SONERAI NEWSLETTER

APR-MAY-JUNE 2009

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WAYNE RICHMOND'S SONERAI IILS

I got this from Wayne in January: Hi Fred: Hope you're well, and still doing plenty of flying. Since chatting with you on phone last, probably 2 years ago, I have had my Jabiru 2200-powered Sonerai IILS flying for 12 months (with 130 hrs on the clock). I'm very pleased with the result (One up lifts off in 250 m, climbs 1600 fpm. At gross, 300 m and 1200 fpm. It cruises easily at 120 kts with 2 up at 2850 rpm. Aero's a lot more nimble than the RV-4 (lot lighter stick pressures) We had a sport aircraft fly-in here last year, and to my delight, had a long chat with John and Betty Monnett (even got John to try my machine out for size). John was over as guest speaker. Anyway, I am getting a good Sonerai following started here, with several partially completed old projects being completed. My sons also both fly, with my youngest (30) being an instructor who thinks the Sonerai is pretty special. I have just ordered a set of Sonerai 1 plans for my son. Best regards, Wayne Richmond. New Zealand. (This photo is sitting in Queenstown (bottom of the south island) on our way to the Warbirds over Wanaka airshow held bi annually.)

SUN-N-FUN IS UPON US, AGAIN

As I write this, it is the first weekend in April, and we're weathering a winter storm warning for the second weekend in a row. It certainly makes it hard to get any flying done, and makes me yearn of the warmer climes of Florida. Unfortunately, I'm not going to get there for the 2009 event. I seriously considered driving down, but having to send four days of hard driving to make the round trip for only four days at the fly-in just didn't make sense to me. So, I'll probably do something a little closer to home, like fly to Dayton to visit the Air Force Museum.

That being said, I hope some of you get a chance to get there. It is always fun, and there are always some interesting airplanes to see. If any of you get there, and see any nice Sonerai's, please take a few photos, and send them to me for use in the newsletter. I'd really appreciate it. Also, be sure to stop by and visit with Steve and Linda at the Great Plains Aircraft Supply booth in Building A. Steve will be running his VW engine building workshop all week in the Engine Workshop, and giving a VW engine forum, so check the schedule for that.

Since the last issue of the Sonerai Newsletter was published in January, I've been spending my winter weekends working on my current project, the Wag-Aero Wag-A-Bond. Keith, my hangar partner, had some room in his heated shop, and convinced me that I shouldn't leave the fuselage hanging in my garage collecting rust any longer. So, I moved it and got to work finishing up the welding. The primary structural welding has been complete for a while, which leaves the installation of the controls, all the mounting tabs, the "birdcage" over the cockpit, and the building and installation of the doors.

So far, I've gotten the stick and rudder controls installed and the elevator and rudder cables made, the tabs for the floor, boot cowl, and firewall in, and the instrument panel mounted. Next, I'll finish the trim system installation, and then it's on to the birdcage and the doors. My goal is to get the welding done so that I can get it sandblasted and epoxy primed this summer. Then I won't have to worry about the rust any more.

As far as the rest of the project goes, the tail surfaces and wing struts are complete, only needing sandblasting and priming. The wings are about 95% done, needing only the aileron interconnect cables installed and the fuel tank covers make. The engine, a Lycoming O-290-G converted to a –D, is on the mount ready to be installed. Of course, the baffling and cowling still need to made. I also have a Sensenich wood prop with the metal leading edges that's ready to go on as well.

I've been telling people this airplane is my "old man, retirement" airplane that I will be able to use when I can't get in and out of the Sonerai anymore. Hopefully, that won't be for a very long while.

Enjoy the spring and summer, and we'll see you in July.

FUSELAGE CONSTRUCTION, PART 2 GETTING STARTED

OK, the shop is set up, all of the tools are bought, and the jig table is built, we're just about ready to start the fun part, building the fuselage.

