

# SONERAI NEWSLETTER

OCT-NOV-DEC 2002

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## **JIM PHILLIPS' SONERAI II AT OSHKOSH 2002**

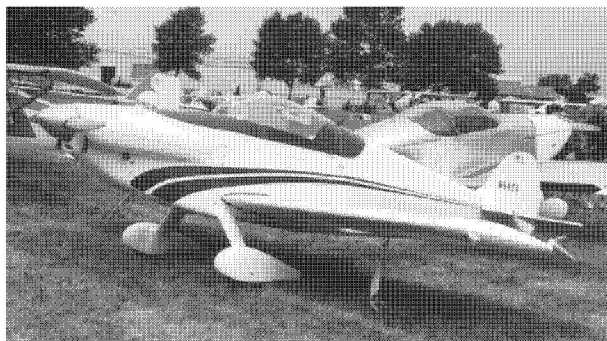
*Jim and your editor have been friends, and members of EAA Chapter 18 in Milwaukee, WI for a long time. As a matter of fact, we finished our airplanes at about the same time, with Jim beating me by a few months. The airplane is powered by a 2180 cc VW with dual ignition and an Ellison throttle-body carb. The prop is a Sterba. The paint is white, with black vinyl trim.*

## **A LOOK BACK AT OSH 2002**

Back in the J/A/S 2002 issue, in my opening article "It's Oshkosh Time!", I stated that I was "planning to participate in the traditional way", meaning that I was going to fly up early, spend the entire week doing all the normal stuff I do, then fly home to get back to my normal life. Well, as has happened before in my life, things conspired to make things just a little "non-traditional".

One of the happenings that I didn't mention in the last issue was that in mid-June, I got "downsized" out my job at Bucyrus International. After almost 29 years there, it was a bit of a shock, so it tempered my participation at OSH just a little. I even considered not going for the entire week, but after considerable thought, and encouragement from my wife, I decided that since I didn't have anything else to do anyway, it would be best to carry on normally. So, the plan was to fly up Saturday or Sunday.

Then, the Wednesday before, I called a friend to talk about the fact that I was looking for work (they call it networking), and he mentioned my qualifications to his boss. He asked if we could get together for lunch the following Monday to discuss job things. Needless to say, I couldn't say "No, I'll be at Oshkosh". So I postponed the trip until bright and early Tuesday morning.



**John Hubbell's IIL**

The lunch went well, and on Tuesday I launched for Oshkosh at about 6:30 AM. Being only 90 miles away, the flight only takes about an hour, so that would get me there shortly after they opened the field for arrivals. I wanted to beat the first-day rush. The Fisk approach is always, at least, a small challenge. This year was no different. Actually, the approach to Fisk was textbook. It was approaching OSH, where things got interesting. I was following a white RV on a long base leg for runway 36 left, when the tower called me as a red RV (they always do that, so from now on the Sonerai is also an RV-1.5), and cleared me to land. He missed the larger RV ahead of me. I called him back and told him of the RV ahead of me, which he then also cleared to land on 36L. He then asked each of us to land down the runway at the third intersection, which we did in turn. And everything worked out fine. I have yet to have an "uneventful" arrival at the convention. It's part of the fun, I guess.



**Rod Killam and his II**

As I pulled up to my normal parking place in the Automotive Engines line, I was pleased to see three other Sonerai's already tied down. Jon Hubbell had brought his IIL, N94TL, up from McLordsville, Indiana. Rod Killam brought his II, N39ME, from Carlinville, IL, and Jeff Lange taxied his almost-complete I, N1463J, across the field from the NE hangar complex. Apparently, all my crying and complaining about last year's turn out had some effect. On Wednesday, Jim Hardy flew in from the Dallas, TX area in his I, N72133, and later in the week, Jim Phillips flew his II, N63JP, up from Waukesha, WI for the day. So, we had six airplanes this year. Thanks guys, for bringing them.



