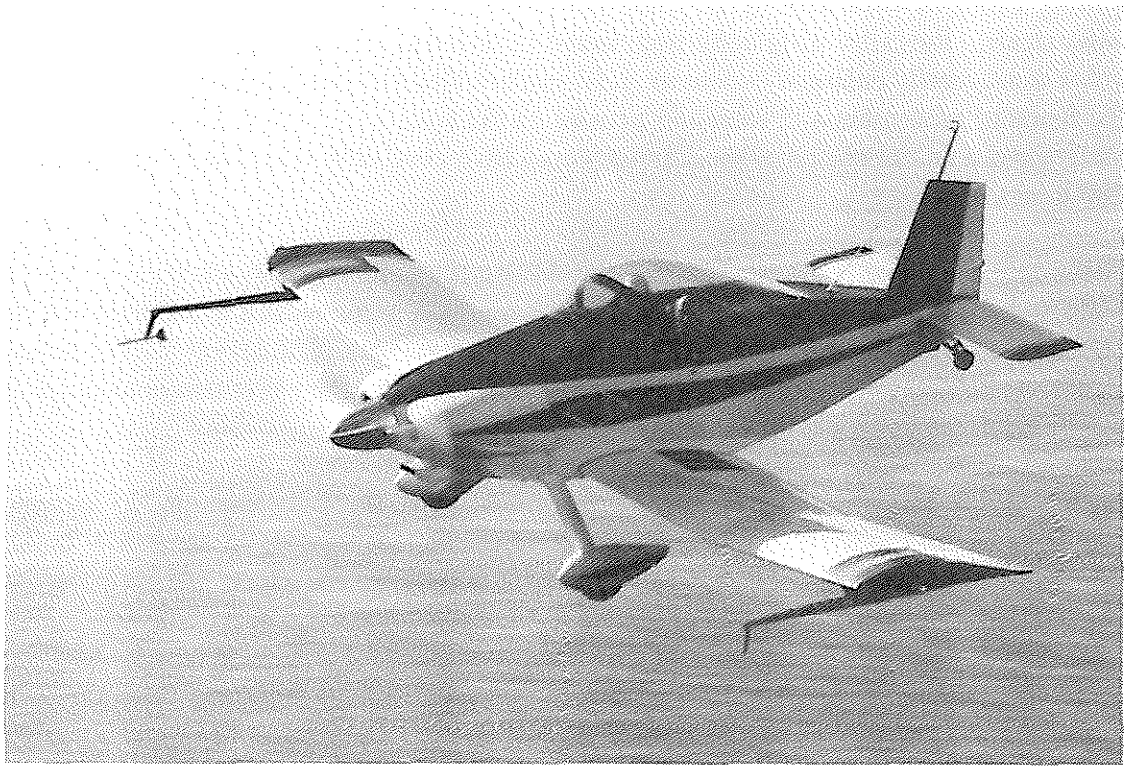
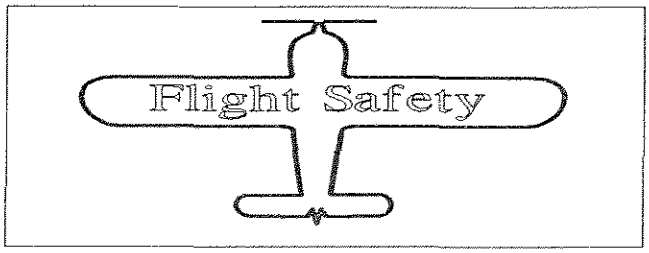
T-18 NEWSLETTER



Ken Brock's T-18 equipped with the CAFE Foundation's Barrographs
See letter from Dick Ecklund on page 8, more to follow.

IN THIS ISSUE:



FLIGHT SAFETY BULLETINS !

During a routine inspection of the outer wing panels of a recently purchased Thorp T-18, standard wing model, the outer wing bolts were found to be loose. Closer inspection showed that some of the holes were greatly enlarged , some to .410" and one that had been drilled to a figure eight shape. Evidence of movement and wear was present on the bolts and in the holes. If this problem had gone undetected a failure of one of the fittings would have eventually occurred. The aircraft has less than 200 hours on it.

Great care should be taken when fitting and drilling the outer wing attach fittings. Any slop in these holes will show up as play that allows the wing junction to move, this movement will eventually enlarge the holes even more. A check of these four bolts should be added to all T-18 yearly conditional inspections ("The annual"). It should also be added to the list of things to check when buying a used Thorp.

Both bolts on the outer to inner wing fittings are designed for sheer loading. No normal amount of torque will keep the wing together if this sheer arrangement is enlarged and loose. In fact by checking the torque table for this size bolt, you will find it's quite low. Therefore, just torquing the bolts at the yearly inspection won't cut it. It's necessary to loosen the bolts and move the outer wing up and down to check the play. Better yet, remove the wing panel and get a first hand look at how the bolts fit the holes. They should have started life as a tight fit, at least a hard push to get them in. If they're so loose that you can slop them around side to side, you have a problem that must be corrected. If the bolts are still snug, you did the job right in the first place. Torque them back up and go flying.

The only way I know to fix the looseness problem is to use an adjustable reamer and open the holes oversize and then find some NAS oversized bolts to fit. Alatec in California can supply NAS 6606-15X bolts that measure .388". This may not be large enough to fill all problem holes. Their phone is (818)727-7800. Drilling the holes out for the next regularly sized bolt is a solution but it removes much of the design margin material around the holes. A design analysis should be done to determine the limits for drilling the holes oversize. Let's hear from the mechanical engineers out there!

Prop Failure during flight:

Gayle LeCount of Georgetown, Illinois reports that his Aymar Demuth prop failed during cruise flight. Gayle made an emergency landing on a highway without any damage to himself or the Thorp. Here's what I know from talking to Gayle and Mike Demuth. Gayle states that the prop was looked at during preflight, no damage was evident. Failure occurred at cruise, about 1/2 of one blade came off. Prop didn't delaminate. Gayle doesn't think a bird strike was involved. Gayle's Thorp is 180 hp and the prop had been in use for one year. A call to Mike Demuth: He has about 1000 props in use. He stated that, any sort of inflight failure is extremely rare for any type of wooden prop unless external damage is involved. Mike has asked for the prop to be sent to him for evaluation and replacement. *Update: Gayle has sent the prop to Forest Products Lab in Madison, Wisc for evalualtion. This is a federal lab that Ben Owens recommended. More on this when Gayle gets a report.*

MORE PROBLEMS---- FLIGHT SAFETY

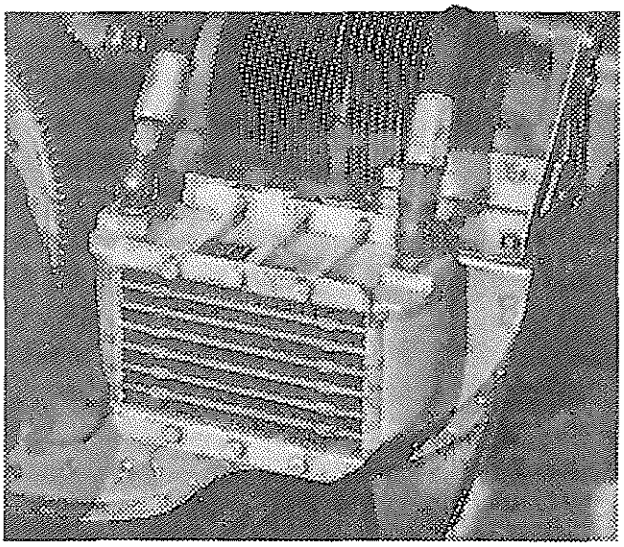
Dear Rich,
I am enclosing a letter and photos which I sent to the FAA regarding the recent failure of my Stewart-Warner oil cooler.

