

# **SONERAI** NEWSLETTER

Apr-May-Jun 96



## **Eliot Willoughby's Sonerai I "Raptor"**

Welcome to the Apr-May-Jun 1996 issue of the Sonerai Newsletter. We have Sun N Fun coming up in the very near future and have been advised by Mr. Dean Mc Ginnis that the Sonerai dinner is set for Wednesday, Apr. 17th at Vito's Restaurant. ( More info available at Great Plains booth). Steve Bennett of Great Plains Aircraft will have his normal booth arrangement and provide over several VW engine forums. I understand that John Monnett will also be there for Sky Struck Enterprises. Please notice the schedule for Sonerai workshops to be held by Sky Struck. All pilots flying their Sonerai into the weekend workshops will receive a free lunch and be invited to the day's events and evening get together.

On the negative side --- it looks like the only Sonerai Forum to be held at Oshkosh this year will be the Saturday Homebuilder's Corner event. Our understanding is that all Forums are on an "invitation only" basis and so far our inquiry to Headquarters has gone unanswered. The Sonerai dinner is still set for Saturday night.

A letter from Gary Stucker,

Dear Ed,

In response to our conversation on this date concerning the covering up of the aileron gap on Sonerai's with tape.

I am currently building a wooden aircraft where the designer emphasizes covering all control surface gaps to increase control performance. My Sonerai II shares a hanger with a Glasair what has it's control surface gaps filled in with tape. The owner states that this helps his rate of climb. With this in mind, I taped over my Sonerai aileron gaps and elevator gaps from one end to the other. It seemed like a quick, cheap fix to increase speed and lift. However, things did not seem to go as planned.

My first and only test flight found me lifting off the runway as I normally do. When about 50 feet up at 85 mph, the plane staggered from side to side as if I had encountered prop wash from the plane taking off in front of me. I quickly leveled off and increased my speed to 100 mph and then climbed away from the airport. I flew out over the ocean where the wind is smoother and opened it up to 150 mph and found no difference in it's handling, climb or speed. I did a few loops and rolls and found no difference in performance. No spins were attempted. In slow flight I again found the plane staggering from side to side every now and then as if I was in someone's prop wash.

When I returned to the airport and slowed down on my final approach, the plane suddenly dropped it's left wing. I slammed the stick over and it then dropped it's right wing. This got my attention and I lowered it's nose and increased my speed. The plane became

stable again until I leveled off a few feet above the runway numbers and began slowing down. The plane then began dropping first one wing and then the other wing as my speed dropped off. I wobbled down the runway until I stalled it on in a three point attitude. The landing was somewhat bouncy and upon taxiing back to the hanger, I immediately removed the tape from my control surface gaps. In doing this I also removed a few spots of paint with the tape. I am sadder but wiser.

I do not understand why this change in my wing and elevator caused such a change in my slow flight capabilities. Without the gap tape, I could mush along at 60 mph even making turns, without any problems. If anyone knows the answer, I would like to hear it. My Sonerai II is the original mid-wing designed with counter balance weights at the wing tips. The plane was built in 1978 by Peter Buck and awarded the Wright Bros. Trophy a few years later for the Best Soneri built, (in the designer's opinion). It is a stable, cheap, easy to fly airplane that cruises at 140 mph, tops out at 160 mph and has been taken to 210 mph without any problems. A top overhaul of the 1850 cc AeroVee just cost me \$250.00. This consisted of new cylinder rings, honing the cylinders, swapping cylinder heads, new valve seats, new valve guides, and new valves. Compare that to \$4000 to \$5000 for the same thing in a Lycoming four-banger. It's hard to beat a Sonerai for performance. Hope to see you at Sun n Fun or Oshkosh.

Gary Stucker 1511 Devonshire Dr.  
Oxnard, CA 93030

Ed's comments -- Thanks for the letter, Gary. I used plastic tape to seal the gaps on just my ailerons after flying the Sonerai II for about three years. The only difference I noticed was a slightly greater roll rate, but it wasn't the sort of thing that was really evident. When I decided to remove the tape to compare the results again, the paint began to come off my wings too, so the tape went right back on for the next 10 years. I never noticed the roll problems that Gary did however. When he called, I did talk about the need to have the ailerons drooped about 1/4" at the trailing edge. Gary felt that his were drooped about that much. It may be that the rig of his particular airplane was affected by the gap seals. It doesn't sound like he is about to try the experiment again for a while.