**Jeff Lange's I**

As I normally do, I spent the mornings with the airplane, and had the opportunity to talk to a lot of you. I always enjoy this a lot, and get to learn a few things, too. For example, are any of you aware of the Sonerai that's being built with a Solar turbine engine in the nose? A cool idea, but where's he going to put all the JetA he's going to need to feed it?



**Jim Hardy's I**

The Sonerai Builder's Forum, on Thursday, went pretty well I think. It's always kind of hard to judge when you're standing up front. There were about 40 people there, and there were a lot of good questions. Hopefully, the answers were as good.

I skipped the Homebuilder's Dinner this year, and instead, went to dinner with Steve and Linda Bennett, owners of Great Plains Aircraft Supply. We had really good fish at a little place on Lake Winnebago about half way between Oshkosh and Fond du Lac. I was told by friends, who attended the Homebuilder's Dinner, that it was very good. Jack Cox was the featured speaker, and gave an excellent talk.



**N99FK in OSH Display Configuration**

On Friday, during the afternoon showcase before the airshow, I had the opportunity to fly in the Homebuilt Review. If you ever get the chance to do this, go for it because it's a lot of fun. There were 14 or 15 airplanes, and we got launched on 45 second intervals. We each did the takeoff pass and then one full pass down the length of runway 36L at 300 feet agl, and then a landing on 36R. It gave everyone a chance to see a Sonerai fly.

Friday night, of course, was the Annual Monnett Builders Party. John, Betty, and Jeremy did their usual bang-up job, and everyone appeared to have a great time. There were only five Sonerai builders there, so we were vastly out-numbered by the Sonex folks, but we didn't care. We like being part of the Monnett "Family". Thanks, John, Betty, and Jeremy for a fun time.

As usual, the convention came to end much too quickly. I decided to leave Sunday morning, so that I could get home early enough to allow me to drive back up to retrieve my camping gear. The morning dawned foggy, so departure was delayed until about 10:30. When I finally got out on the taxiway to leave, the tower closed the field for the B-2 bomber fly-by. It made three passes and departed, then we were allowed to leave. The flight home was uneventful, as was the camping gear retrieval.

So, another Oshkosh was over. Like I said earlier, my joblessness tempered the event for me because I kept thinking that this might be the last year I get to spend the entire week there. With a new employer, I'll have to start over, and go back

to only two weeks vacation (I used to have five). But OSH 2003 is a year away. We'll see what happens next year.

By the way, I did accept a position with Case Corporation (CNH) in Racine, WI at the end of August. I'm now a Technical Specialist in their Technical Support Group with responsibility for crawler dozers. I think things are back on the road back to "normal".

## **SONERAI NEWS**

- **First Flight:** Arlan Jaspers from Sheldon IA called on September 19 to report that he had flown his Sonerai IIL, N811DR, for the first time. His airplane has a 1700 VW with a Harley Davidson carb. He says the airplane flies fine but is a little slower than he expected. He's now looking into changes to the prop to help things out.
- **Sonerai Wing Construction Manual:** It is now available. There are 18 pages of text, 85 photographs, and 12 drawings, as well as a complete materials and a tools list. If you would like your own personal copy, sent me cash, check, or money order for \$25.00. Postage is included.
- **Back Issues:** **Sonerai Newsletter** back issues are 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 \$3.50 each. I have the last two issues from 1994, and all of the issues from 1995, 1996, 1997, 1998, 1999, 2000, and 2001. 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.

