production aircraft. To the gentleman with the 36" inseam... that is what mine is, and I'm 6'3" tall. If you can accept some bend at the knees instead of your legs being straight out, you will be fine with the design. I find it very comfortable, but "snug". When I built my Thorp, I maximized the leg room as much as possible. As for the fuel pump question, it's been discussed in great detail, probably as long as the T-18 has been around. Here's my long-winded opinion: I can tell you with absolute certainty that a fuel pump is not needed if using the standard fuselage tank, IF you build your fuel system correctly... minimum "-6" (3/8") fuel line (stainless braided teflon is good), no unnecessary restrictions, starting with a properly sized finger strainer in the tank, A full-flow ball valve, a minimum number of 90 deg. bends (I have 2), a high-quality gascolator, a 45 deg. (steel) fitting into the carburetor, and a good fuel vent fitting facing into the airstream (don't forget a small, coarse screen on

More ThorpList Chatter

the end to help prevent insects like "mud daubers" from clogging it- important with or without a pump). I know of MANY T-18's without pumps, including 180 hp ships, that have run perfectly for decades and many thousands of hours. It gets back to the KISS principle... why would you want to add a pump (which generally means TWO pumps and usually a bypass check-valve to boot), adding more weight and complexity... something else to fail, if you don't need to (also something else hanging on the back of the engine clogging up that area)? I truly believe that the airplane is MORE reliable if you can avoid the pumps, and this is based on solid fact. It is very important to test your gravity system before the first flight. I got my main wheels up on some ramps, and filled my tank with just 2 gallons of fuel, and disconnected the line where it enters the carb (leave the 45 deg. fitting on the hose if you want, for complete accuracy). Keep the end at the same level that it enters the carb. Use a measuring container and check the flow rate. You're looking for 150% of maximum take-off requirements (in my case with a 160 hp 0-320, about 17 gph, I believe). Keep in mind that you are doing this test without the benefit of ram air pressure into your vent tube, which you will have during flight... and which creates a considerable amount of extra pressure. I've never had any sign of inadequate pressure during limited aerobatics or very steep nose high attitudes. I have experienced momentary loss of pressure during sharp negative G's, but I believe that pumps can "unload" during those situations also. My advise would be to test it, and if you don't like what you see, add the pumps.

John Evens ~ N71JE

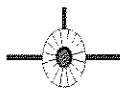


More from the ThorpList

This week I responded to my second ever request to check out a pilot in a T18. It ended with being off the runway and some skin damage to the wings and the prop being trashed.

The owner is in the desert while I'm in the LA area and he thought that, as the insurance wanted him to have 15 hrs of dual, it would be better for me to qualify his instructor. Not enthusiastically, I agreed (by the way, I usually use my CFI only for EAA'ers BFRs and an occasional hr of instruction). The instructor hadn't flown a taildragger in 10 yrs. His experience was in the low power J3 Cub types. We did 2 lds for me and 7 or 8 for him. He in the rt seat with controls & brakes. I thought that we were finally making progress when we make a nice landing and he brings the stick back (I guess that a full-stall 3 pointer in a Cub will stick). As we bounced back into the air, we came down a little nose high (he had tended to flair too high and too slow). As the wing dropped (stall) he jammed the power on and didn't catch the rudder. Neither did I. I also wasn't forceful enough to get him off of the throttle. With high power and torque, but low airspeed, the rudder wouldn't give us a right turn. Off into the boonies we went. Trying to go thru this, I see my biggest mistake in being a failure to treat this CFI as a beginner and not briefing on the (1) torque effect if you aren't on the rudder, and (2) let me have the throttle when it happens.

Harold Underwood

Lets Talk Props

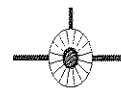
I have some strictly personal observations. I know of 2 aircraft (non-Thorp) in the Denver area which have experienced Ivo prop failures... both showed cracks and distress in the hub area of the blades... with 150 HP or greater, & then there's Harvey M. (with his bad weld). The concept is very appealing, but

cont.

