

# SONERAI NEWSLETTER

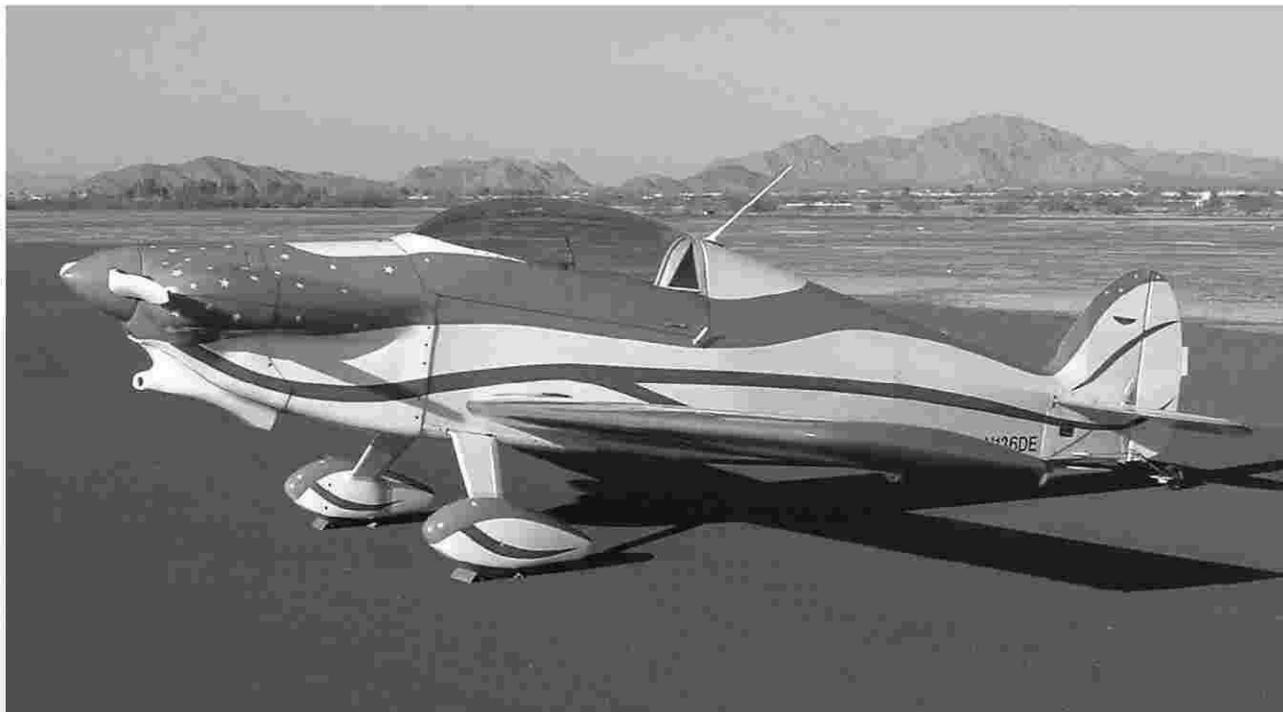
APRIL-MAY-JUNE 2004

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## **DAVE WILCOX'S SONERAI ILS**

*This is the second time Dave's Sonerai ILS has graced the cover of the Sonerai Newsletter, and I think his airplane has gotten better looking over the years. Back on the Jan-Feb-March 1998 cover, the airplane was an LTS sitting on tricycle gear, and had no spinner or wheel pants. You'll note some differences in the cowling area from the "normal" Sonerai II. Dave has split the cowling at the firewall to provide a better cowling-to-firewall seal, and to simplify access to his A-80 Continental powerplant. Dave lives in Gilbert, AZ, and feels that the A-80 gives him much better performance in the hot/high conditions he normally sees there.*

### **SUN-N-FUN'S A'COMIN'**

As you receive this issue (at least those of you in the US), Sun-N-Fun 2004 will be less than a week away. The organizers changed the rules again this year, and moved the start date up a day, so it now starts on Tuesday, and ends on Monday, just like its big brother, Oshkosh. That means the starting day is April 13, and its over on April 19.

