

SONERAI NEWSLETTER

APRIL-MAY-JUNE 2001

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RON TEUBERT IN HIS SONERAI IIL

Ron, who is from Ft. Wayne, IN, is out taxi testing his machine in this October 2000 photo. The engine is a Great Plains 2180 with a Zenith carb, spinning a Sterba 54 x 50 prop. See some other photos of Ron's project along with his commentary elsewhere in this issue.

APRIL = SUN-N-FUN

The opening event of the 2001 Fly-In season is just about upon us. Of course, I'm talking about Sun-N-Fun 2001, which starts on Sunday, April 8, and runs through Saturday, April 14.

I hope you're planning to come. It is always a good time. Yours truly is planning to be there. As I write this in mid-March, I don't yet have my travel plans firmed up, but there is a high likelihood that I will bring the Sonerai down this year. I haven't

done that since 1992, and I feel the need for a long cross-country adventure.

We have a number of things of interest planned again this year. First of all, the Sonerai Builder's Forum is scheduled for Tuesday, April 10, at 9:00AM. (You'll have to get up early that day.) Steve Bennett will be presenting a VW Engine Conversion forum on Wednesday, April 11, at 11:00 AM. He will also be building up a VW engine every day in the Engine Workshop tent starting at 1:00 PM. (Keith Browne will be disassembling the engine everyday starting at 9:00 AM.) And finally,

a small change over past years: Rather than having our annual dinner at Vito's, which Dean McGinnes tells me is now closed, we are invited to the Great Plains Annual Customer Appreciation BBQ Picnic. It will be held on Monday evening, April 9, starting at 5:30 PM in the Engine Workshop tent. It's free, and there will be brats, polish sausages, chips, soda, and all the fixin's. This is always a good time, and you'll get to rub elbows with the builders of other VW-powered airplanes, too.

See you there.

SONERAI NEWS

- **First Flights:** There were no new first flights reported to me this time. When your Sonerai flies for the first time, be sure to let me know. (And send pictures.)
- **Sonerai Wing Construction Manual:** It is now available. There are 18 pages of text, 85 photographs, and 12 drawings, as well as a complete materials and a tools list. If you would like your own personal copy, sent me cash, check, or money order for \$25.00. Postage is included.
- **Back Issues: Sonerai Newsletter** back issues are available in two forms. A 3-1/2" diskette which contains most of the significant newsletter articles published by Ed Sterba from 1987 through 1995 is available for a mere \$10.00. There are also hardcopy back issues for \$3.00 each. I have the last two issues from 1994, and all of the issues from 1995, 1996, 1997, 1998, 1999, and 2000. If you want any of the above, send me a note requesting the ones you want and a check for the correct amount. The postage is included.

AIN'T COMPUTERS GREAT?

If you haven't already noticed, I've given in and allowed myself to be dragged into the 21st century. You know; email, internet, and all that good stuff. A check of the header on the front page will show that I now have a personal email address, fredkeip@aol.com. (I've had one at work for quite a while, but the folks in charge of that stuff don't like us to use it for personal things.) Please feel free to use it to communicate with me. If you send technical questions, I'll try to respond as quickly as I can. Also, if you want to submit articles and digital photos, please feel free.

The new email address is the result of my wife and I buying a new gee-whiz 950 mhz Gateway computer right after Christmas, and it came with a year of AOL. So, I've jumped right in, and started poking around in the various aviation web sites out there. One interesting little site is one created by fellow Sonerai guy and subscriber, Mark Burham. It is a homebuilt aircraft database, and to quote Mark: "The idea is to collect data from owners and builders to see how aircraft perform 'in the real world'." The website can be found at <http://www.avdb.com>. There is an online form that takes about ten minutes to fill out, and you can even upload a photo. Mark would like to get as many airplanes on the list as possible, and if he gets enough data, he'll be able to chart and graph some of the data. Take a few minutes and have a look. (My airplane is file #192.)

