

SONERAI NEWSLETTER

JULY-AUG-SEPT 1998

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(AFTER 6 PM CDT)



HUGUES BAUMGARTNER AND HIS SONERAI I

Hugues is from Savigny, Switzerland. He spent 1500 hrs. rebuilding this airplane between 1994 and 1997 after purchasing it without an engine. It has an 1835 cc VW with dual ignition, Mosler Supercarb, and a 4-into-1 exhaust system. He flies from a 2100' strip at 2400' msl.

OSHKOSH '98

The annual pilgrimage to the "mecca" of all aviation events, Oshkosh AirVenture'98, is about to begin. I hope you've got your plans made and are planning to come. It starts on Wednesday, July 29, and runs through Tuesday, August 4. There are several events planned for us Sonerai enthusiasts this year. The calendar looks like this:

- Thursday, July 30, 7:00 PM - Sonerai Builder's Forum, Tent 2
- Friday, July 31, after the Airshow - Monnett Aircraft Builder's Party at John and Betty Monnett's Hangar

- Saturday, August 1, Noon - Sonerai Builder's Gathering, Homebuilt HQ

Also, the Annual EAA-sponsored Homebuilders Dinner is scheduled for Saturday evening, August 1, from 6 PM to 9 PM. The number of seats is limited, so you need to sign up at the Homebuilt HQ early. And finally, Monday morning, August 3, is Donut Day at the Homebuilt HQ from 8 AM to 10 AM.

As usual, I'm planning to be there most of the week, and will probably spend most of my time around the airplane, so please stop by and say hello. Just look for the bright red Sonerai IIL with silver wings in the auto engine area.

SUN-N-FUN '98 WRAP-UP

The hardest thing about going to Sun-N-Fun for me this year was trying to make a decision about how to get there. I had three choices. The first, of course, was to fly down in the Sonerai. The second was to drive down in my Ford Ranger. And the third was to take the airlines. Needless to say, for any of you who followed the effects of El Nino this winter, taking the Sonerai was out of the question. The weather between Wisconsin and Florida the week before the event was so bad that it would have taken a week just to get there, to say nothing of getting back home.



Sonerai's at Sun-N-Fun '98

So, that left driving or the airlines, and the thought of driving over 2400 miles round trip solo did not excite me at all. Fortunately, I had enough frequent flyer miles saved-up on United Airlines to allow me to fly round trip to Orlando without restrictions. So, that's what I did.

The only problem then was that I had no place to stay since I hadn't made any hotel reservations. With the Sun-N-Fun campgrounds as the only viable option, the challenge was to fit all the necessary camping gear into a suitcase for transport on the airliner. I got a two-man tent, sleeping bag, air mattress, folding camp stool, flashlight, raincoat, and several other little bits and pieces in one medium-size suitcase. All my clothes went in one carry-on bag. I was set.

On Saturday afternoon, I flew from MKE to ORD, and then to Orlando. The weather was stinko from Chicago to Valdosta, GA, with rough air all the way up to 35,000 feet. We cruised at 37,000 feet. Once in Orlando, I rented a car and headed to LAL. Unfortunately, when I got to Campground Registration, they were closed for the day, and weren't letting anyone into the campground. So, I got to spend the first night sleeping in the car. Who said going to Sun N Fun wasn't an exciting experience?

Sunday morning, bright and early, I (and about 50 other late-arrivals) was allowed to register, and by 9 AM the tent was set up, I was cleaned up, and on my way to the convention grounds. From then on it was a blast.

This year we had twice the Sonerai turn-out as 1997. There were four Sonerai II's that I'm aware of. Al Bertelmann from Harvey, LA, Richard Bowie from Dudley, MO, Fred Flynn from West Chester, PA, and Roy Adams from Fayetteville, GA. got there, despite the weather. Roy just stayed for one day and then headed home. Thanks guys, for bringing them down. Al showed off his newly reworked engine installation and cowling with a fully-enclosed exhaust system, fiberglass air inlet ducts, and insulated cowling. Hopefully, I'll have an article on it in the near future.

The Sonerai Forum on Tuesday seem to be pretty well attended, and I got to sit in front and talk about my favorite subject. I hope it was useful and entertaining for those of you who were there. The Wednesday evening dinner at Vito's was extremely well attended, too. I'm pretty sure that we had twice as many attending as last year. Thanks again to Dean McGinnes for making the arrangements. Let's do it again next year.