I seem to remember another builder of a small, fast homebuilt (perhaps a Sonerai, perhaps not) that had a portion of his aileron gap tape come loose and stick up in the air causing quite a roll phenomenon. We also have Steve Wittman to think about. If the tape ever should come loose, hope that it all comes off at one time rather than just a few inches.

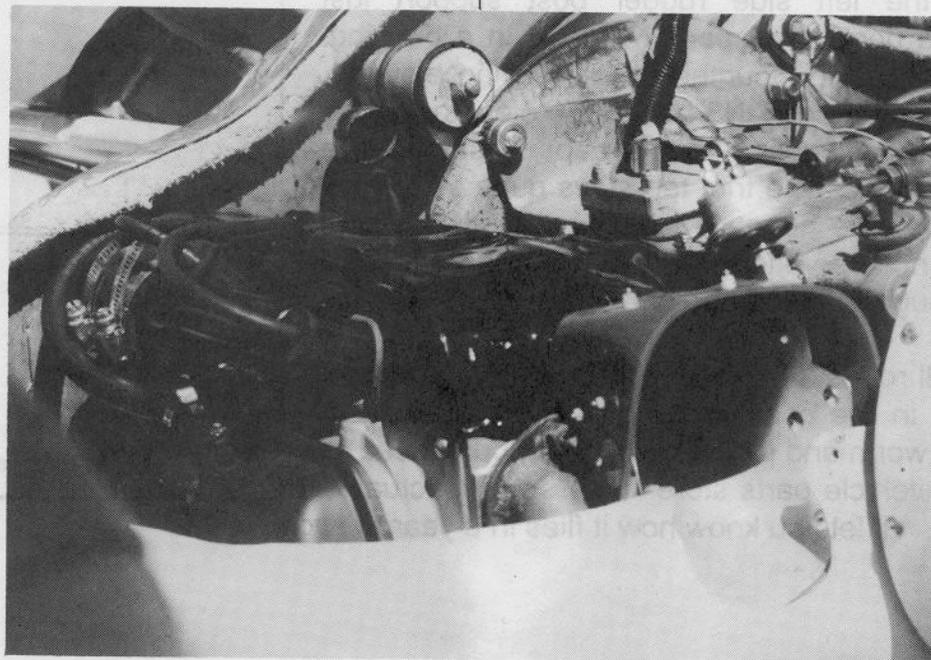
### **BAFFLING ALTERNATIVE**

by Fred Keip

No, this is not about an alternative that's really hard to understand, but a different way to guarantee that the air that's supposed to be cooling your engine does precisely that. The accompanying photo is one that I took at Oshkosh last year of Jim Meier's engine installation.

The most interesting thing about it to me was that the upper baffles were made from stock VW beetle upper cooling shrouds. The slot on top of the shroud that mates with the fan tower has been filled in, and the front has a duct added to connect to the cowling inlet. It makes for a nice, clean and tight installation, and Jim told me that his cylinder head temps run around 320 F. For lower baffles, Jim used the Super Cool Tin, that Great Plains sells.

You might also note that he's running automotive plugs and wires on the magneto, and that the breather line is connected to the valve cover rather than the crankcase. Nice job, Jim.



# SONERAI TRIM TAB

David E. Wilcox, January 11, 1996

Fred, you mentioned that Al Bertelmann had shown you a cable actuated pitch trim system. I encourage you to show some diagrams. I thought long and hard about a cable system and couldn't get comfortable. If it was a simple cable around a pulley, (no connection to prevent slippage at the pulley) I was worried about having a primary control surface at the mercy of a cable tension friction. If I ran a multi-wrap spool, the design got somewhat complicated to prevent tangling

I wasn't going to publish this until I'd flown, but since you brought the subject up I'll show you what I did. I detest long push - pull cables and I am not too fond of a tension cable system if it isn't necessary. I tried to work with a simple non flexible system of some kind, either rotating or push - pull. Figure 1 shows the general layout that I came up with. It is a trailing edge trim tab in the inboard bay of the right elevator. The tab is aluminum, fit with a control horn on the bottom. The attachment hole in the horn is centered under the hinge line with the tab in the neutral position as shown in figure 2. Sorry for the somewhat crowded drawings. I do everything in wire frame, so nothing shows up as hidden lines.