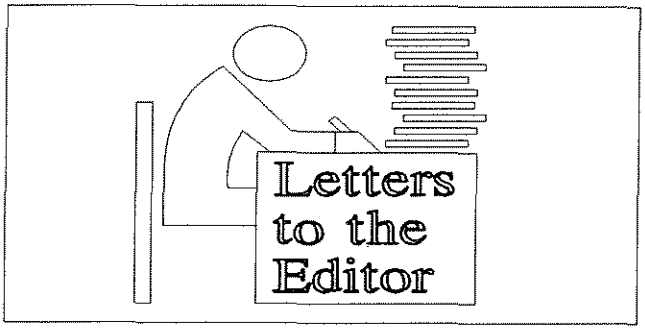
I should emphasize that no knowledgeable person will blame the failure of the weld on the installation for two reasons: first I repeat: 2 experienced aircraft welders who saw my cooler said, in any circumstance, if the weld is properly done, the material around the weld should break before the weld. Secondly my installation is identical to that used by all other T-18 builders. I'm aware of at least in So. Calif. This installation was used on my first T-18 for 2009 hrs. and on this one for 350 hours. Sincerely, Earl Ody

"Alert": I would like to inform you of the failure of a Stewart Warner oil cooler on a 0-360 Lycoming engine on my Thorp T-18, N992PE, on 1 Nov 1995. As you can see in the enclosed photos, the weld broke where the boss is welded on to the cooler on the inboard side. The oil was quickly pumped out of the engine spraying over the engine creating much smoke in the cockpit and zero reading on my oil pressure gage. Fortunately I was over an airport and made a safe landing. The installation of the cooler is standard on most T-18's.

I am calling this to your attention so you may alert many owners of aircraft with this cooler of the danger of a possible failure. Many of my T-18 friends using this cooler are very concerned after learning of my emergency. Although some may fault my installation, experienced aircraft welders have told me that if a weld is properly done, the material around the weld should break before the weld breaks. As you can see from the photos, the break is precisely in the weld where the boss joins the cooler.

When I contacted Stewart Warner, they offered to replace the cooler, free of charge, which they have done. When I suggested they pay to disassemble, inspect, repair if necessary, and reassemble my engine they indicated that they would not do so without being forced by litigation, which I am in no financial position to do. The Stewart Warner people I have dealt with are Tom Ridenour at 812-547-7071 and Scott Eberle at 317-486-2629. If you need further information regarding this incident please call me at 310-833-6872. Thank you. Earl Ody 28903 Gunter Rd. Rancho Palos Verdes, CA 90275-2019





Dear Richard:
Enclosed please find my 1996 subscription fee for new membership in the T18 Mutual Aid Society.
I completed T18 serial number 137 3-1/2 years after purchasing the long-abandoned project; it had passed through a succession of owners over many years. In fact, I have some correspondence from John Thorp transferring registered ownership of the serial number from one owner to another. Apparently, the originator of the project did most of the work I took over. The cost of the materials was considerably less in 1964 than now, as some of the material receipts I have from then plainly show!

Serial number 137 is registered with the FAA as N137EP. It was inspected by designee Jay Foster of Enstrom Helicopter on Good Friday, April 12 1995, and made its first flight a few weeks later. It has over 90 hours on it now and was at Oshkosh this year; the dark red/light gray/black one parked on the aisle. It is powered by a converted 125 HP GPU engine turning a 68 x 70 Aymar/Demuth prop. The engine was assembled using new 3-ring standard-size pistons, rings, bearing and rod bolts, and really does a good job getting N137EP off the ground. Except for a rudder trim requirement, it flies well.

I am a student pilot, having constructed the airplane before learning to fly, and am now taking flight insruction in my brother Bob's C170. Brother Bob and nephew Dave Pernic flew off the required 40 hours without any problems other than relocating the crankcase vent on the engine. I think after the initial apprehension associated with a new airplane, they had a good time!

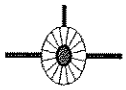
A worthwhile change was to fabricate a new mounting block for the tailwheel. The original mount had a 45-degree angle between the tailwheel fork pivot axis and the mounting surface which is bolted against the spring. The new mount has a 35-degree angle there. This change put the fork pivot axis into the vertical plane and increased the trail of the tailwheel axle behind the fork pivot. The tailwheel is more stable now, with less tendency to shimmy during rollout.

Looking ahead into the future, I plan on changing out the Goodyear brakes and wheels for a set of Clevelands. I know I missed a good deal on a set a few months back, so if this letter is published and any readers know for a set of Clevelands... call me, please! I also am thinking about building a 309 cubic inch GPU engine as described by John Thorp in one of the Newsletters. Have any members done this? Can anyone with experience with this conversion comment on this project? I haven't located a 340 cubic inch Lycoming crankshaft which forms the basis of the engine. Sincerely yours, Edward Pernic 17801 Tanager Ln South Bend, Ind 219/272-3917

Hi Rich and everyone,

I was surprised and delighted to see my T-18 "Nose Art" Tiger on the cover of our recent newsletter. There is a little story behind it, as it was one of the first things I did after I got my T-18. I was extremely nervous about hiring a total stranger to put paint on my new baby, and you always read that T-18's are supposed to have straight lines, so I only imagined what kind of disaster I might be getting myself into. I didn't know a thing about art, I still don't, so to find a good artist I started calling all the art studio's in Los Angeles. The name Jim O'Conell kept coming up so I figured he must be the best. I called Jim and told him point blank that I wanted

perfect realism and no "Tony the Tiger" type pictures on my plane. He didn't bat an eye and we met. His portfolio included work for the group "Kiss" and he is the resident illustrator for the LAPD and Suicide Prevention. I asked how much. He said $1600 bucks. I broke into a sweat but agreed (I've since found out from numerous artist's that's about right). He said he would research about four days at the library and then take a week to complete both tigers. He said don't come back before then. When I did come back I couldn't believe my eyes. He air brushed the underlying Tiger and then hand painted the detail over it. They are so lifelike they look as though they will bite you if you get too close. A lot of people think they are decals. It still amazes me that someone can have that kind of talent, and he didn't discover it till he was age 30. So what started out as a scary foray into art by a knownothing has turned into one of the favorite parts of my airplane. It is a never ending joy for me to see other people enjoy them. Take care- Don Schindler, Woodlanhills, CA.



Dear Rich, We appreciate your time on the newsletter we couldn't do without it. I have painted N-160CJ which keep me from flying for several months. Am now trying to get familiar with the T-18 again. I have about 23 hours on it. I made several changes during the paint time, one I feel is worth while is an electric primer. I removed the mechanical pump and installed a solenoid valve on the gascolator and from it to the engine primer lines. I used a door bell button for the switch, this is only good for fuel pressure systems, which I have since getting rid of the Marvel Carb. I had the usual problem (running to rich) with it.

I went to a Ellison Throttle Body and am well pleased with it . Back to the primer: turn on boost pump, hold button down and count to three and start the engine. It is easier that the mech primer and cleans up the installation with no fuel lines in the cockpit.

I am sending a couple of pictures of the T-18 if you choose to use them.

We had our annual fly in Saturday the 21 and was glad to see two other T-18s fly in, Gary Green and Gary Cotner, we had a total of 43 aircraft and 86 people for the free barbecue lunch. The flyin is cosponsored by the local EAA Chapter 1014. Not bad to have been on the same date as Keerville and another only 19 miles south. Keep up the good work on the newsletter. Coyt Johnston RT. 1, Box 178 Snyder, OK 73566

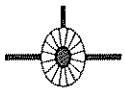
Coyt Johnston's beautiful new Thorp T-18 N160CJ

More Email: Subj: Thorp CA to FL in 2 Days Date: 95-11-12 14:10:44 EST From: Speedy11 Well, I made it to Florida without a hiccup from the plane.