The rest of the time, I tried my best to see it all, and spend a little money. My goal was to find a new ANR headset. For a couple of evenings, I spent the time telling lies with Danny Kight and Steve Garn at Steve's camper, and Danny let me try his Flightcom headset with the Headsets, Inc. ANR conversion. It worked great, and only cost \$170 versus over \$300 for the cheapest new headset. Since I also use a Flightcom 4DX, I decided that was the way to go. It only took about an hour and a half to install, and it works really well. I used to think the passive headset was pretty good, but the ANR is so much better that I wish I had made the change sooner.

When Thursday morning rolled around, I realized that I had Sun-N-Fun'd myself out for another year, and it was time to go home. So, I packed up the suitcase and headed back to Orlando for the sardine-can ride home. I'd like to thank John and Betty Monnett for letting me use their Sonex tent as a resting place, and former Sonerai II owner (and RV-4 builder) Keith Embree from Cambridge, OH for letting me go out to dinner with him and his whacky friends. It was great time, and I'm already thinking about how I'm going to get there next year.

MAG COUPLING BLUES (A LETTER FROM BOB JAEGER)

I'd like you to pass on to the readers a safety concern that they should be aware of. As I mentioned to you at Sun-N-Fun, I experienced an engine failure in flight that necessitated a forced landing. I elected to land on rural country road but struck a utility pole with my left wing that caused the total destruction of the aircraft. I lucked out much better, I'm sure, just because the good Lord wasn't through with me yet.

Anyway, I was flying along at 2000 feet agl when I noticed a burning smell. I didn't see any smoke nor were there any indications of an engine problem from all the gauges. About a minute later I sensed I was losing altitude although the rpm's didn't drop, and I realized that I was not going to make the nearest airport. The farm fields below were pretty soft but I spotted a suitable gravel road and turned to line up on a short final. When I pulled the power back a little the prop stopped dead, and I became a glider. Remembering the warning we receive in training to "fly the airplane," I lowered the nose to set down on the road. I leveled off waiting to flare but had built up some speed that had to bleed off first. Suddenly, the long road became very short with the approaching of some utility poles coming up ahead, and the Sonerai still happily flying along in ground effect.

I was able to miss the first pole, but the second pole was closer to the road and also next to a small bridge with only short iron railings that I knew I wouldn't be able to clear through. As I neared the pole and bridge I pulled up but in the nose high attitude I hadn't noticed I had drifted over to the left a few feet and caught the pole about 15 feet up. In a second the aircraft spun left, flipped over, and landed in a shallow creek bed. Fortunately, the water was shallow and the fuel tanks stayed intact. I ended up upside down at a 45° angle with a slight head cut and some minor bruises and scratches. I shut off the electrics, unbuckled myself, and began breaking off pieces of the already broken canopy to climb out. I then pulled out my cell phone to tell my wife I wasn't having too good of a day.

The folks from the Indianapolis FAA came out and we investigated the cause of the engine failure. We found the aluminum magneto drive coupling had broken into several pieces and was thrashing itself into smaller pieces and molten metal. The engine was perfectly fine. The total time on the part was 180 hours and was the original part that came with the engine from John Monnett. I had inspected the part

visually 20 hours ago but didn't use any dye penetrant check.

After talking to Ed Sterba about the incident, he related that he figured the aluminum couplers were only good for 200 hours and the newer ones made from phenolic were better, although the first ones made out of round stock only lasted about 35 hours. They were then made out of flat stock which had a different grain pattern and they seem to be OK. In talking with Ken Brock, of Gyrocopter fame, he stated that McCullough engines use a rubber drive and they haven't had any problems, but they are a little smaller in diameter.

So, to recap, I'd like to pass on two lessons to be learned. First, in my opinion, if you still have an aluminum coupler, I wouldn't fly again until I changed it out. Secondly, I would practice slipping the Sonerai more often because the fact that the prop had stopped increased my gliding distance due to less drag being present from a windmilling prop and, you really can't experience that without a starter and plenty of altitude. I'm sure that if I had ten more chances to in the same spot, I would be able to land safely all ten times, if I had just slipped it down.

The tough steel fuselage protected me as the full set of harnesses that kept me in place. If I had been in a wood or composite aircraft, I feel I wouldn't have fared so well. So, please see that the word gets out because I sure would like to have been aware of this weak link.