The trick to all of this is the two bellcranks shown in figure 3. The two cranks are identical, with equal throws, at  $90^{\circ}$  angles. The upper bellcrank is fixed to the fuselage on the left side rudder post support just underneath the horizontal spar. I welded in a bushing. The lower bellcrank is mounted to the moving elevator. Here, I simply welded an AN3 bolt to the elevator torque tube. The interconnecting rod sweeps easily as the elevator is actuated. The trim tab stays quite steady. It actually gives a little negative feed back to the system which should increase pitch stability. All end points are supported through 3/16 rod end bearings.

The push - pull rod is 3/8 tubing supported though nylon fairleads. Up in the cockpit, the rod is actuated by a venation blind worm and pinion crank that I purchased at a recreational vehicle parts store. The system actuates smooth as silk. I'll let you know how it flies in a year or two.

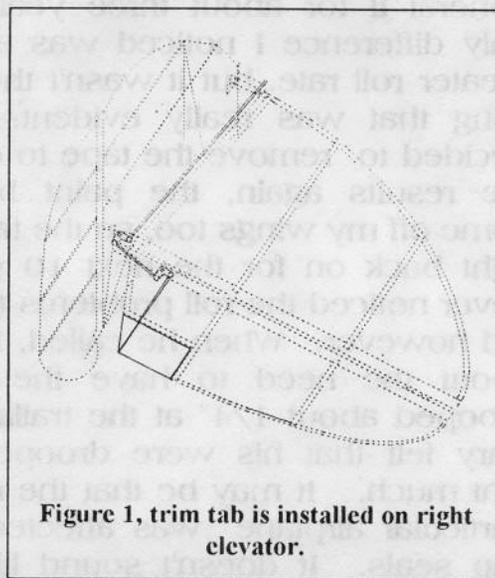


Figure 1, trim tab is installed on right elevator.

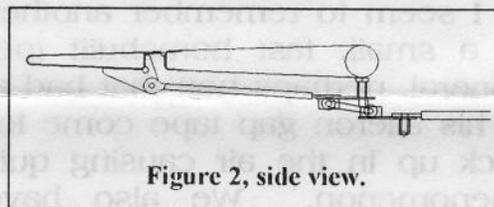


Figure 2, side view.

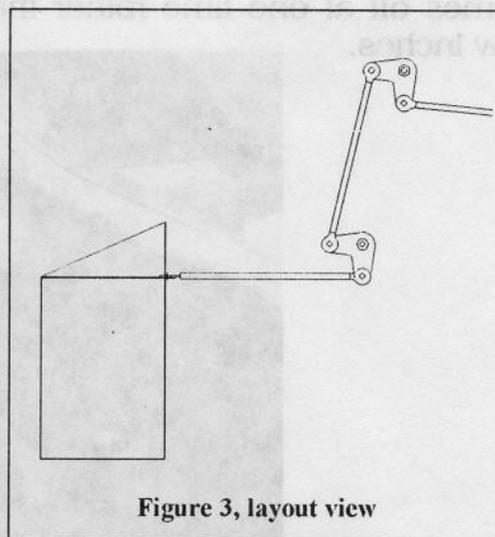


Figure 3, layout view

## **AL'S TRIM** by Fred Keip

At Oshkosh last year, Al Bertelmann allowed me the privilege to poke around in the back end of his Sonerai II. The reason was to look at his recently installed horizontal stabilizer pitch trim system.

