

SONERAI NEWSLETTER

JAN-FEB-MARCH 2000

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(AFTER 6PM CST)



SONERAI IIL AT MERFI '99

This airplane, which is owned by Mike Thompson of Bellville, OH, was one of four Sonerai's that were at MERFI '99 at Marion, OH on September 11, 1999. There were only five at the big OSH event. See what you find at the regional fly-in's?

HAPPY 2000

Happy New Year! I hope your Y2K celebrations included a resolution to get either some serious work done on, or some serious flying in your Sonerai this year. I plan on doing both with N99FK. First, she's going to get a set of the new Great Plains hydraulic disc brakes and a set of new wheel pants this winter. Then, I'm hoping to make it to some of the larger regional fly-ins, Sun-N-Fun included, as well as AirVenture Oshkosh 2000.

Speaking of Sun-N-Fun, it's scheduled for April 9 - 15, 2000 in Lakeland FL. I'm planning on doing the Sonerai Forum again, and hopefully we'll have

some sort of gathering of the faithful. (I promise to work on a rousing rendition of the "Sonerai Fight Song.") Oshkosh 2000 is scheduled for July 26 to August 1. It's never too late to start planning for both of these events.

I hope to see as many of you as possible at these events.

RENEWAL TIME

Yep, it's that time of year again. *Subscription Renewal Time.* Before you throw away the envelope that this newsletter came in, check the mailing label. If the number after the "PD" is 1999,

you will need to send me money if you want to keep getting this collection of words, opinions, and other useful information. The price continues to be \$12.00 US which, of course, includes the postage. All I ask is that you make the checks and money orders out to "Fred Keip" so that my credit union won't get upset when I bring them in to be cashed. Thanks, in advance, for your continued support.

HELP!

As most of you who have been subscribing for a while know, I like to print articles and photos provided by you folks. It's your experiences and ideas that help make this newsletter interesting for us all, and hopefully we can all learn from each other's successes and failures. To that end, I'm going to offer a small bribe. When I publish an article that you send in, you will get the following year's subscription for free. So, please write down your thoughts. (If possible, on a 3-1/2" diskette in Word or Wordperfect.) The articles don't have to be long and drawn out. And they don't have to be perfect. That's why I'm the editor. For those of you who have already sent something in, thanks. I'm working at getting your stuff in.

And please, send me photos of your airplanes or I'll be forced to put mine on the front of every issue, and that might get boring after a while.

By the way, I'd like to thank Jim Hardy, Dave Wilcox, Wes Blake, Roger Godfrey, and Jack Lockamy for their 1999 contributions. Your "PD" dates have been bumped up one year.

SONERAI NEWS

- First Flights: I haven't received any announcements of first flights for a while. When you fly your Sonerai for the first time, be sure to drop me a line so we can let the world know.
- Safety Equipment: There's a new website flight shop that offers a selection of aviation safety and survival gear. It is provided by Eagle flight Safety Products in Rochester, NY. The site address is <http://www.eaglefsp.com>.
- Great Plains News: Steve has just built the first rear drive engine for use in an airplane. It weighed 167 lbs without an exhaust system.
- Sonex News: Development of the engine for the first VW-powered Sonex continues. John

is working on a new rear adapter which will mount a new ignition system similar to the Jabiru system (no Slick magneto), and a starter. It will have the same mounting dimensions as the Sonerai mount. Stay tuned.

- 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, and 1999. 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.