Bob Jaeger
603 Rustic Rook
Somonauk, IL 60552
815-498-3945
rjaeger@prairienet.com

Freditorial Comment: Thanks Bob, for the excellent input. I would have sworn that all of those aluminum couplers had been disposed of long ago. The engine I bought back in 1977 had the same coupler, and it lasted about twenty hours. I discovered the failure when I noticed aluminum shavings in the back of the engine compartment. When I pulled it out it had cracked through at one of the notches. I also got one of the first phenolic couplers and it lasted about 3 hours. Fortunately, I discovered its failure while I was on the ground. My current coupler now has over 500 hours on it. It gets checked at every annual.

One other thing those of you with older Monnett engines should check is whether the EV prop hub is made out of steel. Again, my engine was originally

shipped with an aluminum hub. There were several failures of these hubs with a cracks emanating from the keyway. I replaced mine with a steel hub long before it flew for the first time. If yours is still aluminum, pull it off with a gear puller, buy a new steel one from Great Plains, and put it on. There is nothing more distracting than watching your propeller pulling away from your airplane as you're cruising over the countryside.

BUILDING THE SPARS

This is the second in a series of articles on the "how-to" of building the wings for your Sonerai, and the subject is wing spars.

The spars are the primary structural members of the wings and are therefore responsible for transmitting all of the lift generated by the wing into the fuselage. They are actually quite simple in concept and are relatively simple to make. All four spars are basically the same. Each has a "c"-shaped web made from 0.040" thick 2024-T3 Alclad sheet stock, which is then stiffened by a set of 1/8" x 1-1/4" 2024-T351 cap strips to provide the required bending strength. The whole works is held together with AN470 and AN426 rivets.

Step One - Layout and Cutting of the Spar Webs.

Start out with a 4' x 8' sheet of 0.040" 2024-T3 Alclad and completely cover each side with 2" wide masking tape. This will help protect the sheet from scratches while it is being handled, and will allow the use of a pencil for laying out the flat patterns and the lightening holes. Next, draw the flat pattern of the two main spars and the two rear spars on the sheet. Use the flat pattern dimensions shown in Figure 1 for the main spar channels, and Figure 2 for the rear spar channels. Draw in all of the center lines and bend lines. While you're at it, locate and draw in the lightening holes on the main spar channels. Make sure that you layout a RH channel and a LH channel. (Note from the S-wing plans that there is one less lightening hole in the left wing than in the right wing.) When you layout all four channels on the sheet, be sure to leave about 1/4" between the blanks to allow for cutting and filing to size. (If you are fortunate enough to have access to an 8' shear, you won't need to leave the gaps.)

To cut out the blanks, get yourself a helper and cut them out with a band saw, or use a saber saw. Cutting 0.040" with a tin snips is way too much work. Next, you'll want to trim the blanks to the line, and file the edges smooth.

Step Two - Forming the Spar Webs.

To form the flat patterns into channels you will need access to an 8 to 10 foot long bending brake. Most good heating and air conditioning shops, or sheet metal fabricating shops should have one of these and someone who knows how to use it. Note and hold the defined bend radius as it is necessary to maintain the 6" flat zone on the main channel, and the 1-1/4" flat zone on the rear channel. It is also critical to hold this radius to keep cracks from forming along the radius during the bending process. 2024-T3 is heat-treated and sensitive to bend radius. If it gets too tight, cracks will form on the outside of the bend, turning your channel into scrap. It will be necessary to alter the brake's set-back to get the proper radius. You might want to take some scrap pieces of aluminum to practice on before making the bends for real.

Once the brake is set up to your satisfaction, go ahead and bend up the spars. Because the 2024-T3 has considerable spring back, you will find it necessary to overshoot the final angle a little. It will help at this stage to have some cardboard angle templates to check the final angles of the top and bottom flanges. You will probably find that the flange angle will be a little different at the center of the spar than at the ends. This is normal with most brakes, and you can tweak the flange with a rubber mallet to make the angles uniform after the channel comes out of the brake.

(An alternative to all of the work up to this point is to call Steve at Great Plains Aircraft Supply, and order the prebent spar channels)

Step Three - Cutting the Lightening Holes.