## **TWO CENTS WORTH** By James Gay III

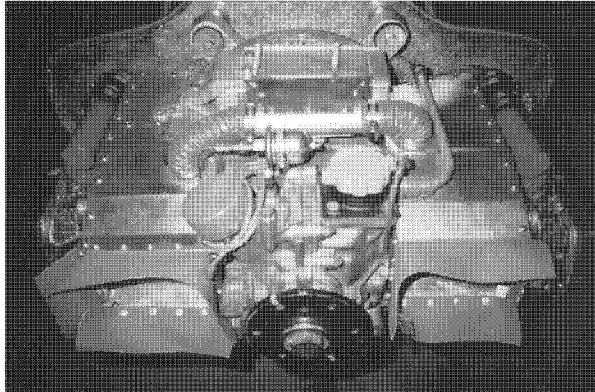
Some readers may remember my article from the first quarter of 2000 dealing with fabricating and welding the fuselage. I wrote it with the idea of helping other builders with the lack of a comprehensive builder's manual. The booklet supplied with the plans, probably written when there were few Sonerai completions, doesn't go into any great detail and in many cases has no information to offer.

The **Sonerai Newsletter** remains the best source of information for the builder; a forum of "how to" articles to provide food for thought. The following contribution is my "two cents worth".

### Cooling Baffles

I decided to use the box baffling system after seeing Fred Keip's setup in the August 2001 issue of **Custom Planes** magazine. They looked like the easiest to make and are supposed to have less cooling drag.

I started by making poster board patterns taped into position after cutting them out; they are easy to cut, bend, and are dirt cheap. This is an advantage because I made many of the pieces over and over until I got the fit "on the money".



**Top View  
Showing box Baffles and Oil Cooler Duct**

For material, I scrounged some .025" thick 3003-H14 grade aluminum sheet at a local recycler, aka the junkyard. I purchased two pieces 18" x 8' for scrap price, a dollar a pound. It had only light scratches and was reasonably clean. This grade is the most common commercial grade next to 6061-T6. It is soft and easy to work. Some of you may have left over 2024-T3 sheet from building your wings, and this grade is the most commonly used to build baffles. But since I have decided to build out the entire fuselage before starting my wings, I had the option to use a softer, more common grade. While this grade is no good for any of the stress bearing structures such as the wings, it is just fine for everything else. I used up half of what I bought and plan to use the other half for my rear access panels and to bridge between the lower cowling and the fabric bow to hide the center of the landing gear.

I cut the pieces out on a band saw, filed all of the edges smooth, and used a hand seamer and wooden blocks to make the bends. Those using harder grades must take into account bend radii to avoid cracking the material. However, the Alclad is more rigid and will stand up to corrosion better. All permanent joints were fastened with aluminum pop rivets, while the temporary joints were fastened with #8 clip nuts and sheet metal screws, all

available in the Aviation section of your local hardware store. The port side was made in two sections, the starboard side in three to clear the oil cooler adapter plate. They were made to be removable for later maintenance.

The next task was to duct cooling air to the oil cooler. My setup is the usual "doghouse" style cooler with a Great Plains Sonerai rear set adapter plate. The cooling shroud itself is held to the face of the cooler with safety wire cables running under the cooler that are hooked to two springs that wrap around the rear and top. The photos and a dimensioned drawing will show this more clearly. To tap air from each baffle, I fabricated a pair of scoops from 1-1/2" OD aluminum tubing. The lower one inch of each tube has a 180 degree cutout with the end capped and is riveted in place to the top of the baffle with a few aluminum sheet tabs. These scoops are connected to each side of the shroud with "scat" aeroduct. At the rear of each baffle I have a 1" OD tube riveted in place to supply a pair of blast tubes for the magneto. Again, I used "scat" aeroduct to connect to nozzles made from 1" OD tubing that are fastened to the firewall with Adel clamps, they are somewhat adjustable to clear the magneto when it is rotated to time the spark. The sizes of all of these air ducts can be changed to suit the end user. I made mine a bit in the larger side due to the high summer temperatures here in Houston.

After fastening the lip seals with 3/8" diameter head aluminum rivets (normally used to rib stitch fabric to metal ribs), I sealed all gaps with high temp Permatex Ultra Copper silicon sealant when making the final assembly. The last piece of baffling is the pan/duct bolted under the ribbed "oilpan" portion of the crankcase. Air is supplied from the horizontal slot underneath the spinner. Fabrication is pretty straightforward, however, leave extra material on the front to trim to an approximate 1/4" gap from the cowling in *your* installation. I riveted some baffle seal material to the front lip to seal the majority of the gaps, to stiffen the bottom, I riveted two lengths of 3/4" x 1/2" x 1/16" thick aluminum angle across the width. The hole shown in the photos is for the leads of my oil temperature sending unit, and the scoop/slot is to blow cold air on my air filter.

