

SONERAI NEWSLETTER

OCT-NOV-DEC 2005

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MIKE WELCH'S SONERAI IIL

As you can see, Mike's airplane isn't quite done, but it's getting mighty close. Mike supplied the photo, along with an article and additional photos that are elsewhere in this issue, early this year, so hopefully it's nearing completion. The engine is a 2110cc VW that Mike built himself, and will swing a Sterba prop. And note the aluminum cockpit side panels.

OSHKOSH 2005

The EAA convention (I know, I know, it's AirVenture) at Oshkosh this year could be characterized several ways. First there was the weather. If it had snowed, we would have had a little bit of everything. There was the stifling heat on Saturday and Sunday prior to the opening. There was the 4" of rain on Monday night. There was standing out by the airplane on Tuesday with a rain coat on to stay warm. And there were some really nice Wisconsin summer days.

The second was the turnout of airplanes. It seemed like the homebuilt area was always full. When someone would pull out to go home, there was someone else waiting to take his spot. We had four Sonerai's come out this year. Of course, I had my Sonerai IIL, N99FK, there. Jeff Lange brought his gray primed, soon-to-be painted Sonerai I, N1463J, from his hangar across the field. Chad Stenson flew his red and white Sonerai IILS, N676CS, with its highly modified 2332cc VW from Sheboygan, WI. And toward the end of the

week, Tim Mikus brought his green and polished, Continental A-80 powered Sonerai IIL, N2308W, in from Greybull, WY. Nice airplanes that were representative of the Sonerai genre. Thanks guys, for bringing them.



Jeff Lange's Sonerai I



Chad Stenson's IILS



Tim Mikus' IIL



And the ever-present N99FK
in display configuration

Of course, there weren't just Sonerai's there. There was White Knight and Space Ship One, the Virgin Atlantic Global Flyer, the P-38 Glacier Girl (it looked really neat flying in formation with a P-51, and an F-4 Phantom, and an F-18), the HondaJet, the Eclipse 500, the Cessna Mustang, six old trimotors, and a gazillion RV's.

We had the Sonerai Builders Forum on Wednesday. Someone counted noses, and said that there were about 40 people there. I presented my slightly updated PowerPoint presentation again, and it seemed to be well received. I hope it was of value to those of you who were there.

On Thursday evening, Jeff Lange hosted the Sonerai Picnic at his hangar on the northeast side of Wittman Field. About 15 dyed-in-the-wool Sonerai folks came over to enjoy the burgers, brats, and fixin's, and provide commentary on the Sonerai II project hanging from the rafters. Thanks from all of us to Jeff for a job well done. He has hinted that he will do it again next year. Let's hold him to it.

Chad flew his airplane in the Homebuilt Review on Friday, showing the rest of the convention-goers how nice a Sonerai looks and sounds in the air. He said he had a good time, too.

I flew my airplane home on Saturday, and returned in my trusty Ford Ranger to collect my camping gear, and spend one more day trying to see everything I'd missed. As usual, the week spent at OSH was a good one, and I'm already thinking about '06. I wonder how that one will be characterized?

SONERAI NEWS

- Great Plains News: As I alluded in the last issue, Steve now has new secondary ignition system drive that mounts on the front of the oil pump housing. If you don't have room on the top of your engine to mount the drive, you can now put it on the front of the engine. Go to www.gpasc.com for more info.
- 2005 Fly-In Schedule:
There's only a couple more big fly-in's left this year. Be sure to go the one nearest you, and show off your Sonerai.
 - SERFI, Evergreen, AL 10/7-9
 - Copperstate, Phoenix, AZ 10/6-9
- 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 2004 in a ".pdf" format. The cost is \$50.00. 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.

MIKE'S SONERAI IIL by Mike Welch

Fred: I met you at Oshkosh 1990 where you gave me a drawing for the top-mounted oil cooler plate for the Sonerai. I had a machine shop make the plate at no cost to me because I worked for the pipe company that owned the machine shop (thanks for the drawing). At that time I had my wing spars built and my fuselage on its gear.

I started building my Sonerai IIL in 1982 from the so-called kit from Monnett. I know what you're

thinking, but it's almost completed. Except for paint, all I lack is the engine baffle seals, and the fiberglass work on the nose of the cowling, which I'm working on now.

The airplane includes the "S" wing, elevator trim, hydraulic toe brakes, starter with the battery in the tail, and a baggage compartment.