Now is good time to double check the lightening hole locations as shown on the plans. It might also be wise to layout the rib attachment locations to verify that you won't be trying to attach a rib to a lightening hole. Once everything looks good, it's time to cut the holes. This should be done in a drill press using a flycutter. Because the spars are almost 8 feet long, you will need to make up a temporary table that is attached to the drill press table to support them. I used a 12 foot long 1 x 10 pine board that I clamped to the drill press table, so that 6 feet of board were on either side of the table.. To keep the 1 x 10 from bowing, I screwed a 12 foot piece of 1 x 4 to the underside to form a "tee" section. (This 12 foot extension will come in really handy for drilling the spar caps a little later.)

Remember when using the flycutter to be extremely careful and to securely clamp the channel to the

drilling table with c-clamps. Once the holes are cut, file the edges smooth and finish them off with some fine emery cloth. As I said when we were building the ribs, you want the edges of these holes to be very smooth. Scratches are fatigue crack initiation points.

Step Four - Cutting the Cap Strips and Angles.

You'll need to cut four sets of main spar cap strips and two sets of rear spar cap strips. This means that you should end up with 4-94", 4-70", 4-46", 2-6-1/8", 4-34" and 2-22-1/8" strips for the main spars, and 2-36" and 2-8" strips for the rear spars. You will also need four pieces of 1-1/4" x 1-1/4" x 1/8" angle: 2 that are 22-1/8" long and 2 that are 18-1/8" long. These angles are 6061-T6 aluminum. (I get asked about that a lot, since it's not in the plans.)

Step Five - Drilling the Cap Strips.

To start the drilling process, take one of the 94" long strips and lay a piece of 1/2" wide masking tape down the center, and layout the rivet hole pattern (1" centers starting 1/2" in from the end.) This will become the master drilling pattern. Next, center punch each hole location except where the taper pin holes go, and then drill all of the holes using a No. 21 drill. Be sure to deburr all of the holes.

Now take the other three 94" strips, stack them together under the master pattern and clamp with a few small c-clamps. Drill the holes in these strips and deburr. As you're drilling, it will be necessary to unclamp the strips occasionally to remove chips. When you put the strips back together, put a rivet in every tenth hole or so to maintain alignment. A dozen 5/32" cleco fasteners can be real handy for clamping at this point.

When all four 94" strips are drilled and deburred, make up the four stacks of cap strips and angles, and drill each stack using the long strip as a template. To make drilling and dimpling the top flange of the spar channel easier, the two angles should be offset downward about 1/8" for additional clearance. These stacks must be kept together as matched sets, so mark the root end of each set using a center punch. Put one punch on one set, two punch marks on the next, and so on. This will keep you from mixing up the parts later. (Believe me, these parts will not be interchangeable between the stacks.)

The same process is used for the rear spar strips. Use the 36" strip as the template, and be sure that you don't drill the 5 rib attachment holes, as they will get drilled later.

Step Six - Drilling the Spar Webs.

The 94" strips are again used as templates to drill the rivet holes in the main spar web channels. At this time assign the various stacks of ribs to the appropriate channels and make sure that you have a right hand spar and a left hand spar, and that you have the top and bottom stacks in their correct places. The 94" strips must be positioned so that the 6" outside-to-outside dimension is held, and that 10" of strip protrude off the inboard end of each main spar channel. It might be necessary to file a slight radius on the top edge of the top strip and the bottom edge of the bottom strip to clear the bend radius in the channel. Once proper alignment is assured, clamp the strips in place and drill the holes. Now, you can remove the masking tape from the various components.

The rear spar webs are done similarly. Use the 36" long caps as templates, making sure that you have 3" of cap strip protruding from the root end of the spar.

Step Seven - The Root End Plates.

Two 1/8" x 6" x 18" end plates are required for each main spar. Cut and file these to size. Also, cut four 0.040" x 1-1/4" x 10" 2024-T3 filler strips. These get fitted between the 94" cap strip and the front end plate. Again, properly align the front end plate and the filler strips and drill using the 94" strip as a template. Once the front plate is drilled, use it as the template for the rear plate. The final step is to countersink all the holes on the front of the front plate and the back of the rear plate that are outside of the spar channel. The AN426 rivets that are used in these 18 holes have a 100° included angle so you must use a 100° countersink tool. A micro-stop countersink tool works really well to get constant - depth countersinks.

Step Eight - Corrosion Protection.