I hopped from Bakersfield, CA to Oklahoma City in one day, parked the plane for about a month, and then recently hopped to Tampa, FL. GPS average groundspeed was 160-170 knots for entire trip thanks to good tailwinds. During several 200 FPM descents, had GS of 195-205 knots. Route of flight was Bakersfield to Victorville to Kingman, AZ to Albequerque to Tucumcari to OKC to Tallahasse to Tampa. Engine ran perfectly. Ailerons are out of trim, so had to hold about10 pounds of right stick pressure during entire trip. Canopy and windscreen got scratched during OKC layover due to dust getting under plastic tarp and wind causing tarp to rub against canopy. Does anyone have experience with Micromesh or another scratch remover?? Any advice appreciated.

Airplane climbs like an angel at 85 mph indicated, but engine cylinder head temp goes above redline. May be due to lack of spinner, but suspect that CHT probe is improperly located. I've got to check that out. Oil temp stays well within normal range at all times.

Now I need to start my clean up work. I plan to redo the interior and panel. The paint is ugly, but can't afford to repaint right now. It's a great flying little plane. In fact, I think I'll go fly RIGHT NOW!! Bye. Stan Sutterfield.



Dear Rich,

We sure did have a great time at OSHKOSH this year especially on Friday during the Thorp activities. It was great seeing you and Roxanne as well as the rest of the Thorp people!

All of the events went very well and as usual, I learned a lot and had a good time doing so.

As I have mentioned in the past, things weren't going too well at the job and as a result I am starting off on a new venture - tomorrow. I will be traveling to Scottsdale, Az. to work with a friend, in flow measurement, and I expect to be moving there in the near future. This doesn't help my project in the short term but, I expect that the project will benefit in the long term.

Therefore, I would like to list some surplus parts for the T-18 in the next newsletter. These parts are extras that I have accumulated and do not want to move. My wife, Elainel may be contacted at home, (215) 321-0446. If necessary, I then can contact the interested party for more info.

The parts are for a standard T-18 as follows:
Wing spars (complete) and ribs - $400.00.
Bulkheads and fuselage skins (which could be used as templates) $100.00.
Miscellaneous fittings for wing, etc. - $25.00
Cowl nose piece and bottom of cowl - $25.00.

Prices are reasonable and negotiable.
I will forward my new address when it is available. Thanks for your help.
Sincerely, Don Ruffner

October 11, 1995

O-290-G on Three Cylinders

Few of us can intentionally shut down one cylinder in flight just to see how the engine performs. That's why I want to describe what happened when my T-18, #844, swallowed an exhaust valve. I was flying near Corvallis, Oregon, intending to measure airspeed with my new prop, Pacesetter 68x64, by flying between two VOR's. This is described by Barry Schiff in "Proficient Pilot II", p. 162.

A change in the sound of the engine drew my attention to the tach, which abruptly dropped from 2600 to 2200 rpm. After switching to left mag, right mag, then back to both, I tried playing with the mixture. This proved to be a mistake, since the engine died, leaving the shiny new prop perched board-like out front. An attempt to re-start indicated a mechanical interference.

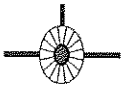
I almost made Corvallis. Touchdown was on muddy grass. Dodging around runway lights and a sign structure let me come to a stop on the runway. The airframe was undamaged.

The piston on the offending cylinder looked as if a muscular, angry person had attacked the top with a three-pound sledge and a cold chisel. In addition to a hole the size of a quarter, the exhaust valve head was stuck on edge in the surface like a coin in a pie. The lesson seems to be that if you have an abrupt, substantial drop in rpm, don't play with it, because it may stop completely.

Shop Note - Baffles and Patterns

You may not need to get baffle patterns from others, since you can make them yourself out of posterboard (thin cardboard), using a method similar to that described by Tony Bingelis in "Firewall Forward" p. 271. The problem is to fit a pattern to an irregularly-shaped engine crank-case. The basic idea is to refine a rough pattern, fixed in position, by taping on small pieces of posterboard, each of which is cut to fit just a small portion, say an inch long. This first-attempt pattern can be removed and traced around to produce pattern number two. This is put back on the engine in the same position as the first (reference marks) and further refined in the same way. A leather punch may be used to make a one-eighth hole in posterboard so that it can be clecoed to a previously-made baffle piece.

How about the problem of matching an existing hole, hidden under the pattern? The baffle on top of the cylinder head can be fitted to the rocker-arm cover in the way described above. Now we have to locate the baffle retaining screw holes. Cut a hole the size of a dime in the approximate location. With the pattern fixed in position on the cylinder head, draw cross-hair lines on the pattern centering on the screw-hole, which is of course visible through the dime-sized hole in the pattern. These cross-hairs can be used to locate the hole when you go to make it in metal. This method of hole location is not accurate enough for rivets, but works quite well for clearance holes. David C. Hamilton 6203 Shaw Lane Aumsville Oregon, 97325 (503) 749-1374



Dear Rich,

Please keep your eyes open for a pair of 5.00 x 5 inch Clevelands. I'll need them in a month or so. I may start calling some of the Trade-a-Plane ads to see what I can locate at a decent price. I also need the flat engine mount for the Lyco 0-29OG on the T-18.

Since we wiped out my T-18 on July 1st I have been intending to write you with some cautions for others. A friend of mine offered to do the initial flights for me since he is more tail-wheel current. In fact during the initial flight in the morning my friend, a CFII, felt so confident with the airplane he did an aileron roll with only an hour or so on the tach! He completed six successful landings at the Fitchburg MA airport; both grass and pavement with no problem.
In the afternoon he and I shot six landings as part of my check-out at Fitchburg and returned to home base at Minutman Airfield in Stow, Massachusetts. On landing, the first with two people, at Minuteman which has a narrow rough runway directional control was lost. We veered off the runway, hit some boulders, flipped inverted and ended up in an adjacent pond upside down and under water. Luckily we both got out without any significant problem. When I saw muddy

water coming in from the top of the canopy I knew we had a substantial problem, took a deep breath and reached for the seat belt!

On retrieval from the pond one tail-wheel spring end clip was found unhooked from the tail-wheel arm AN-43 eyebolt. We feel strongly that due to the rough runway the steel tail-wheel support spring was bouncing so much that the clip rotated around and came off as the tiller springs slacked off.

The mandated caution to all other tail-wheel operators is to safety wire these clips so that it is impossible for them to come off under any circumstance. I had tension springs installed that were adequately tight under static conditions but obviously not adequate under dynamic conditions.

When we hit the water the canopy luckily shattered or we would have become statistics. The local EMTs insisted I go to the hospital since my arm was torn up from the Plexiglas as I departed in a hurry.

Major damage was to the fuselage rear top skin, right hip skin and some minor rework needed between windshield and firewall. Only wing damage was the left outboard panel leading edge at the tip; now I'll add a landing light in that area as I rebuild it.

Both rudder and fin were wiped out by rocks in the pond so I'll build new ones.
The shame of the whole incident was that the airplane was performing beyond expectations. All the instruments were not only in the green, they were in the middle of the green. There was no cross-talk of the strobes on the radio and we were easily doing 155 mph at 2500 rpm on an 0-290G that I'm guessing is putting out about 135 hp.

It was such a "high" to fly it even for such a short time that I can't wait to rebuild it and get going again. If the plane did not perform as well as it did I would not attempt to redo it but just walk away from it!

Enough of my rambling, but I wanted to get my thoughts on to you for passing on to others. The lesson learned the hard way is to safety the safety clips and assume that they will come off at some time although here I still blame the rough runway since we made a dozen no problem landings before the incident.