Tubing:
You did order all the tubing as outlined in the materials list that came with the plans? If you haven't, there are several places to get 4130 normalized steel tubing: Aircraft Spruce and Specialty, Wag-Aero, Wick's Aircraft Supply, and AirParts are the obvious ones. But, you'll probably find that the best deal will come from Dillsburg Aeroplane Works (114 Saw Mill Rd, Dillsburg, PA 17019, phone: 717-432-4589). Be sure that when you place your order that you get pieces of tubing long enough to make your longerons without splicing them. Tubing is usually shipped in random lengths about 12 feet long, so be clear about your needs when you order.

Layout the Side:
Get your pencil, straightedge, and carpenter's square, and draw the full-scale layout of the side of the fuselage on the top of your jig table. The Sonerai fuselage is built a lot like the old balsa stick model airplanes (if any of you are old enough to remember doing that). We'll start out assembling and tacking the two sides. Then, we'll bend them, set them upright on the jig table. And then we'll cut and fit all the cross-members that tie the two sides together. And finally, weld the whole thing together.

The side view of the fuselage that is shown in the plans is the flat pattern that we'll transfer to the table top. Remember, that each of the lines is the centerline of a tube. Once all of the centerlines are drawn, go back and draw the tube width (diameter) for each centerline. In other words, if the tube is ¾" O.D., draw line parallel to the centerline 3/8" on either side of the line. Note that the tube sizes are

specified on the drawing with a circle (for round tubing) or a square (for square tubing) with a number inside and a decimal dimension on the outside. The number on the inside is the tube size in 1/16's of an inch, and the decimal is the wall thickness. (On the Sonerai I drawings, the tube sizes are coded "A", "B", "C", and so on, with the tube sizes defined in the lower left corner of the drawing. If there is no code, it is 5/8" x .035".))

Next, get a piece of 1" (3/4" thick) pine board (or scrap plywood) and cut a bunch of ¾" x 1" x 2" blocks. You'll need 75 to 80 of them. Nail or screw these blocks along one side of each of the tube outlines. Make sure that each of the blocks is at least a couple of inches from each of the tube joints.

One Side in the Jig

Building the Sides:

Now, let's assemble the first side.

1. Start with top longeron since it is straight. On the II's the front portion is ¾" x035" and the aft portion is 5/8" x 035", (on I's, it's one piece, 5/8" x .035"). Cut the pieces long so that they stick past the front vertical, and the rear tail post, an inch or so. The splice joint is located 6" behind the rear seat. Cut the ¾" tube at 30 degrees to the axis of the tube. Insert 5/8" tube into the ¾" tube so that it is 1" forward of the cut. Tack the two tubes together. Don't worry about the somewhat loose fit. Welding the two together will fix it. With the tubes up against the blocks mounted earlier, mount blocks on the other side of the tubes to hold them in place.
2. Fit the bottom longeron to the jig. Bending of the front tube will be required in two places. Heat the area to be bent to cherry red, focusing most of the heat to the outside of the bend, and bend carefully so the tube doesn't kink. Do this operation off the table. You don't want to burn the table (and your shop) to the ground just yet. Tack the front and rear tubes together, and set the tubes in the jig, and clamp in place with additional mounting blocks like in step 1.
3. Starting at the front of the fuselage, and cut and fit each of the verticals and diagonals between the longerons, locking them in place with additional wood blocks as you go. Use a tubing cutter to cut the tubes to rough length. You'll get straight, perpendicular cuts in a lot less time than using a hack saw, and save a lot of hack saw blades. Cope each end of each tube to match the longeron radius, and any other tube that it might intersect. I found that the easiest way to do this is to use the grinder mentioned in the last article. The grinding wheels are typically ¾" wide, and I used a grinding wheel dressing tool to shape one wheel so that it had a 3/8" radius for fitting to the ¾" longeron, and the other t a 5/16" radius for fitting to the 5/8" longeron. It also helps to draw a straight line down the length of the tube to help maintain the proper orientation of the cuts on opposite ends of the tube.
4. When fitting the two tubes supporting the main spar carry-thru, you must insure that the tubes remain at least 1-1/8" apart to guarantee that the carry thru will fit. To accomplish this, fit two spacers, 1-5/32" long between the two verticals before blocking them in place.
5. Cut and fit all verticals and diagonals except those in the last bay. They'll be added when the horizontal stabilizer spar is installed.
6. Now, go back and tack weld all of the tubes together. One tack at each joint is all that's needed. The prevent turning the jig table into a bonfire, slip a piece of aluminum or steel sheet between the tubes and the table. The wood may char a bit, but it shouldn't burn.
7. Remove the tacked side from the jig.
8. Repeat the entire process again to build the other side.