Now that all the bits and pieces of the spars are made, it's a good time to think about corrosion protection. It is not absolutely necessary, but it will help make sure your wings last a good long time, particularly if you have to park your airplane outside in the elements. The old tried and true method is to "Alodine" all the parts and then spray on a light coat of zinc chromate primer. Start by washing all of the parts with warm soapy water to eliminate any oil and finger prints, and wipe dry. Next, "Alodine" the parts. This is a two-part process that converts the aluminum oxide surface of the parts to an aluminum chromate surface which is more compatible with the zinc chromate primer. The first step is a phosphoric acid etch wash which is done using a fine 3M

Scotchbrite pad. This is followed by a chromic acid conversion coating which turns the parts a light gold color. Just follow the directions on the bottles. (I used the Dupont 225S acid etch and the 226S conversion coating. You can also use Alumiprep #33 and Alodine #1201.) This is followed by a light, transparent coat of zinc chromate primer. Now, you're ready to assemble.

Step Nine - Assembly and Riveting

This is the fun part. You get to take all of these bits and pieces, and make useful structural parts. Take all of the parts and stack them up in the correct order in the correct places so that you have LH and RH main spars, and LH and RH rear spars. Make sure that all of your cap strip sets have matching match-marks. Use rivets in every 6th hole or so to maintain alignment and clamp each assembly together. Again, the 5/32" clecos are handy here.

You will be using AN470AD5 rivets in the entire spar except for the stub ends of the main spars where you will use AN426AD5 flush-head rivets. Cut all of the rivets to the proper length using a rivet cutter, which will provide a nice, square cut. The proper length is the grip length of the hole plus 1-1/2 times the rivet diameter.

At this point, it would be a good idea to take some leftover cap strip stock and make up a practice piece with several different layers so that you can practice riveting a little before tackling the real thing.

For the actual riveting, you have your choice of several different methods. Probably the most common is the use of the rivet gun and a bucking bar. You can also use a rivet squeezer, a brake rivet setting tool, an arbor press, or a small hydraulic shop press, if you want. When using the rivet gun method, you'll need a good quality 3X rivet gun, a 5/32" and flush rivet set for the gun, 2-1/2 to 3 pound bucking bar, and a good friend. Of course the gun will require a compressed air supply, so you'll need an air compressor as well. A 1 hp 110 v unit will be more than adequate. If you're lucky, and belong to an EAA chapter with somebody building an RV, you might possibly be able to borrow this equipment and save that expense, since this is the only time you will need it.

Once you've completed your practice, you will start the riveting at the tip end of the spar. These rivets are the shortest and are the easiest to set. Start with the end-most rivet and then do every third rivet down the length of the spar. Then go back and do every second rivet, and finally do the remaining rivets. This

helps to prevent bowing of the spar. The Sonerai was not designed to have forward or backward wing sweep. Make sure that you determine the locations of the rib stiffener angles that mount on the front side of the spars, and the outboard fold brackets because they are held in place by the spar cap rivets. Be sure that you don't rivet these locations yet.

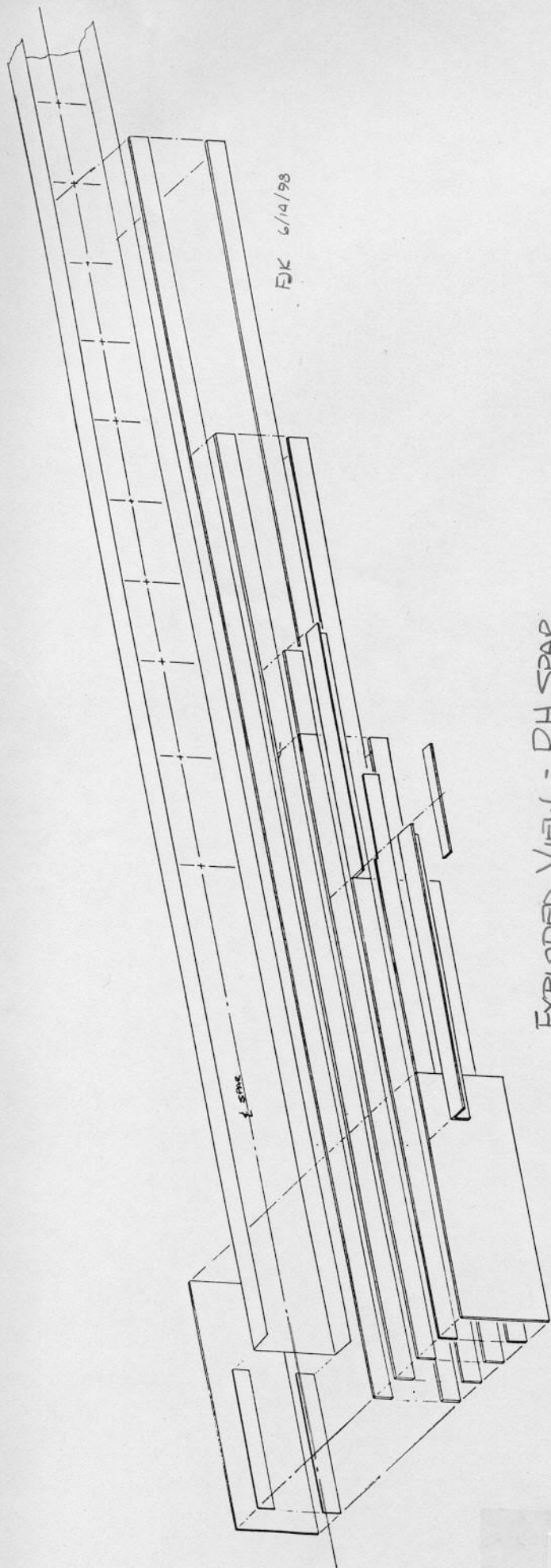
Finally, a couple of comments about the riveting process;