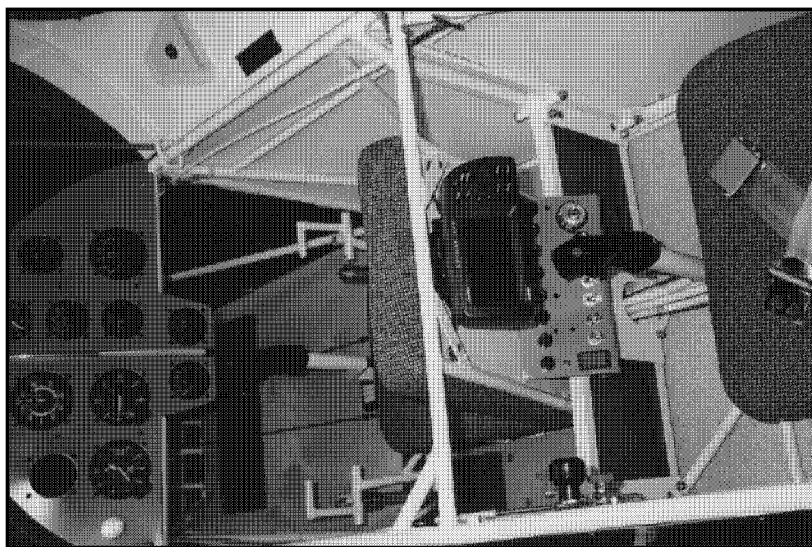
The engine is a 2110 which I built from mostly Steve Bennett's parts. It includes dual ignition, Ellison carb, Sterba prop, and a carb heat box similar to yours which I built from your article in the newsletter. To date, I have 9 hours on the engine, and it runs nice. I hope to have the airplane in the air sometime this year.

Thanks for answering all my questions over the years whenever I called. I couldn't have gotten this far along if not for you, Steve Bennett, and EAA.

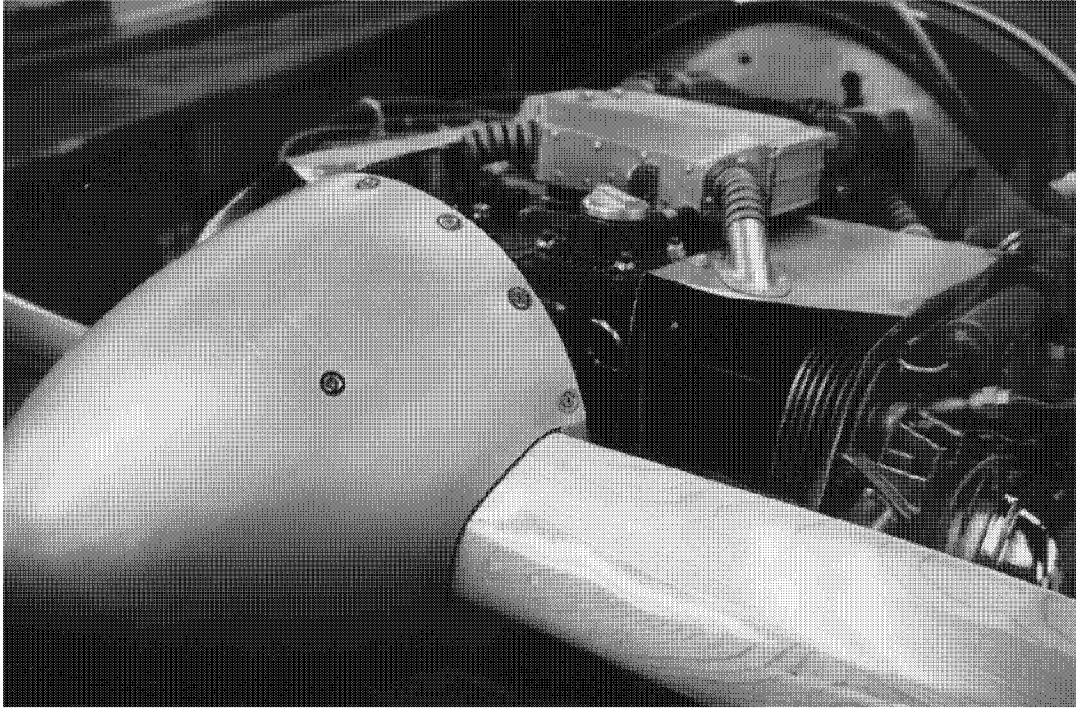
I know this isn't much and I'm not much of a writer, but you said in the newsletter to send stuff that you can publish. Hope this helps.