Layout the Top:

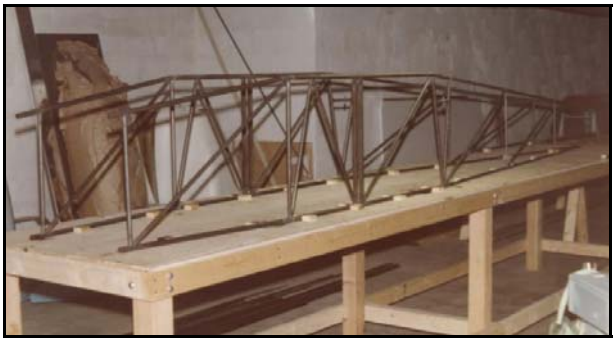
With both sides built, remove all of the wood blocks from the table top, and clean up the top to get it ready for a new layout. This time you'll want to use the top view on the drawing for your layout since we are going to assemble the fuselage upside down. But be careful. Because the top view shown in the drawing is drawn as if you are looking down at the top of the fuselage, you'll need to draw your layout as a mirror image because your layout is looking at the top from the bottom up. (So, to see what your layout should look like, hold the drawing up to the light and look at it from the back side of the page. All that really changes is the orientation of the two diagonal tubes behind the cockpit.

Again, draw the tube widths on each of the tube centerlines. At the vertical tail post location, layout the longerons so that they contact the outside of the post. This will provide adequate clearance for the elevator control push-pull tube later. Drill a 1-1/8" hole thru the table top at the tail post location, and mount the wood blocks on one side of each of the tubes.

Assembling the Fuselage:

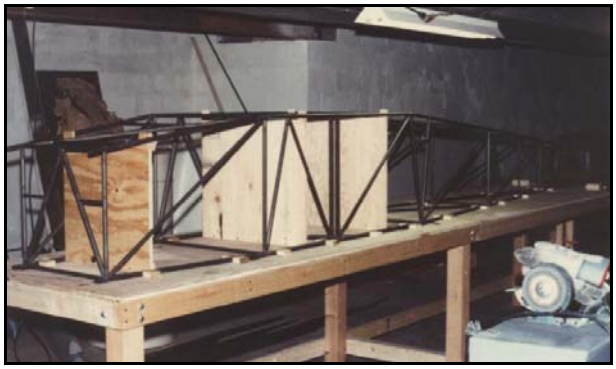
OK, let's make the fuselage three-dimensional:

1. Bend the two sides at the instrument panel station and the rear seat station (stations 29-1/2 and 77-3/8 on the standard II, stations 29-1/2 and 83-3/8 on the IIS, and stations 3 and 4 on the I), using heat in the same manor as when the lower longerons were bent. You will probably want some help from a friend at this point because you'll have to keep both longerons hot as you bend them. Be sure to make a left side and a right side. I would also suggest that both bends be made perpendicular to the top longeron so that it will lie flat on the table. The IIS plans show the rear bend being in line with the diagonal tube. This will result in the top longeron bending up at the rear station, requiring the installation of the shims under the center portion of the longeron.
2. Place the two sides on table up against the locating blocks, and clamp the longerons in place using additional blocks.