- The finished bucked rivet head should be approximately 1-1/2 rivet diameters in diameter, and 1/2 rivet diameter thick. They don't all have to be exactly these dimensions, just close.
- When bucking the flush rivets on the root end plates, the bucked end of the rivets will not end up being flush with the surface of the plate. Do not worry, though. They will be filed or cut flush using a rivet shaver bit mounted in the micro-stop countersink.
- Good riveting technique sets the rivet in one burst of the rivet gun. You will quickly get a feel for this. Also, the thicker the stack of ribs, the longer the burst will be.
- Don't be too concerned if you occasionally put a "smiley" on a rivet head, or over or under buck a rivet. Just leave it and move on to the next one. You are allowed up to 20% of the total with some abnormalities. Removing these abnormal rivets can potentially do more damage than leaving them in.
- If you get a rivet that is so bad that it must be removed, I'd suggest buying a high-shear rivet punch and use the rivet gun to push them out. To remove a rivet, center punch the head at the dimple, and use a 5/32" drill to remove the head. Then, use the punch in the gun to bump the rivet out. Sometimes if the rivet is real stubborn, it might be necessary to very carefully drill through the length of the rivet with a 1/8" bit and then bump it out.

So, now we're ready to attach the ribs to the spars. We'll do that next time.

1998 FIELD OF DREAMS INVITATIONAL FLY-IN

The 1998 Field of Dreams Invitational Fly-in is scheduled for Labor Day Weekend, September 4, 5, and 6 at the Ottawa, Kansas airport. It is invitational in that participant aircraft must have a design gross weight of 1350 lbs or less. To obtain an info pack on the event, call Bill "Spud" Spornitz at (913)764-5118 or (913)397-0518. See you there!