I'm planning to be there, after a one year hiatus. Now that I get two weeks of vacation again, I've got the time to make the trip south. And I'm planning to make the trip in my Sonerai one more time. Notice that I said "planning". If the weather decides to be difficult, I will take an alternate mode, but I will be there. The "plan" is to depart Wisconsin on Friday, the 9<sup>th</sup>, and get to Florida on

the 10<sup>th</sup> or 11<sup>th</sup>. That will allow Monday, Tuesday, and Wednesday at the Fly-In. Departure will be on Thursday to allow enough time to get home in case of bad weather en route.

On opening day, at 9:00 AM, I'm presenting the "Sonera Builders Forum" in Tent 9. That's the first forum period on the first day, so if you're planning to come, you'll have to get up early. Please come, since it's no fun to present a forum to a bunch of empty chairs. Bring your questions and experiences, as I like to have an open discussion. (And I've got a new PowerPoint presentation, too!)

There are several other forums that you might be interested in. Steve Bennett will be presenting his VW Engine Assembly and Disassembly classes on Tuesday, Wednesday, Thursday, and Friday in the Engine Workshop Tent. Disassembly will start at 10:00 AM, while assembly will start at 1:00 PM. Steve is also presenting his "VW Conversions in Sport Aircraft" forum on Thursday at 1:00 PM in Tent 7. John Monnett is presenting a forum entitled "AeroVee and AeroCarb" on Wednesday at 1:00 PM in Tent 4, and again on Saturday at 9:00 AM in Tent 8. And finally, a good friend of mine, Bill Bateman, is giving an excellent forum on the "First Flight of Your Homebuilt" on Wednesday at 10:00 AM in Tent 2, and again on Friday at Noon in Tent 2. Bill is a retired F-16 test pilot, and teaches the one day "Flight Testing" class that is part of the EAA SportAir Workshop Series. Go if you haven't flown your airplane yet.

Also, don't forget the excellent workshop tents where you can try our hand at welding, sheet metal, composite, and wood construction techniques. Your time will be well spent there.

And finally, if things work out, "Alligator" Al Bertelmann (I'll let him tell the story) would like to host a barbeque lunch at his hangar at South Lakeland airport sometime during the convention. He asks that you check at the Great Plains Aircraft booth for details. South Lakeland airport is a neat grass airport about five miles south of LAL. There is a shuttle bus that runs back and forth throughout the day.

So, I hope you're planning to come, and that I get see you. If I get my Sonera there, please stop by and say "Hi".

## SONERAI NEWS

→ Great Plains News: A new updated Sonera information pack is now available. Contact

Steve or Linda at Great Plains to get one. (402) 493-6507, [www.gpasc.com](http://www.gpasc.com)

→ Fly-In Schedule:

- Sun-N-Fun, Lakeland, FL 4/13-19/04
- SWERFI, NewBraunfels, TX 5/14-15/04
- SAA, Urbana, IL 6/11-13/04
- Golden West, Marysville, CA 6/18-20/04
- Northwest, Arlington, WA 7/7-11/04
- OSH, Oshkosh, WI 7/27-8/2/04
- Copperstate, Phoenix, AZ 10/7-10/04

Be sure to go the one nearest you.

→ First Flights: No new first flights to report this time. Be sure to drop me a line when you fly your airplane for the first time. A picture would be nice, too.

→ Sonera 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, send me cash, check, or money order for \$25.00. Postage is included. (The manual is now included with the plans, so you new plans holders already have it.)

→ Back Issues: **Sonera Newsletter** back issues are now available in three forms. The first is a 3-1/2" diskette which contains 209 of the newsletter articles (text only) published by Ed Sterba from 1987 through 1995. It costs a mere \$10.00. The second is a CD which contains complete copies of all of the newsletters published from 1996 through 2003 in a ".pdf" format. The cost is \$50.00. And finally, 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, 2001, 2002, and 2003. If you want any of the above, send me a note requesting the ones you want and a check for the correct amount. Postage is included.

## NEW BACK ISSUES

Now I know that the title doesn't make much sense when you think about it. How can back issues be *new*, when they are really old? Actually, it isn't that the back issues are new, it's that I'm now offering them in a different format covering the years from 1996 through 2003, all of the issues where yours truly has been involved in the editing and publishing of the **Sonera Newsletter**.