Mike Welch
Vestavia (Birmingham), AL

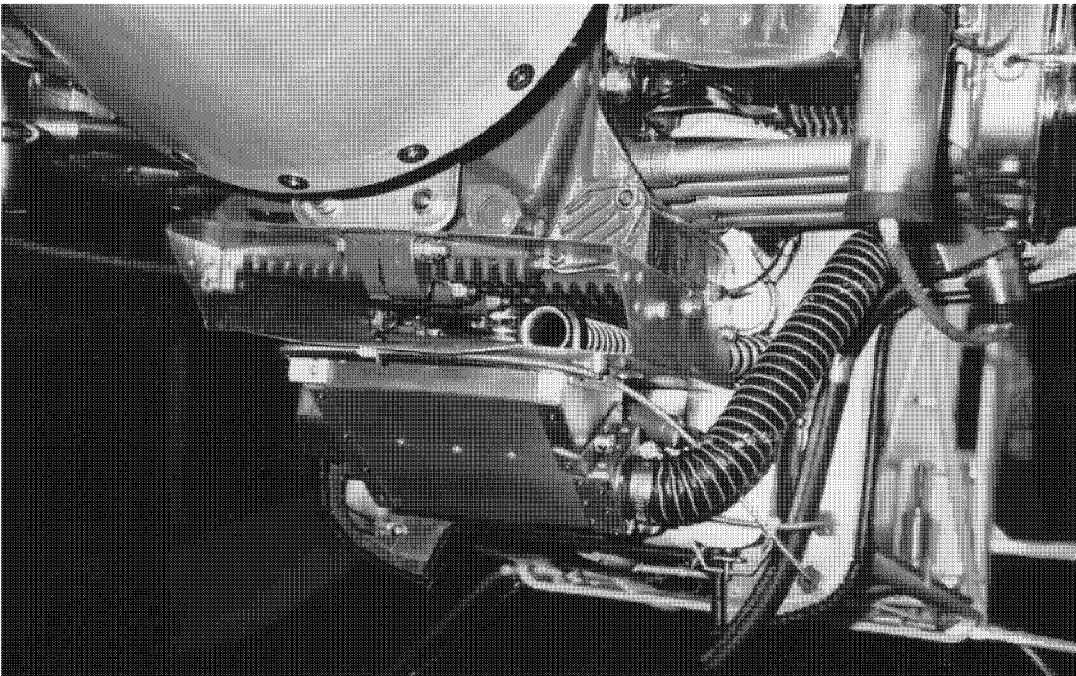
Freditorial Comment: Mike, great stuff. Short and to the point. I hope you'll send pictures of the final product, and a first flight report. By the way, I still have the set-back oil cooler adapter drawings, if any of you want to build one the hard way. Otherwise, Great Plains has them already made.



Mike's cockpit is neat and simple.
Note the set-back front seat back and the toe brakes.



A top view of Mike's 2110 VW
with box-style baffles and oil cooler plenum.



The bottom view showing the oil pan baffle and the air box.

IIL FOLLOW UP by John Avent

The Jan-Feb-March issue featured John's Jabiru-powered Sonerai IIL on the cover, along with the story of his first flight. Here's some additional info on his airplane that he sent earlier this year.

Hi Fred: Sorry to take so long to get back to you. I have had extended family visiting before Christmas and then was out of town after Christmas. I had also hoped to get some more flying in so that I would have a little more to write about, but the weather has not really cooperated. I hope this has not held you up on the newsletter.

I did not use the Jabiru factory firewall forward package, either. I did a weight and balance on the plane without the engine to calculate the position of the engine, then designed the mount as required. I ended up a little long on the motor mount, so the plane is a little nose heavy. CG range is from 8.34 inches to 12.3 inches for my weight (175 lbs). Empty weight is 530 lbs. with battery and basic VFR instruments.

Other than the Jabiru engine, I did not make many modifications. I used a leaf spring instead of the rod-type tail wheel spring, and used a Matco tail wheel unit. The runway I operate from is a little rough, so the standard little tail-wheel would not have worked too well (it could get stuck in the cracks in the runway). I am using the standard mechanical brakes, but plan to upgrade to hydraulic brakes sometime soon. I built custom fiberglass wingtips, and the cowl is all custom made for the Jabiru installation. The upper nosebow and lower cowl (back to the firewall) are fiberglass, and the rest is aluminum.