EXPLODED VIEW - RH SPAR

7

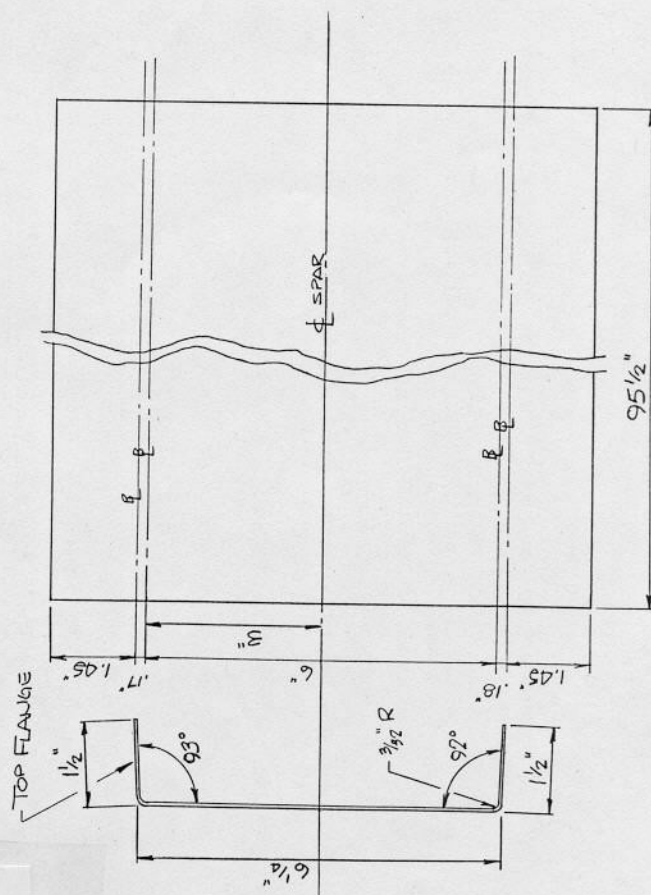


FIGURE 1

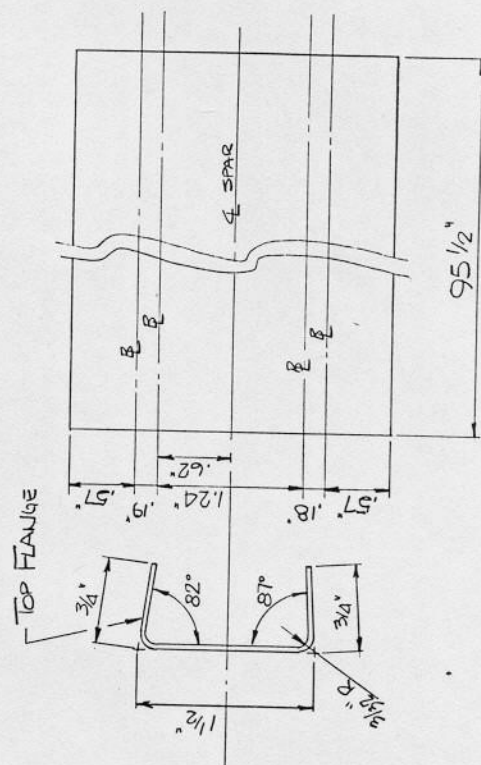


FIGURE 2

WANT ADS

For Sale - Sonerai I, 4 Hrs T.T., less Engine. \$3,900, Jim Jaeger, Box 438, Kewaskum, WI 53040, (414)626-2611 (3/97)

For Sale - Set of Enginetics brakes with 5" wheels. \$175.00
Dick Foster (515)287-2554 (2/97)

Air Schank Going Out Of Business Sale - New and used Sonerai parts, Engine parts, Tools and hardware, New and used instruments. Call or write for 5 page list. Bob Schank, 35 Clarence St., Belleville, MI 48111, (734)697-7057 after 5 pm. (3/98)

For Sale - 1600 VW engine, 0 TT. Disassembled - all new parts. Complete engine. Mexico universal AS41 case, Case inserts. Case machined for Great Plains Force One Prop Hub. Has Force One Hub Parts. Dual Port Heads. Forged counter weight balanced crankshaft. Balanced pistons and rods. Pauter performance cam. Horz oil cooler and adapter plate. \$1900 Bob Schank, (734)697-7057 after 5 pm (3/98)

For Sale- New Bogie tailwheel \$10.50, 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 \$6.50, 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, Used two rudder cables with MS667-3 clevis ends 10'-9 3/4" long \$7.00 for both, Used two aileron P-P rods, one is 13 5/8", the other is 14 1/4", both with AN481-4P on one end and REB-3N on other end \$6.00 each, New (4) 87.5 cylinders and pistons \$75.00. You pay the shipping. Bob Schank (734)697-7057 (3/98)

Wanted - Monnett Super Vee prop hub extension assembly and magneto/engine mount unit. Please call with price and condition of available parts. Mike Smith (601)324-2801 Daytime (2/97)

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 (1/98)

For Sale - 1992 Sonerai IIL, 300TT, dual ignition, electric start, new tires, brakes; has S-mod, basic VFR instruments. Not a show plane, but well built and flies great. \$6000.00 firm. Also have new in the box

Bendix/King KX99, Garmin GPS-90, intercom. Dennis Barnette, (601)256-9767 or e-mail at dennis1@mail.tsixroads.com (3/97)

For Sale - VW remanufactured block, late model, line-bored .010 under, case savers, etc. \$250.00; Rare Sonerai I Rattray cowl, straight cheek, firewall and engine mount to match. Buyer pays freight & crate. \$450.00 Elliot Willoughby, (502)477-2466 (3/97)

