

SONERAI NEWSLETTER

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ED FISHER'S SONERAI I "BLUEBERRY"

This is Ed Fisher's Sonerai I "Blueberry" in its original blue and white paint. This photo was taken at the Cleveland Air Races on Labor Day 1978, the first race for the airplane. The three people with "Blueberry" are (from left to right) Ed's ex-wife Karen, Bob Downey, the pilot who flew the airplane during the races, and Ed. For more on the history of Ed and his airplane, see Ed's article below.

A LOOK BACK AT THE SONERAI I – PART 1 by Ed Fisher

"The right airplane for you at THE RIGHT TIME"...my dad told me as we walked around this bright green sassy looking midget racer. It was the early '70's, I was in high school, and had been helping my dad build a Cassutt Racer, but this little

Sonerai really caught our eye, and it certainly looked less complicated than the Baby Lakes biplane I was toying with at home.

The year was 1971, and I had already decided that being an aircraft homebuilder was the path in life for me. I loved biplanes (still do) but also loved the lines of the classic mid wing racers. We really

looked it over that year at Oshkosh, and minded our own business, not wanting to bother the young man who was standing with it talking to everybody. It was my mom who convinced me to go talk to him, and at that minute I met John T. Monnett, and he took time to answer all my questions. We went over cost, time to build, speeds, and I was convinced. We were told that the construction drawings would be ready by that Thanksgiving. That seemed like an eternity, but we told him he would get a check from us, and then we took dozens of pictures of the airplane. The real thrill was to actually get to see it fly that week, and hear the mighty VW bark.



N11ME, The Sonerai I Prototype

After being home from Oshkosh, I was still on cloud nine. I was already looking at VW engines in junk yards, designing paint schemes, and got a magazine subscription to **Hot VWs** magazine. I scoured every piece of the VW information I could find. Thinking I could go to the junk yard, buy an engine, haul it home, wash it down, and install a few conversion parts quickly gave way to the reality that I would probably build up an engine from new or overhauled parts, but we did go to the yard anyway, and picked up a low mileage 1600 just to have it on hand. Besides, it would allow me to tear it down and learn about the little engine.

That fall, I fired off a check to Betty Monnett at 410 Adams St. in Elgin, Illinois. I was so excited, and just after January 15th I received the plans package, serial #175...This was now real, and I don't know who was more excited, dad or me!

The Sonerai I was the first basic VW-powered airplane that caught my eye that had the racy looks I wanted. There were plenty of other good designs, but I wanted the midget racer looks and performance.

In no time, with my mom's help, I had an order off for a large crate of 4130 tubing, and the scrounge hunts had begun. I looked forward to any new

information from Monnett Experimental Aircraft (MEA), and dad and I built the jig table. Money and time were tight, but on weekends I could get started. High school, running track, flying, and two part time jobs, plus playing drums in a band left small amounts of organized time. About this time, a friend, Rudy Esser, who worked with dad said that he wanted in on the fun, so we decided to build two airframes at once. Rudy had his own serial number, and was a good machinist, so that would help with some of the fittings.

Dad did most of the welding on the two fuselages, but I had learned to weld in that first winter, and kept busy cutting, fitting, and building my very own airplane. At one point I had the opportunity to get an X-1 style racing canopy mold from Cassutt building friends in nearby Cleveland, so I fixed the mold up and taught myself fiberglass work on the canopy, the first modification in a series of cosmetic changes which would set this Sonerai I apart, and also at that point, the name "BLUEBERRY" became its name.

As soon as Monnett had the spring gear, I had the money saved, so I ordered one. The following Oshkosh I was able to proudly show other Sonerai builders my pictures, and actually got to fly with John Monnett in the prototype Sonerai II. What a thrill! Coming back home, brackets, tabs, bushings, all began to pile up as I kept busy with the hack saw and grinder. Before I knew it, I am a high school graduate, a private pilot, and a Citabria owner. Flying the Citabria and chasing girls put Blueberry on the back burner, but after a couple years off, I needed to get back to it...Now married, working two jobs, buying a house with a nice two car workshop (some people call them garages). I had a nice place to work on the Sonerai. MEA did not have all the preformed parts available yet for the wings, so we formed the spar channels, and I hand hammered the ribs, and kept all the aluminum parts under the bed, in the carpeted bedroom.



Blueberry Uncovered

I remember making the trip to Elgin to visit MEA's new "factory" at 955 Grace Street, where we spent the morning on a Saturday with John, Greg Ericson, and John's dad. We were there to get one of the first full fiberglass cowls that were made available.