ANOTHER SET OF WINGS

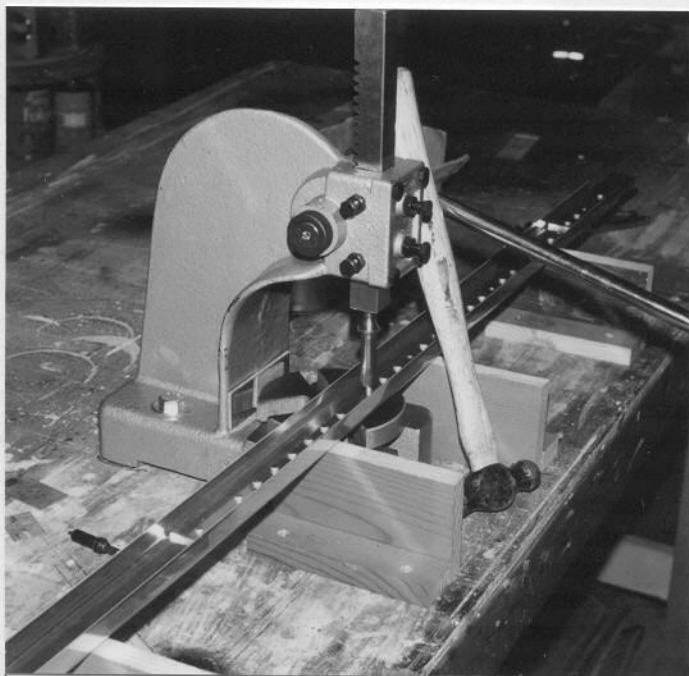
For the past three and a half months, your intrepid editor has undertaken the task to build a set of Sonerai IIS wings. No, I didn't roll my trusty red and silver machine into a ball, or anything like that. In fact, it's flying just fine with its modified "A" wings. What happened is that I got a call from Greg Klemp at Specialty Welding.

He had sold an essentially complete Sonerai IIS airframe to a customer in France with the intention of welding up the fuselage (as he'll do for anyone) and building the wings. Well, the press of his welding business (He makes all of the welded components in John Monnett's Sonex along with all kinds of other non-aviation stuff.) didn't allow him the time to build the wings, so he pleaded with me to help him out. And after some considerable negotiation (He offered me money.), I said yes. He would supply all of the components, including wing ribs, formed spar channels and ailerons, and the welded steel components. I would get to fit everything together, drill a million holes, and buck and pull rivets.

I decided to do the project for several reasons. The first, of course, was the money. The second was the challenge. It has been almost 20 years since I built my wings, and I wanted to see if I could do it again, besides I still have my original fixtures. The third was that I wanted to build a set of "S" wings so that I understood the challenges of building that design. And the fourth was the opportunity to document the entire process photographically so that I could create a detailed "How-To" manual that would be an extension of the five articles that I wrote in 1998 and 1999.

As I write this in mid-December, I have completed assembly of both wings and am about to put the first wing in the fixture to install the skins. The goal is to have them done by the first of the year.

A couple of things of note have come out of the process so far. The first is that I built a rivet squeezer for about \$60 that works extremely well, and allowed me to rivet the spars solo. See the photo below.



THE RIVET SQUEEZER

I started with a 1 ton arbor press purchased from ENCO in Fernley, NV for \$24.99. Next, I bought a set of rivet squeezer heads from Aircraft Tool Supply (catalog no. 3456-3) for \$19.95. And I used a flat rivet set that I bought a long time ago. The round platen on the base was drilled with a 3/16" drill to mount the squeezer head (you'll use the 5/32" and the flush heads), and a 1/4" drill at its center to allow the use of a 1/4" bolt to lock it in place. The bottom end of the arbor was drilled with a "Y" (.406") drill to accept the .401" rivet set shank. The rivet set is held in with silicone glue.

To squeeze the rivet, I used a 40 oz. hammer, striking the top of the arbor. Six to seven strokes per rivet is all you need.

The other thing that I found while attempting to properly locate the outer wing fold support tubes, is that the location on the drawings is incorrect for the "stretch" airplane. Since the bay behind the

rear seat is 6" longer on the "stretch" airplane than on the standard, it is necessary to move the outer brackets out toward the wing tip 4". So, those of you putting the folding mechanism in your "S" machines, please take note.

Hopefully, sometime in the next couple of months, I'll have the Wing Builder's Manual available. I'll let you know in the next issue.

WELDING THE FUSELAGE

by J.S. Gay III

With all the emphasis that I've given to building the wings for our Sonerai's over the past couple of years, it's probably time to start looking at building the rest of the airframe. So, when Jim Gay offered to share his welding expertise and experience, I was more than happy to oblige. Jim told me that he hadn't written anything much since he'd graduated from high school, but I think you'll agree that he did a great job.

