

SONERAI NEWSLETTER

APRIL-MAY-JUNE 1997

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(AFTER 6 PM CDT)



LARRY WEST'S SONERAI IIL

SONERAI SILVER !!!

1997 marks an important milestone in the history of the line of Sonerai aircraft. This year we celebrate the **25th Anniversary of the First Flight of the Sonerai II**. To celebrate, John and Betty Monnett are planning to throw a party in the tradition of the old Monnett Experimental Builder's Parties at their hangar on Wittman Field on Friday night (August 1) of the EAA Convention. All Sonerai builders, supporters, and aficionados are invited. I would like to ask everyone who can, to **FLY YOUR AIRPLANES TO OSHKOSH '97**. A lot of Sonerai's have been built and flown in the last 25 years, and it would certainly be a real tribute to John and the airplane to get as many of them as possible to Oshkosh. Can you imagine a whole row of Sonerai's dovetailed together?!? Let's do it!

SUN'N'FUN 97

Welcome to the annual **SUN'N'FUN** issue. With the annual springtime celebration just a week or so away, I thought that I should bring you up-to-date on what I know so far. First, Dean McGinnes is arranging for the Sonerai Dinner at Vito's on Wednesday night. Second, according to the lady I spoke with at the SNF office, there does not appear to be a Sonerai forum scheduled. Check the program to make sure. We'll schedule something out by the airplanes if need be. Check the Great Plains booth. And thirdly, several of you have told me that you are going, and five have said they are flying their airplanes down, including me. Hope to see you there.

FORMAT CHANGE

Because I got so many reports that our beloved postal service had mutilated the last newsletter prior to delivery, I'm trying a little bit different format this time. First, as you've already noticed, it came in an envelope this time. Second, the number of pages of print has been reduced from 9 to 8. And finally, the print size has been reduced from a 12 font to a 10 font, so that I could maintain the same number of words. (Actually, the smaller font allowed me to fit an extra article.) I hope you like it. Let me know what you think.

BUILDER'S SUPPORT REVISITED

As I promised last time, here is a list of Sonerai builder/pilots who have volunteered to help answer your questions:

Al Bertelmann, Harvey, LA., Phone: 504-347-0412. He has built and is currently flying a Sonerai II.

Dick Morrow, East Moline, IL, Phone: 309-755-1495. He has a Sonerai IILTS.

Jim Quinn, Endicott, NY, Phone: 607-786-0995 or 315-735-3846. Jim has a Sonerai II with an A-65 Continental. He has over 1200 hours on it now.

Please use common sense when calling these guys; no collect calls and call at reasonable hours. Also, let me apologize for volunteering to help you guys out, and then not publishing my phone number. Well, it's now part of the header on the first page. (Sorry about that. I didn't realize that there wasn't a phone number until the day after the newsletter was mailed.)

SONERAI NEWS

- For all of you midwest Sonerai folks, John Atkinson has invited us to a Fly-in at Big Foot Airfield in Southern Wisconsin just west of Walworth on June 21. They will be raffling off a ride in a Sukhoi.
- John Monnett now has an E-mail address: SONERAI@VBE.COM. He says he'll try to answer your questions.
- Due to the press of other business, *Sky Struck Enterprises* has not yet scheduled any Sonerai building classes for 1997. John says that they might

schedule some after Oshkosh '97. We'll keep you posted.

- Note: I'd like to use this space to announce first flights and other important events, so please let me know when these things happen.

Q & A #1

Jerry Gore from Hendersonville, NC sent in the following questions along with his subscription check:

1. Does the POSA carburetor require any heat to prevent carburetor icing? I know it has no venturi, but does FAA final check out know that?

I flew my Sonerai IIL for about 4 years with a POSA Supercarb (with mixture control) without any form of carb heat, and to the best of my knowledge never encountered any icing. Nearly every other POSA installation that I've seen has not had any provisions for heat. Some have been set up to use warm cowling air all of the time, and others have had cold outside air ducted to them (like mine.) As far as the FAA is concerned, I don't believe there is a mandatory requirement for carb heat, but you might want to check with your local FAA inspector to find out.

2. I bought my unfinished Sonerai IILS, which had very poor mechanical brakes, so I put on Great Plains hydraulic brakes with the 360° disk. This has not been a big improvement, time will tell.