Another good thing to do, particularly if you're building, is to sign on to the Sonerai list at www.lists.kz. This is an email list that allows you communicate with other Sonerai folks who have also signed on to the list. It is really simple to sign on. Simply send a blank email to sonerai-subscribe@lists.kz. You will get a return email. Just follow the instructions. Once you're signed up, you can send emails to the list, and hopefully get good responses. Plus, you'll get copied on all of the other emails sent to the list that you can comment on. It can be fun.

If any of you find other good sights and services out there, let me know, and I'll help spread the word.

RON TEUBERT'S PROJECT

Along with the cover photo, Ron sent in the following letter and photos about his essentially stock IIL.

Fred: As I read my just-received newsletter, I was again reminded of the inspiration you have given me. Thank you. (Oh, pshaw – Fred.)

Here are a few shots of my Sonerai IIL project:

1997.... I started the project with parts and sub-assemblies bought from John Hubbell. First, I did some finish welding on the fuselage, then stripped it, and covered it Poly-Fiber two-part epoxy primer.

1998.... I built a rotisserie, fitted the fuselage to it, and covered it and the tail surfaces with Poly Fiber covering thru the silver coat. I then mounted the gear engine and cowling.

1999.... After moving to a new house, in my new garage, I fit up the canopy. With help from template drawings from John Monnett, I baffled the engine. I then installed the instruments, and made the required hook-up's, mounted the carb and linkages, bolted up the prop (Sterba 54 x 50), fit the spinner, and welded that tight curve in that one exhaust pipe.

2000... I moved the project from my garage to my hangar. After doing some finish work, I installed the wings. On Labor Day weekend, with surprisingly little fanfare, I started the engine! After a few small oil leaks, I have moved on to some taxi testing. I received my registration (N242RT) in September.

2001... I am snowed in just like you, Fred! But I hope to soon dig out and then I hope I can finish up a few odds and ends (safety wire some bolts, etc...). From there I will do up a weight and balance, and maybe get my inspection in.

My first flight may not be too far away!!!

Also, I have a Great Plains 2180 with a Zenith carb and air filter (no pump). Do you think carb heat is necessary? I'm running 100LL fuel.

Freditorial Comment: I would certainly consider installing carb heat of some sort. The Zenith is a

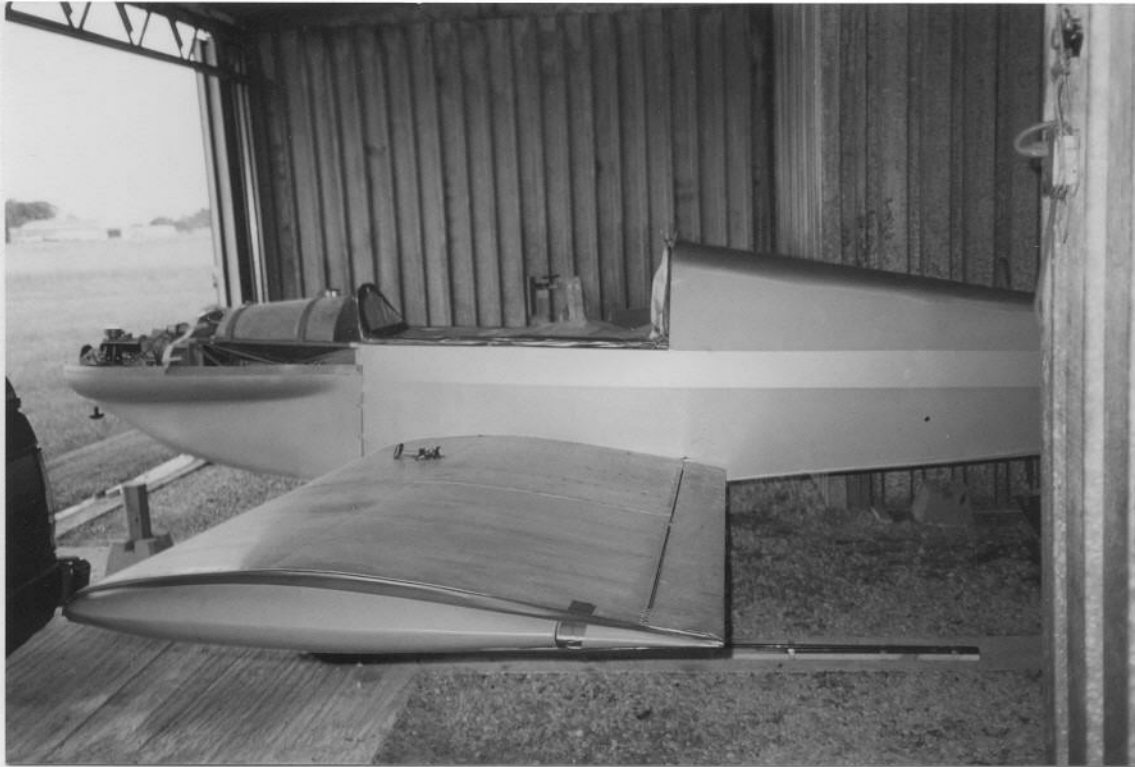
real carb with a venturi, so it could be more susceptible to icing than the slide valve-type carbs. One solution I've seen is to build a sheet metal shroud around the filter with a cold air duct leading to it thru a control valve. When warm air is needed, the valve is closed, forcing the carb to draw warm air from inside the cowling.



