SONERAI NEWSLETTER

APRIL-MAY-JUNE 2006

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PAUL MOMBOURQUETTE'S SONERAI II

In the last issue, there was a photo on the back page of Paul and his Sonerai II taxiing in from his first flight. Well, here's another photo (and something we don't see much in the newsletter, an in-flight photo) of Paul's great-looking machine. It is white with purple, black and gray trim. The engine is a Great Plains 2110 VW swinging a Sterba prop. See Paul's article and more photos inside.

GETTING READY

I'm writing this on the 2nd of April, two days before the start of Sun-N-Fun '06. A couple of months ago, I had hoped to be in Florida on this day on my way to Lakeland. But it turned out that it was not to be. A brief study of my finances dictated that it would be better to stay home and focus on OSH and some of the more local fly-ins. So, now I'm trying to figure out what things that I'm going to fix and update on the Sonerai for the upcoming flying season. April is Annual Condition Inspection month, so now is the time.

There are several parts on the airplane that I try to replace every few years. The first is the Tygon tubing that makes up the fuel gauge and the vent lines. After about 4 or 5 years, it gets really stiff and starts to discolor a little. So, I burn the fuel level down below 5 gallons before the annual, and drain the remaining fuel into a 5 gallon can. Then, out with the old and in with the new. The same

goes for my fuel lines. I've always used 3/8" ID automotive fuel hose from the tank to the gascolator, and ¼" from the gascolator to the carb. I just cut off the old and install new. And the 1-1/2" radiator hose connections in the intake manifold will get replaced, too.

Another set of parts that gets replaced every year or two is the spark plugs. As you all probably know, I now run Autolite #425 automotive spark plugs on both the primary and secondary ignition systems, along with the Great Plains spark plug adapters on the primary. Since the plugs cost about $1.50 each, it just makes sense to replace them often, and avoid any plug problems. Think about it: 8 plugs at $1.50 each is only $12.00 for the entire set. One Champion REL37B shielded plug costs over $30.00.

The final thing I'm considering replacing are the two rear exhaust pipes. These are the original pipes that I built back in the early '80's out of mild steel tubing. They still feel solid, but I think it's time that they get replaced. I just don't want to be going somewhere, and have a pipe blow off. It could get kinda nasty if there was 1200°F exhaust gas blowing on the cowling or firewall.

And one final bit of interesting info. Back in January, I was out flying about and had to fly through a light rain shower. This wreaked a little havoc on the varnish on the leading edges of my prop. The prop is a Sterba with the polyurethane leading edges. The varnish came off the polyurethane and exposed the wood immediately behind the leading edge. To prevent further damage to the wood, I removed the prop, completely sanded it with 150 grit sandpaper, and refinished it with three coats of polyurethane varnish. Of course, I rebalanced it, and then installed it on the airplane. I was pleasantly surprised to see the performance increase by a few miles per hour. I had noticed that the cruise speed wasn't really up to my expectations for the last year or so, but I thought that maybe the engine was tiring a little, and the airplane and I were getting a little fatter. Who would have thought? I'm always learning something about this airplane.

Keep on building, and fly them often.