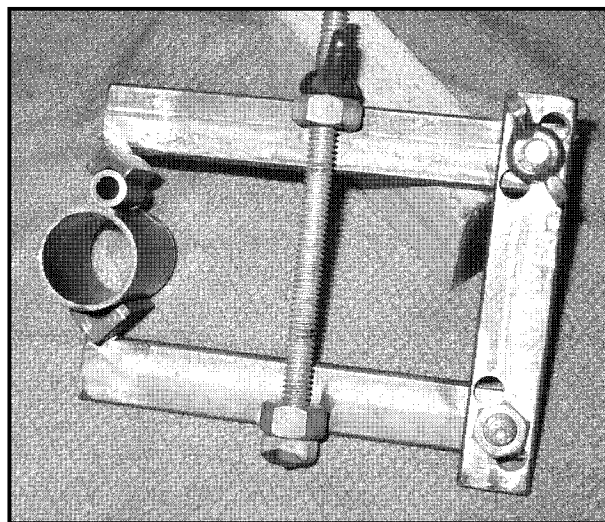
I covered the fuselage and tail using the Ceconite 7600 process (now ACS) up through the filler coat. I used exterior latex house paint for the final topcoat. It turned out pretty well (I'm not a great painter), and was much less expensive than using any "regular" aircraft paint. I used a water-based primer designed to prime aluminum on the wings and other aluminum and fiberglass parts. The "stars & bars" on the fuselage and wings are vinyl decals from a local sign shop.

So far it has been a delight to fly and basically trouble-free. I now have 5-1/2 hours on it, and am just about to get comfortable landing it (our runway is only 40 feet wide). Let me know if you need any other info. I'll keep you informed on the progress of the flight testing.

BUSHING POSITIONER TOOL

by Tom Hubbuch

In many welded tube fuselages it is necessary to position and weld short tubes or bushings along side other tubes to serve as hinges. When fabricating the rudder and stabilizer hinges on my S2LS project I found it very difficult to accurately position and hold these bushings in place for welding. I tried twisted wire, C-clamps, spring clamps, etc., but all were cumbersome. So, I devised a crude tool which solved the problem for me. The photo should be fairly illustrative of what I came up with, but a few comments may be helpful:



1. Make the individual parts in the spirit of the drawing. Use what you have at hand.
2. The angles should be about 1 to 1-1/4" inches long, and the angles legs should be about 1/2" each. I had to trim, grind and file a larger legged angle, since I did not have this small size angle available.
3. Note the notch in the ends of the arms. File them about 1/8" deep; they will help to position the angles to the arms in the next step.
4. For initial assembly, alignment and welding of the tool - locate the angles on opposite sides of a tube of about 1" to 1-1/2" in diameter. The angles legs should have line contact with the tube, and theoretically should be parallel with each other. You can tape them in place if you don't have three hands. Then, with the arms adjusted on the backbone to be fairly parallel to each other, snug the attachment bolts, and tighten the clamping wing nut enough to ensure that the arms notches engage the angles and will stay in place. Adjust things to get the angles perpendicular to the arms and the arms perpendicular to the backbone. Resnug the bolts if necessary. Then, weld the angles to the arms. A heavy tack weld should do; I don't

think a full penetration, all around weld is necessary, and excess heat may cause distortion and negate all the careful alignment you just went through.

5. The series of closely spaced holes in the backbone allows positioning of the top arm to accommodate various combinations of sizes of frame tubes and bushings, and still keep the arms parallel to each other. This could be made into a continuous slot if you spend time filing or have a mill.

6. Tack the arm attach bolt heads to the back sides of the arms to keep the bolts from turning, and use wing nuts to allow easy, no-wrench tightening.

In use, position the bushing, and its spacer shim if used, on the frame tube, and manipulate the tool to the correct position. Tighten the clamp wing nut just enough to hold the parts in place. Too much clamp force will cause distortion to the bushing or frame tube when welding heat is applied. The initial weld should be just a quick tack weld to hold the bushing in place. A similar quick tack on the opposite side will fix the bushing in place, and the tool can be removed.

If possible, tack all the bushings on the frame tube, and re-check alignment of each bushing relative to others. I used long all-thread rods installed through one bushing to the others to help eyeball alignment. When satisfied, do the finish welding.