Keep up the good work on the Newsletter Rich, we all appreciate your above and beyond efforts.
Sincerely, John Q. Cragin
T-18 #554 160 Stratford Road Needham, MA 02192-1432 phone (617) 444-3105

Subj: T-18 CAFE Foundation Test

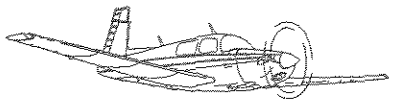
Rich, On Friday, 3 November I flew the Skooter to The Santa Rosa County airport to join Ken Brock who had arrived the day before. Ken and his able assistant and co-pilot, Olliver (Smitty) Smith (builder of N104X), were hard at work with Brien Seeley, Otis Holt, and Ed Vetter to instrument N42KB (better known as "Sweet Marie") for the CAFE flight test series. If you are not familiar with the capabilities of the EAA assisted CAFE Foundation, read the "W10 PERFORMANCE REPORT" article in the 29 June 1994, Sport Aircraft. They had all stayed up late the night before to get most of the hard work accomplished to take advantage of promised good weather for the weekend. The test date had been in question due to fog conditions during the preceeding week. I was constantly impressed during the weekend testing with the dedication of this volunteer group. As soon as the instrumentation installation was complete Ken and Otis took the T-18 up for a shakedown of the data aquisition. C.J. Stevens, Chief Test Pilot for the foundation was busy flying the Cessna Conquest II for his regular boss. C.J. arrived back later on

Friday and was able to finish some of the shake-down of the complex data system. Ed Vetter is constantly improving both the instrumentation and software used and was busy into the dinner hour (with his laptop at the restaurant) on Friday evening. Ed commutes into Santa Rosa with his Mooney from San Jose. On Saturday the weather was great and testing began in earnest. There had been some concern that the zero thrust system that the Foundation has pioneered and refined would not work properly with the constant speed prop. This was the first constant speed propeller installation instrumented by CAFE. With some usual final glitches in software and hardware fixed, the zero thrust system proved to be correct and instrumented testing was completed by the end of the day. Stephen Williams arrived to start the data reduction on Saturday and it was verified that the instruments could be removed on Sunday for the handling qualities evaluation. Larry Ford, Vice President of the Foundation, provided crucial help on Saturday with his great chilli feed and again on Sunday when he provided a new airspeed indicator. Saturday night Betty Stephens, C.J.'s wife treated Ken, Smitty and myself to more of the great hospitality with her delicious lasagna dinner with all the trimmings. It was a great evening food, wine and airplane stories. I owe a big "Thank You" to Dr. Brien Seeley, President of the CAFE Foundation and all the members who allowed me to participate in the T-18 tests. Look for the test results in a Sport Aircraft article in February or March, 1996. You in the T-18 community all know how good John Thorp's design is, and soon the rest of the homebuilt community will be able to appreciate the numbers. Richard Eklund 11/29/95

FOR SALE

Chromed Ken Brock T-18-5-2 Spinner for Constant Speed Prop.

I have over $355 invested in the spinner and would like to sell it for $300 and I'll pay for FedEx shipping. If it doesn't fit your prop, I'll buy it back so you're not stuck in the same situation I am (assuming it's returned in the same condition). Call Stan Sutterfield, 813-653-1189



AeroElectric Connection

submitted by: Robert Clayton

internet:robert.clayton@sbe.k12.ut.us

Editor's Note: The following information about Robert L. Nuckolls' AeroElectrical Connection was sent in by T-18 Mutual Aid Member Robert Clayton. Thanks Robert, it really looks like the service that Nucklolls provides would be very helpful for building and/or reworking an electrical system. This is one area of homebuilding that needs to be improved. I know of one T-18 that had an electrical fire that could have ended in diaster if the pilot hadn't acted quickly.

Letter from Nucklolls to Robert:

Robert,

Sorry to be so hard to catch! I've been working a certification package for Bill Bainbridge - the new SD-20 alternator (vacuum pump pad driven 20 amp machine) is going onto the production Mooneys. We've had a really tight grip on spare time; had to put some things on the back burner. I just got out of a meeting with the FAA this morning - things went well and I can now catch up on other matters.

I think you were wanting some stuff about the Connection to put into print . . . here 'tis . . . .

AeroElectric Connection
6936 Bainbridge Road
Wichita, Kansas 67226-1008
Phone (316) 685-8617 Compuserve I.D. 72770,552

The AeroElectric Connection is an information service, now 9 years old and 800 readers strong. The printed portion looks like a book but it's published in a 3-ring, loose leaf binder format permitting periodic updates. Presently, 270+ pages and 14 chapters cover d.c. fundamentals, batteries, regulators, alternators, over-voltage

protection, grounding, circuit protection, electrical instrumentation, switches and contactors, wire, wire termination, antennas and feedlines, lighting and pressure measurement. Appendix A lists vendors of services plus new, used and surplus components of interest to builders. Another appendix contains do-it-yourself avionics projects which may be scratch-built, kit-built or purchased assembled and tested. An expanding group of power distribution diagrams describe several design philosophies unique to plastic and metal airplanes. Chapters are being planned and written on systems instrumentation, motors, audio and transmitter control systems, custom wirebook development, failure mode effects analysis and electrical noise management.

Perhaps most important is the consulting service. Since we cannot all sit down in a classroom together, questions are answered by active dialog with readers. Over the years I've become dependent upon reader contact to guide my writing; it is impossible to answer questions when you don't know what they are! Use e-mail when you can, I check my mailbox several times a day. If you're not yet "treking the nets', a phone call will do.....

The 'Connection fills a gap between 'cookbooks" and engineering texts; not light reading, but it is fun. We don't get into discussions of sub-atomic particles but we do take things apart far enough to have an idea about how they work. The style is conversational and I often use anecdotes from my experience in Wichita aircraft manufacturing. From time to time, "Hot Flashes" (newsletters) are mailed when important subjects must be addressed between regular issues of the 'Connection.

The 'Connection is a dynamic work which grows with new technology and our collective experiences.

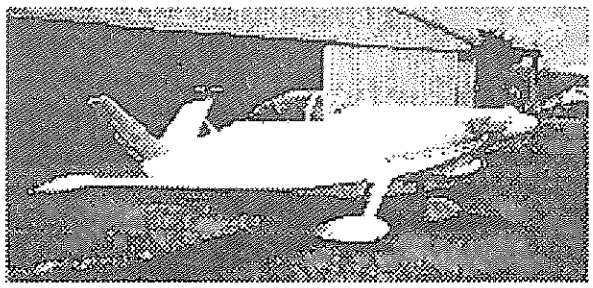
Custom Wirebooks: A completed electrical system installation can easily require more than 1000 pieces of material and hardware. Trying to remember where all the wires go and where parts were purchased can add a lot of frustration when future repairs or modifications are needed. Further, at some point in time, you will probably want to sell your completed project. A prospective buyer will be more willing to pay the asking price if the electrical system is well documented. Custom wirebooks from the Connection are professionally prepared, page per system drawings which rival those provided with any certified, general aviation airplane. Optional wire numbering kits permit wires to be identified using numbers called out on the finished drawings. Purchasing custom wirebook services for your project provides an enhanced level of consulting during assembly. $42.00 ($62.00 overseas) gets a new subscriber all materials in print plus a subscription for the next regular issue of new chapters plus all intermediate newsletters. Calls to (316) 685-8617

FOR SALE ITEMS

Act RT 359A Transponder $350
Genava Radio, "works" Cheap
3- Great American wood props
asking $300 each. Contact Ed Ludtke
Phone: 605-361-2301

Magellan Skyblazer GPS
Used 2 months (traded aircraft)
all accesories: moving map, extra
antenna: Works great! $600 OBO
Bill Essenburg (608) 637-2663

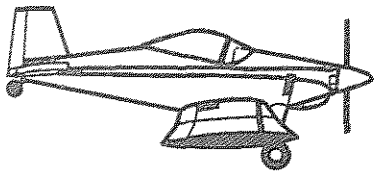
12 sheets of .025 alum, Dynafocal
engine mount, 210413 Woodward
Governor contact: Lyle Mccullough
414-642-3876



built by Gale Abels an Award Winner

TT since new A/E/P 0-360 180 HP, Hartzell CS prop, is 750 hrs. The interior is very well done. Some of the equipment includes- King K VOR W/GS, KI204 Indicator, KMA-24 Audio Panel. EDO-AIRE RT563A Navcom,EDO-AIRE RT661A Comm, Ball Variometer, Narco AT50A Transponder, Terra Encoder, (freshly certif.), new ELT battery, and the airplane is licensed thru September 1996.
Contact: Dean Cochran (303) 466-3472 he is selling it for Mr. Abel's family. $42,500

FIRST FLIGHT REPORT



by Joe Gauthier

November 28, 1995

My wife Carol and I enjoyed the Nature Center Lunch and forum this year at Oshkosh. That is a much better place to conduct such meetings and I trust you'll continue to use that place if it's available.