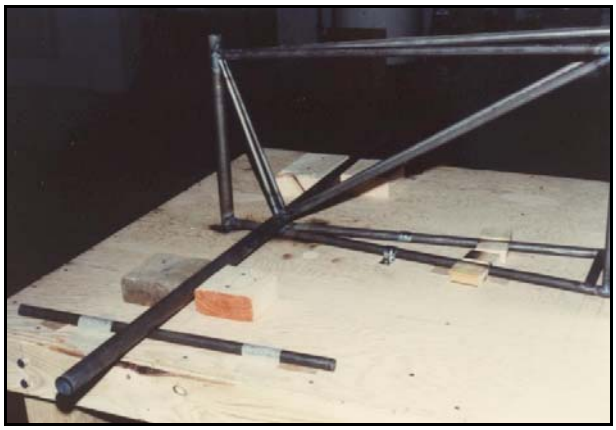
The Two Sides in the Jig

3. Fabricate three temporary plywood bulkheads that screw to the table top, two that are 22-1/2" wide (20" wide on the I) and 24" high, and one that fits between the tubes midway between the firewall and instrument panel stations. Fit the first two between the sides in the cockpit section, and clamp the sides to them to keep them parallel to each other and square to the table top.



The Three Temporary Bulkheads

4. Cut fit and tack all of the main horizontal and diagonal cross tubes. Ignore the fuel tank mounts for now. Remember that the bottom view in the plans is how the diagonals will look on the jig table.
5. At the tail, slide the vertical tail spar thru the hole in table top, and fabricate a plywood support that mounts to the underside of the table to hold the tube in place, and block and clamp it. Tack all four longerons to the post. Use a minimal tack on the top longerons as they will be cut out later. Leave 1-1/2 to 2" of the tail spar sticking above the bottom longerons (will be below when you flip the fuselage upright) for mounting tail spring tube. Note that you want at least 36" of tail spar above the centerline of the bottom longeron (it will be longer if plan to raise the turtledeck)
6. Fabricate the horizontal stab spar. Be sure to slide the 12" long piece of 7/8" x 065" tube into the 1" x 058", and center it properly. There is no need rosette weld it since the process of welding the longerons to the spar will lock it in place. Locate the spar on the top longerons, block up ends with pieces of 5/8 tube, and use pieces of 2 x 4 as mounting blocks to hold in place, and tack to the longerons. Now, cut and fit the diagonals in last bay.

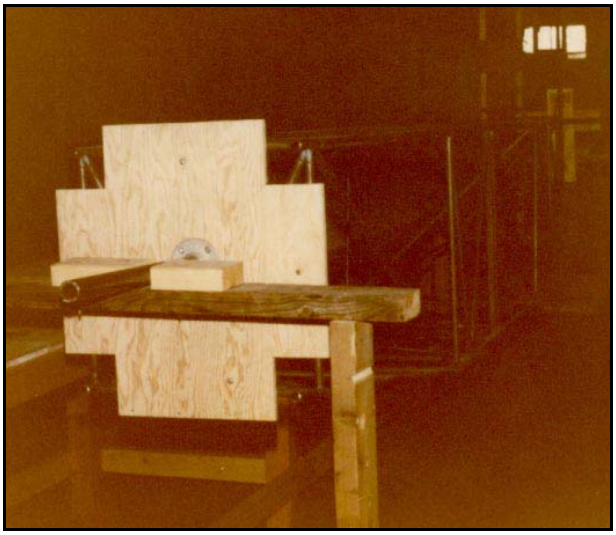


Tail Spar Installation

7. Tack all of the tubes to the sides.
8. Remove tacked fuselage primary structure from the jig. Flip it upright, and cut, fit, and tack the two diagonals from the top longerons to the tail post.

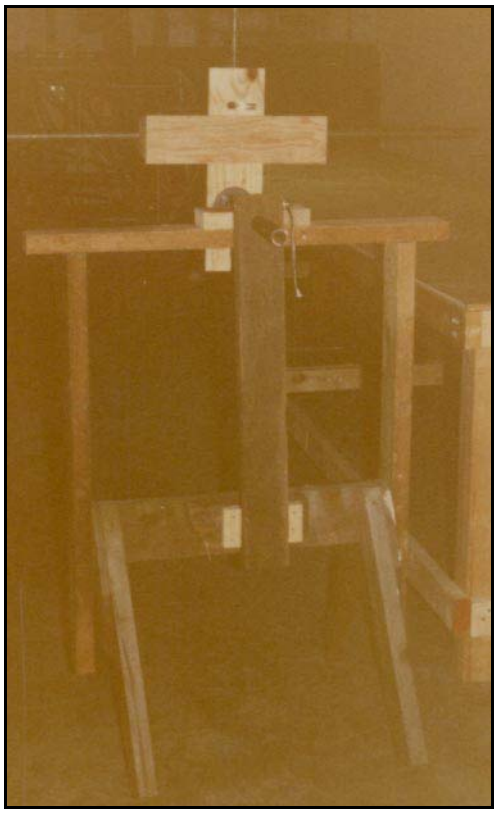
Welding the Primary Structure:
It's now time to make the primary fuselage one homogenous structure. In other words, it's time to weld her together.