ANOTHER SPARK PLUG STORY

Did you ever wonder how something as wonderfully simple as a spark plug could make life difficult? Well, I have, and here's my story.

For most of the flying season this year, my airplane has been increasingly hard to start. (That's important because I don't have the luxury of electric start.) Once the engine was started, it ran well enough, and seemed to be generating it's normal horsepower (which, of course, is never enough), but it just took a lot effort to get there. It was even getting to the point where I was getting afraid to go somewhere for fear that she may not start for the return home. It was getting frustrating.

The part that really frustrated me was that "hard starting" is usually the classic symptom of the magneto going bad. But this mag only has a bit over 200 hours on it. That's no where near the normal life for a magneto, and I wasn't looking forward to shelling out several hundred dollars to repair or replace it.

The situation was finally brought to a head a few weeks ago, when on a Saturday I decided to just go out for some local aviating. I rolled the airplane out of the hangar, preflighted it, and proceeded to start it. Well, to make a long story short, it took somewhere between 50 and 100 blades to get her to run. Needless to say, my left arm, and my patience were worn out, and my trust of the magneto was waning.

After a nice flight, I put the airplane away, and decided do something about it the next day. Bright and early on Sunday morning, I returned to the recalcitrant beast with a spare, used 4216 mag that I had inherited from Ed Sterba when he moved south, with plans to install it to see if it would fix the problem. But before I went that far, I decided to see how well the existing mag worked. I removed all four of the Champion RL87YC automotive spark plugs, reconnected them to the mag, and set them on the cylinder heads. I then turned the mag switch on, and pulled the prop thru four times to check the quality of the spark at each plug.

Surprise! Surprise! There was a healthy-looking spark at each plug. To verify my observations, I asked good friend, Ken Flaglor, who was in the process of doing the final assembly on his new Dakota Hawk, to come and take a look. He agreed that the spark looked pretty good. Not perfect, but pretty good. So, the mag appeared to be OK. Now what do I do?

Ken looked at me and said, "Why don't you put a new set of plugs in? They're cheap." It made sense, so off to NAPA I went for a new set of Champions. Well, they didn't have the Champions, and neither did Bumper-to-Bumper or AutoZone, but they had the equivalent Autolite #425 at the awe-inspiring price of \$1.38 each. So, Autolites it was. I put them in, hooked everything back up, and pulled her out for the TEST. Two shots of prime, four blades to prime the cylinders, mag on, and four blades later, she was running. Ah, just like the good ol' days. I was a happy Sonerai guy. And she's been like that ever since. Even the hot starts are easy.

The next day I was telling Keith, my hangar partner, about the experience, and he said, "Shoot, I could have told you that." Many years ago, he owned a Triumph motorcycle shop, and all of the Triumphs were shipped with Champion spark plugs. At least half the time, the new bikes would not start. Once the Champions were replaced with NGK's, they'd start every time. Apparently, they will fire well in the open, but won't fire when under compression. I've since told this story to several other people and heard similar stories. Needless

to say, my Sonerai will no longer have Champion plugs in it. And at \$1.38 a piece, the Autolites will be getting changed at each annual inspection.

MIDWEST SONERAI GATHERING

Well, my first stab at organizing a **Midwest Sonerai Gathering** is in the books. I had hoped that we could get a half-dozen or so airplanes to the North Central Old Fashioned EAA Fly-In at the Whiteside County Airport (SQL) at Sterling-Rock Falls, IL on September 17 and 18, but it was not to be. Even though the weather was almost perfect, the Sonerai turnout consisted of me and N99FK on Saturday, and an appearance by Norm Swanson from Midlothian, IL with his 1850-powered Sonerai II Sunday morning. (Actually, Norm wasn't aware of the Gathering. He just came for the breakfast.)

I still had a good time displaying the airplane, and talking to everyone. Several folks came some distance to see and talk Sonerai's. Harry Teal and his wife, Maggie, drove up from Sanford, FL. Harry is building a ILS with a metalized fuselage and tail, and is going to install a Great Plains engine with water-cooled heads. Tony Gibson and his friend, Mandy, drove down from Winnipeg, MB. B.P. Wisniewski and his brother drove over from Eastlake, OH. And Bob Richtsmeier came over from Iowa. Sonerai guy Dave Rawlings was also there, and we talked some about his water-cooled head engine that he's been installing in his II "Sporty". Hopefully, we'll see that flying next year.