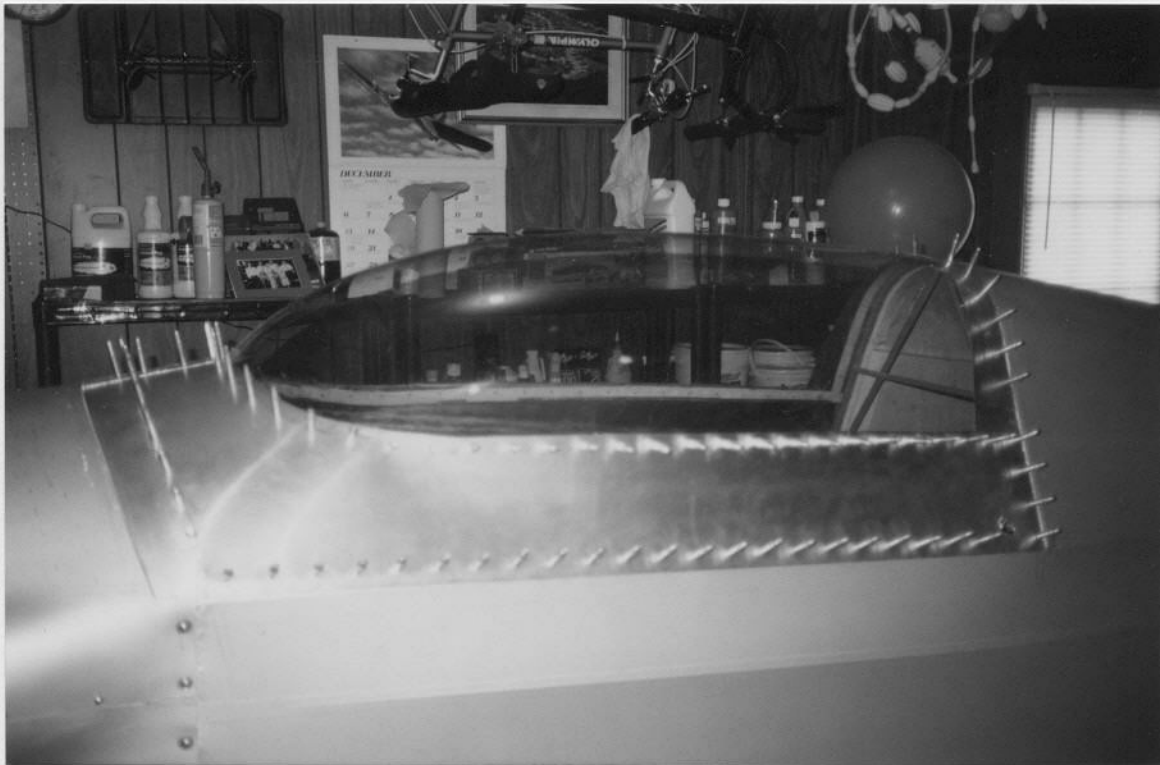
June 1998 – On the Rotisserie



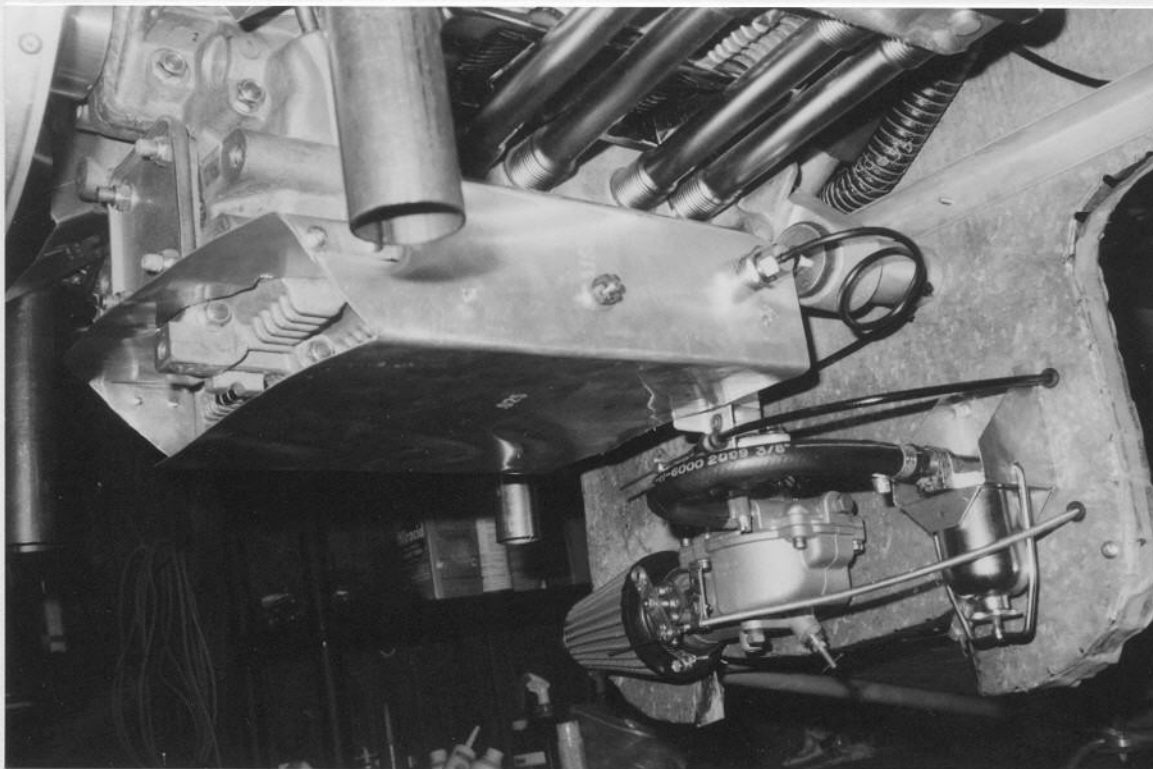
January 1997 – Finished Welding and Test Fit Parts



August 1998 – Fuselage in Silver and Engine Mounted



March 1999 – Canopy Fit-up



July 1999 – Engine with Zenith Carb

WING SPAR CARRY-THRU QUESTIONS

A letter from Australian IILTS builder, John Stewart.

Dear Fred: Here we go again, a long time between letters. The time just seems to fly away. First of all, the important things: Please find enclosed the re-up for the Sonerai Newsletter. Also enclosed is \$25.00 American for that manual on the wing building for the Sonerai. That manual could be a godsend for me. The drawings I have from Steve Bennett are A4 size and the information is all there, however it can be frustrating at times digging it all out. It couldn't have come at a better time. I am nearing the end of the major work on the fuselage (IILTS) hoping to have all the other time-consuming details sorted out by years end. So then I can begin serious construction on the wings. The tail feathers are all made as well, so it's coming along.