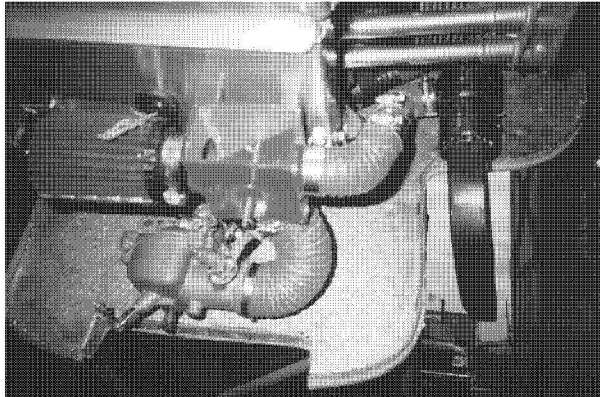
### Carb heat-air filter

I furnished a full scale dimensioned drawing for my version of the carb heat selector box, there should be a couple of photos also. My induction system consists of a Zenith floatbowl updraft carburetor available from Great Plains (it does require carb heat to be safe), a K and N clamp on style air filter,



my carb heat selector box, and a heat muff on the port side rear exhaust pipe.

The main body of the selector box is fabricated from 2" x 3" x 1/8" thick 6063-T5 aluminum tube 4" long, and while a bit heavy, it will not warp out of squareness and cause the flapper door to bind. The round tubes are 6061-T6 aluminum, all of these are available from Wick's Aircraft. As I stated in the plans, I elected to bond the round tubes to the body with J-B Weld brand epoxy putty. The maximum temperature stated on the J-B Weld package is 600 degrees Fahrenheit, and frankly if you experience such extreme air temperatures in your engine compartment, carb heat will be the least of your worries.

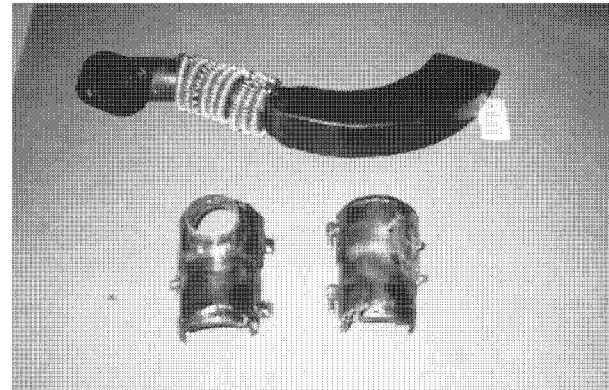


**Bottom View  
Showing Carb Air Box and Ducting**

The mechanical strength of the bonds was tested to destruction on an earlier rejected assembly that had the air outlet to the carb on the bottom of the box and would not fit inside the cowling. Four to five heavy blows with a ball peen hammer and a few choice words were required to cause each of the round tubes to separate from the body. Just to be sure, I did reinforce the tube supporting the air filter in the second and final assembly with riveted tabs, the other two just support the weight of the aeroduct and require no reinforcement. I chose bonding instead of welding to prevent warpage of the body and because J-B Weld is available almost everywhere, where as access to aluminum welding equipment is not. The rear mounts shown on the selector box plans are to attach to the aluminum angle riveted to the pan/duct. This can be changed to four Micarta blocks if desired. Just bond them in place, and drill and tap the body for #8-32 machine screws. The bushing shown in the plans is screwed to the body with machine screws, again just tap the body. The screws must be slightly below flush inside to avoid binding the flapper door.