Harry, Maggie, Tony, Mandy, and I went out for dinner at a local family restaurant Saturday evening. The food was good (and inexpensive) and the company was superb. It seems that you can talk about our little airplanes for a long time. Afterwards, we wandered back to the airport and the mini-campgrounds that got set up there.

So, will there be a 2006 Sonerai Gathering? I'd certainly like to try again. At minimum, I hope to go to the NCEAA Fly-in. Why not join me?

A NACA "SMILE" by Tommy Warren

Building a Sonerai requires a fair amount of research (education), just as the FAA intended, especially their power plant systems. I learned that cooling the VW engine housed inside a Sonerai cowling seemed to be a fairly common problem. After talking to Sonerai owners, and inspecting any number of installations, it seemed to me that total

VW cooling could be broken down into 2 areas: 1) oil cooling and 2) cylinder head cooling.

I noticed that, there was not just one correct cooling setup, however there are basic guidelines, which should be followed to keep our VW's cool.

One part of the oil cooling system involves ducting air to the oil pan cooling fins. I decided to use an NACA designed cool air cowling inlet (smile) under the prop. (*Editor's note: the cowling that Tommy is describing is commonly referred to as the SuperVee cowling, which is not supplied with a "smiley" like the more common EV cowling.*) For those not familiar with NACA, it was the forerunner of NASA. Anyway, it is my opinion (and the opinion of NACA) that, when correctly designed and installed, this style opening is more efficient and creates less drag than a random cowl opening. It can be designed using formulas readily available on the Internet allowing for flexibility of dimensions resulting in a direct flow of cooling air, exactly matching the VW's oil pan frontal area. In conjunction with a simple aluminum oil pan baffle, these accessories, when installed correctly, can provide an important part of your oil cooling system.

I can provide these fiberglass NACA inlet cowling openings, made from a male mold. It is the same as I fly on my Sonerai I, and comes complete with installation instructions; a full sized cowling cutout template, pictures and hardware (rivets). The price is \$40 plus shipping.

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Happy

Holidays

Fred

WANT ADS

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TAPER PIN REAMERS & WING RIB LIGHTENING HOLE FLANGING DIES FOR FREE LOAN. Brown & Sharp #3 and #5 for AN386-3 and AN386-5 taper pins. \$150 deposit, shipping one way ~ \$5. Free loan for 14 days, \$2 per day after that. David E. Wilcox, 517 E. Saratoga St., Gilbert AZ 85296. dwilcox@ispwest.com

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)

RACEAIR DESIGNS IS AVAILABLE FOR YOUR FABRICATION AND RESTORATION NEEDS. Contact Ed Fisher, (330)856-7520, raceairdesigns@hotmail.com. Over 30 years experience in dope, fabric, welding, and sheet metal. Numerous awards including 1991 and 2004 Oshkosh Grand Champion Ultralight. No job is too big or small. Need a fuselage welded? Give Ed a try!!

For Sale: Gyrocopter (Benson-type) with Brock seat tank, metal tail, extended mast for Rotax or your choice. Offset gimbal head with rotor

blade bar. Needs rotor blade and engine. Otherwise assembled, on gear with Brock joystick control and wheels. \$1950. Fred Ninneman (816)353-1161 (2/04)

For Sale: Sonerai II, built 1981, 200 TT, Revmaster 2100S. Will deliver for expenses. \$10,000. Also, a complete HAPI 1835 with Zenith carb, \$3,000. Bob Jorgenson (435)678-3436, bobl@snsa.com (2/04)

For Sale: Sonerai II project. Ready for cover. S-wings, on the gear, fiberglass turtledeck raised for taller pilot, built for Continental A65 which is included (basket case). \$5,000 invested, will take \$2,500. Kurt Schafer, (807)274-1766, wkos@jam21.net (3/04)

For Sale: AeroConversions Aero Carb ACV-CO2, 29mm for 1835 VW, new, never installed. \$300. Dick Bonney, (727)733-9273 (4/04)

Wanted: Sonerai II mid-wing or low-wing taildragger, preferably with a 2180 VW. Bob Campbell, 112 Chestnut Street, North Reading, MA 01864 (1/05)

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: Revflow 32mm carb, complete with air filter and ram air tube. \$60US Please email Tony @ umgibso1@yahoo.com if interested. (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. \$16,500 Fred Ninneman, 816-353-1161. (4/05)



Norm Swanson and his Sonerai II at the "Gathering"