I am forever being beset by problems, probably as do American builders, by being unable to get the parts I need, such as rod ends for the elevator control system. Only 3/4" are available. This gets to be a major hassle as the alternative is to import such things. Importing ANYTHING into Australia is a very expensive proposition. So, I was hoping

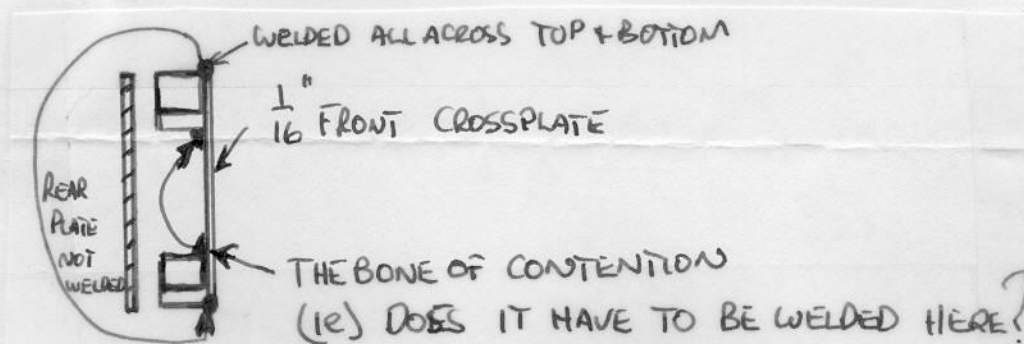
that there are commercial substitutes available. If you know of any you could drop me a line (snail mail), that would be great help.

The arrival of the Newsletter is an event in Sonerai people's lives, it seems. I have been known to pontificate that it would be impossible to build without it. In spite of that, there are many that probably have. So, what am I saying here? Keep up the good work, Fred. The help you give the builders IS invaluable.

After going back through past newsletters looking for a screw jack type elevator/stab trim, I designed one of my own, so I am hoping you have a workable one tucked away in your archives. (See the Oct-Nov-Dec 1996 issue – Fred.) If you could mail me anything, I would sure appreciate any info. A designer I am certainly not.

Now, another little welding question on the wing spar carry-through box: The drawings mention to weld the front 1/16" crosspiece to the 3/4" square tubes all the way across the top and bottom, but it says nothing about the inside of the joint. I will add a sketch here to explain it a bit more clearly:

It seems to me that a weld here would interfere with the edges of the tongue of the wing spars. Originally, I planned to weld both sides and radius



off the edges of the spar tang to clear this, but now I am not so sure. All the components are made for this, the brackets for the control system are welded in. So, once I have this very important bit welded up, I can proceed with that tricky bushing stock attachment to the fuselage.

I hope these questions are not confusing at all. A couple of our guys over here have had heaps of trouble with fitting the wing spar into the carry-through box after everything has been welded, and riveted together. A little fix here, if things can be planned a little earlier, is to allow an extra 1/16" or less between the fuselage verticals (5/8" square wing carry-through attach verticals). Then, shim to fit for final assembly. Any thoughts on this one would be a terrific help, not necessarily for me, as I am a bit too far down the track now, but others may welcome the advice.

Once again, many thanks for the past help, and aero talk.

John Stewart
Chelsea, Victoria, Australia

*John: First of all, thanks for renewing your subscription to the **Sonerai Newsletter**. It's good to hear that my efforts are leading to some good.*

As far as your question about welding the carry-thru box is concerned, there are seven pieces of .063" 4130 sheet that get welded to the 3/4" x .058" square tubing. There's the large front sheet, and six little filler strips that fit on the rear side of the tubes under the three 1/8" thick plates. The rear filler strips provide a .813" wide opening to slide the .790" wide spar into. Only the .063" pieces are welded to the tubes, and only on the outside of the box. Do not weld on the inside of the box where you indicated on your sketch. The five 1/8" plates are bolted to the box using eight AN4 bolts. (I welded the 1/8" plates on my carry-thru box, as well as bolted them. I guess I didn't read the plans close enough, and did more work than I needed.)

Fitting the carry-thru box to the fuselage can be made a little easier, if you cut some 1.125" (plus a little) long spacers to fit between the two vertical 5/8" square verticals on each side before you weld them in. I didn't do that, and had to file the outer

1/8" plates down a bit to get the box to fit.