SONERAI NEWS

- Great Plains News: Be sure to stop by and see Steve and Linda at Sun-N-Fun. Their booth will be located in Building A, in it's usual place. Also, Steve says that they now have the new Diehl "X" case in stock. This is the Diehl rear housing with the engine mount locations to match the original Monnett mount locations shown in the plans. And he has the new updated tailwheel springs in stock. These springs have a much larger machined radius where the pivot stem meets the flange. For more info, see *www.gpasc.com*.
- 2006 Fly-In Schedule:
  Here's a list of the big ones this year. Make plans now to go to the one nearest you:
  - Sun-N-Fun, Lakeland, FL 4/4-10
  - SWERFI, Hondo, TX 5/12-14
  - Golden West, Marysville, CA 6/9-11
  - Rocky Mountain, Watkins, CO 6/24-25
  - Northwest, Arlington, WA 7/5-9
  - AirVenture OSH, Oshkosh, WI 7/24-30
  - MERFI, Marion, OH 8/25-27
  - Virginia, Petersburg, VA 9/30-10/1
  - SERFI, Evergreen, AL 10/6-8
  - Copperstate, Phoenix, AZ 10/12-15
- New Sonerai Website: A few months ago, Scott Plischke (whose beautiful IIL was featured a year ago) turned on a new website dedicated to all of the Sonerai aircraft. The URL is *www.sonerai.net*. Scott has obviously spent a lot of time developing this site, and it has the potential to be very useful to all of us Sonerai folk. So, go out and take a look. It is very well done, and invites your participation. Sign up is free.
- A Formula V Website, Too: Dale Hueske dropped me a note back in February. He's now the webmaster for the Formula V website, *www.formulav.com*. He, along with Ed Fisher, are attempting to revitalize the Formula V racing scene, and are looking for interested people. You can contact Dale toll free at 1-877-679-0976.
- Sonerai Wing Construction Manual: There are 18 pages of text, 85 photographs, and 12 drawings, as well as a complete materials and a tools list. If you have an older set of plans (The manual is now included with the plans, so you new plans holders already have it.) and 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 now available in three forms. The first is a 3-1/2" diskette which contains 209 of the newsletter articles (text only) published by Ed Sterba from 1987 through 1995 It costs a mere $10.00. The second is a CD which contains complete copies of all of the newsletters published from 1996 through 2005 in a ".pdf" format. The cost is $60.00. And finally, there are also hardcopy back issues for $3.50 each. I have the last two issues from

1994, and all of the issues from 1995 thru 2004 (That's 42 issues!). If you want any of the above, send me a note requesting the ones you want and a check for the correct amount. Postage is included.

PAUL'S FIRST FLIGHT

By Paul Mombourquette

After getting some good information from Scott & Fred I was able to make the first flight of my Sonerai II mid-wing in November of last year. It went very well with a tail low takeoff and 85 mph climbout to the 7200' traffic pattern altitude. Out of the pattern I found I had built in a nice roll to the right and very little directional stability. Needless to say the seat-of-my-pants wasn't spending much time aligned with the seat-of-my-plane. A quick return to the pattern also proved that the runway hider out front worked excellently. My biggest concern before the flight had been what would happen on the ground when the bouncing started. I needn't have been worried though, because the rollout was truly a non-event. What a great relief and sense of accomplishment all rolled up in one!

My Sonerai had taken eight years to complete, during which time I moved to California and back again. I found the whole process of building to be enjoyable with painting being possibly the hardest for me to learn. The GPAC engine is 2110 cc with 7.5:1 compression, dual ignition, Ellison TBI, electric start and Ed Sterba 54 x 46 prop.

My secondary ignition is an electric unit made by Electromotive and uses a trigger wheel which I made, mounted behind the prop hub.

I have several Revmaster parts on the engine including their combination oil pump/oil filter/fuel pump and their large oil cooler horizontally under the engine sump. The fuel system uses a Facet electric boost pump, with a bypass check valve, feeding the gascolator then thru to the Revmaster mechanical fuel pump and into the Ellison TBI.