To keep the welding process as simple as possible, it's always easiest to weld in the down-hand position. What I found useful was a swivel fixture that allowed me to roll the fuselage along its longitudinal axis so that I could keep the joint in a position where most of the welding would be down-hand. The swivel consisted of two pieces of 1" pipe, screwed into 1" pipe flanges that were bolted to pieces of plywood bolted to the firewall station and clamped to the tail post. These pipes rested on saw horses elevated to put the fuselage at a comfortable working height. A clamp was installed on the rear pipe so that the fuselage could be locked in any position.


Front Swivel

To minimize the effects of shrinkage and distortion on the fuselage, it will be necessary to weld the joints in "spiral" pattern, starting at the front and moving to the tail. Start the welding at the front firewall bay. Start with the joint at the top RH corner, and weld the joint completely. Then, weld the top LH corner joint complete, followed by the bottom LH joint, the bottom center joint and finally, the bottom RH joint. Move back to the next bay, start at the RH top joint, follow the same sequence of joints, LH top, LH bottom, RH bottom. Do that at each bay all the way back to the tail post. Remember that you don't want to weld the top longerons to the vertical tail post since they'll get cut out later.) The spiral pattern equalizes the stresses caused by the welding and should result in a fairly straight fuselage.

That should keep you busy until next time when we'll start installing all the rest of the stuff…


Rear Swivel and Lock

Freditorial Comment: As I've been writing this "how-to" I've realized that it's been over twenty-five years since I've actually performed all of these operations, and I may be forgetting some things. I'd really appreciate it, if you see anything that I may have forgotten, or if you have a better way to do these things, to let me know so that I can include them in future articles. Thanks.

WADE JONES AND HIS SONERAI II

by Ivan Martinez

Sonerai II midwing, plans #374, was started by Wade Jones in 1976. When Wade started the project, he was 43 and lived in Aurora, Illinois. The following year he moved to Bartlett, only 10 minutes away from John Monnett in Elgin. He frequently visited John, and Greg Erickson, who worked closely with John. There was a close knit

group of builder/flyers in the Chicago area at the time. Some of them were Wade Jones, Bob O'Day, Pete Buck, Ed Sterba, Mel Lamb, and many others.

Project #374 took 14 months to complete and was test flown with a 1700 VW in April of 1978 at Huntley, Illinois. Two weeks later, Ed Sterba performed his first flight at Crystal Lake, Illinois. Wade says the 1700 engine was the best engine he has ever had on the airplane. It would do 140 mph at 3400 rpm. Six months later, he changed to an 1850 VW. He flew it with the 1850 for many years.

N44WJ in its original VW configuration

Wade has taken the trusted Sonerai everywhere he has lived. He now lives in Brazoria, Texas only a few miles from where he grew up. His home is on an airport with a 2700' grass runway, so he flies the Sonerai often. There is also a Piper Tripacer and a Zenith 601 project in his hanger. The 601 is being scratch built & should be finished this year.

Wade has built two other Sonerai fuselages. In 1978, he built a Sonerai I fuselage for a friend, and in 1981, he built a Sonerai IIL and sold it to another friend. This friend then sold it last year to another friend who is finishing it now. In 1984, Wade bought a Sonerai I project completed it, then sold it unflown.

He considers the Sonerai to be a rugged airplane that has operated on many rough surfaces. He marvels at the difference in the rugged construction every time he compares it to his 601. The Sonerai is "tuff". Between the 601 wing and the "S" wing, there is no comparison.