And welding in the bushings that hold the carry-thru in place isn't really very tricky. Just cut four pieces of bushing stock long enough to span across the two 5/8" square tubes and the 1.125" gap between them (2 @ 3.125" long and 2 @ 3.875" long). Locate and weld them in. And then, cut out the pieces of bushing where the carry-thru box goes. The bushings will be in line, and once you've got the box properly aligned, you can use the bushings as a guide to drill the four 5/16" holes in the box.

Another thing to consider is to drill and taper ream the main spars to the carry-thru box before you build-up the wing. You can do that very accurately in a drill press, and it's a whole lot easier than trying to do it in the airplane. Also, with just the spars attached to the box, it is very easy to align the box to the fuselage using a transit or water level.

I hope this is helpful.

MORE QUESTIONS & ANSWERS (SPARS & VERTICAL TAIL SIZE)

Here's a letter from Reid Christiansen.

Fred: Thanks for the wing manual. I have most of the newsletter articles, but it is nice to have them all in one form.

I have been reading past newsletters and I'm wondering about the difference in using AN bolts in the spar instead of rivets. I have some photos of a IIL wing under construction, and noticed that he had used bolts. Also, it seems that the FV racers use bolts. Can you clarify that for me.

My second question has to do with the size of my rudder. I had Greg Klemp weld my fuselage which was ordered as an original IIL with a round tail, it

came as a stretch with a round tail, and I have read some guys claim that the rudder is too small to start with, and mine is smaller than the square tail that comes with the stretch version. What is your opinion?

Thanks again for the help,
Reid Christiansen
San Marcos, CA

Reid: The first time that I saw AN3 bolts used in place of the standard 5/32" AD rivets in the main spars was on the wing modification that were produced in 1984 for the original nine-rib "A" wing. They were shown as an option to using rivets to make it, perhaps, a little easier to modify an already completed wing. From a strength point of view, they are classic overkill. There are a couple of problems that I can see using bolts. The first is the need to match-ream every hole to suit each bolt so that each bolt is a "snug" fit to each hole. This is to guarantee that all of the bolts share the required shear loading. Regular AD rivets swell when they are bucked, eliminating the fit problem. A second minor problem is weight. The bolts weigh quite a bit more than the rivets. And finally, the bolts, nuts, and washers cost a lot more.

Relative to your rudder size, if it has the same area as the original Sonerai II plans, you should be all right. If it is much smaller, you should probably consider making it bigger. The tail on the "stretch" is 12" further aft than the standard II, so it will be more effective. (It's called an increase in tail volume.) I have a squared-off version of the original round tail, which has maybe 5-10% more vertical fin area and the same rudder area. It has plenty of rudder power. The only exception is at the beginning of the takeoff roll, where I have to leave the tailwheel on the ground until I reach 45 mph indicated before I lift the tail. This is because the elevator has a greater area than the rudder, and it is possible to lift the tail before the rudder is effective. The yaw stability with the original tail size is fairly neutral, and some guys are increasing the tail size to increase it. I don't find it to be a problem. Besides, the larger you make the tail, the more susceptible the airplane will be to weathervaning effects in crosswinds. Everything is a compromise.

I hope this helps.

SONERAI AVIATION UPDATE by Roger Godfrey

Roger sends this update on his Sonerai III since the article he wrote in the J-A-S 1999 issue.

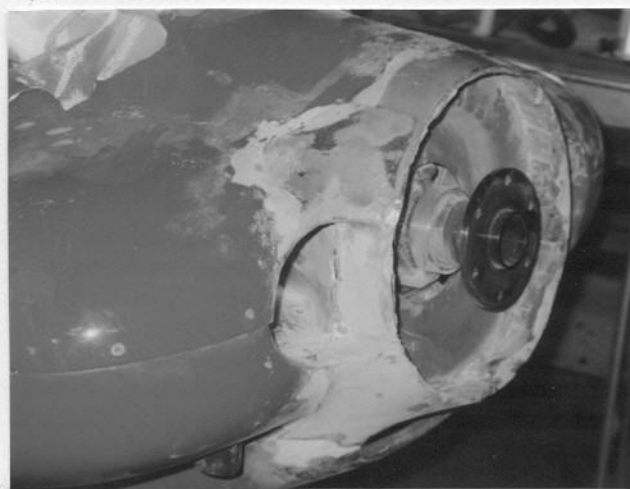
I thought I'd drop a line on Sonerai 49RG. When I ended the last article for your newsletter, she was down and out at Oskaloosa airport. She had a blown cylinder-to-head seal caused by an uneven block, which placed one cylinder further out than the other, and a bent gear having made a silent approach from power reduction on downwind. I land better with the engine running, and it was the 1/2" gear, but in truth, it was probably too many slam dunks on a carrier with Uncle Sam paying for the equipment.