I converted to the Enginetics hydraulic disk brakes several years ago, and found that they were better than the old worn Azusa brakes, but not so much better that you could put the airplane up on its nose. One thing that you need to do when you install these brakes, is to remove the return springs from the brake housing. This will provide better braking.

3. Since I'm a short guy (5'-5"), I want to fly from the front seat. How much extra weight do I need to have in the rear seat to stay in C.G. limits?

It is difficult to give a good answer without knowing the weight and C.G. of your airplane. Once you do your final weight and balance check prior to first flight it should be easy to calculate.

4. I have installed the throttle/mixture quadrants in the front and rear cockpits, and am having trouble getting enough room for the hardware inside the housing. Has anyone else done this, so that I can pick their brains?

I can't help you much with this one, Jerry. I mounted the throttles pretty much to the plans and mounted a vernier mixture control in the rear cockpit. If any of you have mounted a prefab quadrant and can help out, please let me know.

5. What is the best method of squaring the engine to the fuselage frame?

If I remember correctly, I used a 4 foot long carpenter's level at the prop hub face to set the vertical alignment, after leveling the fuselage. Horizontal alignment can be checked using a straight edge clamped to the prop hub horizontally. It should be 4 or 5 feet long and centered on the hub. Measure back from the ends of the straight edge to some convenient point on the centerline of the fuselage, and adjust so that the measurements are the same. The actual adjustments are made by shimming the motor mount spacers with large diameter washers, or by custom machining the individual spacers. The engine should be absolutely square to the fuselage; no down or side thrust.

6. My wings are completed. How can I tell if they are the latest configuration? Are there extra rivets I can check out?

There are a couple of things to check. First, count the number of ribs in each wing panel. Since your's is an "S" there should be 11 in each. If there are, you should have the latest since the "S" wing is the latest. Also, you can verify this by looking in the root end of the wing. If you see a piece of 1-1/8" x 1-1/8" x 1/8" angle rivetted to the top spar caps, and 1" x 1" x 1/8" angles at each of the rib attachments to the main spar, and half way between each rib, you have the latest. These reinforcing angles are on the inboard half of the wing only.

Q & A #2

I continue to get the occasional question about the structural integrity of the wing design, and what the wing modification is all about. I thought that this issue had been put to rest several years ago, but with new people coming into the fold, I guess it hasn't.

A question from Jim Hodge: "I've seen several references to a wing mod, but don't know the history. I'm assuming that the current plans already have the mod incorporated but wonder what happened?" And Michael Katurbus writes: "I am quite interested in the resolution of an issue I read of a year ago; one which, as I recall, questioned the structural integrity

of the design (or, at least, the wing and attachment points.)

Back in late 1983, a modification was issued to all owners of Sonerai II's, IIL's, and IILT's for the alteration of the wings to increase their load carrying capability. It provided better safety factors at the maximum design loads. Basically, this modification consisted of the addition of a number of angles to the wing spar to provide additional strength and spar web buckling resistance. Since that time, all plans sets have had the modification incorporated in the drawings. When the Stretched version was released, these modifications were also made part of the "S" wing.

Three wing-failure fatal accidents lead to the mod. All were related to aerobatic flight. All were flown by pilots other than the builder and none had read the Sonerai Flight Manual, disregarding the allowable maneuvers, maneuvering speeds and the aerobatic gross weight limitations. All were due to overload, all involved modifications or deviations from the plans, or excessive weights. (One of the airplanes had an empty weight of 600 lbs., not leaving a lot of useful load to get to the 750 lb aerobatic gross. This airplane also had an airspeed indicator which read low, resulting in the airplane operating at much higher airspeeds than the pilot thought.)

This modification was developed using static tests of actual wing panels. The original design failed in a buckling mode at 7.6 g's at the aerobatic gross of 750 lbs. (Design limit load is 6 g's.) The final design was taken to the original 9 g ultimate load and showed only slight permanent deformation. This wing now provides an extreme margin of safety.

The important point to be made here is that there have been no structural failures of the primary airframe on a Sonerai II since the mod was incorporated. Remember, you need to build the airplane light, know its and your own limitations, and fly it with intelligence. That way we can fly them until we are too old to climb into them any more.