Up until now, these newsletters have been available only in hardcopy format for the subscription price of \$3.50 each. For all of the issues that amounted to \$112.00.

They are now available on CD-ROM in ".pdf" format for \$50.00, postage paid. That's 32 issues, complete with all of the photographs, and an index/directory, for less than half the hard copy price.

Because they are in the .pdf format, it will be necessary that you have a copy of the Adobe Acrobat Reader on your PC, but have no fear, you can download a copy from [www.adobe.com](http://www.adobe.com) for free.

If you'd like a copy of the new CD, send me a check or money order made out to "Fred Keip" to the address on the front page.

As a note of interest, I'm hoping to convert all of the Ed Sterba newsletters (1987 thru 1995) to .pdf, and have them available on CD later this year. Stay tuned.

## **A FEW THOUGHTS ON AUTO FUEL**

by Al Bertelmann

I have been promising forever to be a regular contributor to Fred's excellent newsletter. By way of introduction, I completed my Sonerai II Mid-Wing in July 1988 and have been flying it as continuously as possible, considering that I spent 5 years in South East Asia and 50% of my US time offshore working in the Louisiana oil fields.

Over the years, I have installed numerous small modifications which at the time seemed like a good idea. Most didn't work out which I attribute to learning by trial and error, with an emphasis on the error. This brings me to my topic for this newsletter, which is my experience with auto fuel.

In 1988, my first several hours during the test-flying period were probably typical of everyone with a new Sonerai. I battled high CHT's, high oil temperatures, and of course the only time the ball was in the center was when it was whipping from one side to the other. After about 5 or 6 hours, I was kind of getting the hang of it and most of the gremlins were being solved one by one.

I was running a 2074 CC Monnett Conversion VW with a POSA Carb and other than trying to find the right combination of needles and settings, the engine was running pretty strong. I believe that I was running about 10.5:1 compression, but it may have been slightly lower. When I ran out of 100LL in the plane and in my extra gas cans, I switched to car gas which in this case was Super Shell

Unleaded. My reasoning basically was that the engine didn't know that it was in an airplane, so why pay the extra money?

The engine started up fine and ran strong so off I went. Upon reaching downwind, I throttled back and the engine started to misfire. I cut the corner short and headed back to the airport and upon closing the throttle on short final the engine stopped. I made a good dead stick landing and pulled off into the grass. It took me forever to restart the engine, but it finally caught and I taxied back to my ground crew where we went through the fuel system, carburetor, etc. without finding any real cause for the shut down. Not to be deterred, I fired the engine back up went at it again with identical results.

Over the next 5 flight hours or so, I was a hazard to aviation sputtering about the pattern and making about 20 dead stick landings. After each landing I took something else apart to look for a cause. Fuel lines, air filter, gascolator, fuel flow, different needles; you name it. I wasn't getting any closer to finding the answer but I was getting real proficient at disassembling the POSA Carburetor and I was also becoming a real wiz at dead stick landings. The fun came to an end one day however when a spam can pulled out onto the runway as I was sputtering in for another landing. The engine didn't die, but I only had about half power and I made a go around at about 50' within the perimeter of the airport. Looking out the cockpit, the ants really were ants.

In desperation I called Neil Sidders, who at that time was the Sonerai Guru for POSA Carburetors. The first thing he asked me was if I was running auto fuel. When I answered in the affirmative, he announced that my problem was "vapor lock" and suggested that I switch back to 100LL.

Well Duh!!!! Why didn't I think of that? The Sonerai uses down draft engine cooling and the POSA Carburetor is right in the hot air exit path. Aluminum is a great conductor of heat and without a float bowl; any bubbles in the fuel line would cause it to vapor lock. I switched back to airplane fuel and the problem went away.