I started setting up shop and building the fuselage jig table in May 1997. As I write this article, it is now July 1999. It's taken about two years to achieve the level of completion shown in the photograph. A wise man once said, "A journey of a thousand miles begins with a single step." He must have been a homebuilder. My journey has been fun, educational, and hopefully, I'll have a flying machine at the end.

In the past two years I've completed the fuselage itself, the control stick/torque tube assemblies, rudder pedals, fuel valve shutoff lever, instrument panels (I put a small one in the rear seat position), floorboards, turtledeck skin, battery box / mount and the seats. What remains to complete my fuselage is the mounting of the landing gear/wheels (this month's project), canopy frame, tail control surfaces, elevator and aileron control linkages, rudder cables, and the main spar carry through. The latter will be fabricated and tacked together without welding; it may be necessary to break the tacks to adjust for a snug fit on the main spar tangs once the spars are built. This is an example of how it pays to plan ahead before making something permanent in your project. Since you're building "from scratch", it will save time and expensive material (also a lot of swearing) if you proceed with a "custom built" mindset.

I've been a Welder/Fitter in the fabrication industry for 23+ years. I have also been a certificated pilot



JIM GAY'S SONERAI III FUSELAGE

for about 19 years. The following recommendations and suggestions are not meant to be a final authority as to procedures, but are based on my experiences. They are to help less experienced builders avoid the pitfalls and trials of learning a new skill. I will cover the aspects of welding first.

I originally planned to Heli-Arc (T.I.G.) the welds on my fuselage, but abandoned the idea after considering the costs and hassles of setting up a machine (no 220 volt service) in my rented shop. The 4130 material must be pre-heated to a minimum of 300 F anyway, then welded with the Heli-Arc torch, and then post-heated with a torch afterward to stress-relieve the joint. (Too much tool swapping for me!) There are many in my industry who believe that the Oxy-Acetylene process is obsolete; this may be true from a production standpoint. Some kitplane manufacturers use the M.I.G. (wire feed gun) process to weld their fuselages, but for the average "workin' man", the cost is just too prohibitive. Dollar for dollar, you will get more utility from an Oxy-Acetylene rig. The aircraft industry has been using this method since before WW II; I've been told that Mooney still does it this way. It seems to be just as strong as a Heli-Arc weld, considering the application.

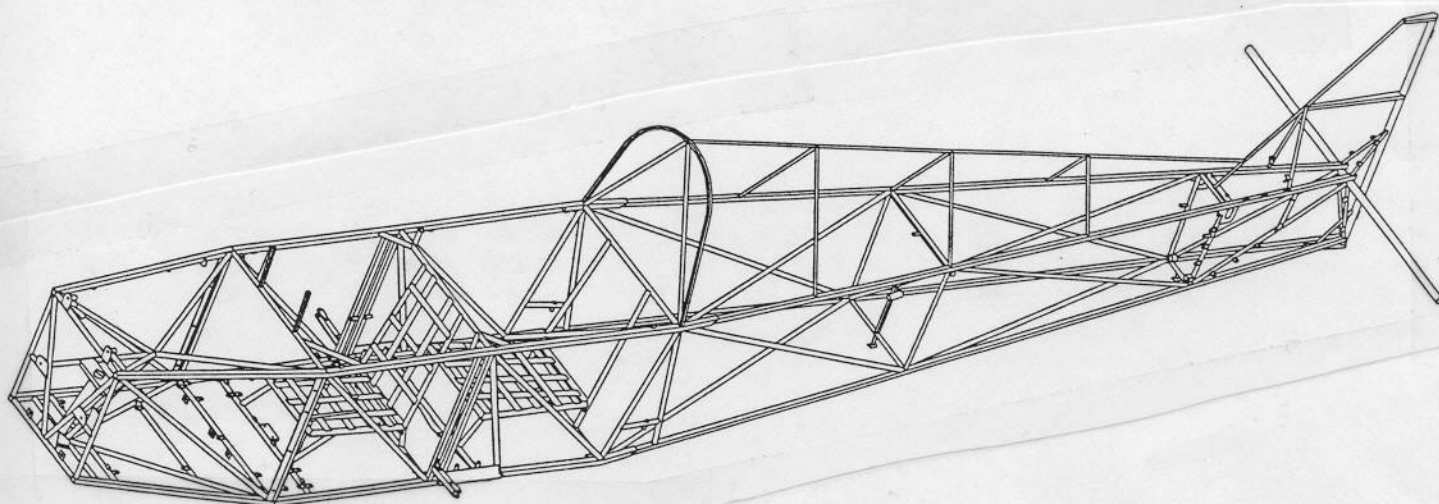
Invest in name brand regulators, torch handle, and welding tips. Avoid off-brands and imports; Victor, Smith, and Harris are well known brands that can be repaired if necessary. Buy several different