The carb heat muff is fabricated from an

automotive exhaust reducer, 2-1/2" ID x 2-1/4" ID. The endcaps are large diameter freeze plugs welded in place, look for the sizes used on big block Ford engines. Dismountable barrel hinges are made from 3/16" OD cold rolled round rod and 3/16" ID bushing stock, see the photo. The exhaust pipe is wrapped with 5/16" diameter screen door spring to give a larger heat radiation surface, the extra heavy wall of the reducer should also hold in more heat, the total height of the muff is only 4-1/4" and needs all the help it can get.



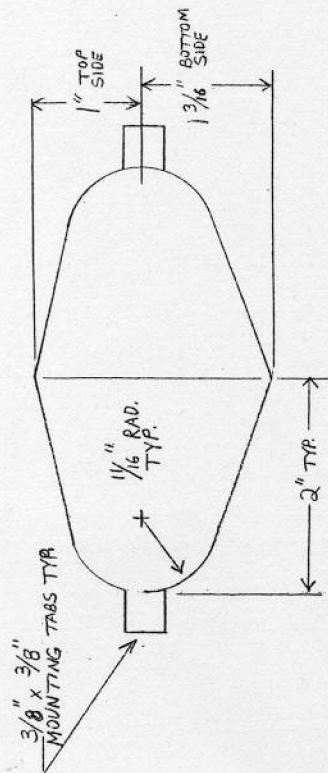
**Carb Heat Muff**

The Sonerai presents a very small frontal area, due to its close cowling, this helps to make it fast due to low drag. However, this makes it tough to fit all of the necessary components inside the confines of the original cowling without using a shoe horn. I understand earlier models used the Posa carburetor and did not require carb heat, many dispensed with air filters all together. They did not have a secondary ignition and Fred tells me that most did not utilize an oil cooler. The point is that these refinements take up space and you will not realize it until starting the engine installation; fitting a turbocharger would be a real neat trick.

All of the components described in the text and in my drawings fit the inside of *my* cowling, just barely. All this does is give the builder a place to start. Feel free to make whatever changes are required for your application. There are no patents pending, and the plans and ideas are for you to use as you see fit. Good luck on your engine installation.

James Gay III  
Houston, TX

*Freditorial Comments: Great input, James. It's worth far more than two cents. On the Sonerai, it's a given that the engine compartment is like trying to fit the proverbial ten pounds of stuff in a five pound cowling. The drawings are on pages 6 & 7.*



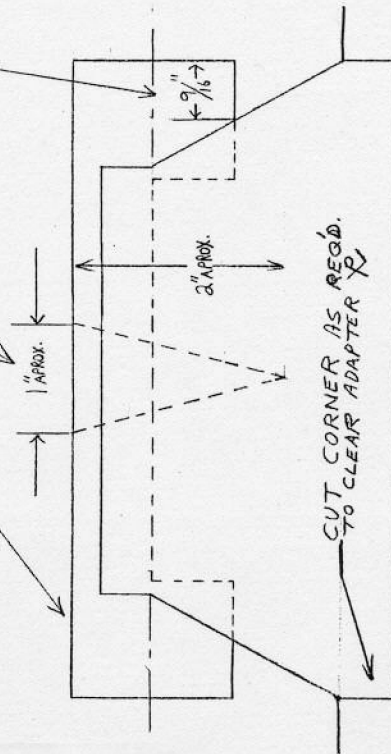
DIVIDER  $\frac{R}{2}$  APPROX. DETAIL  
BEND AT  $\frac{R}{2}$  TO FIT