I'm very happy to tell you that our S-18 finally took to the skies on the 16th of Sept. The first flight lasted almost exactly one hour and went about as good as I could dream. I had previously flown several other Thorps' accumulating over 25 hours of experience so I knew what to expect. Last Saturday, the 25th of November I was signed out of the flight test area and gave several passenger rides. I take serious delight in seeing the expressions on my friends when they first experience the excellent way the Thorp handles. I still haven't put on the wheel pants or fairings on it yet, so I'm unable to tell your readers very much about performance (Speed). I can say that a straight and clean Thorp flies very well. It is a hands off airplane in smooth air, requiring very little assistance from the rudder pedals to make smooth coordinated turns. I can also say that it is the best "Wheel Landing" plane that I've flown. I'll provide all the numbers once the pants and fairings are installed.

About the only suggestion that I can make at this time is that the S-18, long, wide fuselage and convertible wing equipped with a 150 HP Lyc and Wood prop is tail heavy. That has been noted in previous newsletters and I'm simply adding my agreement with those who have already noted this condition. I've made provisions for relocating the battery to the right seat well, under the seat of course. I borrowed a Landoll Dynamic Balancer for the starter ring gear as the first change to improve CG. The Landoll balancer has been flown for about 22 hours and at this point, I don't see any great benefit except for the improvement in CG. Maybe I'll change my mind as my flight time increases. I'm currently using one of the old Sensenich Wood Props, (66X76) which performs well. With outside tiedown in New England, the weather can be harsh on wooden propellers. I'm curious if your readers have any experience with the metal propellers that Sensenich has available for "High Performance" homebuilts. Vans aircraft is offering them to their builders and I know a local RV6 owner who loves the metal prop that he has. I also have one of the 1984 model Warnke "Almost Constant Speed" wood props that I want to try. This one was made from dark wood, looks like mahogany although I know it is not, and I've been told that they are troublesome. Anyone have a comment on that?

I initially thought that No. 3 cylinder was running 80 Deg F hotter (at 410 Deg F) than the others because my oil cooler gets it's air from the baffles behind No. 3. I found that completely blocking off the oil cooler for a short flight didn't lower the temp on No. 3 by 10 Deg F. I also noticed that the hot cylinders and EGT peaks swapped from No 3 at partial throttle to No 1 & 2 at full throttle. I spoke to Evan Roberts in Houston, Texas, remembering his comments in a recent T-18 Newsletter on the T-18 carb he is using. He gave me Bob Brashear's name from Waco, Texas. I spoke to Bob and he suggested leaking intake tubes as the cause for my EGT imbalance. I followed his suggestions and sealed the intake tubes where they join into the oil pan. I found only a very slight improvements in the data after sealing the intake tubes. While researching the carburetor part number options, as suggested by Evan and Facet Aerospace, I noticed a Lycoming service instruction that included a new carb nozzle to improve smoothness in certain engines. I tried that nozzle and finally settled on a jet opening in it's base that is slightly larger .111 vs the original diameter of .104" and have nearly solved the problem. The discharge end of the new nozzle has a very thick wall sections and a pattern of holes in the sidewall near the tip. Apparently this configuration results in better atomization of the fuel and better distribution. The EGT spread is quite good now at higher power settings up to but not including full power. I have to pull the throttle back 1/4" after takeoff to get #4 cyl to show any appreciable EGT at all. I'm still averaging 9GPH which is too high for a 150 LYC. In retrospect, I may have gone too far, by .005" or so, opening up the jet. I have an Ellison Throttle Body injector unit that I plan to install in the near future. Any suggestions or experience on that would certainly be welcome.

I have a significant amount of air coming into the cockpit from the aft canopy skirt. I would appreciate hearing from anyone with a simple solution to that problem.

The wing pins holes on the left side turned out a little too large and the wing tip could be moved an almost imperceptible amount. A friend who is a metallurgist and chief engineer for his employer suggested Electrolysis Nickel plating to replace the Cadmium and build up the size a bit. I had a local aerospace plater add .0015 to the diameter and solved the problem very well. Mil Spec plating and Hydrogen embrittlement baking techniques were used of course.

Does anyone have a simple way of getting rid of the stiff turning long shaft and universals for the pitch trim? I'd love to find a simple way of connecting an electric motor directly to the threaded screw that drives the trim arm and eliminating the universals altogether.

How about a long lasting lubricant for the aileron and servo tab piano hinge pins? I've tried WD-40 and LPS but they don't last more than a couple rain storms and then the rust starts over again. Has anyone tried Stainless pin for those hinges? I remember reading of some concern for dissimilar materials corrosion when mixing up aluminum and stainless steel.

I'll send more information as it develops. In the meantime, feel free to publish my telephone number and address with my offer to discuss any aspect of this project with all who are interested.

PS I have attached an item I wrote for our local EAA Newsletter on finishing wood propellers.

Sincerely, Joe Gauthier
9 Kowal Drive Cromwell, CT 06416
(860) 635-4058

Congratulation Joe, it sounds like you have a fine flying T-18. Rich

WOOD PROPELLER REFINISHING

To those of us who love wood propellers, there's nothing like that gleaming hunk of natures best composite hanging out on the business end of our trusty Powerplant. Nice spinner, or skull cap, properly installed, bright and clear with a fresh coat of varnish.

A few simple tips are all that is necessary to achieve the gleaming, varnish finish on your prop. It is usually not necessary to remove all of the old coating, just that which is loose or unsightly. If partial removal of the old coating results in a wide variation of surface coloring, then, complete removal may be necessary. 180 and 220 grit sandpaper, used dry worked well for me, followed by 4XO Steel Wool.

It's best to note the balance condition of your prop at various stages of this process to determine the need for asymmetric application of finish to one blade vs the other for balance. My professionally made prop needed two extra coats of varnish on one blade to achieve perfect static balance. A simple cable suspension balancer works great for me. It is simply two cones, a section of 1/2" steel tube to mount the cones in the prop hub, a small washer with hole for the cable to cover the end of the tube and some 1/1 6th steel cable to suspend the propeller with. The cable is secured in the center of the tube, slightly above the mid-point of the prop hub. When the washer lays exactly over the end of the tube, the propeller is in perfect static balance.

The best paint brush you can afford is absolutely necessary. Mine was a Chinese Ox Hair bristle and it worked beautifully. Most varnishes can't be stroked repeatedly when applying, so it has to be put on full, wet and smooth with as few strokes as possible. Use the largest brush you can handle to reduce the application time. This gives you an extra minute or two to smooth out any rough spots. Let it dry vertically if possible to give the falling dust in your shop the smallest possible target.

Spar Urethane seems to be the coating of choice. It should dry overnight, in a warm and dry environment. Dull the surface and knock off any dust with the steel wool and recoat until the finish and balance are acceptable. A clean, dry, dust free surface and work area is absolutely necessary. I used Automotive Tack cloths immediately prior to applying the varnish. Give this coating plenty of time to dry, at least several days before you fly in any kind of precipitation. The slightest amount of rain will eat away at varnish that has not been thoroughly cured. Even with a good UV rating, and effective cover, if tied down outside, the best finish will need regular attention. If you happen to have a heated workspace, propeller refinishing is a good winter activity.