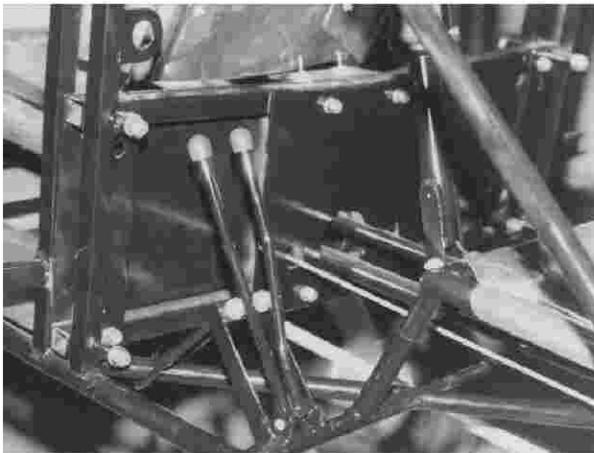
I would like to be able to say that I learned a good lesson, but remember the part about learning by trial and error. About 10 years later I was back in the US for a vacation from SEA and was planning on flying my plane to Sun-N-Fun. The plane had been moth balled for several years and I was frantically going through it for the trip. I had set up at a small grass field and was low on 100LL. By this time I had discarded the POSA in favor of the

Zenith Carburetor and decided to auto fuel it (one time only) to allow me to ferry my plane to a larger airport. Remembering my prior experience, I reasoned that this carb has a real float bowl hence less chance for vapor lock.

I decided to orbit the field before departing for fuel and on the third circuit the engine misfired violently and quit. I turned toward the airport and crossed over the power wires with about 10' to spare and made the shortest successful landing in the history of Sonerai's. This time it wasn't vapor lock. The engine had pre-ignited and blown a hole clear through #4 piston. Needless to say that I didn't fly to Sun-N-Fun that year and that I will never – never, use auto gas again (in this airplane).

## BUILDING AND INSTALLING THE MAIN SPAR CARRY-THRU BOX

*I've had several requests to come up with a set of assembly instructions, similar to my **Sonerai Wing Construction Manual**, for the fuselage, and all the other stuff that goes in it, or on it. This will be the start, and hopefully over the next several issues, I can address the entire fuselage building process. Why start with the main spar carry-thru box? Probably because it's been an issue with a few of the builders over the last few months, and it's fresh in my mind. So, here goes:*



Installed Low-Wing Carry-Thru

The main spar carry-thru box is one of the critical structural pieces of the airplane. Its primary function is to attach the wings to the fuselage, and carry the primary fuselage loads into the wing main spars (or carry the main wing spar loads into the fuselage, depending on your point of view). So, it is important that the carry-thru be built straight and true, and installed correctly for the airplane to function correctly.

### Material:

The main spar carry-thru boxes of all of the various Sonerai models are basically the same. While the mid-wing carry-thru is absolutely straight, the low-wing carry-thru incorporates 3 degrees of dihedral on each wing, and has a 2.50" hole through the center to allow passage of the control stick torque tube assembly.

They are all made from 4130N steel and are comprised of the following components:

¾" square x .058" wall top and bottom tubes

.063" sheet covering the entire front face

2" wide, 1/8" thick bars on the ends, front and rear

3" wide (on mid-wings), or 6.75" wide (on L's), 1/8" bar on the center rear face

.063" sheet spacers between the rear 1/8" bars and the tubes

Along with a certain amount of welding, AN4-13A and AN4-14A bolts with AN365-428A nuts and AN960-416 washers are also used to hold the components together.

### Fabricating and Welding:

Cut all of the pieces to the proper size, and dress all of the edges smooth using a disc sander and a file. The tubes for the low-wing version must be beveled 3 degrees on both ends, and welded together prior to assembly. It will be necessary grind the front and rear welds flat to allow fit-up with the front sheet and rear spacers.

Clamp all of the parts together, and drill all of the ¼" holes for the AN4 bolts. Bolt all of the parts together using hardware store bolts and nuts for the welding process.

To help guarantee straightness and flatness during the welding process, build a stiff, flat, square fixture to bolt the assembled carry-thru box to. A couple of pieces of 4" x 4" x ½" steel angle, about 24" long, bolted together to form a tee, work really well. A piece of steel channel will work, too. If you're lucky, you can get this material at your local scrap yard really cheap.

Using your carry-thru assembly as a template, drill the eight ¼" holes through the fixture, and bolt the assembly to it with the front side facing up. Now you're ready to weld.