sizes of welding tips to handle the various material thicknesses. I use Victor #00, #0, & #1 size tips, getting the most use from the #0. Forget about using a 4130 or other high tensile steel filler rods, the cost is high and the availability is less. The welds are harder and more prone to cracks unless the whole assembly is stress relieved in a furnace. Instead, I recommend a 1/16" mild steel filler rod, grade ER-70S-6 available in most reputable welding supply houses for about \$1.50/lb. Shop around by phone for the best price. The welds give approximately 70,000 PSI tensile strength in mild steel parent metal and slightly higher due to admixture in 4130 parent metal. It is also high in silicon; which serves as a deoxidizing agent. In layman's terms, it combines with the oxides and other trash in the puddle and floats them to the surface. It can be cleaned away by power wire brushing. This is helpful if you have to seal a gap in a poor fit-up. Let the joint cool to well below red heat, buff the joint and make a second pass if necessary.

It is a good idea to invest in a 4.5" angle grinder equipped with a wire brush wheel to clean the material before and after welding. If the grinder is equipped with a 1/8" thick grinding disk, it can be used to cut tacks if necessary or to roughly shape parts before finishing on a bench grinder. Again, this is no place to economize. Buy a name brand tool such as Sears, Black and Decker, Makita, or Milwaukee. Avoid the Flea Market specials imported from Red China. They sell for thirty to

forty dollars as opposed to sixty five dollars and up for the others. I gambled and tried one. After two months of light use, it quit on me and then caught fire in my hand. Afterward, I examined the inside switch and found that the ground wire was clipped off and not attached even though it had a three prong plug. I now have a Sears model and it has given me almost two years of service. Also, one safety consideration; wear eye and face protection. Wire wheels have a nasty habit of shedding bristles as they wear and impaling tender body parts. Handled carefully, a power brush is far superior to hand brushes for cleaning welds. Before moving on, I have one last recommendation. Stress relieve the welds immediately after welding while the metal is still hot. Heat the joint to a dull red and let it cool in still air. This saves time and welding gases. Also, none of the welds will be forgotten if you stress relieve as you go.

version. Again, it's very important that the tabletop is flat and level in length and width. This is helpful when joining the two fuselage sides. When marking the layouts on the tabletop, keep in mind that **the drawings show the centerlines of the tubes only!** Make your layout thus and **draw in the lines for the tube edges afterward.** After fitting and tacking the two sides of the fuselage, (use small wood blocks to hold the tubes in place, see your builders manual) set them aside and erase the first layout. Two coats of cheap latex house paint (about 1 quart) applied with a disposable 3" roller should easily cover the old layout. After the paint dries, mark the second layout **from a clearly defined centerline** down the middle of the tabletop. Draw in the longerons first, then all the cross members, top and bottom and label accordingly. Some locations are **both** top and bottom, some are top **or** bottom **only**. It helped me to layout the diagonals also, to ensure



I built my jig table on top of three heavy duty sawhorses. I lined them up straight (snap a chalk line on the floor) spaced at seven foot intervals and anchored them solidly to the floor with Liquid Nails brand construction adhesive. I then built an 18 inch x 15 foot frame out of 2" x 4" lumber directly on top of the horses, blocking it up as necessary to level it in length and width. The top is 5/8" particle board as stated in the builder's manual. Have the lumber yard rip the panel lengthwise to give you two 2' x 8' panels. Most places have a panel saw and will cut it for a small charge, this makes it easy to transport to your shop. The two pieces will make a 2' x 16' tabletop, the one foot extension called for in the builder's manual is only necessary for the "stretched"

correct orientation .