Passengers, including his wife, were carried often in the Sonerai. With the 1850 VW, he at 200 lbs and a friend at 170 lbs, could take off no problem and fly at regular cruise speeds, even on 90 degree Texas summer days. Also in 1988, with the 1850 VW, he out ran two separate KR2's belonging to friends, topping out at 155 mph. There are no plans for the completion of his Zenith 601 to cause the abandoning of flying the Sonerai.

The following is a chronicle of changes and modifications made to Sonerai #374 between 1976 and today:

1. When test flown, it had a 1700 VW & weighed 465 lbs. John Monnett did not believe how light the airplane was, and commented that "Wade must have left something off".
2. Six months later, it had an 1850 VW engine. This engine was the "rave" at the time.
3. In 1991, the plane was fitted with an A80-8 Continental.
4. In 2005, he installed an O200-8 Continental. That is how it is flown today along with a Sterba 62/58 prop. The plane weighs 567 lbs now & it has over 350 hours.

Because of the engine changes, and others, the cowling has seen 4 major modifications. The fuselage & wings have seen their share of modifications also as follows:

1. The vertical surfaces were raised 5".
2. The turtle deck was raised 2".
3. The original mechanical brakes were converted to toe-actuated hydraulic units purchased from Great Plains.
4. A Skybolt canopy (a friend gave to him) was installed.
5. New "S" wings were built with solid rivets (wing incidence angle was ¾" lower at the back to correct a fabrication mistake).
6. 5/8" thick main landing gear was installed along with a flat spring tail gear (also used as ballast).


Wade and N44WJ Today

Wade is now 75 years old. We met 17 years ago at a fly-in, and I consider him a close friend.

Ivan Martinez
Sugarland, TX

IS IT LOVE OR IS IT MONEY? By Bob Barton

So you have your own airplane! And you love it. And when you think about the way it responds to your wishes in the air, you are sure it loves you too.

At fly-ins, I see beautiful show planes, sporting thirty coats of hand-rubbed paint. The owners are, naturally, proud of these airplanes. But I also see pilots at fly-ins with planes they love and they don't necessarily expect anyone to love them like they do. These aren't "show planes". They are traveling companions. All kinds: some old, some new. Some fast some slow. They weren't brought here to show to other people. They were brought because that's the kind of thing you do with someone you love.

Seems to me that there is a parallel between owning and flying your airplane and marriage … marriage to someone you loved at first sight. **Yes!** You saw her from a distance and you just had to get to know her better.

Building or restoring an airplane is a lot like a long courtship. It is a period in which you really get to know someone well. And it is a process that involves commitment and genuine interest.

At these fly-ins I also see the wives and companions. They come in a wide variety too. Really! Some wide, and some out of *Variety*. Some comfortably dowdy and some Bay-Watch chicks.

Now it well may be just a hint of subliminal jealousy surfacing, but it seems to me that some of those guys with the "chicks" don't look quite as happy as their "less fortunate" compadres.

I can't help but wonder if the "chicks" really love the old geezers they are with or are they there just because he has money. Maybe that's what the old geezers are wondering too.

But this not a story about marriage. It's about airplanes. I read stories about people with airplanes in the Bo Derek class, and often I read not how the owner formed this beauty with his own hands. But how he paid other people to do the metal work, the woodwork, the fiberglass, the interior, the engine, the paint … The author says it was all done by his *friends.*

It's nice to have friends; especially if they are skilled artisans. But are we really talking about friendship, or do I hear cash register bells in the background?

I'll always remember one of the first fly-ins I attended … There was a VP-2 there that looked like it had been finished with a brush in barn paint. I had a slight feeling of disdain, when a small voice in my head said: "Wait a minute, Bob. He loves that plane and he flew it here. How did you get here?" So I slunk back to my car.

Know what? I think real love is more beautiful than money anytime.

2009 FLY-IN SCHEDULE:

Here's a list of the major fly-in's for 2009. Make plans now to go to the one nearest you, and show off your Sonerai:

- Sun-N-Fun, Lakeland, FL 4/21-26
- Virginia, Suffolk, VA 5/30-31
- Golden West, Marysville, CA 6/12-14
- Arlington, Arlington, WA 7/8-12
- AirVenture, Oshkosh, WI 7/27-8/2
- Rocky Mountain, Denver, CO 8/22-23
- MERFI, Urbana, OH 9/12-13
- Copperstate, Casa Grande, AZ 10/22-25
- SERFI, Evergreen, AL 10/23-25

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.

