

SONERAI NEWSLETTER

OCT-NOV-DEC 2009

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ROGER GODFREY'S SONERAI IIL AT OSH 2009

This was Roger's fourth trip to AirVenture from his home in Ottumwa, IA. As you can probably tell, his airplane is a little different from the average Sonerai IIL. The most significant difference is in the wing, where he replaced the original with a longer span, thicker Riblett airfoil wing. He's also raised the height of the tail about 9". The airplane has a 2180 VW with a Sterba prop. You'll note too that there are fairings to clean up the landing gear, and small wheel pants on the tailwheel. Take a look at more photos of Oshkosh '09, including a couple of other Sonerai's, on the following pages.

SEEN AT OSHKOSH 2009



Jeff Lange's Sonerai I. Jeff couldn't run in the AirVenture Cup this year, so there's no report of broken speed records, but she's fast.

Tim Hoversten's Sonerai IILT in the Affordable Flying Center. This airplane started life as mid-wing taildragger



A replica of Art Chester's Jeep from the Golden Age of Air Racing. It's smaller than a Sonerai, but with that big engine, it had to be fast.



The Airbus A380. All of those people are waiting in line to walk thru it. It's just a BIG airliner...

So, you wanna build a jet? Here's John Monnett's latest: the Sub-Sonex.



I saw this tool box under a very pretty Pietenpol with a Model A Ford powerplant. It expresses the true feelings of us day-VFR pilots.

IT'S JUST ABOUT TIME TO RETIRE

I know that many of you don't want to hear this, but your intrepid editor/publisher has made the decision to retire from the newsletter business at the end of 2010.

I've been pondering the question for a couple of years now, and it is time. There are several reasons for calling it quits:

1. Most importantly, I've run out of gas. 2010 will be my fourteenth year as editor/publisher. Ideas for new and interesting how-to articles just aren't coming anymore, so it gets harder and harder to come up with interesting and useful stuff for you to use.
2. The number of subscribers has fallen off significantly over the years. Back in 1996 and 1997, more than 240 people subscribed to the newsletter. Today, it is well under 100. I'm truly appreciative to those of you who've supported me thru the years, and I hope that the newsletter has been useful.
3. I truly think that the days of the written and mailed newsletter are nearing an end. With the proliferation of the internet, and really great websites like Scott Plischke's *www.sonerai.net* and the various group sites, the demand for a dedicated newsletter has gone away. These sites allow a nearly instantaneous exchange of information and ideas that is impossible to compete with.
4. It's time for me to move on to new things. My Wag-a-bond project is at the 90% done, 90% to go point, and I really need to get it finished before the fuselage is consumed by rust. And just this past week (on Oct 28th), I accepted a position on the EAA Homebuilder's Council. I'm not sure yet what my duties will entail, but I'm looking forward to the new challenge.

Now, with all of this being said, it doesn't mean that I will be abandoning the Sonerai community. I plan on continuing to fly N99FK for a long time, and supporting the *www.sonerai.net* site as much as I can, maybe even writing the occasional article. Also, I'd like to continue to be available to provide technical support to anyone who might need it.

Is it possible for the Sonerai Newsletter to continue after 2010? Only if someone is willing to take on the task. If you think you might want to be the next Sonerai Newsletter editor/publisher, email me or call me, and we can talk about it.

Finally, there are a couple of you who have extended your subscriptions thru 2011 and 2012.

Have no fear, if no one comes forward to continue the newsletter, I'll send you a refund check.

FUSELAGE CONSTRUCTION, PART 3 – FITTING THE DETAILS

Now, it's time to install all of the little bits and pieces that turn the primary structure into a useable fuselage. Here's a list of the things that need to be welded in:

1. Engine mounts (on the SI the mounts for the engine mount).
2. Fuel tank supports and hold-down straps.
3. Nose gear supports, if you're build the "T" version.
4. Fuel valve mount.
5. Instrument panel mount.
6. Tabs for the floor boards and cowling attachment.
7. Control stick bearing supports.
8. Seats
9. Seat belt supports.
10. Main landing gear supports and bushings.
11. Rudder pedal hinge bushings.
12. Brake handle mount.
13. Throttle mounts.
14. Canopy mounts.
15. Vertical stabilizer.
16. Turtleneck structure.
17. Tabs for the rear access panels.
18. Tailwheel support tube.
19. Stringer attach tubes.
20. Rudder cable fairlead tubes.
21. Wing fold cross tube / static port.
22. End caps for the front end of the longerons.

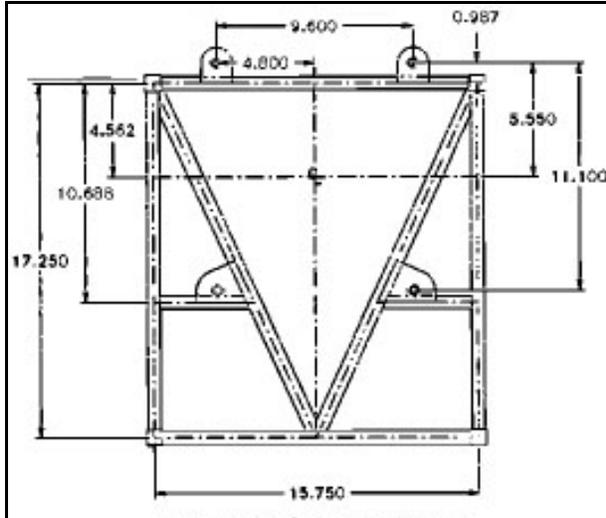
You'll also need to think about where you'll mount the battery, ELT, radios, and so on.