DIVIDER  $\frac{R}{2}$  SHOWN ONLY  
IN THIS VIEW FOR CLARITY

TYP. HOSE CLAMP  
IS  $\frac{1}{8}$ " WIDE

$1\frac{1}{2}$ " O.D. TUBE

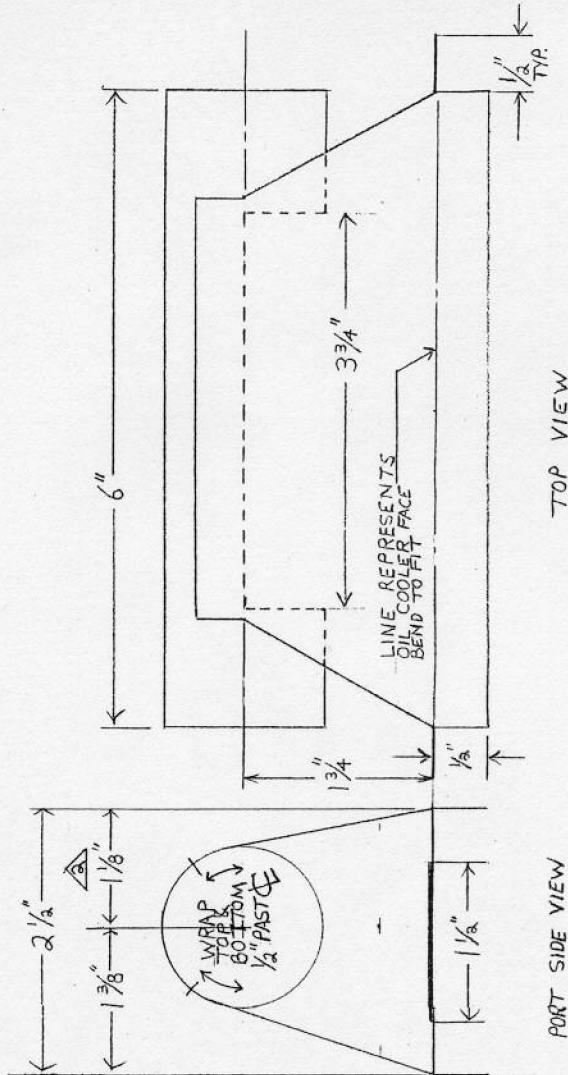
6



BOTTOM VIEW

# OIL COOLER SHROUD

REV. 2 & OF TUBE LOWERED  $\frac{3}{8}$ " TO CLEAR COWLING.  
J.S. GAY 1-2002. FULL SCALE.

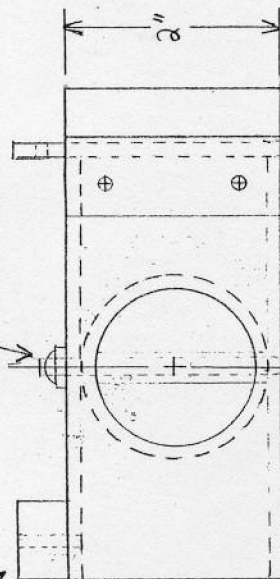


PORT SIDE VIEW

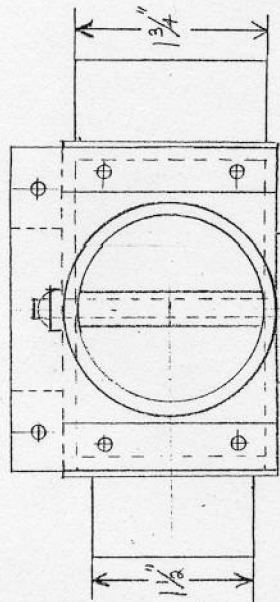
TOP VIEW

3/4" x 3/4" x 1/2" THICK  
MICARTA SPACERS (2 REQD)