Back home I fiddled with the control systems, wing skins, and in general finished up the airframe, while I looked for engine parts. I finished up the wings in a friend's heated basement, and now was really ready for the engine, so I could "fit" the cowl.

That engine turned up in a call from a friend in Columbus, who informed me that his EAA chapter Pober Pixie, was going to be re-fitted with a Continental, and would I be interested in buying their 100 hour 1600 cc VW with all of Monnett's SuperVee accessories, and a prop and spinner, for \$750... Well, the next morning, a Saturday, we had the back seat out of the '65 Ford Mustang, and were headed south with cash in hand. What a boost to the project..!!!

That next winter the engine mounting, cowl fitting, baffling, and instrument panel were finished off, and covering had begun. I had decided to use Ceconite and hand rubbed butyrate dope, and the long process of spraying and sanding was underway. A couple of years earlier I had seen a stunning Skybolt that was painted Insignia blue, and that, to me, looked about the color of fresh blueberries, so I bought a 5 gallon bucket and went to work, trimming it all with Daytona white.

About this time a t-hangar became available nearby for \$50 per month, and I grabbed it up! Now, as I finished painting parts, they went out to the airport, where I set up a bench, a couch, toolbox, and small refrigerator for the "occasional" desire for a beer. Once all the parts were out to the hangar, it was assembled, weight and balance computed, and fuel flow tests were accomplished. We actually got it running a few times, but we were constantly adjusting the POSA carb, and tweaking things while I started taxi tests. I had all the FAA paperwork in order, soon the big day arrived for the inspection, and my local FAA agent, Todd Kemmerrer, signed it off and told me to be careful, and have fun. Fortunately, I had gotten some time in dad's Cassutt already, and I was really current, so I did not think I would have too many problems.



Low Pass?

May 31st, 1978, was the big day. Dad wanted to see the test flight, but I was jittery and wanted to "go", so I was actually in it running when he got to the airport. I waved, and taxied down to the end, swung around, and slowly opened the throttle. I waited a few seconds and then raised the tail, and it smoothly accelerated and lifted off. I climbed out, broke left then right, and stayed fairly close in the whole time. Everything felt good and solid, so after a few circuits of the airport, set up a reasonably long final and brought it in. As I touched down and was rolling I noticed that it was a tad more sensitive on the ground than the Cassutt, but totally honest. Coming up in front of my hangar, I shut down and just sat there, but dad pretty much pulled me out of the cockpit with a bear hug. He kept saying over and over that I had built and flown my own airplane, in front of his eyes. It was an emotional time for both of us, and I will never forget that day. Vast quantities of brew were consumed that evening...



#77 In Flight

Later that week, I was able to begin the test program, and I was able to start collecting the performance data, and look for leaks, wear, etc. Later that month, dad flew it. It was great to see and hear it from the ground, and it looked like it was really moving out. After he landed, he told me he saw 170 in level flight at full throttle. Geez, I

remember only 165. Gosh, dad was a smooth pilot...

The next three months were spent flying off the restrictions, and tweaking this or that, and installing a much better, cleaner set of wheel pants. Wet sanding the wings, taping up everything was very important as Labor Day was coming, and we were going to race at Cleveland.

Ed Fisher
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FUSELAGE CONSTRUCTION – PART 5 EVEN MORE DETAILS

OK, enough airplane noises for a while. Let's get back to work.

The Seat Belt Attachment Points:

The attachment points for the seat belts are simply a pair of $\frac{1}{4}$ " ID x 1-1/2" long steel bushings (3/8" OD x .065" wall 4130 tubing is a good alternate) that are welded to the underside of each seat frame where it intersects with seat's rear vertical support tubes. Once they are welded, you'll need to drill them out with a $\frac{1}{4}$ " drill bit to suit the AN4 bolts used to secure the belt brackets.

An alternative is to bend a set of u-shaped brackets to loop around the fuselage cross tube where the back of each seat bottom is supported. Use 0.063" thick x $\frac{3}{4}$ " wide 4130 strap stock, and make it long enough to wrap around the tube and allow the installation of the seat belt attach bolts.



U-shaped Seat Belt Bracket

The shoulder harness strap will simply wrap around one of the cross tubes in the structure. For the front seat, that'll be the cross tube separating the front and rear cockpits on the low wing

airplanes. On the mid-wing airplane, you'll need to fabricate a bracket to bolt to the back side of the main spar carry-thru. For the rear seat, it'll wrap around the cross tube that is mid way between the back of the rear seat and the leading edge of the horizontal stabilizer. This, of course, assumes that you will be using the "Y" type shoulder harness and a three-bar slide.