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, send cash, check, money order, or PayPal) for $25.00. Postage is included. Fred Keip, (262) 835-7714, *fredkeip@aol.com*

BACK ISSUES: **Sonerai Newsletter** back issues are available in three forms. The first is a CD which contains all of the complete newsletters published by Ed Sterba from 1987 through 1995 in ".pdf" format. It costs $40.00. The second is a CD which contains complete copies of all of the newsletters published from 1996 through 2008, also in ".pdf" format. The cost is $50.00. If you buy both CD's, the package price is $75.00. And finally, there are also hardcopy back issues. I have the last two issues from 1994, and all of the issues from 1995 thru 2007 (That's 54 issues!). Contact me for pricing, and I'll make you a deal. As usual, I accept cash,

check, money order, or PayPal for the correct amount. Postage is included. Fred Keip, (262) 835-7714, *fredkeip@aol.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)518-8383, *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: Sonerai IILS single-place. 200 hr TT, 2180 w/dual electronic ignition, 40 amp alternator, starter, hyd. lifters, and new heads, Sterba prop, extra fuel tank, 5/8" landing gear, Monnett factory-welded fuselage, S-wings, Icom A-20 radio. See the July-Aug-Sept 2007 issue for photos. Asking $8700. Doug Johnson, Topeka, KS, 785-246-0844 (4/08)

FOR SALE: Sonerai IIL project. Engine: 1915cc overhauled w/ new aluminum cases machined by Rimco for 94mm cylinders, cylinder mating surfaces decked, and ALL gallery plugs drilled and tapped. Scat 69mm stroke counterbalanced crank. New std. Oil pump, main, rod, and cam bearings. Scat bolt-on gear cam shaft w/ new steel straight cut cam gears. Monnett shrink-fit prop hub. Scat gland nut w/ new Great Plains mag drive. New piston rings. Std. Dual port heads (Great Plains), drilled and tapped for 10mm spark plugs, later machined by Rimco to give 8.1 to 1 comp. Ratio. Accessories include, Slick mag.w/ new points and condenser, Dyna 5 electronic ign., Monnett Electro-X engine mount w/ alternator and a new voltage regulator/rectifier. All air baffling completed. I have about $3000.00 tied up in the engine alone. Mag. timer included.
Fuselage and empennage: Welded and fabricated by professional weldor (me), see my articles in past issues. Sand blasted and gray epoxy primed. Mounted on 5/8" main gear w/ Azusa wheels and mech. brakes, Piper Cub hub caps, no wheel pants. Great Planes tail spring and wheel. Rudder cables and elevator push/pull tube connected. Turtle deck, seats, upholstery, harnesses, engine controls, electrical system, fuel system w/alum. tank, canopy, fire-wall, and engine cowl (Great Plains) installed. Instrument panels have Westach gauges, needs only airspeed ind. and compass, TSO'd altimeter included. Most parts were painted before installation w/ Randolph alkyd enamel as required.
Wings: Uncompleted spars only, lightning holes cut, cap strips cut, drilled and counter sunk, ready to rivet, quantity of AD rivets included w/ cutter and rivet sets, alum. angle for stiffeners, all finished parts Alodyned and zinc-chromated.
I've got 10+ years and lots of $ invested, steal it from me for $5000.00USD or best offer, let's negotiate. Builder's logs are included if sold complete. I will consider parting it out; but I'd really like to sell it on to someone who will complete it. Sold as is , where is, in Houston, Texas. No Paypal, or checks , cash only, face to face, after inspection at your leisure. Contact info: James Gay, *jsgiii@att.net,* or at 713-922-9080. (2/09)

WANTED: Sonerai II parts. I'm attempting a Sonerai project as a cancer treatment diversion; please let me know what you have to sell. Call 24/7 Thank you. M.Lee Wachs 707-463-0467. (2/09)

The Sonerai IILT Prototype at OSH (a while ago)