More from the ThorpList

being the well-educated group that we are, with a lot of propeller experience good & bad (remember the tests using Bob Dial's T-18?), we should be as aware as any group about how ULTRA critical a propeller is. Ivo seems to bend over backwards to get their props on the higher horsepower engines in the field... to get some free test piloting perhaps? Nothing wrong with that, except we're talking propellers here. Harvey was lucky, but others may not be. With all due respect to Ivo (and Harvey), I wouldn't lay my butt on the line. There was a local guy with a longEZ. According to him, he was strongly encouraged to try the Ivo Magnum on his pusher. Probably most of you know that this is considered a definite no-no by Burt Rutan - a pretty smart guy. There is something about disturbed airflow before it gets to the prop, greatly increasing the potential for destructive vibrations, and wooden propellers are the safest choice. After a very short time the thing showed distress in the hub area (they use a piece of metallic tape that shears as a warning). He sent it back, got another one just like it, and installed it! No guts, no glory I guess. I have an Aymar-Demuth 68-75, 160HP, true airspeed 180 mph at 2550 rpm, 7500' msl, less than 7.5 gph. Full throttle, 2800 rpm, over 200 mph. Home field elevation (Jeffco) almost 5700' msl, and climb is better than 1000 fpm fully loaded. At sea level with just me, better than 2000 fpm. Some guys prefer the props with more laminations... there are pros & cons. Remember, more laminations, more glue which has no real strength itself. Of course, fewer laminations and the quality of every one is more critical.

John Evens~N71JE



Editors Note: We will have more Prop Talk in the next issue. Please send me your thoughts on propellers for the T/S-18.

Upcoming Thorp Events

MARCH 24, 2001 ~ Plans are in the works for another Paso Robles Thorp Fly-In, mark your calendars !! On Saturday we'll get together for another fantastic Tri-Tip BBQ. Be prepared on arrival, we'll have a line out on the runway for a spot landing contest. Awards will be given for best of types, furthest distance flown, and others. Flyers will go out soon but mark your calendars now. Come out on Friday and we'll plan a late afternoon flight out to see the gorgeous California coast on an airborne tour. Sights will include Pismo Beach, San Luis Harbor, the Diablo Canyon Nuclear Power Plant, Montana de Oro State Beach, Morro Bay and it's famous Rock and then The Hearst Castle. That night we can experience one of Paso Robles' great restaurants.

April 8-14, 2001 ~ Sun'nFun Fly-In, Lakeland Florida. As of this writing the Thorp Dinner is planned for Tuesday, April 11. The date and time for the Forum have yet to be decided. The exact time and date will be posted on the "t18.net" website as soon as it has been set. Contact Bob Highley at: "n711sh@aol.com" for more information.

May 18-20, 2001 ~ Thorp Fly-In at McAlester, OK. The Ramada Inn at McAlester has rooms for \$49 single and \$54 for doubles. Cancellations until 6 P.M. on the day of arrival. Their ph # is 918-423-7766. Ask for the Holt-Green Party. Contact Gary Green at: "ggreen@itexas.net" for more information.

July 24-30, 2001 ~ Airventure 2001 ~ Oshkosh, Wisconsin The T-18'ers usually have a lunch and a forum on Friday in the Nature Center at 12:00 Noon. We have lunch, followed by a small informative meeting. This years activities are tentatively scheduled for Friday July 27. Anyone who has an interest in the T/S-18 is encouraged to attend. For more information, contact Roy Farris at: "rfarris@wworld.com"

October 5-7, 2001 ~ Gilbertsville, Kentucky T-18 Fall get-together. For Lodge reservations phone: (800)325-0146 and ask for the Paine Party. For more information contact Jim Paine at: "jpaine@ioa.com" or call (828)698-0368.

T-18/S-18 Thorp Newsletter
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January 2001



\$25



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THORP T-18 MUTUAL AID SOCIETY ----- 2001 DUES

Please continue your support of this valuable exchange of ideas, building tips and safety information covering John Thorp's greatest design. Please make checks payable to: Roy Farris P.O. Box 182 Noble, Illinois 62868. Make check for \$25.00 US, \$30.00 for outside. I don't know yet how the postage increase will affect out mailing costs.

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