Rear Shoulder Harness Attachment

The Main Landing Gear Supports and Bushings:

The points where the main landing gear attach to the fuselage are reinforced with a "U" shaped piece of the 0.063" 4130 flat stock. This channel provides a flat surface for the main gear to contact the frame. Layout, cut and bend a pair of the channels, making sure that you have a LH support and a RH support. Each support is welded to the bottom longeron along the entire top of the inside edge, and then tacked to each of the vertical and diagonal tubes along the top of the outside edge.

The location of the 5/16" bushings for the attachment bolts will depend on whether you are building a taildragger or a tri-cycle gear. For the taildragger, the bushings are located 7-1/16" apart so that the bolts will be in front of and behind the gear itself, requiring a clamping bar and spacer blocks to position and hold the gear in place. For those of you working off the IILTS plans, take a look at the Jan-Feb-March 2004 issue of the **Sonerai Newsletter**, for the details.

On the tri-cycle gear airplane, the main gear is attached to the fuselage immediately behind the main spar carry-thru box, so there is no room for the bolts to straddle the gear. The bushings are placed 3-1/4" apart, requiring the bolts to pass thru the gear. Note that when the gear is attached in this manner, it is necessary to machine a large chamfer on each side of each hole to accommodate the flexing of the gear on those few harder-than-normal landings.

The Main Spar Carry-thru Box Mounting Bushings:

Obviously, the 5/16" main spar carry-thru box mounting bushings must be properly located and securely welded. The front and rear bushing in each pair must also be aligned with each other so that the AN5 bolts that secure the box in place will easily pass thru both bushings. This alignment is actually very easy to accomplish. Simply weld in a single long piece of the bushing stock that bridges across the two square vertical tubes, and then carefully cut out the piece of bushing between the two tubes. Once the bushings are welded and trimmed, drill them out with a 5/16" drill bit. This will require a 12" extension bit to allow access.

The Wing Fold Hinge Tube Support:

If you plan to install the wing fold components in the wings, fabricate and weld the support components together. For the mid-wing airplane, the support is welded square to the front vertical square tube. On the low-wing airplane, it is welded on at an 87° angle to accommodate the 3° dihedral in the wings. Also, note that on the low-wing airplane, it will be necessary to heat and twist the tube to provide proper alignment of the spar when the wing is folded. If you don't have the spars built yet, you might want to wait to do the twisting until you can use the spars to get the proper alignment.

The Rudder Pedals and Hinge Bushings:

To properly locate and mount the rudder pedal hinge bushings, it'll be necessary to first build the rudder pedals. When fitting and welding the 3/16" bushing stock to the bottom of each pedal, it is important to keep the bushings in alignment. An easy way to do that is to use a piece of the 3/16" all-thread to hold the bushings on a common centerline. It'll be necessary to drill out the bushings prior to welding so the all-thread rod will pass thru. The bushings can then be slipped onto the all-thread, properly located on the rudder pedal, and welded in place. Once the welding is complete, the all-thread can be pulled from the bushings, and the bushing redrilled to clean out the weld scale.

The rudder pedals, along with the all-thread rod, can then be used to align and hold the bushings that are welded to the fuselage.

And just a note about the rear rudder pedals that are shown in the Sonerai II and IIL plans. I'd strongly recommend adding a diagonal 5/8" x 0.035" brace tube from the mid-point of the vertical tube to the mid-point of the horizontal tube to help keep the vertical tube from bending. That vertical tube, all by itself, is pretty spindly, and it will bend under heavy load. Ask me how I know....



Rear Rudder Pedal Reinforcement

The Brake Handle Mounts:

If you are planning to use the mechanical brake arrangement as outlined in the plans, fabricate the brake lever(s) and the mounting tabs, and weld the tabs in place. If you plan to install hydraulic brakes now would be a good time to determine how you will mount the master cylinders, and whether you are going to use toe brakes, heel brakes, or hand brakes. Each one will have its own set of mounting challenges to overcome.

The Throttle Mount:

The throttle lever mounts are welded to the LH side of the fuselage structure. The rear mount is basically an AN4-12 bolt with an AN470-4 washer welded to the diagonal tube. The rear throttle lever is sandwiched between two leather or nylon washers so that the attaching nut is used to provide holding friction to the system. The front mount is fabricated from 0.063" 4130 sheet and incorporates tabs that provide the connection point for the throttle cable and the throttle stops. The cable sheaths that are used for the mechanical brakes make great throttle cable sheaths. Use 0.049" piano wire in the sheath.