Be careful when laying out the fuselage taper from behind the cockpit at Station 77-3/8" to the rudder post at Station 179-3/8". Too many builders taper to the **center of the rudder post**, this **does not give enough clearance** for the elevator horn to move freely. Instead, draw the centerline of the longeron on a **tangent** to the rudder post. Simply use a compass to draw a 7/8" diameter circle on the long centerline at Station 179-3/8" to represent the rudder post. Draw a centerline at 179-3/8" perpendicular to the long centerline and measure 5/16" from the edge of the 7/8" dia. circle on this perpendicular centerline. (Or about 3/4" from the center, on both sides). Use this point to locate the top longeron centerlines. One easy way to

ensure enough clearance for the elevator horn is to check the layout after the longeron tube edge lines have been drawn on the tabletop. Locate Station 175-3/8", this is where the horizontal stabilizer spar will be located after the fuselage clusters are all welded. Draw a centerline at this point perpendicular to the long centerline and draw the tube edge lines to represent the 1" dia. stabilizer spar tube. Measure from the long centerline along the leading edge line of the 1" spar tube to the outer tube edge line of the upper longeron, it should measure 1 1/8" to 1 1/4". If it's less than this, recheck your layout and redraw if necessary. It's much easier to redraw a layout now than to correct the fuselage after the sides are heated and bent in to form the taper. The rudder post, the horizontal stabilizer spar and all the braces will be fit and aligned after all the fuselage clusters are welded. When fitting the rudder post, the upper longerons are fit on the previously discussed tangent. These are temporarily tacked in place to hold proper alignment of the rudder post. Later, they are cut off behind the stabilizer spar and capped after all the welding is done on the stabilizer spar and rudder post. This is where the elevator slips into place. The lower longerons however may be squeezed in slightly and notched to blend in with the rudderpost for a better looking fit and a stronger weld. To keep the tail ends the longerons flopping around and possibly being damaged, I temporarily tacked a piece of 7/8" x .065" x 12" long tubing in place of the rudder post at Station 179-3/8" after fitting in all the cross members and diagonals. After welding all the clusters, remove this tube and use it for the inside reinforcement of the horizontal stabilizer spar according to the plans.

After making an accurate layout, cut and notch all the cross members for the cockpit area. Make sure they are all the same length, as "right on the money" as you can get. You are now ready to join the fuselage sides. Keep in mind that the fuselage is built upside-down on the jig table. Use the same wooden blocks to locate the tubes on the jig table layout as you did when fitting the sides. The upper cross members lay on the tabletop, and the lower cross members are fit above it, also the lower ones can be held in place with light duty bar clamps. Don't forget to cut and fit the diagonals before tacking the cross members in permanently as it is impossible to fit them in place afterward. Load the two sides and all the upper cross members into the jig. Position the two lower cross members at Station 29 1/2" and at Station 73-3/8", hold them in place with bar clamps. To mark the