If you are building any version of the Sonerai II, the plans call for welding only the seven pieces of .063" sheet to the ¾" square tubes. On the other hand, the Sonerai I plans call for all of the pieces, both the .063" and the 1/8", to be welded to the tubes. In fact you can weld the II carry-thru either

way, and in either case you must use all of the AN4 bolts that are called out. And to clarify the weld locations: All welding is on the outside top of the box, and the outside bottom. Do not weld on the inside of the box, where the wing spar will slide in.

To minimize any distortion that might be caused by the welding process, it is recommended to weld in the following sequence:

1. Tack the front sheet and the front center spacers every 3" to both tubes, starting in the center.
2. Tack the end spacers at each end, along the top of the top pieces, and along the bottom of the bottom pieces. Do not weld on the ends or the inside of the box.
3. Starting at the top center of the front sheet, weld outward 1" to the left.
4. Move to the bottom center of the front sheet and weld outward 1" to the right.
5. Go back to the top center and weld outward 1" to the right.
6. Then back to the bottom center and weld outward 1" to the left.
7. Repeat the process on the two center spacers.
8. Then go back to the front sheet and weld another inch using the same pattern.
9. Continue the process until you get to the outboard ends of the box and all parts are welded to the tubes.

Once the welding is complete, go back with your torch, and bring the weld joints up to a dull cherry red color, and slowly back the flame out to allow to slowly cool. Obviously, you can't do the entire box simultaneously, but by heating up 3" or 4" and slowly moving the red area from one end of the box to the other, the stress relief/normalization can be accomplished fairly quickly. Allow the carry-thru box to cool completely before removing it from the fixture. Once it's removed, install all of the AN4 bolts to complete the assembly.

#### Installing the Taper Pins:

The drilling and reaming of the main spar attach taper pin holes can be performed next, or after the carry-thru has been installed in the fuselage. It is really dependent on the status of the wing construction. If the wings are already complete, the drilling and reaming can be done using a hand drill after the carry-thru has been aligned, drilled, and bolted into the fuselage. If the wings are not yet assembled, the drilling and reaming can be done very easily on a drill press.

In either case, the first thing to do is to layout the location of the 4 taper pin holes on the box and drill

a 1/8" diameter pilot hole at each location through both the front and back plates. This is best done on a drill press to guarantee that the holes are perpendicular to the carry-thru and in line. Next, using a red Sharpie pen, draw a line down the front of each main spar at the location of the taper pin holes as shown in the plans.

Then slide one spar into the carry-thru box and align the line on the spar with the pilot hole in the carry-thru. Be sure that the spar is correctly installed in the carry-thru and that it is right side up. You wouldn't want the wing installed upside-down. Clamp the spar in place. If you are using a drill press, clamp the assembly down with the front face of the spar facing up so that it can't move. Shim it as required to keep it square to the drill bit.

Drill and taper ream one hole before moving on to the next one. Start the drilling process with a 1/8" bit and step up in increments up to a final diameter of 7/16". The small end of the AN386-5 taper pin is .455", and ideally, you want to have 1/16" of the small end of the pin sticking out of the hole. When you start the reaming process, go slowly, and once the reamer breaks out of the end of the hole, stop and try the taper pin for fit. Continue to ream a little at a time until the small end of the in body sticks out at least 1/16". When you get to that point, leave the pin in the hole and move on to the next hole. Repeat the process for the other hole on that spar. The pins are now matched to the holes, and you should mark each pin so that it will go back in the same location. Remove the first spar, and repeat the process for the other spar.

If you perform the drilling and reaming process in the airplane after the wings are complete, it will be necessary to do all the drilling by hand using a hand drill. You must be careful to keep the holes square to the front face of the spar box. This will be challenging because you'll be working close to the fuselage sides.

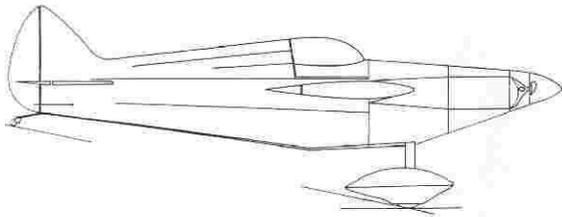
#### Installing the Carry-Thru Box:

The carry-thru box is held in the fuselage by four AN5 bolts that pass through 5/16" bushings welded to the 5/8" x .058" wall square tube verticals. To help guarantee that the bushings are in line, a long bushing should be welded to each of the two tubes at each bolt location, and then the center portion of the bushing removed after the welding is complete. The bushing pairs are then drilled out with a long 5/16" drill bit to allow the AN5's to pass thru.