The Vertical Stabilizer and Turtledeck:

Logically, as we are installing things from front to rear on the fuselage, the next thing to install would be the turtledeck, but since the turtledeck intersects with the vertical stabilizer leading edge, we need to build it first. Before we get started, though, there are a couple of things to consider. The first is the height of the front of the turtledeck.

For those of you who are tall (taller than 5'-10") or who may have a long torso, it may be necessary to

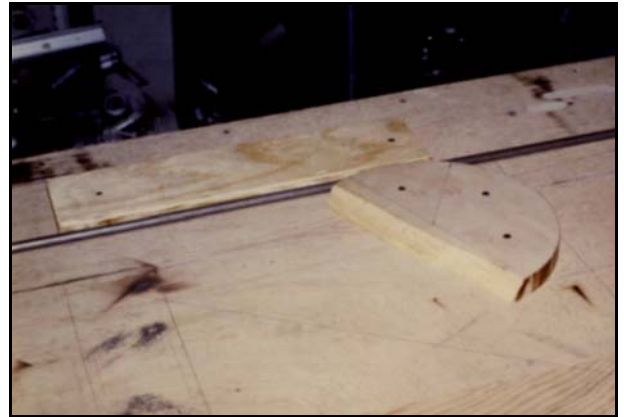
raise the height of the turtledeck so that you'll fit under the canopy once it is installed. In my case, I found it necessary to raise it 2" to provide enough clearance to the canopy. To determine if there is a need to do it on your airplane, make a cardboard template of the front turtledeck bulkhead, tape it in place on the fuselage, and sit in the seat to check it out. The top of the template should be at least as high as the top of your head, and maybe a bit higher, given that you'll probably have a headset on. Once you've determined the correct height, any increase in the height should be added to the plans height of the vertical stabilizer. This must be done maintain the effectiveness of the stabilizer and rudder. If you raise the turtledeck height too much, without increasing the height of the tail the same amount (or more), the yaw stability of the airplane will suffer.

Once the height has been determined, and the 36" long spar tube has been lengthened as needed (It's easy to slice on a piece. Just follow the guidelines in FAA's AC 43.13, chapter 4, section 5. You do have a copy, right?), you'll need to decide what the shape will be. Although there are two different tail shapes shown in the plans, the finished shape can be varied some to suit your own esthetic requirements. The only recommendation is that the finished size of your surfaces have no less area than what is shown on the plans. Larger is OK, but smaller isn't. Again, it gets back to the stability of the airplane.

Once the shape has been determined, cut and form the leading edge tube and weld it in place. You need to make sure that it is aligned with the vertical centerline of the fuselage. Next cut, bend and fit the rib, and weld it in place. (f you are building the "square" tail as shown in the plans, you'll need to make the tip rib first, then cut and fit the leading edge tube, and then fit the center rib.) Finally, cut, fit, and weld the two 3/8" x 0.035" diagonal brace tubes from the leading edge to the top longerons.

Now you can start on the turtle deck. Start by forming the front former out of 3/8" square x 0.035" wall tubing. The 7-5/16" radius bow can be bent cold over a 6" radius hardwood semi-circle that is nailed to a piece of plywood, or your work bench. Use the cardboard template created earlier as your pattern, and work the tube slowly to get the shape that you want. Make sure that you start with the straight legs a little long so that they can be trimmed to the proper length once the radius is bent. Tack the front former in place, then cut, fit, and tack the two 1/2" x 0.035" diagonal braces. I'd also strongly recommend welding a 1/2" x 0.035" horizontal cross tube to the two diagonals for the

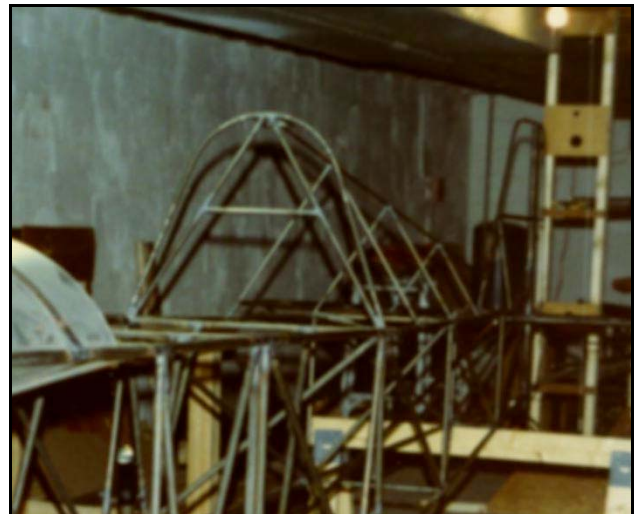
shoulder harness to pass over. You want to locate the tube so that it is slightly higher than the top of your shoulders. This will prevent the shoulder harness from imparting a downward force on your spinal column during a sudden stop.