THE FINAL COVER

One of the phases of building the Sonerai that seems to cause a lot of trepidation for the first time builder is the final fabric covering and painting process. The main reason, I think, is that, unlike pounding on metal or sawing on wood, working with fabric is something most of us have no experience with. And also, the

covering and paint is the first thing that everyone sees and judges the quality of your work on. (Whether that's fair or not, I'll let you decide.) But have no fear, it's actually pretty simple, and in fact it's a lot of fun. And the really neat part is that it turns that fuselage and tail skeleton into an airplane.

First of all, I don't want anyone to think that I'm an expert, and that I know all there is to know. I'm not and I don't. But, I've covered my airplane twice in the last ten years, and I'd like to pass on a few of the things I've learned so that hopefully your covering and painting will go smoothly.

The first time I covered my Sonerai, I used the Stits process (it's now called the Poly-Fiber process, but I still call it Stits) from beginning to end, using Polytone for the finish coats. The second time I used the Superflite II process. The fabric installation part of both processes is similar and both will turn out a good looking finish if you follow the directions. The significant difference is that the Superflite II process uses all two-part polyurethane paints while the Stits process uses less toxic single-part paints. Stits offers Aerothane for the finishing coats which are also two-part paints. As you probably know, polyurethane paints provide a very glossy, wet-looking, extremely durable finish. Polytone normally dries to a semigloss finish and needs to be buffed out to get a good shine. So, let's get to the work.

Prep Work

Like everything else in building an airplane, the quality of the end product is directly proportional to the amount of the preparation work done before the job is started. This is particularly true of the finishing work. Here are a number of things that need to be done before the first piece of fabric is cut:

1. Although, this may sound obvious, make sure that everything that needs to be attached to the structure is done. It gets really difficult to weld mounting brackets, or whatever, once the fabric is on. Make sure all of the controls work, the wings fit, that there is a place to mount the ELT, the battery, any radios, etc. And don't forget the stringers.

2. I know a lot of you aren't going to like this, but take the engine, landing gear, instrument panel, and fuel tanks out. Working with the basic fuselage is a whole lot easier without all of this stuff because you are going to need to roll it over and over to put the working area at its most convenient position, and as we'll see later it makes things a lot easier to paint. Also, it's a whole lot lighter. Besides the engine installation should be made so that the engine is relatively easy to take out. It will make it easier to

maintain in the long run. (I can take the engine off my airplane in about an hour and a half.)

3. Look at your lower longerons. Are they straight? Or are they bowed in? They should really be bowed out a little bit (1/4" to 3/8"). This is because the fabric can shrink as much as ten percent during the shrinking process and this can put some significant forces on the longerons, causing them to bow in. Bowing them out a little will result in straight longerons.

4. The entire fuselage and tail structure must be primed with a two-part epoxy-type primer. This includes the top of the aluminum turtledeck fairing. The reason for this is two-fold. First, it does an excellent job of protecting the steel tubes from corrosion. (Now is a good time to make sure the inside of the tubes are protected as well. Stits Tubeseal works well.) Second, it's necessary to provide a good surface to glue the fabric to. Both the Stits and Superflite processes use strong solvents in their fabric glues. They will lift any normal single-part primer, thus decreasing the corrosion resistance and the strength of the fabric bond to the tube. Any of the epoxy zinc chromate primers will work well.

5. Work in a well ventilated, well lit work area. Don't work in the basement unless you've got an extremely effective vent fan, or an extremely understanding spouse.

6. Use a fresh-air face mask (like a Hobby-Air) if possible. The glues and paints are pretty nasty things and can make you very sick, if not dead. This is very true of the two-part paints. Use only a fresh air mask with them. A carbon filter mask does not filter out the isocyanates in the catalyst, and it's the isocyanates that are deadly. A carbon filter mask is ok for the gluing process.

7. Wear rubber gloves, too. The reasons are the same as for wearing a fresh air mask. Your skin can absorb these chemicals very easily. I don't want to scare anyone, but there is no need to get sick while finishing up your machine.

Covering

Now that the fuselage and tail surfaces are all prepped and ready, the first thing you should do, if you haven't already, is to read and understand the instruction manual that comes with the process you choose. The Stits manual is very good. Superflite's is ok, but not as detailed. Also, both Stits and Superflite sell a video. Buy it and watch it a couple of times to reinforce what's in the manual.