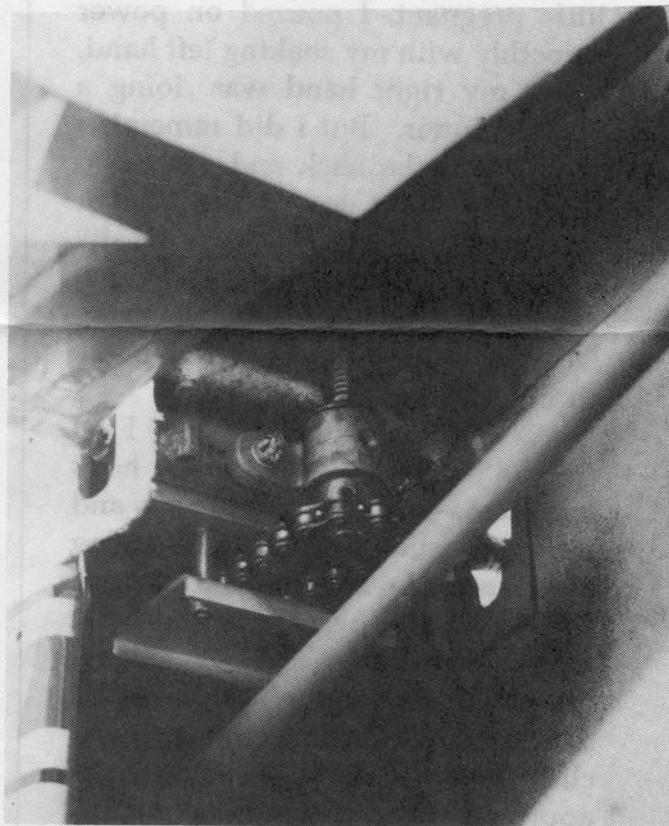
I had been using a spring-bungee arrangement on my airplane, but it only allowed nose up trim. This was good for only part of the flight envelope, since the airplane is set up for neutral trim at about one half fuel. So, once the first four or five gallons of fuel were burned, it was necessary to hold forward stick to maintain level flight. I really felt that some sort of fully adjustable trim would be better. And Al's system sure seemed like the ticket.

The two photos tell most of the story. The first shows the jackscrew arrangement. It consists of an acme thread screw from a c-clamp, a commercially available bushed pillow block bolted to the horizontal stabilizer tube, a small bicycle sprocket, and a welded bracket supporting the acme threaded nut which is bolted to the fuselage. There is also a piece of aluminum angle mounted on the front side of the stabilizer tube. It acts as a spacer to keep the stabilizer centered in the fuselage and provides an attachment point for the chain deflector. A length of bicycle chain which has a length of 1/16" aircraft cable attached, turns the sprocket.

The cockpit end of the system is shown in the other photo. It shows a small crank with a shaft attached to a pulley. The shaft runs in another bushed pillow block which is bolted to a mounting bracket clamped to the fuselage tubes. The 1/16" cable is wrapped around the pulley.

Al told me that the system is very effective, requiring only a quarter to half a turn of the crank to deal with most situations. It is neat system which is simple to make using off-the-shelf items, and is retrofitable to existing airplanes.

I've used this design as a basis for my own trim system, and hopefully I'll have an article on it next time. I want to fly it first to make sure it works.



A letter from Eliot Willoughby,

Dear Ed and Fred,

Finally I have finished and flown my Sonerai I. The first flight was on July 7, 1996 and typically, during my 7th hour of taxiing, I found myself airborne and drifting off to one side of the runway. (First timer's note: check out the wind before committing to fast taxi work or you may prematurely become airborne).

Finding myself in this unexpected condition, like being a little pregnant, I poured on power smoothly with my shaking left hand, while my right hand was doing a similar flutter. But I did remember not to grip the stick and used two fingers on top to minimize over controlling. (Of course, I really wanted to GRAB that Stick!!) My climbout was an oscillating wonder, I'm sure, at 80 mph -- and this plane climbs like a rocket!!

After leveling off at 2000 Ft., I pushed my eyeballs back in my head from cross-checking instruments and keeping visual contact while flying the plane. Shucks, I'd even stopped shaking. I circled the strip at Bardstown and checked lateral control in increasing banks to 40 degrees in gentle motions and climbed up to 3000 Ft. to do some approach to landing stalls and slow flight. Stalls were clean, but with little warning and a little power was all I needed. She flew straight and level -- smooth as silk -- and I cranked up 3600 RPM and 160 IAS, not too shabby. Unfortunately, the oil temperature caught my eye to spoil the fun -- 240 degrees and

climbing! Yow! I throttled back and descended.

So -- I put down in a bit of a hurry to say the least. I made the best and last perfect three pointer since I've flown the plane. (We won't discuss subsequent excursions in landings.)

After I stopped, I was surprised to be congratulated by the FBO and chairman of the Sammuels Field Air Board ( I thought I'd escaped all spectators but my ground team.) Then I looked under the plane at a rather alarming display of oil. I pulled the cowling off to find a large amount of oil had covered the rear of the engine and firewall. The rear seal had blown.

I pulled the mag and mag drive off the crankshaft, installed a new seal and buttoned it up. Then, remembering an article about oil temperature and oil separators in the Sonerai Newsletter several years ago, I searched my warped mind as to what could cause oil seal problems, especially since oil pressure and all other engine instruments were on the mark.