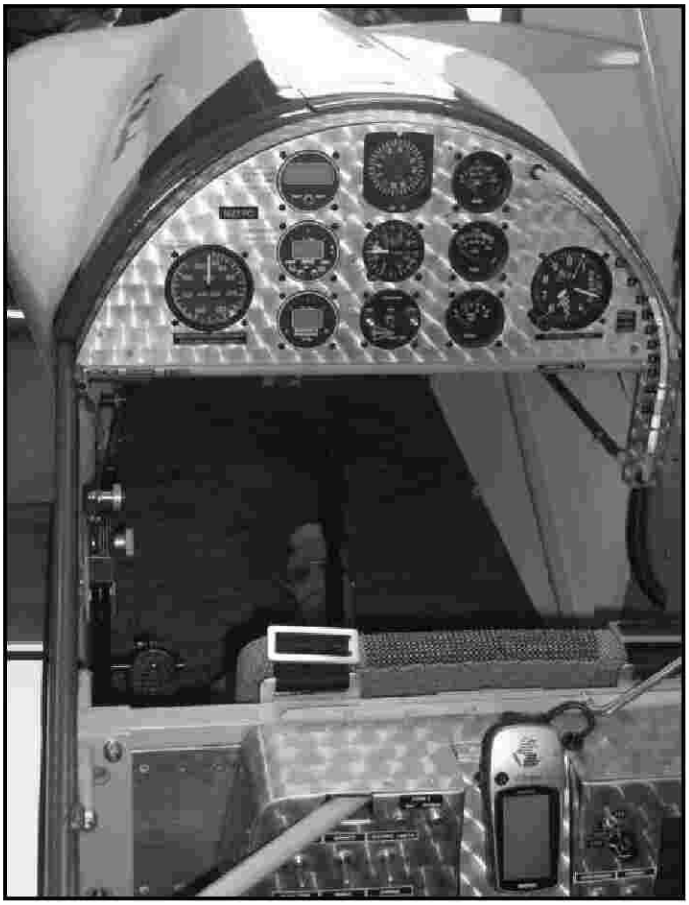
I have an electrical system with an ICOM A200 radio, Sigtronics intercom, rear seat switch panel and Menzimer electric trim. In the tail is a 17ah R/G battery, halfway into the tail access area.

Most recently I have added 7/8" length to rudder pedal control horns and switched to compression springs to operate the tailwheel. This reduced the pedal throw and now allows the rudder to hit the stop within my leg throw. This helped me a lot on the ground by reducing sensitivity.

I'm now in the process of trimming the plane to fly hands-off, which is going well. If I keep at it I know she'll be just right by the time the good weather gets here.

Happy building/flying,
Paul Mombourquette
Santa Fe, NM
themombos@yahoo.com

The Classic Profile of Paul's Sonerai II



A nicely done instrument panel and interior.

AZUSA WHEELS by John Stewart

Hi again Fred! Yes the dreaded Azusa "wheel wobble". It's different every time you put them together. Mine were particularly bad, and I nearly discarded them, then I read this article by Ron Wegner in **Recreational Aviation Australia Magazine** (June 2005). I will snail mail the article to you next week. I stuck mostly to the article, but in hindsight (experience gained), the following is what you do:

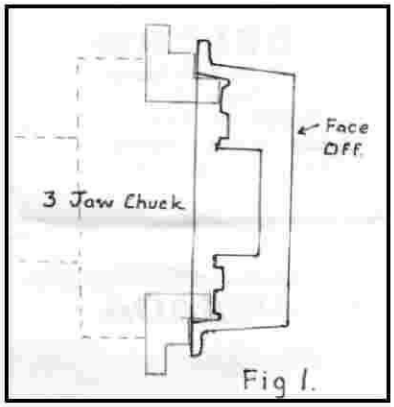


Fig 1.

First, get a 5/8" commercial hex head bolt (use a 3/4" bolt if you have that size axle) long enough to use as a mandrel to mount your entire wheel on and bolt together, a nut, and six large washers. Second, turn the hex head of the bolt down so that you have a concentric mandrel (bigger than the bolt). I faced the front of the bolt head as well, undercut it a bit, and centre drilled both ends. This worked out pretty well. You may need a carrier (handy if you've got one) so you can drive the mandrel from the chuck, or between centers (you could make one up if you had a mind to). Third, now the fun bit. Put the outside face of a wheel half in the three jaw chuck making sure that the spokes are hard against the chuck, and face off the inside split line surface (see Fig 1 from the RAA magazine article). There isn't much metal at the split line to do the next bit, but you turn a spigot on one half 1/16"deep by 1/16"wide, and a 1/16"by 1/16" recess on the other half to match so that the 2 halves can locate accurately together (see Fig 2). This is the important bit, as all else follows from here. DID I MENTION THAT YOU FILE OFF THE PINS THAT ARE SUPPOSED TO ALIGN THE

WHEEL? You could probably turn them off anyway.