From here on out, I'm going to describe the use of the Superflite II process because that was the system I used last winter. You'll need 16 yards of the 72" wide SF-102 fabric, one roll each of 2" wide and

3" wide reinforcing tape, and two quarts of SF-U-500 fabric cement. Also, get a good quality pinking shears, several 1" wide paint brushes, some small cans or jars for mixing glue, and an iron. (If you are going to use the household one, plan on buying a new one when your done.)

The fuselage is covered using three pieces of fabric: the bottom, the right side, and then the left side. Start with the bottom, by rolling the fuselage over until it is upside down. Roll out and cut a piece of fabric long enough to go from just behind the landing gear attach point to just past the tail post. Drape this piece over the framework and pull to one side so that the long edge of the fabric is aligned with the bottom longeron. (See Photo 1) It helps to have a bunch of spring-type clothes pins to hold the fabric in place. There will be about 3 and a half feet of extra fabric to trim off as you go. Use it on the tail surfaces. Start gluing the fabric to the longeron, working from the front of the fuselage to the tail. The glue must be reduced using MEK. I found that I liked the glue to be a little thicker than suggested in the manual. It held the fabric better while still wet. Remember that the glue must be worked completely through the fabric to provide a proper bond. The fabric should be trimmed so that it wraps about 3/4 of the way around the the tube. Once you get to the tail post, work your way up the other longeron to the front of the airframe and then, across the front, pulling the fabric snug as you go. It doesn't need to be real tight. The iron will take care of that. (If you splatter glue on the fabric away from the glue joint, wipe it up immediately with MEK. It will show through the paint if you don't.)

Now comes the fun part. Calibrate the iron, and start shrinking the fabric per the manual. The secret is to keep moving at a nice, medium speed over the entire piece of fabric. Go over it several times at each temperature setting. Once the fabric is shrunk, you will want to go over the glue joints with the tip of the iron to smooth out any bubbles that might have formed. This will give you a smooth surface for the next piece. When you're done, you should have something that looks like photo 2.

The right hand side is covered next (if you want to do the left side, that's ok) and the procedure is basically the same as the bottom, except that along the bottom longeron you will be gluing the side fabric to the bottom fabric instead of the tube. (See photo 3.) The proper glue joint here requires a 1" overlap for proper strength. As you proceed around the vertical stabilizer, if you have any radii, you will need to either notch the fabric or heat shrink it around the curve to get it to lay properly. The preferred method is to use

the iron, but on the concave curve where the vertical stabilizer blends into the turtledeck, you will probably have to notch it. These notches will show through the tapes, but they can be filled with primer so that they won't when you're finished.

Prior to gluing the fabric to the turtledeck, paint the entire exterior of the turtledeck with a coating of glue, and allow to dry. To get a straight overlap joint along the length of the turtledeck, first lay the fabric over it, pull snug, and glue it down to the right of the centerline. Using a pencil and a straight edge, draw a straight line on the fabric along the center of the turtledeck. Next, draw another line parallel to and 1" to the left of the first line. Trim the fabric at this line and glue to the turtledeck. You will repeat the process with the left side fabric. The result is a nice straight joint. (See photo 4.)

Once you have the entire perimeter of the RH side fabric glued, go ahead and shrink it like you did the bottom. You should get something that looks like photo 5. Then, do the left hand side. It should look similar to photo 6 when you're done.

The next step involves the application of the reinforcing tapes, but first go over the glue joints with the tip of your iron again to takeout any bubbles and to smooth out the edges of the fabric. Work with just the tip, and work in short stokes so that you don't shrink the edges of the fabric. You just want to make sure the edges are all glued down.

The tapes are installed everywhere the fabric touches the structure, and where ever there is a fabric overlap. Use the 3" tape at the lower longerons, around the vertical stabilizer, along the turtledeck seam, and around the cockpit. The 2" tape is used everywhere else. Photos 7 and 8 show the layout I used. Standard practice is to lay the tapes down so that tapes parallel to the airflow are attached first, with the the remaining tapes applied to overlap the first tapes.

Once all of the tapes are glued down, it's a good idea to paint over all of the tapes and the the fabric that's in contact with the turtledeck to seal the weave with two coats of the reduced glue mixture. This really helps to minimize pin holes when the painting is done. And as you did with the edges of the fabric, use the iron to make sure all of the edges of all the tapes are sealed down and smooth.