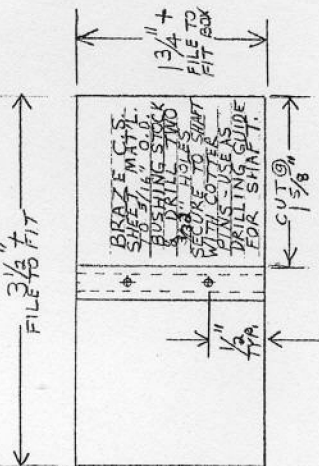
AN3 NUT TO  
ADJUST FRICTION



PORTSIDE VIEW



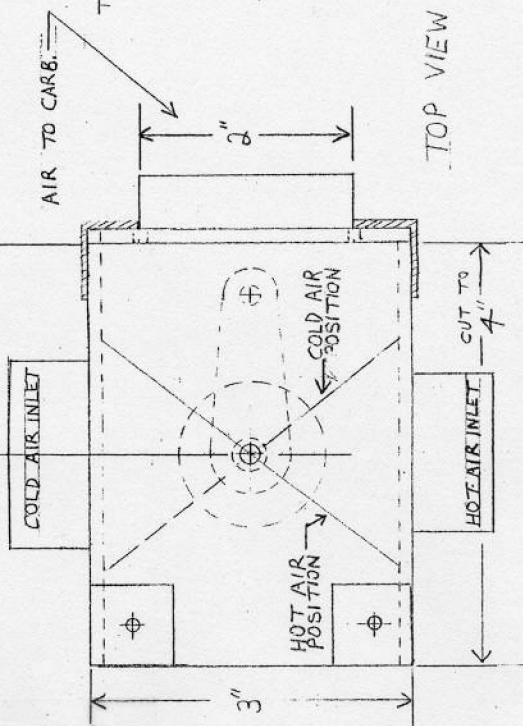
REAR VIEW



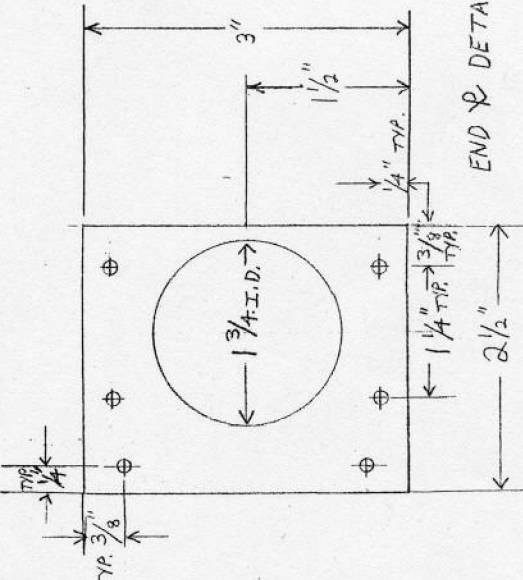
FLAPPER DETAIL

ORIENTATION OF  
ACTUATOR ARM AS REQD

J. A. HAY III 2-2001



TOP VIEW



END VIEW DETAIL

CARB. HEAT BOX - NOTES:  
 ① FULL SCALE DRAWING - DIMS. NOT SHOWN CAN BE MEASURED ON DWG.  
 ② BODY IS 2" x 3" x 1/8" 6063 ALUMINUM TUBE - 4" LONG. END  $\phi$  IS 1/8" THICK ALUMINUM. ROUND TUBES ARE 6061FB ALUMINUM. SIZES CAN BE CHANGED TO SUIT DIFFERING REQUIREMENTS.  
 ③ ROUND TUBES & MICARTA SPACER BLOCKS ARE BONDED WITH JB WELD EPOXY PUTTY - MAX. TEMP 600°F. REQUIRES SEVERAL HEAVY HAMMER BLOWS TO BREAK TUBE FROM BODY, TUBE CAN BE REINFORCED BY RIVETING TWO ALUMINUM SHEET TABS FOR EACH TUBE - FABRICATORS CHOICE.  
 ④ END  $\phi$  IS FASTENED WITH TWO 1/2" x 3/4" x 1/8" ALUM. ANGLES, RIVETED TO PLATE, USE 8-32 SCREWS TO ATTACH TO BODY.  
 ⑤ BUSHING IS MADE FROM AN-S WOOD WASHER & A 1/2" LONG 5/16" O.D. BUSHING STOCK. SHEET IS 3/16" O.D. COLD ROLLED ROUND BAR - THREAD ONE END