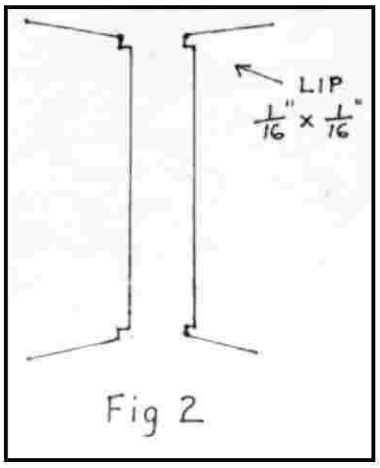


Fig 2

Now, you can mount the whole shebang on the mandrel. I pulled the washers up against the outer bearing cup on both ends, and it worked out ok, but a carrier would do the job better (see Fig 3). Now, you can see just how true the whole wheel runs. I had a bit of machining to do here, but this exercise here is to face off the brake drum mount face so it's dead true to the rest of the wheel. You may not be able to face all of it because of the mandrel and/nut/spacer but that's easy to undercut later on. That's pretty much it for the wheel.

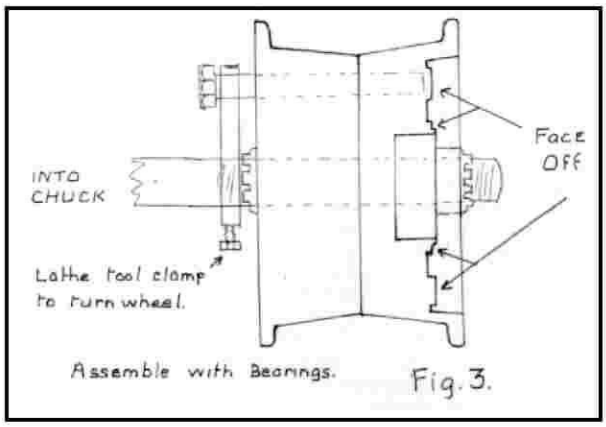


Fig. 3.

For those of you with a disc rotor bolted to that face, it should be fairly easy to mount the whole wheel with rotor bolted on to"face off" the rotor (the inside may be a bit of a trick, though. Another way to do it would be to take the bearings out (heat the half first), and with shims of aluminum, hold the bearing housing in the chuck and face off from there (I would do this if I wanted to do the job again as I got swarf or dirt in a couple of the bearings (sealed bearings), and I will have to replace them, but that's for another day.

ANOTHER TRAP IS THAT it seems that the BOLT HOLES THEMSELVES DO THE ALIGNMENT OF THE BRAKE DRUM. I machined another spigot where the brake drum hole fits on. It was a lot different. Then of course, a light skim cut out of the brake drum, and it sure looked pretty good. The bolts were then a bit tight, and I had to open the holes out .030". It all fits together fine. A bit of a clean up of the hole where the tube valve fits through, and it looks pretty respectable now.

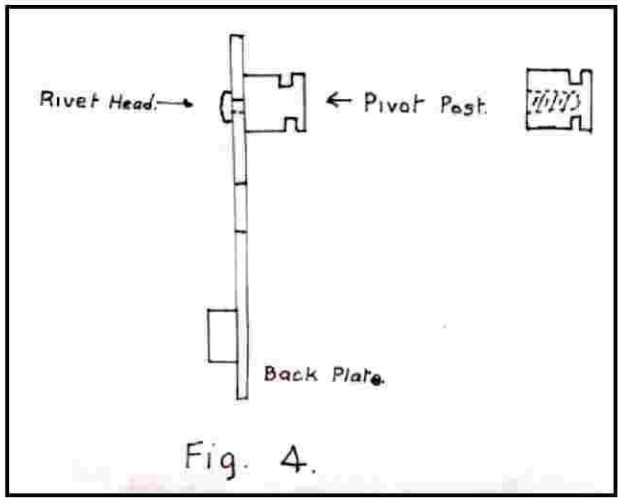


Fig. 4.