We'll attack each of these items, one at a time. So, where do we start? How about the firewall station?

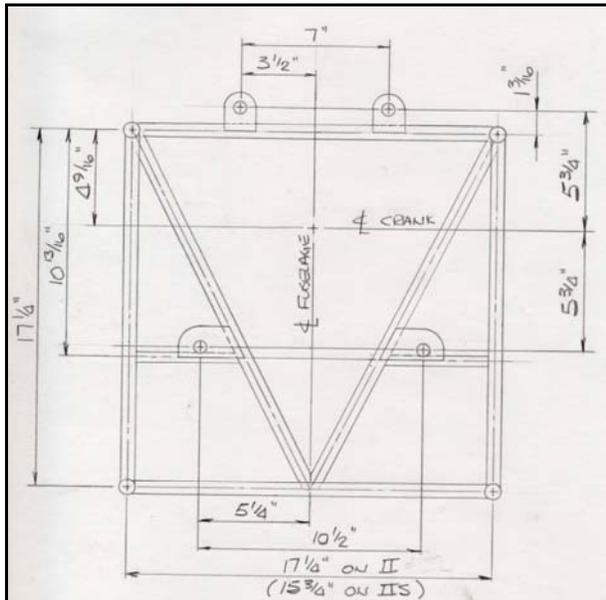
The Engine Mount:

At this point, you are going to have to make one of the more important decisions about your Sonerai II project (not yet required for an SI at this time), and that is whose engine that you will eventually bolt to the firewall. The reason, of course, is that the different suppliers of VW conversions have different mounting patterns. The dimensions shown on the plans fit the original Monnett Electro-X mount, as well as the Great Plains X-mount, and the Diehl X-casting. If you are planning to use a Revmaster, AeroVee, or Great Plains with the regular Diehl case, the pattern is shown in the

Diehl mount drawing. If you happen to have one of the older HAPI or Mosler engines (or an A-series Continental), the pattern is shown in the HAPI mount drawing. If you are going to use an engine requiring a separate engine mount, the mount bushings should be placed in the four corners of the firewall station.



The Diehl/Revmaster/AeroVee Engine Mount Locations



The HAPI/Continental Engine Mount Locations

One other point to note with the AeroVee engine is that the starter is located at the 9:00 position when viewed from the rear. The starter will probably interfere with the LH front diagonal tube, so you might want to reconfigure the tube location to provide adequate clearance. One suggestion would be to put a bend in the diagonal at the point where the short horizontal tube joins it to move the

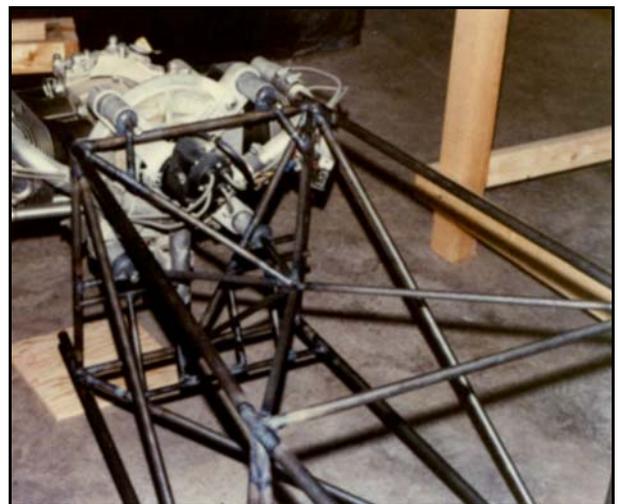
diagonal away from the starter. Just be careful to leave enough room for the lower left engine mount.

And one other thing to consider when choosing the Great Plains engine with the standard Diehl case is the starter location. If you are building the "T" version, it will be necessary to buy the Diehl case with the starter at the 12:00 position so that it doesn't interfere with the nose gear strut. The problem with the 12:00 position is that the starter will interfere with the top horizontal cross member at the firewall station. This will require modification of the cross member. One possible solution is to remove a short portion of the tube where the starter is located, and then weld another piece of tube under the remaining stubs. Make all of the cuts at a 45° angle, overlap the lower tube on the studs about 1", and use 0.032" thick 4130 sheet to cap the ends of the tubes.

Once you've decided on the engine brand, you can proceed to cut and fit the short horizontal tubes that support the lower mounts, and then fabricate the flat mount plates and bushings. Weld the bushings to the plates before fitting the plates to the firewall station. At this point, it would be wise to fabricate a fixture to hold the four mounts in the correct orientation relative to each other, so that they don't move out of position while the welding is being done.. A few pieces of hardware store angle iron will work well.