Station locations for the lower cross members, hold a 2' spirit level against the side of an upper cross member or the tube edge layout line on the tabletop. After centering the bubble to indicate Plumb, make a mark on the inside of the lower longeron. Do this for both ends of the cross member. After clamping, check for Plumb alignment again with the level. This ensures that the lower cross members are directly over the right location, according to your layout. To keep the cross section of your fuselage Square, Plumb the fuselage sides with a 2' level. Start at Station 29 1/2", tacking the upper and lower cross members, next is the only diagonal, then the next cross members and so on. Continue fitting until you reach Station 73-3/8". Do not tack tubes at this Station until you get to it, hold the lower cross members with the bar clamp until then. Use the level to Plumb the sides as you go, also use it to Level all the cross members. After all the cockpit area is fit-up, the fuselage sides can be heated and bent to form the taper. Work the front half first, to get the feel for it. Fit all the tubes before starting the rear half. Fit all the remaining tubes the same way as you did the cockpit area. I find that using a level jig table and a 2' spirit level for alignment is faster and more accurate than clamping two framing squares together as suggested in the builders manual. However, if the table is not level in both directions, this technique will not give accurate results. Take your time when leveling the table during construction.

To minimize the twist along the centerline, simply place the edge of the 2' level against the long centerline at an upper cross member and move the bubble to indicate Plumb. Draw a mark on the lower cross member and take measurements from the inside edges of the lower longerons to the center mark, they should be equidistant, (no more than 1/16" difference). Or if you prefer, mark the center of the upper cross member and see if the edge of the level is on that mark when the bubble indicates Plumb on the long centerline. Remember, the fuselage is being fabricated upside-down. The foregoing will be easier to understand if you read Tony Bingelis' book **The Sportplane Builder**, particularly the chapter titled "Fuselage Alignment" before starting fabrication. As a matter of fact, all four of his books are a valuable investment, full of useful information and ideas.

I raised my vertical stabilizer (rudder post) by 4" and my turtle deck by 2 1/2" to give me more headroom; this seems to be a common modification on the Sonerai II. I've seen a problem

that other builders had with the rudder post bowing toward the firewall due to warpage when welding the 3/8"x .035" tubing used to brace the rudder post to the top longerons. I welded my rudder post braces, horizontal stabilizer spar, and the bottom of the rudder post **Before** fitting the vertical stabilizer ribs (angular tail profile), leading edge tube, and the 3/8"x .035" leading edge braces. This eliminates the bending moment caused by the welds drawing by allowing the rudder post to move forward slightly instead of bowing. If I had to fit mine again, I would have inclined the rudder post aft by half a bubble (2' level again). As it is now, my rudder post leans slightly forward by half a bubble but has remained reasonably straight. Only by checking with a level can the slight lean be detected.

I used an Ol' Joint Jigger tubing notcher sold by the Dale Wilch Company to notch the ends of my tubing. It uses bi-metal hole saw blades and sells for about \$150.00. Although it is not mandatory to use one, it makes a nice tight joint with a very minimal amount of work. For those builders with more time than money, the tube ends can be hand crafted with a bench grinder. Don't be overly concerned with small gaps less than 3/32". With practice, the builder can seal these with a minimal amount of weld, clean by power brushing and if necessary weld over the joint with a normal sized weld. Although most publications warn against re-welding a joint, most problems arise from failure to clean the oxides from the surface of the first pass and also from overheating the joint. In my years in the welding trade, I have made many code quality multi-pass welds in heavy sections of 4130 material with a variety of welding processes. The secret is to take your time and let the joint cool in between passes and maintain a clean joint. However, this is not a recommendation to get carried away and lay down a "gorilla weld" (big, strong and ugly). Use just enough weld to do the job or you will have problems with warpage.

I hope that the foregoing suggestions will help the fabrication of your fuselage go more smoothly, but don't take your information from a single source. Read other publications on this subject such as **The Aircraft Welding Manual** put out by the EAA or the books by Tony Bingelis. Absorb as much knowledge as you can and make up your own mind. This is where the education aspect of home building comes in.

James S. Gay III
Houston, TX

SATURDAY, NOV. 6

By Jim Hardy

I got this e-mail from Jim on Monday, Nov. 8. This is what it's all about.