Why Vacuum Pumps Fail

by Mike Busch

Editors Note: My thanks to Mike Busch for letting us use this great article on Vacuum Pump failure in our newsetter. Read it and take heed. It was downloaded from the internet Avweb on line aviation magazine.

Modern dry vacuum pumps often fail prematurely—always catastrophically and without warning—usually at the worst possible time. Why do low-time pumps self-destruct, and what (if anything) can you do about it? Read on. This originally appeared in "The Aviation Consumer" Mike Busch

Most small aircraft depend on air-driven gyro instruments powered by vacuum produced by an engine-driven air pump. The vacuum system is a simple one, and it should be reliable and trouble-free. Too often, though, it isn't. Ambient air enters the system through a central vacuum filter, ensuring that the gyros breathe only clean air and are protected from dirt and other contaminants. The air passes through the gyro instruments (where it spins the gyros), then through a vacuum regulator, and finally to the suction inlet of an engine-driven vacuum pump. The pressure outlet of the pump usually discharges its air into the engine compartment. (Aircraft with pneumatic deicers use the discharge air to inflate the boots.)

How Much Vacuum?

Air-driven gyro instruments are designed to operate with a pressure differential of about 5 inches of mercury (about 2.5 psi). The pump is designed to produce plenty of airflow to spin the gyros even when the engine is idling on the ground. At normal flight RPM s, its capacity is much greater than necessary (as much as 20 psi). To maintain relatively constant airflow through the gyros, the regulator permits enough ambient air to leak into the system downstream from the gyros to limit the pressure differential across the gyros to about 5 in. Hg. The regulator is adjustable, and has its own foam air filter to protect the pump from contamination. The cockpit vacuum gauge is connected to read the pressure differential across one of the gyro instruments (usually, the attitude indicator). The gauge normally has a green arc between 4.7 and 5.2 in. Hg. The vacuum regulator is adjusted so that the cockpit gauge reads about 5 in. Hg.

Most twins and some singles (such as the Cessna P210 and the Piper Malibu) use a redundant system with two engine-driven vacuum pumps. These systems employ dual regulators and a set of check valves to ensure that instrument vacuum remains normal even if one vacuum source fails. When the system is operating normally there is almost no pressure drop across the central vacuum filter, and only minor pressure losses in the rest of the system. The load on the vacuum pump should not exceed 6.5 in. Hg. in single-engine aircraft. (The max for twins, with their longer hose runs, is 7.0 in. Hg.)

Dry Vacuum Pumps

Since about 1970, our gyros have been powered by "dry" air pumps which use self-lubricating graphite vanes spinning inside of an eccentric aluminum cavity. (Before 1970, oil-lubricated "wet" pumps were used) Because dry pumps don't use engine oil for lubrication, they don't require an oil separator, and provide oil-free discharge air for deice boots. But dry pumps have one big disadvantage, and that is their singularly unattractive failure mode: they work flawlessly for an unpredictable life span, then fail catastrophically and without warning (usually in a great puff of graphite dust).

The dominant manufacturer of dry air pumps is Airborne, a division of Par ker-Hannifin Corporation located in Elyria, Ohio. Airborne manufac-

tures a wide range of air pumps, regulators, filters, check valves, air manifolds, and also control valves for pneumatic deicing systems. Most non-deiced aircraft use Airborne 200-series dry air pumps, while booted aircraft use the larger 400-series pumps. The small 200-series Airborne pumps list for about $400 and have a rated warranty life of 1,000 hours. But don't feel bad: the bigger 400-series pumps cost $1,200 and are warranted for a paltry 400 hours!

Graphite and Plastic

All Airborne pumps are built with a slotted graphite hub and graphite vanes. The hub and vanes rotate within a polished elliptical interior cavity within the aluminum pump housing. The vanes are free to slide in and out of the hub slots as they rotate within the eccentric cavity. Centrifugal force holds the vanes against the cavity wall, providing the requisite air-tight seal.

The pump drive incorporates a frangible plastic coupling that is designed to shear instantly if the pump's rotational drag exceeds normal operating torque by any significant amount. This ensures that a pump failure cannot damage the engine's accessory drive.

Backwards is Bad

The hub slots of Airborne pumps are canted in the direction of rotation. For this reason, Airborne offers different pump models for clockwise and counterclockwise applications. The most common model numbers are 211CC and 441CC (for counterclockwise rotation) and 212CW an d 442CW (for clockwise rotation). It's not difficult to break the code.

Installing a wrong-direction pump is a sure prescription for premature failure. Most Continental engines require a clockwise pump, and most Lycomings require a counterclockwise pump. But not always. In fact, twins with counter-rotating props need one of each.

Sigma-Tek vs. Airborne

For years, Airborne had the dry air pump business all to themselves. But in the mid-1980s, Sigma-Tek introduced a new air pump STC'd as a direct replacement for the popular Airborne 211CC and 212CW pumps.

The Sigma-Tek model 005 pump is identical in principle to the Airborne pumps they replace. They use similar free-sliding graphite vanes and a similar eccentric cavity. However, the Sigma-Tek pump uses an aluminum (not graphite) hub with orthogonal (not canted) slots. Consequently, the Sigma-Tek pump can be used for both clockwise and counterclockwise applications.

The Sigma-Tek 005 pump costs about the same as the Airborne 200-series units, and has a comparable warranty. Some folks are convinced that the Sigma-Tek pump lasts longer, but we've seen no hard data to support this contention. On the other hand, if you've had a bad run of luck with Airborne 200-series pumps, it couldn't hurt to give the Sigma-Tek a try.

Why Pumps Fail

Horror stories abound of dry vacuum pumps that fail before their time, sometimes just a few hours after installation. Owners who have been repeated victims of such premature failures often come to believe that obtaining rated life from a pump is a matter of luck, voodoo, or karma. This simply isn't so. Almost every case of premature dry vacuum pump failure can be traced to one of three causes: contamination, overstress, or faulty installation.

Dry air pumps are extremely vulnerable to contamination, particularly by liquids. The graphite vanes are designed to operate absolutely dry, and the introduction of any liquid can quickly destroy a pump.

One of the most common causes of premature dry pump failure is contamination by solvents used to wash down the engine compartment after maintenance. If solvent overspray enters the pump (usually through the discharge port or the

drive coupling), it will mix with the carbon dust in the pump to create a sticky residue. Even a small amount of this stuff can cause the brittle graphite pump vanes to fracture in short order. Consequently, it is absolutely essential to cover the vacuum pump and its discharge tube (usually with a plastic bag) before spraying solvent. Another common cause of pump failure is oil contamination. Oil can enter the vacuum pump in several ways. One frequently-seen culprit is a leaky pad seal gasket between the pump flange and the engine accessory case. Actually, any engine compartment oil leak that allows oil to get on the pump may find its way inside through the drive coupling. Alternatively, oil that gets on the vacuum regulator will quickly oil-soak the foam garter filter and start being sucked inside the pump itself. If even a tiny bit of oil gets inside a dry pump, it's history.

A dry pump can also be destroyed by carbon contamination. A dry pump normally fails suddenly when a graphite vane or hub fractures, generating a cloud of carbon fragments. When the failed pump stops pumping, residual vacuum upstream of the pump often cause some of these graphite chunks to be sucked out of the pump and lodge in the hoses or vacuum regulator. If the system is not meticulously cleaned of carbon before a replacement pump is installed, the new pump may ingest these fragments. This may result in failure of the new pump in just minutes or hours.

Overworked Pumps

Another cause of short pump life is overstress. This may be caused by a dirty central vacuum filter, a kinked air line, or any other obstruction or construction that causes the vacuum pump to work harder than it should.