## STATIC SOURCE FIX

*Jack Lockamy sent in the following note on a method of fixing erratic static pressure readings.*

If the static source for your instruments connects to the 5/8" steel tube running through the fuselage that supports the wings when they are folded, and you get erratic and swinging needle indications, here is an easy and inexpensive solution to the problem:

Visit your local auto parts or plumbing supply store and purchase two 5/8" RUBBER EXPANSION PLUGS. (Cost is approx \$5 for two plugs.) The plugs will have a bolt that passes through the plug and is tightened into a nut that compresses the rubber to plug the hole. Drill a small (1/16" – 1/8") hole the length of the bolt in ONE of the plugs. Install a plug in each end of the tube. This will provide you with a smooth-flowing static source even in the most turbulent wind conditions, and your static instruments will provide accurate and steady indications. You may even want to paint the plugs to match the color of the fuselage. Also,

during your preflight inspection remember to check the new static port for possible blockage.

*HOPE YOU*

*HAVE A*

*HAPPY*

*HOLIDAY*

*SEASON*

## 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.*

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

**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 IILTS (low wing, tri-gear, stretch) fuselage for sale. The engine mount is for Diehl accessory case, \$5500, but includes landing gear and hydraulic brakes – which is a \$6500 value. Call Steve at (402)493-6507 for more info. (3/01)

For Sale: VW Engine/Parts. Priced to sell complete – only \$600. or individually as needed. NEW: single port cylinder heads, 92 mm pistons & cylinders, valve covers, & x-casting. USED: engine case, 1835 cam, stock 69 mm crankshaft, & other misc. parts.

Call after 7:00 PM. Dan Bernard, 785-483-6812 (4/01)

For Sale: Sonerai II Stretch fuselage, prebuilt spars, ailerons, Monnett ribs, fiberglass cowlings, wing tips, & wheel pants, nosewheel, tailwheel, canopy, Great Plains 2180 w/dual ign., Diehl case, starter, no alt. or intake sys, some instruments. \$8000. Call Steve Garn, 336-877-0318 (2/02)

For Sale: Sonerai II Mid-Wing, minor ground loop damage, new prop, new cowlings, supercarb, 1850 EconoVee, all major parts. Pictures available email. \$2500. Jack Hall, 760-949-6999, jhhall6980@aol.com, Southern California (4/01)

For Sale: Sonerai IILS, fuselage and wings complete, on the gear, cowlings, canopy, needs engine and prop. \$7500. Don Jester, 417-466-3013 (1/02)

Wanted: O-320 Lycoming, 150 hp, all accessories, dynafocal, mid-time or less. No prop strikes. Call Fred Ninneman, (816)353-1161 (2/02)

For Sale: Sonerai IIL. Fuselage welded, on gear, wings/aileron done,

2180 engine, no prop, cowlings, canopy there but needs finishing, no instruments, lots of parts. \$4200/offer/trade. Eric Stadjuhar, (402)896-6352 or (402)669-0271, Omaha, NE (2/02)

Wanted: Folding Wing Sonerai (in process OK). Joe Hearn, (352)628-1027 (3/02)

For Sale: Sonerai Parts. Complete instrument panel, Rand-Robinson 3-blade prop, Posa Supercarb, Slick Mag & harness, gascolator, 5-point harness. All new! Gary Harvey, (705)799-7448 (3/02)

For Sale: #68 Zenith Carb, \$75; Monnett X-casting, \$50; Monnett SuperVee prop extension ass'y, \$150; Monnett single-port intake manifold, \$50; Aero-Vee valve covers, \$25; 2" steel prop hub & plate, \$25. Jim Meier, (608)255-6773 between 8am & 5pm, or (608)849-9499 after 5pm (3/02)

For Sale: Sonerai II mid-wing, only needs paint and assembly, 1835 with dual ignition (Slick mag and Bosch 009). \$6500. Greg Buckley, (559)226-5992, [glibflyfun@cs.com](mailto:glibflyfun@cs.com) (3/02)