By blind luck, a crevice in my cerebellum coughed up crankcase pressure at higher RPMS increasing dramatically if your oil breather isn't doing it's job. So -- I pulled the fitting from the plate on the block where I had located the oil breather line. I had installed a cover plate over the oil pump opening to which the vent fitting is mated. In a late night stupor, I had made a gasket but forgot to make a hole in it for the vent!!

Red faced, I made the fix and no more trouble. Needless to say, I

love this little bird, named "Raptor", which is assigned race number 10 (perfect) by the Formula Vee Air Racing Association. I plan on campaigning it, -- who knows, maybe I can even give Brian Dempsey a little more competition.

There are many people who provided help, aid and advice in my Chapter 110 -- Cliff Shaffer, John Leone, Chuck Stottlemeyer and of course, Ed Sterba. I thank you all and look forward to seeing you Sonerai jocks, whenever and wherever! My ground team consisted of Larry Hauschows.

Time to build -- 11 years, 2200 hours (I built three to get one) . 1 marriage, 1 divorce -- a very expensive plane project. The project really took about three years.

Eliot Willoughby 3311 Mc Adams Ct. Louisville, KY 40299

Ed's comments -- Congratulations Eliot! It's always nice to hear about another Sonerai taking to the air. At least you found the way back to your airport, more than a few first flight pilots can say.

You are not alone in the oil breather situation, other people have done that before you. Whether you use a separator or just go straight overboard with the fumes, it is necessary to have a big enough breather and not have too many restrictions in it. You'll notice in another article, Fred Keip is converting his breather to one or two of the rocker covers. That has been done before too.

Have fun flying Raptor and give Brian a good run for his money.

## **REBUILD PROGRESS** by Fred Keip

Well, the last three months have been pretty productive on the Sonerai rebuild front. As I write this in mid-March, I've designed, built, and installed a horizontal stabilizer-mounted pitch trim system. (More on that, later.) I've completely redone the cooling baffles on my engine by going back to a highly modified version of the original Monnett box baffle. The crankcase breather has been moved from the top of the case to the valve covers. A new front floor board, front seat bottom and back, and rear hat shelf and bulkhead have been fabricated out of 1/8" birch plywood. And I bought a new Magellan Skyblazer LT GPS. That was the fun part.....

Now I'm in the process of doing the dirty work; stripping and cleaning off the old Stits Polytone from everything that doesn't have fabric on it. Fortunately, I've found a really quick way to get it done. (I was going to say "neat" way, but there is no way to be neat when it comes to removing paint.) Based on suggestion from my hangar partner, Keith Tridle, I tried using straight MEK to take off the paint, and let me tell you, does it work great.

It took two of us about an hour and a half to completely remove all of the Polytone from one wing panel. We used about a gallon and a half of MEK, a couple of Scotchbrite pads, and a whole mess of rags. You've got to wear a paint spraying mask and rubber gloves, and work in a well ventilated area, but it sure beat any strippers I've used in the past. Plus, it left the epoxy zinc-chromate primer intact.

All we've had to do to the wing panel to ready it for paint is to wet sand it to smooth it out. We figure that it will only take us

about 3 to 4 hours and we'll have the other panel ready to paint.

I've also used this method to unpaint the cowling halves and it worked equally as well. They were also primed with epoxy and it was unaffected. Prolonged exposure to MEK will eventually lift epoxy primer, but you have to leave it on for a long time, and fortunately, it evaporates quickly.

So, now all that's left is to repair some cracks in the cowling, unpaint the canopy skirt and landing gear, recover the fuselage and tail, and repaint everything.

Unfortunately, it's not going to be done for Sun'n'Fun. I'm planning to go anyway. Hope to see you there.



Sky Struck Enterprises, Inc.  
presents:

# Sonerai

## Builder's Workshop & Fly-In\*

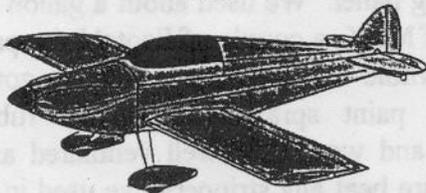
Oshkosh, Wisconsin

with designer

**John Monnett**

June 8<sup>th</sup> & 9<sup>th</sup> / September 28<sup>th</sup> & 29<sup>th</sup>, 1996

\$199.00



### \*Sonerai Pilots!

Fly your Sonerai to our workshop on Saturday  
and lunch is on us!