Here's a typical scenario. As a result of maintenance or old age, an air hose in the vacuum system becomes constricted (due to kink or collapse). The pilot notices that the cockpit vacuum gauge reads lower than normal, and squawks this condition to his shop. The A&P readjusts the vacuum regulator to bring the vacuum gauge back to normal operating range, without troubleshooting the underlying cause.

The pilot is happy, and the mechanic is happy...but the vacuum pump is now profoundly unhappy because it now has to produce 150% of normal vacuum. A pump that is working too hard will run hot and will ultimately fail prematurely.

Installing Pumps Correctly

Installing a replacement vacuum pump is a quick and easy procedure, but there are some important rules that must be followed to ensure that the new pump can enjoy a long, healthy life.
Make absolutely sure that a new Airborne pump is the correct model for direction-of-rotation. A wrong-direction pump looks identical, but won't last long . (Sigma-Tek pumps don't care which way they rotate.)

Never clamp a new vacuum pump in a vise when installing the fittings. The soft aluminum pump housing can easily be distorted, ruining the pump. Airborne pumps come from the factory with a red-and-white "anti-vise" decal, but overhauled pumps typically don't.

Never use thread compound or Teflon tape when assembling threaded vacuum fittings. Any excess sealant could be ingested by the pump, causing its destruction. Airborne recommends a sparing application of silicone spray on the threads, but nothing more.

Make certain that the vacuum system is scrupulously clean before installing a new pump. Always blow out the hoses with compressed air, replace the central vacuum filter and the regulator's foam garter filter with new ones, and check the regulator seat for trapped carbon fragments. Any contamination left over from the failure of the old pump can (and often does) result in premature destruction of the new pump.

Troubleshooting tips

Troubleshooting the vacuum system is a process

often misunderstood by mechanics. Most shops lack the proper test equipment, and rely on the cockpit vacuum gauge. But the cockpit gauge is a poor troubleshooting tool. It shows only the pressure differential across the gyro instruments; it does not show how hard the pump is working. Furthermore, it's not uncommon for cockpit gauges to be way out of calibration. For example, the vacuum gauge on one single-engine aircraft was found to require 9 in. Hg. of vacuum to indicate 5.0 in. Hg. on the instrument. The vacuum pump, forced to provide 10.5 in. Hg. instead of the normal 6.5, was being replaced every 300 to 400 hours, along with frequent gyro instrument overhauls.

Proper vacuum system troubleshooting requires special test equipment. Airborne's Model 343 Pneumatic Test Kit includes everything needed to troubleshoot both vacuum and pressure systems for instruments and deice boots: a vacuum source, calibrated gauges, adjustable regulators, and various other special fittings. For small shops that cannot justify the expenditure to purchase this test kit, Airborne's technical service department has several loaner kits that they can make available on short term loan.

Interestingly enough, one of the most helpful indicators of impending vacuum pump problems is the little red-and-white "anti-vise" sticker that comes affixed to every new Airborne dry pump. A darkening sticker is a reliable indication that the pump housing temperature is hotter than it should be. This usually means that the pump is working harder than it should, and is likely to fail prematurely. It's a good idea to check the color of the vacuum pump sticker at each oil change.

Overhaul vs. New

Sooner or later, you're going to face vacuum pump replacement. You'll have to decide whether to buy a new pump, an overhauled pump, or a do-it-yourself pump overhaul kit. The first thing you should know is that Airborne's official position is that their pumps are not to be overhauled. In fact, Airborne stamps "Do Not Overhaul" on the pump housing of each new dry air pump they make. Nevertheless, overhauled dry air pumps are available from RAPCO, Singer, and various other sources. Typical discount-house prices for overhauled 200-series pumps range from $175 to $225 exchange, with a 400-hour warranty. Overhauled 400-series pumps for booted aircraft sell for $550 to $650 exchange. In addition, do-it-yourself pump overhaul kits (containing a new hub, vanes, drive coupling, and gasket) cost only about $70 for 200-series pumps and $135 for 400-series pumps. (These prices come from Chief and San-Val ads in Trade-A-Plane.)

Overhauled vacuum pumps have received reviews that are decidedly mixed. We believe that it is not enough simply to replace the hub, vanes, and drive coupling. If the pump cavity is not polished smooth, then the new vanes won't last long. For that reason, we don't much care for the do-it-yourself pump overhaul kits. And if you opt for an overhauled pump, be careful what overhauler you choose. Ask whether he reconditions and polishes the pump cavity on his rebuilt pumps. (On a purely anecdotal basis, we've had good luck with RAPCO rebuilts, and poor luck with Singer.)

Rebuilts Worthwhile?

Does it really make sense to buy an overhauled pump instead of a new one? For the big 400-series pumps, maybe so. A RAPCO overhaul can be purchased for $600 less than a new Airborne. The author has a 400-series RAPCO rebuilt pump on one engine of his Cessna T310 that has reached 1,000 hours and is still going strong. For the smaller 200-series pumps, the merits of overhauled units is questionable. The same Trade-A-Plane ads that offer rebuilt pumps for $175 to $225 also offer brand new Airborne and Sigma-Tek pumps for less than $300. The new pumps come with a 1,000-hour warranty, while the rebuilts are warranted for only 400 hours. For the extra $75 to $125, we'd be inclined to go for a factory-new pump.

We'd stay away from the do-it-yourself overhaul kits in any case.

Wet Pumps

Back in the 1960s (when light plane IFR was young), piston aircraft were delivered with so-called "wet" vacuum pumps that used metal vanes and were lubricated by engine oil. The principal manufacturer of wet vacuum pumps was Garwin. These pumps were long-lasting, reliable, and usually did not fail suddenly; they wore out gradually, and eventually required overhaul.

The discharge air from a wet pump contains an oil mist, so these pumps require an oil separator in order to return most of the oil to the engine sump. Even with an oil separator, a certain amount of oil is discharged out the breather (and usually onto the belly of the aircraft).

Consequently, wet pumps aren't great for aircraft with deice boots, because the oil can cause the rubber to deteriorate. Also, pressure-type instrument systems (like the ones used in later-model Bonanzas and Barons) can't use wet pumps because the gyro instruments would become contaminated. with oil.

But if you have an older airplane that uses a wet-pump vacuum system, you might do well to hang onto your old Garwin pump and oil separator, rather than converting to the newer-style system.. In our view, a little oil on the belly is a small price to pay for a vacuum pump that doesn't fail suddenly and without warning.

Pressure Systems

Although the accompanying article talks about vacuum systems, some light airplanes (particularly later-model Beechcraft) use a pressure system. Pressure systems use precisely the same dry air pumps and gyro instruments as vacuum systems do. The filters, regulator, and cockpit gauge are different.

Pressure systems suffer from exactly the same problems as vacuum systems do. The dry pumps in pressure systems are equally vulnerable to contamination, overstress, and faulty installation. And the troubleshooting techniques and equipment are essentially the same.