At this point, the fuselage is ready for paint, and you can move on to the tail surfaces. I'll cover that next time.



PHOTO #2



PHOTO #4



PHOTO #1



PHOTO #3



PHOTO #6

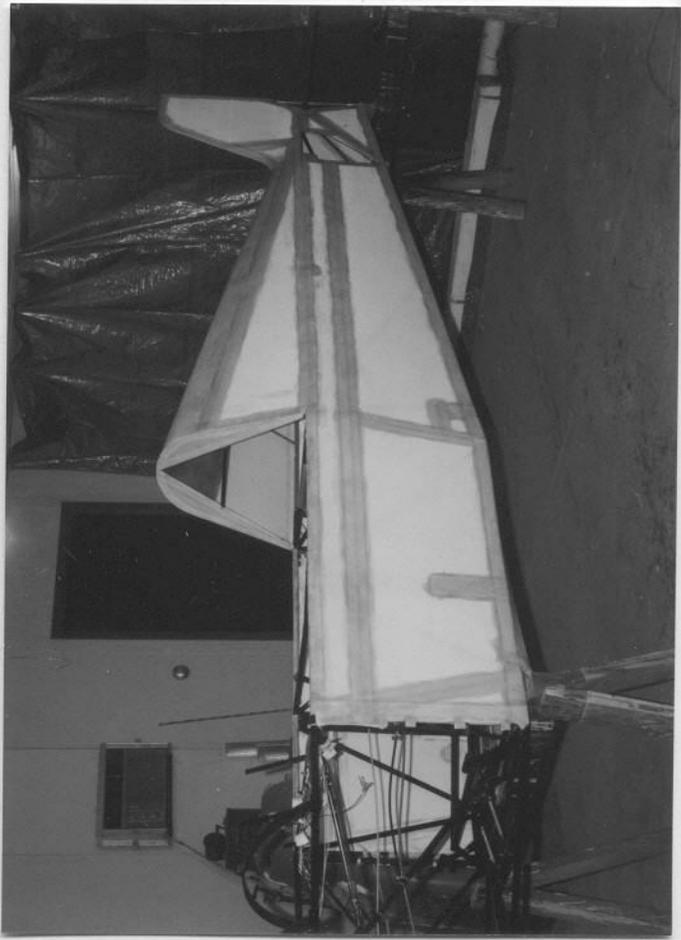


PHOTO #8

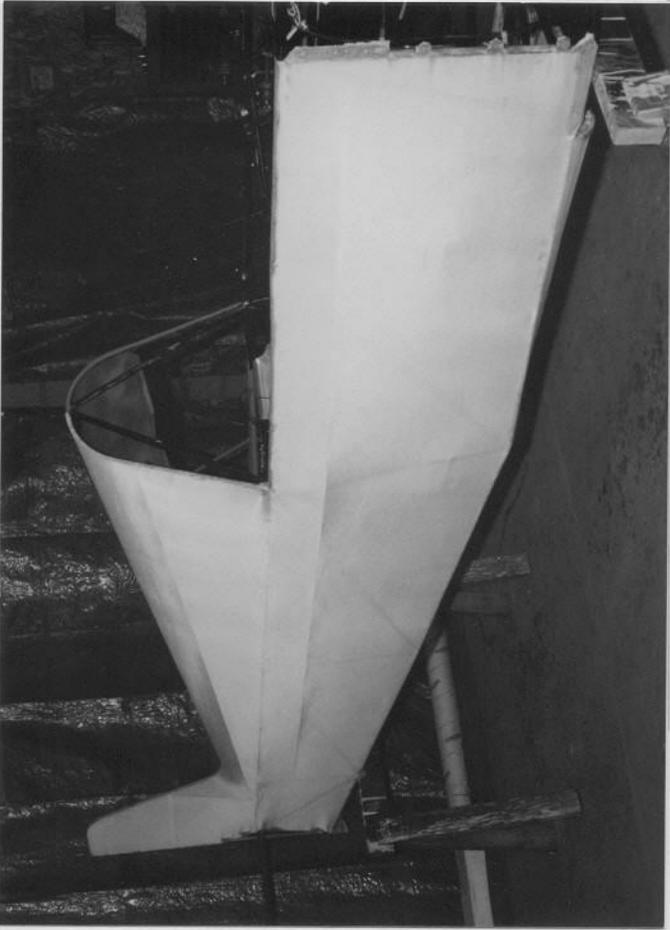


PHOTO #5



PHOTO #7

WANT ADS

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

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

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, (313)697-7057 after 5 pm.