In any case, I ordered a new 2180 engine kit from Steve Bennett. I wanted the Force One prop seal as my old Monnett hub has always had more leaks than a Nixon press conference. Steve gives more instructions for measurement on assembly than anything I have ever built, but never assume anything and it won't bite you, I guess. I have CB big valve heads which Steve drilled for dual ignition. I wanted to swap in my old cam which was a torque monster at low rpm, but I didn't. Steve's cam may be as good, and it clears the stroker crank with a narrow shaft, mine might not. I did use my ball-foot rocker arms. I bought the dual ignition a piece at a time, and had to assemble the rotor on the shaft. I think it is made for a motorcycle, and needs to be cut off to go into the low profile housing. The first time, I didn't cut off enough, and the magnets were too high to trigger the sensors. After a series of activities, not unlike the vote in Florida, I got the ignitions to work. It is neat to be able to switch off the mag and have the engine keep trucking along.

On the first start-up, the engine needed a lot of carb adjustment. I assumed the idle adjustment was a fuel adjustment, and I could not get the thing to rev out and idle. A call to Steve confirmed that the idle adjustment was an air bleed. Now we are cooking; 300 more static rpm and the thing idles like a diesel. Then two things happened more or less simultaneously. My neighbor came out to gripe about the noise, and the engine seized. (The noise issue isn't as one-sided as you might think. She has a large barking dog which messes under our clothes line.) The stoppage was caused by me somehow rotating the front bearing and seal, and placing the alignment stud in the oil hole instead of the alignment hole. Not one of my better moves. Muriatic acid ate the extra aluminum off the prop hub, and a polish with 1500 sand paper in a drill press left it as good as new. I split the case again and put in a new bearing and seal. When it started, it seized again. The first abrupt stoppage had elongated the hole in the case for the alignment stud and I repaired it with JB Weld. Apparently, I got some JB under the stud, and it

pressed too hard into the new bearing. A third disassembly got everything right and it runs well.

The new prop hub places the prop quite a bit further forward, and a cowl modification was in order to look right, and improve air flow. I installed a new 5/8" gear, and redid my wheel pants, which suffered from my arrivals, and their use as a step by the brain-dead. Don't you love fiber glass? How can people build composite aircraft? I may itch until retirement. The photo shows the cowl done with kids modeling clay, fiber glass, and three gallons of calamine lotion. Now, it's time to repaint and fly.



WANT ADS

These Ads are provided as a service to you, the subscriber, and are free of charge. I only ask to be informed when the Ad is no longer valid, and needs to be removed. Thanks.

TAPER PIN REAMERS FOR RENT:
Brown & Sharpe #3 and #5 for AN386-3 and AN386-5 taper pins. \$1.00 per day for both reamers, \$150 deposit.
David E. Wilcox, 517 E. Saratoga St., Gilbert, AZ 85296, (602)231-2804

COMPLETE SONERAI RIBS AVAILABLE FROM QUALITY RIBS L.L.C. Orders taken once per year in September. (602)231-2804

SPECIALTY WELDING CAN SUPPLY YOUR COMPLETELY WELDED SONERAI FUSELAGE AND OTHER WELDED COMPONENTS.
Contact Greg Klemp at *Specialty Welding*, W6461 County YY, Neshkoro, WI 54960, (920)293-8089 or (920)293-8007 (Fax)

For Sale: 40-160 mph airspeed (yellow tag), \$100; fuel pressure gauge, \$65; Telex 950 headset, \$50 Dick Morrow, (309)755-1495 (1/01)