The Fuel Tank Supports:

On all of the Sonair II's, the fuel tank is supported by the top longerons and a "spider" of tubes that have a joint below the level of the longerons. There are also diagonal tubes from this joint to the bottom of the firewall station and to each of the lower engine mount bushings, as well as short diagonals to the upper engine mount bushings.



Fuel Tank Support "Spider"

The centerline of the spider joint is located 5" down from the centerline of the top longerons, and 12-1/2" back from the centerline of the firewall station cross tube. It will probably be easiest to install all of these tubes with the fuselage upside down on your jig table. Fabricate a wooden "stick" 5-1/8" long that you can attach to the table top on the centerline of the fuselage, 12-1/2" back from the centerline of the top firewall station cross tube. This will provide a support point for all of the spider tubes.

Cut, fit, and tack the four spider tubes, then do the same for the two diagonals that go to the lower engine mount bushings, and the one to the lower firewall cross tube. Finally, cut, fit and tack the short diagonals that connect the upper engine mount bushings to the front spider tubes.

Once all of that is done weld all of the tubes in place.

UPGRADE FROM MECHANICAL DRUM BRAKES TO DISK BRAKES

by Scott Rupp

If you are looking to upgrade your drum brake to something with a little more power, or are looking for light brakes, this may be the way to go. I found mountain bike mechanical disk brakes on-line from Jenson USA for \$45 each. First off, I believe brakes are for use taxiing and emergencies. I do not know if I would use this brake setup for continual use on a short field. All the parts needed weigh in at 23 oz. per wheel. Using a 160 mm rotor, the rotor is marginally larger than the 5" Azusa rim.

To make the caliper mount, I started by drawing the plans axle mount on paper. I drew the rotor diameter around the axle center point. Next I aligned the brake pads to where I wanted them to run compared to the rotor with the caliper mount on the caliper. I then extended the plans axle plate out to encompass the mount, but not interfere with the caliper.

The rotor adapter started from 1/2" aluminum from Fred. I drew the wheel bolt pattern out and put the rotor bolt pattern in the center. This was all cut and drilled, then I tapped the rotor bolt holes for the brake kit provided M5-.80 bolts. The outer diameter of the adapter was then milled down to 1/4" thick to accommodate the three bolt heads for the rims. The adapter is spaced out from the rim using

1-3/4" spacers made from 4130 bushing stock. This provides enough clearance between the tire and the caliper. The rim bolts used were 3 1/2".

Mounting the caliper to the axle plate was done by spacing the rim out from the axle plate about 2-3/8", then positioning the caliper over the rotor and marking the bolt hole locations on the axle plate. I did not attempt to find a right and left caliper, so each side is made the same and then mounted to the landing gear with one upside down, putting the cables at the back of the landing gear leg.

By using hand brake levers mounted to the rudder pedals I have differential braking. Pictures of this can be seen on sonerai.net in the photo gallery in the o2koold folder. From the bike shop I found a lever that will pull two cables equally. This will be mounted in the front for full dual controls. A hook will be made to hold the front lever, acting as a parking brake.

This setup has not been flight tested yet. Both my technical counselor and my test pilot have been impressed with the holding power of these brakes. They are able to prevent a 500 cc fourwheeler from moving while in tow, and brought both the fourwheeler and airframe to a stop from 25 mph.



The Caliper Assembly



The Disc Assembly



All the Bits and Pieces



A Top View of the Brake Assembly

WISDOM (?)

Here are a few nuggets of wisdom from Larry the Cable Guy:

1. A day without sunshine is like night.
2. On the other hand, you have different fingers.
3. Remember, half the people you know are below average.
4. He who laughs last, thinks slowest.
5. A clear conscience is usually the sign of a bad memory.
6. If you think nobody cares, try missing a couple of payments.
7. OK, so what's the speed of dark?
8. When everything is coming your way, you're in the wrong lane.
9. Hard work pays off in the future. Laziness pays off now.
10. How much deeper would the ocean be without sponges?
11. Eagles may soar, but weasels don't get sucked into jet engines.
12. Inside every older person is a younger person wondering, 'What the heck happened?'

Happy Holidays

Fred

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

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!!

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)

FOR SALE: 1915cc VW Conversion w/ new aluminum crankcase, balanced forged 69mm crank, SCAT C20 cam with EMPI steel bolt-on timing gear with straight cut teeth, new dual-port cylinder heads drilled for 10mm secondary plugs, Monnett shrink-fit prop hub, SCAT lifters, 26mm oil pump, top-mount oil cooler, Slick 4216 mag, GPAS secondary ignition and 20 amp alternator, and Monnett Electro-X mount modified to allow use of the 20 amp alternator. Engine was built in 2003 but has not been run. Can crate and ship to USA locations at buyers expense, or can be picked up in Houston, TX. \$2500 OBO. James Gay III, jsgiii@att.net, or at 713-922-9080. (4/09)



Hernan Marcos' Sonerai IILS
As you can see by the registration number Hernan is from Argentina.
The engine is a Continental A-75.