Tom Walker, today, flew up in his Sonerai I and met me at 0900 this morning at my airport. Soon we were joined by an airborne arrival of Ed Flores in his Sonerai II. Tom and I launched and met Ed (our newest Chapter 661 member) airborne and we headed south to the Pecan Plantation airport about 75 miles out. This day was the "Fall Fly-in/Bratwurst Lunch" sponsored by EAA Chapter 983. Bucking at least a 20 mph headwind, we entered the pattern for our usual arrival. Flight of two Sonerai I's at firewall speed! Descending through a break in the trees at the north end of the runway, I realized we were now a part of the local golf driving range! Titleist flack lobes in sight! In tight protective formation we crossed the threshold at 170+ with a break to an overhead pattern and return for sequential landings. Knowing we would lose Ed in the 170+ mph run, I was very surprised to look down, (up out of the canopy) to see Ed in the pull also with good spacing to enter behind myself on the landing return.

Landings behind us, We taxied in together and shut down amongst what had to be nearly 50 airplanes. Ultralights to the Polen Special! You haven't seen a fly by, until you've seen that thing go by and I can only guess the velocity! Adding to the sinister appearance of it's speed was the darkly shrouded pilot, Dick Keyt, in full military mask and helmet. Yes, I'm thinking 'how could I do that in mine!' Other aircraft outside the obvious VW powered racers, were a flock of 5 T-18's that had obviously been practicing formation flight, several fine RV examples, (even an "8"), a few Glasairs, lots of "Spam Cans" and a Breezy.

After our fill of Brats, and fly-by's, we decided it was time for the trip home. All fueled and oiled, we started up and departed to the south. A final return pass, and we headed north towards home. No event here, wind was now at our backs for the 30 minute cruise. Tom Walker peeled off at Northwest Regional, and I dropped off at The Bar VK as Ed continued on to home at Gainesville.

Let's see, Fun, Food, Flying, Fellowship, Friends,yep, it was a good day. Searching the calendar for the next good day, . . . any suggestions?

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.

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 (2/99)

TAPER PIN REAMERS FOR RENT - Brown & Sharp #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)231-5824

Wanted: Sonerai I, Prefer flying, but call on any type. Jack Spring, 248 Jack Spring Ln., Kentwood, LA 70444, Home (504)229-8297, Work (504)344-1533. (2/99)

QUALITY RIBS L.L.C. SELLS COMPLETED RIBS FOR SONERAI AIRCRAFT. Contact Great Plains Aircraft or Quality Ribs L.L.C. direct at (602) 892-7189 for a brochure.

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: Sonerai I - Very nice single place, five minute wing fold design, \$3000, one hour south of Oshkosh, (414)626-8726 or (920)533-4379 (4/98)

For Sale: Sonerai IILT, 95% done, needs covering, all parts to finish, 1835 cc reman. VW, prop, instruments and flight controls installed. \$5000 (541)564-8153 (4/98)

Wanted: Sonerai. Prefer single place Sonerai I. Must be well-crafted, well-cared for, hangared, and in good condition. John Borra, 3327 Willow St., Hays, KS 67601. johnborra@media-net.net, (785)628-0658 (2/99)

For Sale: #5 Brown & Sharpe reamer, used one time. \$25.00. Also, RTN100 tubing notcher, used on one project. \$100. Call Gene at (501)394-3412. (2/99)

For Sale: New HAPI tapered prop hub, \$100; Factory rebuilt German late 1600

case, line-bored .010 under, in the box, \$150; Steel billet counterbalanced crank, standard, like new, in the box, \$200; 1600 VW engine-late block, counterbalanced crank, special cam, valve train, balanced, Force One hub, includes rare straight-cheeked Sonerai I cowl, firewall, engine mount, & S-I plans, \$2800; Tennessee Props 50x33, new, \$100; call Elliot Willoughby, (502)477-2466 (no collect) or write, 2323 Hochstrasser Rd., Fisherville, KY 40023. (2/99)

For Sale: VW engine case, new, cut for 94 mm cylinders, clearanced for stroker crank, and bored for Force One prop bearing. \$250.00. Call Kevin Hosp (317)899-8456 (3/99)

Wanted: Sonerai IIL or IILS with 2180. I would consider an 80% built airplane without engine. Lee Holloman (435)527-3105 (3/99)