Before the holes are drilled thru the carry-thru, it is necessary to align it with the fuselage to guarantee that the wings are square to the fuselage sides in the mid-wing airplane, or that there is an equal

amount of dihedral on each side on the low-wing airplane. This is most easily done with the spars in place, using carpenter's levels, a transit, digital "smart" level, and/or a long plastic tube filled with water. Once alignment is achieved, use the 5/16" bushings as drill guides and drill thru the carry-thru, inserting a bolt in each hole as you go.

When the drilling is complete, you can disassemble everything for prep, prime, and paint.



### **FORMULA V UPDATE** by Chris Kalishek

I am currently building a Sonerai 1 with the help of an excellent friend, Dick Bonnie, at his shop in Clearwater, Florida. This is my first building project and I am very fortunate to have Dick's skill and workshop. Dick has built several airplanes and recently finished a Sonerai II. His dedication and attention to detail is making my first airplane building project both enjoyable and educational. Our project is really coming together quickly. We started the wings in mid-September and will finish them this weekend, after approximately four months! We have the pre-welded fuselage and the 1600cc Volkswagen engine ready to move into the shop after the completion of the wings. I have attached several pictures of the wing construction with this e-mail.

One of the reasons I chose to build the Sonerai 1 is first: it's a great flying airplane, economical to operate with performance that will satisfy any pilot. Second, I would like to see Formula V Air Racing get going again. I did fly in several Formula V races in 1996-97, and on June 22 1997 had a mid-air collision while racing at West Hampton Beach, Long Island Gabreski Airfield. This was all over the news and in several aviation publications. The combination of negative press and lack of airplanes has resulted in no Formula V Air Races since this accident.

Formula V air racing rules require that all aircraft be powered by the 1600 CC Volkswagen engine, carbureted with a maximum venturi opening of 32 mm, and run on 100LL. The aircraft must weigh a minimum of 450 lbs empty and have at least 75 sq.

ft. of wing area. The class is open to other designs, but most fly the Sonerai 1 with the spar modification. Ed Fisher of Raceair Designs (designer of the Skylight, Micro Mong, Zippy Sport, Flitplane, Polecat, Mong Sport and some other ultralights and homebuilts) is currently building two Formula V race planes, one Sonerai 1 which he is modifying the fuselage on, and a Woods Bros. Racer, # 31, which needs considerable restoration. Ed also built "Blueberry" #77 which was raced in almost every Formula V race ever held.

Formula V Air Racing is the most exciting sport I have ever participated in, and is probably the least expensive racing out there. If anyone would like further information on Formula V, they can visit the web page [www.formulav.com](http://www.formulav.com), or contact me at [ckalishe@tampabay.rr.com](mailto:ckalishe@tampabay.rr.com), or by phone at (727) 773-2268. I am in the Tampa Florida area. I have recently taken over responsibility for the web page and will be adding a photo gallery and web forum, links to Great Plains, and other part/plans sources in the very near future.

Chris Kalishek  
Formula V Air Racing  
# 20 "SUNBEAM"  
(727) 773-2268

### **AN INSTRUMENT PANEL VARIATION**

By Bob Schwarz

Here are three photos of my instrument panels in my Sonerai IIL, which is finally coming to completion. (The cold weather is slowing the finishing process.)