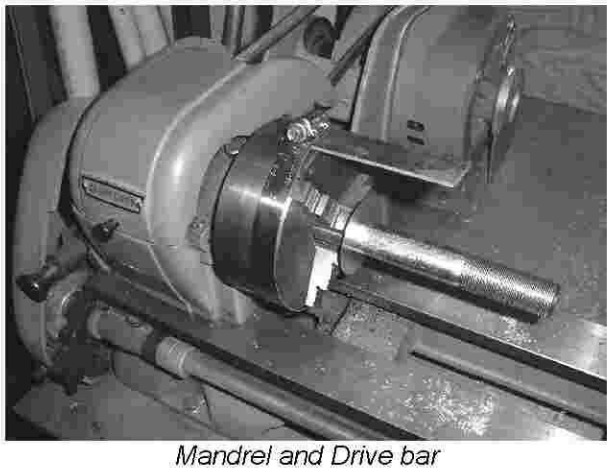
As for the drum brakes, THE IMPORTANT BIT IS the anchor/pivot post on the top of the back plate. This plate has to be aligned so that the shoes actually contact the full circumference of the shoe to the drum. The way ahead here is a bit of magic. Drill the rivet head off and remove the post. Machine off the remaining rivet head, and tap out the post to 1/4" UNF (see Fig 4). I used metric socket head grub screws (stainless steel) here. 5/8" deep works just fine. Just a bolt and lockwasher would probably do. I locked the grub screw down so that it was easier to adjust (into the post that is). Now, open out that rivet hole in the backing plate to 5/16", or a bit more. Put it all back together; wheel halves, bearings, drum, backing plate, brake shoes, all on the axle. Put the brake arm back on. Hold the axle in a vice, or on the landing gear itself. You have put the post on the back plate haven't you, with the bolt through it and the nut and lock washer nipped up. Then hold the brake arm hard over to apply the brake, and do up the bolt or nut, and lock the adjustment. This aligns the shoes with the drum. To check that every thing has worked out, use a feeler strip (say .010"), and you will find it does contact closely around its circumference pretty well, if not a bit more adjustment may be necessary. Before I did this, I had less than a third of the brake shoe in contact with the brake drum (if you did nothing else this would improve the brakes). I had to relieve the under carriage leg so that that bolt wouldn't jam

against the leg (drilled and countersunk). If you used just the bolt and lockwasher, it probably would clear that. So there you have it, Fred. This is a condensed version and it's a bit long winded. Well now time for a coffee break. Clear Skies and Fine Weather to you and our Sonerai Brotherhood.

CHEERS FOR NOW,
John Stewart
Melbourne, Australia

Freditorial comment: Timing can be a wonderful thing. John's article came to me as I was trying to figure out a way to keep my Great Plains disc brakes from screeking and scrawking as I taxied about the airport. The problem was that there was more than .045" of runout in each of my brake discs and that was causing the brake calipers to move back and forth in their holders. I had to come up with a way to eliminate the runout. The cause of the run out was not the discs themselves, but the Azusa wheels. They have always wobbled.

My first attempt to fix the problem was to buy a new set of Azusa wheels from Wicks (they had the best deal at about $28.00 a wheel). Well, they weren't much better than my old originals. After talking to John, and getting his article, I decided to try to true up the disc mounting surface using my 6" Craftsman metal lathe. It did the trick.



Mandrel and Drive bar

I did things a little bit differently than John did, but it was similar. First, I filed the split between the wheel halves to get them to fit as tightly together as possible. Next, I bought a 6" long, ¾" grade 5 fine thread bolt and nut from my local Ace Hardware. I cut the head off so that it would fit in the 3-jaw chuck on the lathe to act as a mandrel. Then, the wheel assembly with its bearings (but no bolts) was slid onto the mandrel bolt using several ¾" ID washers to properly space the assembly, and the nut was installed on the bolt to hold the assembly tight. A piece of aluminum bar stock was clamped to the chuck with a large hose clamp to drive the wheel. Finally, a single-point cutting tool was used to true up the brake mounting surface. I found that the mounting surfaces were as much as .030" out of plane before I machined them.

Machining the Mounting Surface

Once the wheels were trued, and installed the brake disc run out was substantially less, and the noise has pretty much disappeared. (As a side note, I also found that the screw holding the brake puck on the fixed side of the caliper wouldn't stay tight, so I put a small dab of high-temp silicone on the back side of the puck and reinstalled the screw. I think that helped, too.)