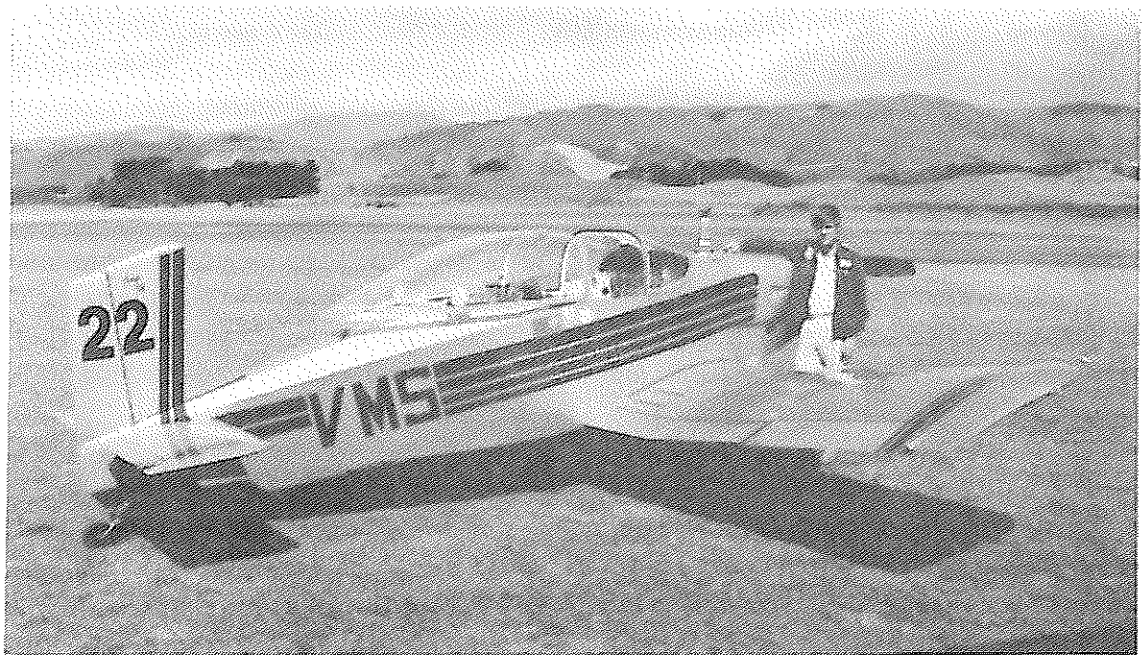
Standby Systems

Because dry vacuum pumps fail suddenly, without warning, and usually at the worst possible time, backup vacuum systems have become popular add-ons for single-engine airplanes that fly serious IFR.

Some airplanes (such as the Cessna P210 and the Piper Malibu) are factory-equipped with dual engine-driven vacuum pumps, much like the system that twins use. The disadvantage of this arrangement is that both pumps are turning (and wearing out) all the time. If one pump fails, the probability of the other pump failing shortly thereafter is decidedly non-trivial.

Several manufacturers (including Airborne themselves) offer STC'd standby vacuum systems that use a dry air pump driven by an electric motor. These are excellent systems, and have the advantage that the standby air pump runs only when needed. Such systems are rather pricey, however.

Precise Flight offers a very inexpensive STC'd backup vacuum system that provides backup power to vacuum-driven gyros by using vacuum from the engine's induction manifold. This system works well, but has several limitations. It does not provide adequate vacuum at high throttle settings (such as one might use when carrying a load of ice on approach). Furthermore, the Precise Flight system should never be installed on turbocharged aircraft (although it often is, erroneously).



Tony Schischka and his Thorp T-18

We have finally arrived home from our trip to Oshkosh which included a further three weeks touring in the US. Tired but happy!

As you will no doubt appreciate, for first time visitors, you can not see every thing in one week! We tried though! The highlight was the T-18 dinner and forum, rounded off nicely by walking around the attending T-18's on the flight line. It was nice to be able to look over, under and around the aircraft to see how other builders have dealt with different areas and problems.

Lyle Trusty kindly spent some time with me explaining some of the improvements that he had incorporated on his T-18. I liked his tail wheel arrangement, I had been thinking of something like it myself! But there it was already thought out, he has plans, so a deal was done and hopefully they are in the mail at this time.

I enjoyed talking to builders and especially those with construction under way. I was surprised to find there were still many under construction and that the plans numbers are now over 3000.

Enough of all that! I promised to send some facts about my T-18C.

ZK-VMS is a T-18C powered by a Lycoming 0-320 A2A coupled to a Sensenich W66LM76 propeller. My plans are #867 obtained in 1972. The first flight was in May 1989. You don't have to be a genius to see that equals 17 years! So builders out there don't give up, just persevere!

VMS is a true home built, I built every part of it save the fibreglass wing tips, wheel pants, spinner, aluminium roll over bar and steel main spar fittings for the folding wing. The engine cowl is all metal except the air scoop which is glass on foam. The canopy is a story in itself, while it has a few ripples in the rear section it does the job.

The engine which came out of a 1955 Piper PA18A-150 was run out. I bought it on a gamble, stripped it and found the measurements to be near new tolerances. I had the case and crank assembled at an overhaul shop but the rest I built myself, had to put half inch valves in. Total cost was about NZ$3000, the biggest single cost in that exercise was the cost of fitting to a certified run in rig and do the full Lycoming break in procedure ($700)

The airframe is strictly standard, (I didn't see the

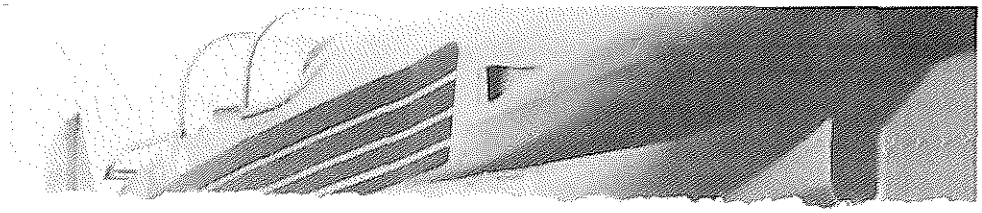
need to change a perfectly good design!) the thing that is different is the cowling. If you look at the photo enclosed you will see it does not have the normal air intakes. The cowl is configured for a true up draft system a-la Rutan Defiant who I must give credit to for the inspiration.

Air for both carburation and cooling enters the lower divergent duct where it is slowed to a manageable speed. It flows up through the cooling fins and exits out the top of the cowl. The theory of it all is that the sump, fuel system and electrics all run in cool air instead of being fried with pre-heated air. The normally hot side of the cylinder is cooled first, effectively reducing the temperature gradient across the cylinder (should prevent typical cracking).
I guess the $64,000 question is does it give any performance increase. The answer is I really don't know! Without having an identical aircraft with the standard cowl to fly against I have no means of measurement. Cylinder temperatures only fluctuate 40C between climb, cruise and descent, so that's a plus.

I can achieve a TAS of 155Kts @ 8000' using 2600 rpm and 19 in hg manifold pressure. This equates to about 65% power. It chews the gas at these rpm, what I really need is a constant speed prop so I can get the rpm down and the manifold pressure up, the engine becomes more efficient at those rpms/mp.

I still enjoy flying her and have no intention of replacing with a later design. The only thing I would have liked is the new airfoil section, this seems to allow the aircraft to fly some 5 kts slower and that represents a large change in energy which especially important if you are trying to squeeze into a short strip! Alas my folding wing drawings were produced before the change. . I don't miss the wide body change since both my wife and I are of slight build, though I believe the extra five or six inches in fuselage length probably improves the tail plane/full flap problem.

Well that's enough from me, would love to hear from other T-18'ers and if any one is coming out to our fair country please make contact with me.
Regards, Tony & Viv Schischka 17 Bodmin Terrace Plimmerton 6006 NEW ZEALAND
PS: had two T-18 news letters waiting for me when we arrived home. Have just about worn the print off reading them!



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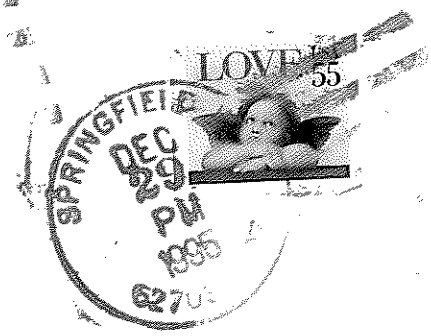

[redacted]

All dues run from Jan to Jan. Please send your 96 dues now.

I need everyone's help on this! In spite of several notices in the newsletters and two seperate personnel letters a small number of individuals put-off paying their dues until late in the year! This makes it difficult to plan and get my printing and mailing bills paid. If you've noticed I'm now mailing First Class Postage which is much higher, with no increase in dues. I need your dues now folks! **Please help by mailing now!** Some of you have paid for 96, check the label it will show a dollar amount if paid or a zero if you haven't.