(Rain Date Sunday)

Join in the camaraderie of enthusiastic Sonerai Builders.

For details and registration information call:

**1-800-SKY-STRK**

1-800-759-7875

Sky Struck Enterprises, Inc. presents:



The Sonerai Seminar/ Workshop is divided into sessions that cover the techniques and skills involved in building your own Sonerai. Sessions involve demonstration, discussion, and active participation in "hands on" experiences. An informative materials packet is provided for each workshop attendee.

**Design Overview:** A photo retrospective that focuses on the philosophy that has made the Sonerai series one of the most successful and economical sport aircraft designs.



**Aluminum Wing Construction:** Aircraft aluminum alloys, applications and hardware terminology are discussed. Building the wing fixture, forming ribs, riveting etc. are covered. You'll be cutting, forming, drilling, riveting and fastening an actual part.



**Basic Metal Working & Welding:** 4130 Chromoly steel tubing and sheet fabrication, and oxygen/acetylene welding are demonstrated with "Dos and Don'ts" and "tips".  
**Tubing Truss and Tail Construction:** The simple techniques of building the fuselage and tail surface fixtures, cutting, bending, and fitting tubing will save you many hours in construction.



**Dope & Fabric:** An art as old as aircraft has been improved so covering the aft fuselage and tail are easier than ever. The popular "systems" pros and cons are discussed. You'll learn to glue, shrink, rib stitch, tape, and finish dacron.



**Finishing & Painting:** Surface preparation and techniques for the various materials covered in the other sections are demonstrated. Popular finishes and application equipment choices are explained. Working with Plexiglass (cutting, drilling, and fastening) is included.



**Engine and Prop:** VW engine conversion dos and don'ts, installation, maintenance, propeller selection, etc. help you make the right decisions to complete your Sonerai.

**General Review and Q&A Sessions** end the day. You're encouraged to access the instructors to answer questions and get further information. Remember, like building a Sonerai, our seminar will be fun and rewarding so dress comfortably and be ready to learn and enjoy!

# Want Ads

For Sale -- 2 Ray Jeff Lorans, P1-99 w/  
self contained battery packs, both w/ new  
chargers. \$175.00 ea. or both for \$300.00.  
In cartons w/ manuals.  
Mike 219-534-2900

Wanted -- Cont. A65 taper shaft prop hub  
and professionally welded fuselage for  
Sonerai (set up for Cont.) Also, I have  
Bendix mag rotors to correct the S-20 AD.  
For Sale -- Cont. A75-8 300 SMOH  
John Mc Laughlin 25839 Tallwood Dr.  
North Olmsted, OH 44070 216-734-5578

For Sale -- Subaru engine 1985 EA82 turbo  
engine complete with EFI, computer, turbo  
all access. 5 subaru repair manuals. \$1400  
for all. Also, EA82 non-turbo engine TBI  
injection. Car ran but engine may need  
work. Bob Stieg 815-397-1533 days  
815-234-2283 eves.

For Sale -- VW 1835 engine. All new. Hd.  
lifters, SCAT heads, Hapi access case w/  
dual alt., elec. ignition, prop hub  
installed, Zenith carb. Might separate.  
Apart for inspection. Can assemble.  
Bob Stieg 815-397-1533 days  
815-234-2283 eves.

For Sale -- Sonerai II midwing, Supervee  
cowling, Sterba prop, 2100 engine  
w/Revmaster prop ext. Also, 4016 Slick mag  
w/ 100 hrs, and misc. instruments.  
Eddie Eiland 1350 Thunderbrook  
De Soto, TX ph.214-230-8475

Wanted -- Son II LTS, LS, or LT w/2180,  
but will consider a taildraggerw/ smaller  
engine. Prefer wing mod already done.  
Bud Aumann 11340 w. 38th Ave. #26  
Wheat Ridge, CO 80033 ph.303-420-6071

For Sale -- Porsche 914 2 liter engine  
project. Motor ran, mostly converted. 9"  
prop extension. Ellison carb. 650 Honda  
alt. Aluminum welded manifold. Potentially  
best VW conversion yet. Very cheap.  
Roger Durham 1370 Thompson Ave.  
Glendale, CA 91201 818-846-9163