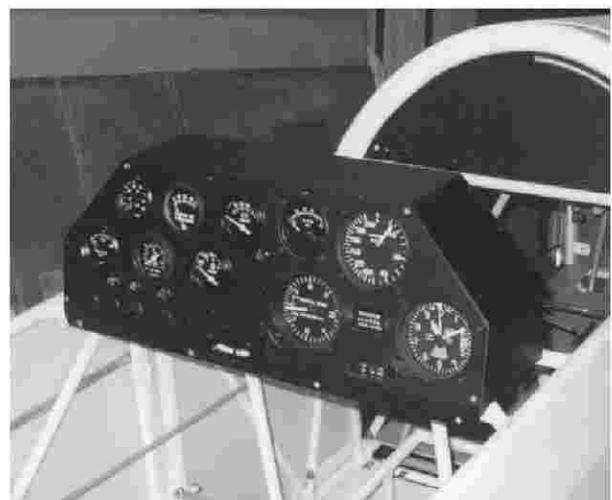


Photo 1

Photo 1 shows the rear panel with all the instruments, fuses, switches, etc.

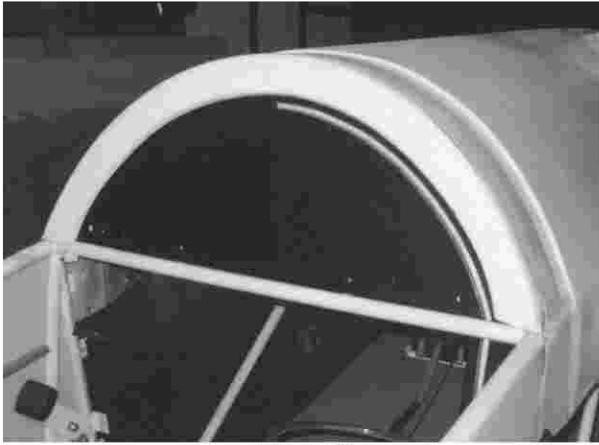


Photo 2

Photo 2 shows the forward panel with the fuel quantity indicator and auxiliary magneto switch that is connected in parallel with the rear switch.



Photo 3

Photo 3 shows the back side of the rear panel with the tunnel for the front seat shoulder harness strap. The front cover comes completely off for maintenance and inspection of the wiring, etc. I've also incorporated an extension of the fuel valve rod to the rear cockpit through a universal joint.

Bob Schwarz  
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Rschwarz29@hotmail.com

## WHAT DO AERODYNAMICISTS DO?

By Bob Barton

*Here's another one of Bob's "Tales" (He's given me a bunch of them). Enjoy...*

I once read an article about all the different types of flight instructors a young lady had had, and foibles of each type. The ex-military pilot was stiff and gruff. A future airline pilot steered her out to

five-mile finals. One of her instructors was an aerodynamicist. His trait was that when she asked him a question, he would put her to sleep answering it.

So, early on, I had an answer to the question: "What do Aerodynamicists Do?" They talk. But this knowledge didn't come naturally to me because, you see, I am an aerodynamicist. And it is a fact that most of us have difficulty seeing our own peculiarities.

It was requested that I give the program for our local EAA chapter describing what aerodynamicists do. (That is a nice way of putting it. Actually, I was the one who did the requesting.)

So I talked about how we could calculate the performance of my homebuilt airplane. I showed how to develop the drag equation; how to calculate the rate of climb at higher weights; how soft fields affect the take-off distance; how to develop the equation for the thrust versus velocity curve. I discussed how ground-effect influenced induced drag, and how approach speed affected landing distance. I showed how all this "flying" could be simulated (safely) with a calculator, pencil and paper. And how it could be done in weather which kept our "physical" airplanes on the ground. I talked, and talked. Well, it was interesting to me anyway. But I realized in the end that I had put almost everyone there to sleep...and I had to apologize.

Several months later, I was at a nearby airport and a fellow came up and introduced himself, and asked if it was not true that I was, in fact, the guy who had given the talk on aerodynamics at the chapter meeting. I, reluctantly, admitted that I was, and was about to launch an apology, when he interrupted me and said, "I was at the meeting and I had my 14 year old son with me. At that time he doing very poorly in school. Your program opened his eyes to the fact that the math and physics he hated so much in school, were actually connected with the airplanes that he spent most of his time thinking about. Since that day, he has become an A and B student."

I guess I must have worn a stunned smile for several days. I couldn't help but tell myself that one out of thirty wasn't too bad a percentage. And anyway, the other twenty-nine got a good nap.