Wanted: Sonerai IIL completed and flying, prefer something built in the 1990's. Contact Ed Collins, (530)872-4400, or write 261 Chandler Dr., Paradise, CA 95969, or email BEIDMAN@AOL.com (1/98)

For Sale: Sonerai II kit. Welded airframe with tail feathers, flight controls, and gear. 1835 cc VW with Electro-X mount (10 amp alternator), 4016 Slick Magneto, Posa carb, propeller, spars finished, Super-Vee cowl, fuel tank, most instruments. \$2750.00 OBO Zeke Zechini, (703)707-1949(work), (703)830-1046(home), or mark.zechini@lmco.com (1/98)

For Sale: Complete Sonerai II kit. Fuselage and tail welded, some instruments, all parts to complete except engine and paint. \$3800. Ed Torbett, (815)895-3888 (3/97)

Wanted: Any Sonerai parts to help add to Sonerai/KR-1 Museum, tax deductible. Call or write: Tom Hall, 658 S. Abbey Ave., Springfield, MO 65803, (417)862-3837 (1/98)

For Sale: Sonerai IIL w/ 75 hp Lycoming 0-145-C3, Magnum Ivo-Prop, ground adjustable, 12 gal wing tanks, S-wing, new 3/4" Grove landing gear, new canopy, improved cowl, 60 hrs TT. Flies great at 3.5 to 4 gph! \$9500 OBO. Call Craig Merrill, (803)521-4577 (2/98)

For Sale: Sonerai IILTS (convertible to LS), Fuselage 95% complete, Wings assembled, cowl, gear, fuel tank, ailerons, and wing tips. Mike Land (414)843-2808 (1/98)

Wanted: Engine/project for Sonerai II, prefer 2180 w/ dual ignition but will consider all. Jeff Newlin, 12173 E. 1700th Ave, Hutsonville, IL 62433, (618)563-4456 before 10 PM central. (1/98)

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 on the company. (2/98)

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. (2/98)

For Sale: Complete VW intake system, professionally built with a Rajay turbocharger, heads, and Posa carb. \$600. David Fitzjurs, (501)963-6037 after 5 pm CST. (2/98)

For Sale: Sonerai IILT on gear (easily converted to IIL), Trim system, controls & rudder cables in, Fuel tank, pump, and all plumbing included. Built per Monnett to stay light. Project 95% complete. Bubble canopy needed. Panel done, instruments in. Lots of hardware. Spars done. 1 wing 75% finished on steel jig. Junker engine on fuse for cowl fitting. New pickled 1914 VW with all plumbing except carb. New Sterba prop. This is a very nice and complete project. Too much to list. Will consider parting out. Bob Wood - Sheboygan, WI, (920)803-9205 (work), (920)803-9206 (fax), (920)452-4095 (home) (2/98)

For Sale: Sonerai II, fuselage welded, 5/8 gear, wheels, brakes, canopy, fuel tank, instruments, no fabric. Engine is Monnett EV, 90.5B x 78S, dual ignition (one Slick mag and one electronic ignition), Warnke 52" prop, spinner, Diehl case, oil cooler, and Mosler carb. Wings are ready to assemble and include prefab Monnett ribs, completed spars and sheet skin material. \$6500. Phoenix, AZ (602)892-7189 (2/98)

For Sale: VW 2007 cc engine, Monnett EV, 90.5B x 78S, dual ignition (one Slick mag and one electronic ignition), Warnke 52" prop, spinner, Diehl case, oil cooler, and Mosler super carb. All new. \$4500. Phoenix, AZ (602)892-7189 (2/98)

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) (2/98)

For Sale-Two Sonerai Projects, 1850 cc VW, four 150 hp inverted Tiger inlines, new Sterba Sonerai prop, stock Subaru EA-81, Sonerai cowlings, canopies, etc., Hatz biplane wings, center section, and fuel tank, Christen Eagle ailerons. Will happily trade or negotiate within sane boundaries. Also have 2 1/2 runway acres on Arizona Airport, M. Lee Wachs (707)463-0467 (3/98)

For Sale-Sonerai I Low Wing, 98% complete, 1835 w/ Super Vee prop hub ass'y, Sterba prop, all instruments, painted. \$6000 OBO, Call Fred Keip at (414)835-7714 (3/98)