N772MT'S ELECTRICAL SCHEMATIC

by Mike Then

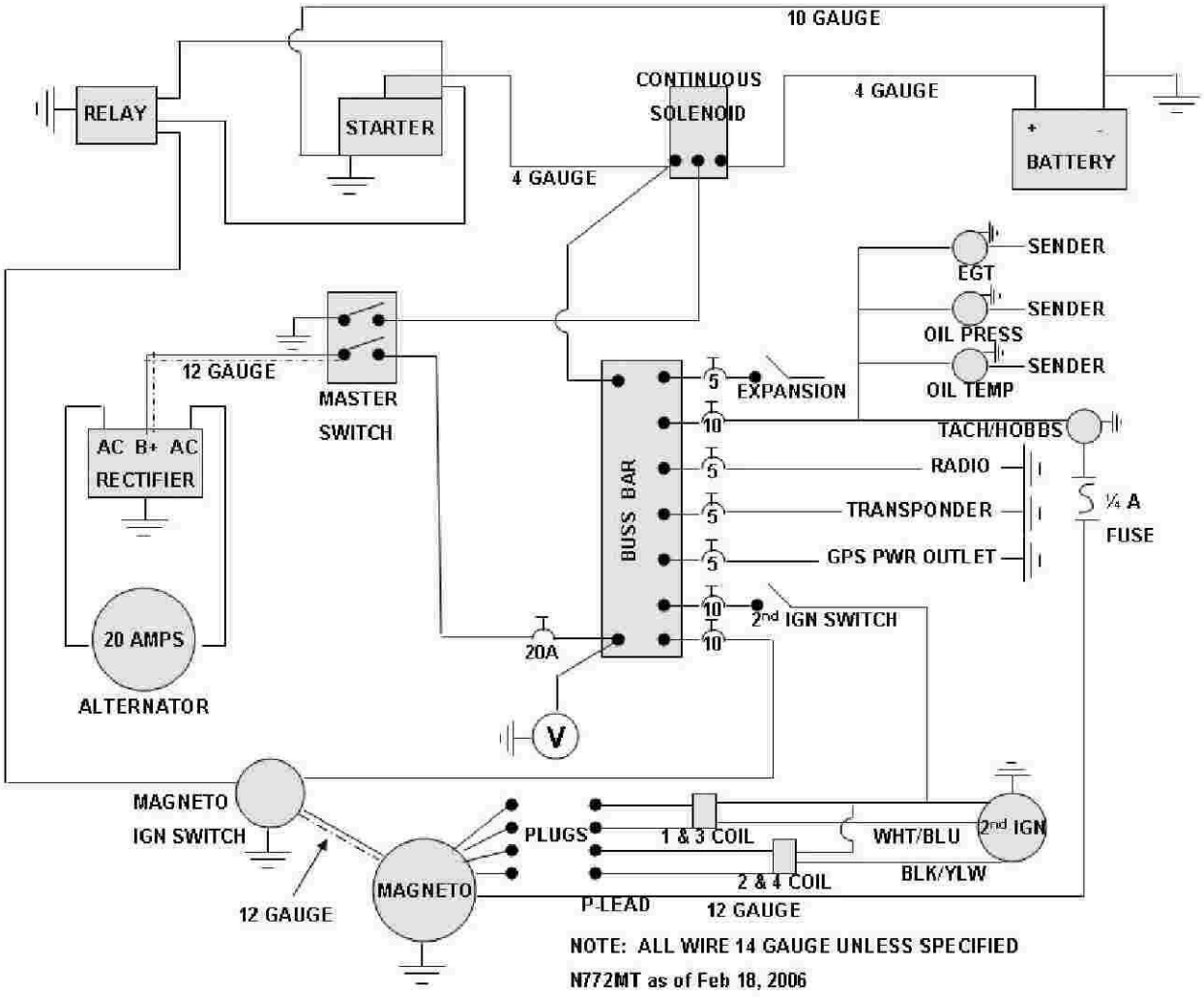
Fred: As promised, here is my electrical schematic. At may help others, as it represents probably the most you would want to have on a Sonerai with 20A alternator. Here are some additional notes:

- Battery is a UBX20L-BS (sealed) about 250 cold crank amps
- Starter relay system draws min power from the battery. Relay is a Cole Hersee RA-400112-NN
- In addition to the airframe, ground the battery directly to the starter!!!
- Battery is in the tail of my LTS, per plans. Depending on your configuration, I would consider putting behind the pilot for more forward CG.
- Starter, continuous solenoid, mag switch, alternator, volt regulator, 2nd ignition system, Slick 4316magneto are all from Great Plains

- With all these goodies, my LTS empty weight is 644 lbs.

As I previously mentioned on my first flight, I had a believed mixture problem causing a lean situation. Late fall/early winter I attempted 2 flights, but each time I was not comfortable with the engine run up. I seemed to be chasing adjusting the mixture with every change of 20 degrees F. AeroVee thought my adjustments were excessive, and suggested to look into my timing. That is where I sit, with now my "disposable" time focused upon our house construction with hopes to complete the home by Nov 06 ("hopes" key word). I will keep you advised on the next flight. As always, thanks Fred for keeping us all informed!!!

Mike Then
n772mt@earthlink.net



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FOR SALE: Sonerai II with 8 total hours of flight time. It has been garage kept the entire time. It has a production date of Feb 1982. It has an air cooled 4 cyl. 70 hp Volkswagen engine. Engine has been turned over from time to time to keep it from seizing up etc. Charlie Barnes, cell # 469 853-6472 or email at *tx-rmef-1@swbell.net* (2/05)

FOR SALE OR TRADE: Aerosport Quail. All metal, high wing, cantilever. 11 gal fuel in wing tanks. Cruise 105mph on 3.5GPH. Built in 1977, in storage 15 years. 450 ttaf, 44 hrs since VW rebuild. Easy entry, just raise the door and sit down. Tri gear. $9,500, includes new GPSIII and IcomAR5. New slick mag. Lic till Oct. May take Sonerai2 original or project trade. Jack Cupp, Phoenix, AZ 85032 602-788-9117, *jack@xoomup.com* (3/05)

FOR SALE: Sonerai IILTS w/ 100 hp liquid-cooled Rotorway engine. 67 hrs TT, covered with Stits Aerothane. Always hangared. A good flyer. Reason for selling: too many birds in the roost. $15,000 Fred Ninneman, 816-353-1161. (2/06)

FOR SALE: Magellan Skystar Plus handheld GPS, with moving map, aviation database, 12 volt DC power chord, remote antenna adapter, and yoke mount. Works great, but can no longer get database updates. $50. Fred Keip, 262-835-7714, *fredkeip@aol.com* (1/06)

FOR SALE: Sonerai II. Fuselage complete; 2 sets of tail feathers; landing gear with disc brakes; tailwheel; 2 sets of wing tips; cowling; wheel pants; rebuilt 1850 VW with alternator, posa carb; many extra parts. $2500. Joe Kelly, 10141 Flagstone Rd., Brooksville, FL 34601, 352-796-9793 (1/06)

FOR SALE: 5/8" Sonerai II landing gear, including Tracy O'Brien C-90 hydraulic brakes, ¾" Cessna-style axles, 5" Azusa aluminum wheels, tires. Used but low time. New $850. Sell for $425 plus shipping. Located in Juneau, WI. Email *dbcpa@powerweb.net* for photos. Dave 920-887-3131 (2/06)

FOR SALE: Round Specialty Welding horizontal stabs, elevator, and rudder for Sonerai II. $100. Harry Teal, *hhteal@webtv.net* (2/06)

WANTED: Sonerai I complete airplane or well-along project. Solid workmanship and light weight. Bill, *machouse3462@sbcglobal.net* (2/06)

Steve Dyer's Sonerai II

This airplane was featured on the cover of the Oct-Nov-Dec 2004 issue when it was owned by Drew Waterworth. Steve has added flames and the lightning bolts to the red-orange paint job. Lookin' good!