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**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)

**RACEAIR DESIGNS IS AVAILABLE FOR YOUR FABRICATION AND RESTORATION NEEDS.** Contact Ed Fisher, (330)856-7520, [raceairdesigns@aol.com](mailto:raceairdesigns@aol.com). Over 30 years experience in dope, fabric, welding, and sheet metal. Numerous awards including 1991 Oshkosh Grand Champion Ultralight. No job is too big or small. Need a fuselage welded? Give Ed a try!!

For Sale: Sonerai II mid-wing, only needs paint and assembly, 1835 with dual ignition (Slick mag and Bosch 009). \$5000 OBO or trade. Greg Buckley, (559)226-5992, [gibflyfun@cs.com](mailto:gibflyfun@cs.com) (1/03)

For Sale: Sonerai II wing components. One kit w/front and rear spars, ailerons, cap strips, and hinges, \$650. One kit same as above except w/o rear spars. Two sets of 18 ribs, \$400 each. One set of 16 Quality ribs, \$450. Or everything for \$2000. South suburb of Chicago. L. Edwin Langeland, (708)389-6637 after 6 PM. (3/03)

For Sale: Turbo Revmaster engine, 94mm pistons, Warnke prop, 180hrs tt. \$4500 OBO. Kris Kampe (603)367-4322, [kampe1@earthlink.net](mailto:kampe1@earthlink.net) (4/03)

For Sale: Sonerai IIL, TT 294 hrs, TSTO 170 hrs, 1834 VW 60hp @ 3400, A&P owned, always hanged, Annual due 3/31/04. \$10,900 obo. Ken Christian, (660)263-7937 (1/04)



For Sale: Sonerai IL, 98% complete. Built as low-wing using Sonerai IIL plans as a guide. 1835 VW w/ SuperVee prop hub, oil cooler, & HAPI UltraCarb, Sterba prop. This airplane was 1-2 months from completion when the original builder was killed in a motorcycle accident. Current owner doesn't have the time to finish. \$4,500. Allen Bruggink, (262)335-6459, [allenb@hnet.net](mailto:allenb@hnet.net) (1/04)

For Sale: Sonerai IILS, N2533Z, Jabiru 2200 (80 hp/2000 TBO), 60 hrs TT engine/airframe, expertly crafted by experienced builder, custom Sensenich prop, Cleveland wheels/brakes, 15 gal. fuel, Odessey battery, folding wings(trailerable), flies perfect/hands off, bought L-16...must sell one, \$20,000 firm, Mike Frost (941)729-1050. (1/04)

For Sale: John Monnett's prototype Sonerai IIL, approx 500 hrs TT, good condition, always hanged, engine runs well but probably needs a teardown inspection before flight, needs new tires to fly, \$6,000. Bobby Webb, (662)429-4273 (1/04)

For Sale: Gyrocopter (Benson-type) with Brock seat tank, metal tail, extended mast for Rotax or your choice. Offset gimbal head with rotor blade bar. Needs rotor blade and engine. Otherwise assembled, on gear with Brock joystick control and wheels. \$1950. Fred Ninneman (816)353-1161 (2/04)

For Sale: Sonerai II, built 1981, 200 TT, Revmaster 2100S. Will deliver for expenses. \$10,000. Also, a complete HAPI 1835 with Zenith carb, \$3,000. Bob Jorgenson (435)678-3436, [bobl@sisna.com](mailto:bobl@sisna.com) (2/04)

Wanted: Project donation for Navajo Youth Flying Program, 4 corners area SE Utah. Bob Jorgenson (435)678-3436, [bobl@sisna.com](mailto:bobl@sisna.com) (2/04)

For Sale: Sonerai I, has flown a few times, but has no paperwork. Structure is solid, finishing details are poor. Wings flush riveted w/ AD rivets, but no S mod. Engine has ForceOne prop hub, electric start. Complete as is, \$3,500, w/o engine, \$2,400. Individual pieces: fuselage/tail/spar box \$900; wings/aileron \$1,500; 5/8" gear/wheels/brakes/axles, \$300; Scott tailwheel/spring \$50; instruments/panel/fuel tank, \$300; Ed Fisher, (330)856-7520, [raceairdesigns@aol.com](mailto:raceairdesigns@aol.com) (2/04)