For Sale: Used Bogie tailwheel and Monnett tailwheel caster with 2-5 1/2" springs (needs the chains) \$25.00, New unmachined Monnett "Electro X" casting \$100.00, Used Monnett Sonerai I fuel tank (needs cleaning) \$55.00, Used pair of axles, 3/4" shaft, 5 3/4" long \$4.00, Used fuel shutoff valve \$5.00, Used set of rudder pedals asm. with toe brakes (see Sonerai I drawing page 11 and 15c) \$20.00, Used Sonerai I torque tube asm. (see drawing page 5) \$40.00, New (4) 87.5 cylinders and pistons \$75.00. You pay the shipping. Bob Schank (734)697-7057 (2/00)

For Sale: Sonerai IILTS w/ Great Plains 2180 cc, 95% complete, excellent workmanship, \$13,000.

Chris Mullaney (301)872-9308 (2/00)

For Sale: Revmaster 2100 w/ dual Bendix mag, starter, Revflow carb, oil cooler, prop (56x45), approx 400 hrs, came off KR-2, \$2250, Doug Evenson, devenson@mindspring.com, (706)327-4601(H), (706)888-4602(cell) (4/00)

Wanted: 20 amp Syncro magnet ring for HAPI 1834 VW engine and 20 amp Syncro stator for same. Must be in perfect condition. Ken Christian (660)263-7937 (1/01)

For Sale: Sonerai I Project - Welded chromoly fuselage w/ horizontal stabilizer, elevator, rudder, supine aluminum seat, aluminum fuel tank, main landing gear, including additional components to finish either as trike or taildragger; wheels, axles, mech. brakes; elevator push-pull tube, rudder pedals, rudder cables, misc. control system components; plans, builder's manual, supplements, & instructions for installing optional nose gear. Entire project fits into a pickup. \$900. John Borra, 3327 Willow St., Hays, KS 67601 (785)628-0658, johnborra@media-net.net (4/00)

For Sale: Hand held radio power amp, Communications Specialist Inc. CS-10. 1/2 price off Chick Aircraft catalog. \$84.50. Boost hand held transmit from 1 to 10 watts. (602)231-2804 (3/00)

For Sale: 2180 VW with Force One prop hub, dual ignition, 0 SMOH, complete firewall forward from Sonerai II, \$2500, Fred Dube, (203)284-8642 or n99fd@webtv.net (3/00)

For Sale: Sonerai I Project - Std. Wing

done; welded fuselage, tail surfaces, controls, on gear; 1600 VW w/ SuperVee mount; canopy; cowl; wheel pants; aluminum tank; \$5000 OBO, John Ricchio, (708)447-0448 (4/00)

For Sale: Complete landing gear from Sonerai II, including Condor tires, Goodyear inner tubes, Azusa brake system, 3/4" tapered bearings. Off flying Sonerai, in excellent condition, \$400 Call Ron (301) 390-7705 (1/01)

For Sale: VW 1835 including dual port, dual ignition heads, taper prop hub, 150 SMOH, in excellent condition, sold as is, \$1500 OBO Call Ron (301) 390-7705 (1/01)

Wanted: Looking for someone to do the spar modification on a set of Sonerai II wings. Reasonable cost, On or near the East Coast (Washington-Baltimore Area) Call Ron (301)390-7705 (1/01)

For Sale: 1988 Sonerai IIL, 2180, 133 ft, 0 smoh, GP electronic ign and a magneto, GP alternator, Carb heat for NEW REV Flow carb, Oil cooler with new braided steel lines, NEW TERRA 250 D Transponder with encoding altimeter, New Icom A 22, Garmin 295 GPS, 5 point harness for the rear seat with dual retracts, 8 gal gas tank in rear, hydraulic brakes and brand new tires, A 22 foot new enclosed Haulmark trailer with lights inside, and a winch to get it in and out. Steel wing cradles that all fit inside of the trailer with the plane. A wing lifting device that will allow one man to put the wings on or off. \$14,200 which includes the new trailer. Don Shipley, Donan5@aol.com, (334) 598-5216 Ext 23104