Typical Tube Bending Fixture

Next, cut, fit and tack the 3/8" x 0.035" top tube to the front former and the leading edge of the vertical stabilizer. Then, cut, fit, and tack the six diagonal brace tubes. And finally, weld the whole assembly together.

All that's left then is to form and fit the brackets to the diagonal braces to support the edges of the aluminum turtledeck cover, and it would be wise to install them after the cover has been formed and fitted to make sure that they are in the correct locations.



The Turtledeck Structure

Your fuselage should be looking more and more like an airplane now. Next time, we'll finish up with the details.

FLOYD SMITH'S TALE by Bob Barton

Over the past several year's I've published several of Bob's stories because they've tickled my aviation funny bone, and hopefully yours as well. Here's another one:

While I was building my Sonerai ILL, I came to the point where I needed to have some welding done on a couple of aluminum parts. Many times, I had passed by the Smith Welding Yard in our corner of town; thus it came to mind first. The gate was padlocked and the sign said nothing about hours of operation. But it *did* give a phone number.

Mr. Smith informed me that his yard was open only on weekdays, but (to my surprise) that he would meet me there in 15 minutes. Arriving at the Smith Welding Yard, I was reminded of a principle I had noticed before: when dealing with junkyards, *there is no such place as "Away"*. You can't throw anything *Away*. You are already there! It was just so at Floyd Smith's business. We were walking on *Away*.

Floyd was interested in the purpose of these odd pieces that I wanted welded. Now I have become somewhat shy about telling people that I need their help in building an *experimental homebuilt airplane*. They tend to jump back, automatically flooded with visions of liability lawsuits. So I have learned to tell them that I am building "*an off-road vehicle*". I do mention that it is to be powered by a VW engine and will go 140 mph.

But I sensed an honesty in Floyd's demeanor, which allowed me to level with him...that what I was building, was an airplane. Floyd's eyes turned slightly misty as he remembered what had happened some fifty years before. In the early thirties, one of the publications like Mechanic's Illustrated or Popular Science ran an article describing how to build a small, single place airplane. And this captured Floyd's imagination.

At that time, Floyd was helping on the family farm, and he knew that Papa would not approve of him "frittering away" his time on such a project. So it was that Floyd set up a clandestine shop in an unused barn on their property. He obtained a motorcycle engine, of the prescribed type and carved a propeller for it, then proceeded with the construction of the fuselage framework... and had it almost completed, when Papa noticed a path through the weeds to the unused barn, and went down to investigate.

You have heard it said, "*Hell hath no fury like that of a woman scorned.*" And that may be true, but

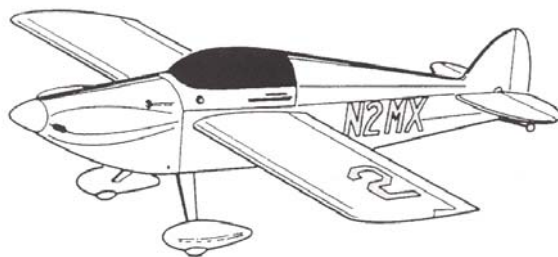
the fury of a 30's patriarch whose authority has been bypassed, runs it a close second. Papa, saying he would not allow his son to kill himself in such an inane contraption, attacked, and demolished the framework with an axe handle.

This left the engine and propeller with no foreseeable future. So, Floyd bolted it to the backend of a wagon, (which made a conveniently mobile test-bed), just to see if it would run. When it did finally start, (it's often like this, isn't it guys?), the throttle was wide open. The wagon leaped into action and trundled down a slight incline, across a road and into the ditch. Floyd later sold the engine to a young man, who's father took less interest in his son's welfare, and it is said to have successfully powered a homebuilt through the skies around Atlanta.

2010 FLY-IN SCHEDULE:

Here's a list of the major fly-in's for 2010. Make plans now to go to the one nearest you, and show off your Sonerai:

- Virginia, Suffolk, VA 5/22-23
- Golden West, Marysville, CA 6/11-13
- Arlington, Arlington, WA 7/7-11
- AirVenture, Oshkosh, WI 7/26-8/1
- Rocky Mountain, Denver, CO 8/28-29
- Copperstate, Casa Grande, AZ 10/21-23
- SERFI, Evergreen, AL 10/22-24



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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

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)



N99FK After Her Spring Bath...