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. \$2100
Bob Schank, (313)697-7057 after 5 pm

For Sale - Limbach 1700 Engine.
Don Brinkley, (414)335-6519

For Sale - VW 1835 engine. All new hyd. lifters,
SCAT heads, HAPI Access. case w/ dual alt.,
elec. ignition, prop hub installed, Zenith carb.
Might separate. Apart for inspection. Can
assemble.
Bob Steig, (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,
(214)230-8475

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

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 rubber plug \$5.00. Everything
together \$85.00. (210)899-4824 eves. or
(210)438-3154 week.

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 NPR
piston rings. All for \$500.00
(217)935-5345

Wanted - Sonerai II project or completed aircraft.
Preferred to have it 70-80% completed.
Dave Valaer, 2833 Summit St., Sioux 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 Sonerai
III project.
Mike (219)534-2900

For Sale - Sonerai III, A&P built, Dual ign.,
hydraulic toe brakes, wing mod., much more,
AeroVee 2020 w/ 60 hrs.
Russ Larson (406)857-3304

For Sale - Sonerai I fuse. and flt. controls,
complete except cover. Wings complete and
skinned, 1600 VW rebuilt, SuperVee casting,
spinner and prop, L.G., most everything else.
John Ricchio (847)413-4962 or (708)447-0448
evenings.

For Sale - Sonerai I kit, welded fuse., wing kit,
cowl, canopy, gear, wheels and brakes. \$2000
John Dialogue (801)571-3063

For Sale - SoneraiII bubble canopy, smoked
brown, complete with latches, etc. \$300 (US)
(613)632-9601 home, (514)437-6129 work

Wanted - 5/8" landing gear and fuel tank for
Sonerai II.
Jerry Campbell, 722 N. Main, Aberdeen, SD
57401, (605)225-8675

For Sale - Sonerai III, 275 TT, 1834 HAPI,
Aerobatic tested, light damage. Must sell \$3750
(309)944-2366 weekends

Wanted - Sonerai engine, instruments, and
airframe parts.
Gene Cook, 114 Imperial Ave., Friendswood,
TX 77546

For Sale - HAPI motor mt., Bosch starter,
Alternator, 3" prop ext, ignition switch, tailwheel
assy., taper pins, #8 pin reamer
Greg Jannakos, 994 Vineyard Circle, Stone Mtn,
GA 30083

For Sale - Sonerai III fuselage approx. 85%
complete. Sticks, rudder pedals in, tail feathers
on. \$850.00
Bill Waters (770)466-2464

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

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 Ray Jeff Lorans, PL-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 McLaughlin, 25839 Tallwood Dr., North
Olmstead, OH 44070 (216)734-5578

For Sale - Revmaster 2100D with prop, all acces.
included, starter, alternator, oil filter, carb, eng.
mount. \$3975.00
Len (616)676-9711

Wanted - Early style Monnett SuperVee motor
mount (not x-mount), 32mm Posa Supercarb w/
needles, AC42 sparkplugs, broken tapered rod
tail spring.
Dave Patterson, N 3280 Hwy 146, Fall River, WI
53932

For Sale - Assembled wing spars w/ mod parts,
nose rib blanks w/ holes cut. \$900 invested, will
sell for \$500.
Frank Dwelley (860)653-7106

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

For Sale - 1700 VW Engine. Posa super carb,
mag, shielded ignition, Sonerai motor mount,
alternator. Sonerai II landing gear complete with
wheels, axles, and pants. Gas tank, all flight
instruments, stab. Complete. Prop, spinner and
more. Wm. Ziegler, 2 Theresa Ann Court,
Albany, NY 12205 (518)869-0137

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, \$100 deposit.
David E. Wilcox, 517 E. Saratoga St., Gilbert,
AZ 85296, (602)231-5824,
105702.2156@compuserve.com

For Sale - 1992 Sonerai III, 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
dennisl@mail.tsixroads.com