Wanted: Starter and flywheel to fit Mosler/Hapi accessory case. Kevin Hosp (317)899-8456 (3/99)

For Sale: Sonerai IIL, 1834 VW, 201TT AF & Engine, 83 STOH included new heads (dual Ignition), cylinders, pistons, rings, valves, valve springs; elec. start, no alt, wheel pants, EBC ELT, Sterba 54x42 prop. This is a good solid aircraft with low time. \$9800; Also have custom-built a/c trailer for Sonerai, with drop down ramp for loading. \$300. Ken Christian (660)263-7937 (3/99)

For Sale: Parts for Sonerai II (Midwing) - VW engine, 60 hp, HAPI 1835 w/ dual ign. and electric start, 220 TT, prop strike, HAPI accessory case, Slick Mag, POSA card, starter; Sonerai II cowls - 1 brand new, still in box (bought 2/99), 1 used w/ lower half damaged; mid-wing fuselage, 220 TT, gear attach damage, horiz. Stab trim, good fabric, tailwheel ass'y, controls, seat pads, canopy frame, panel, elec. Switch box, battery box, firewall, etc.; 10 gal. Fuel tank; towing package (rear hitch attaches to tailwheel, and fuselage and wing support fixtures); landing gear - 5/8" w/ brakes, wheels and tires, wheel pants (damaged); some instruments. I need to cleanup my hangar, make me an offer. Tim Abke, (937)355-7471 or tabke@logan.net (3/99)

For Sale: Complete Sonerai IILTS kit w/o engine and instruments. \$2200 (worth \$4500). Charlie Quit, (516)423-8673 (3/99)

For Sale: 1978 Sonerai II mid-wing, 110 hrs

TTAF, 10 hrs on engine, Excellent condition, \$10,000. Vic Verhassect, (765)962-8913 work, (765)935-7016 home (4/99)

For Sale: #5 B&S taper reamer, \$25; Hamilton vertical card compass, \$200 (new); 40-169 mph airspeed (yellow tag), \$125; altimeter (yellow tag), \$150; Mac trim system, \$125; fuel pressure gauge, \$65 Dick Morrow, (309)755-1495 (1/00)

For Sale: 2-6 ply Airhawk tires with tubes (new), \$120; auxiliary fuel system (6 gal) with accessories for a Sonerai, \$75. LeRoy Taylor, (271)935-5345 (4/99)

For Sale: Sonerai IIL; fuselage complete except for tank straps, on gear, wings complete, canopy, cowl, and firewall fitted, basic instruments, ballistic chute, Great Plains 1915 VW. Family emergencies make it a must sell. \$5000 for everything. Jerry Kennedy, (405)733-4932 (4/99)

Wanted: Any Sonerai IIL w/folding wing, w/ or w/o engine. Prefer one in SE USA. J. Hearn, (352)628-1027, or mail to 7379 Sue Ann Ln., Homosassa, FL 34448 (1/00)

For Sale or Trade: Older Sonerai kit - tack welded two place low wing taildragger fuselage, all fiberglass, new canopy, etc. Want motorglider for 220 lb person with broad shoulders and beam. M. Lee Wachs, call nights Pacific time, (707)463-0567 (1/00)

For Sale: Landing gear, fuel tank, wheels & brakes, axles, welded fuselage. \$500 for all. David Henry, P.O. Box 663, Perry, OK 73077, (580)336-3182 (1/00)

For Sale: VW engine - 1915 complete FWF as removed from Sonerai II, TT since OH 175 hrs. Includes: new crank, cyl./pistons, valve train (Scat), dual ign., carb system, alternator, air/oil separator, prop hub, spinner, prop, engine baffling; truly a complete bolt on and fly system. Included in the package - tail wheel with spare wheels and a single master brake handle. \$2800 OBO. Gene @ (218)525-6758 or e-mail: gene12@uswest.net (1/00)

For Sale: Monnett X-mount, set of heads bored for 92 mm, 92 mm cyl. & pistons, set of REL37B spark plugs. Don Shipley, (912)756-6543, or e-mail: donan5@aol.com (1/00)