For Sale -- 1990 Sonerai II L 2180 G.P.  
engine, Ellison carb, S-wing, Aux fuel  
tank, tinted canopy, white/red sunburst  
wings and tail. 250 hrs+ Actively flying.  
\$10,000 Call Vic at 507-282-6647

For Sale -- Sonerai I Kit, welded fuse,  
wing kit, cowl, canopy, gear, wheels and  
brakes. \$2000.00  
John Dialogue 801-571-3063

For Sale -- Sonerai II bubble canopy --  
smoked brown, complete with latches, etc.  
\$300.00 (U.S.) 613-632-9601 home  
514-437-6129 work

For Sale -- Sonerai II midwing fuselage,  
nice welding, controls, tailfeathers, spar  
box, gas tank, seats, on gear with 6X6  
Azusa wheels, \$1000 or \$1250 w/ new Slick  
mag and harness. Might trade for Son I  
parts, other airplane parts or ?  
Harry Fenton wk: 815-965-4700

Wanted -- 5/8" landing gear for Sonerai II  
and also fuel tank  
Jerry Campbell 722 N. Main

For Sale -- Sonerai II midwing w/ 1700  
Monnett conv. needing to be rebuilt.  
Aircraft partially disassembled. \$6000.  
Tom Freeman 708-526-3180

Wanted -- Sonerai II in flyable condition  
with trailer if possible.  
Steve 916-489-5514

For Sale -- Sonerai IIL 1700 VW, 1000 TT  
100 STOH, new ICOM A21, Intercom, new  
interior, excellent paint, 110 mph on  
3.5 gph \$8000 Runs Flys and looks great!  
Steve 605-336-7791

Wanted -- Sonerai parts  
John Bauer 14601 SW 272 St.  
Naranja, FL 33032 658-8357 beeper

Wanted -- Son II project or completed  
aircraft. Preferred to have it 70-80%  
completed.  
Dave Valaer 2833 Summit St  
Souix City, IA 51104 712-277-2823

Wanted -- Variety of good used or new  
Sonerai parts: cowling, canopy, 5/8"  
landing gear, spinner, S wing kit. Also  
interested in a Son IIL project.  
Mike -- 219-534-2900

Wanted -- Used, worn out, junk 4000 series  
Slick magneto. Super Vee prop hub and  
casting.  
Bob Schank 313-697-7057 after 5 P.M.  
35 Clarence St. Belleville, MI 48111

Wanted-- 1850 or larger long block  
suitable for Sonerai II Super Vee, in good  
working order.  
Nick Fourdraine RR # 1  
New Glasgow, N.S. Canada B2H 5C4

For Sale -- Sonerai II LT (easily conv.  
back to conventional gear) Wing Mod, VFR  
instr., Cleveland wheels and toe brakes  
No engine or prop.  
Ivan Haecker 8434 FM 2673  
Canyon Lake, TX 78133  
210-438-3354 weekend 210-899-4824 eve.

Wanted -- Sonerai prewelded or tacked  
fuselage with tail feathers. Also, landing  
gear kit.  
Joe Burr 4098 Eddystone Dr.  
Cincinnati, OH 45251 317-827-7195

For Sale -- 2 valve covers, 2 dual port  
int. man., 1 external oil cooler adapter,  
1 oil cooler eliminator(bypass). All above  
are cast aluminum \$65.00 total. Also--  
4 exh. flanges, 2 steel "U" bends for exh.  
\$25.00 total. Also -- 1 dist.hole ruber  
plug \$5.00 Everything together \$85.00  
210-899-4824 even. or 210-438-3154 week.

For Sale -- Pitts S-1c 180 hp, full  
inverted, many features. Call for details.  
Joe Norris 715-886-3261

For Sale -- 1 Type 3 Supercase by Claudes  
Buggies, 1 forged crankshaft w/hub and  
prop extension, 2 cyl.heads w/ S.S.valves,  
1 set of NPR piston rings. All for \$500.  
217-935-5345 evenings

Wanted -- Complete of nearly completed  
wings for Sonerai II midwing and canopy  
309-633-2365

abA tnsw

# SONERAI NEWSLETTER

<b>Ed Sterba</b>	<b>Fred Keip</b>
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<b>414-728-1367</b>	<b>414-835-7714</b>