SONERAI NEWSLETTER

JULY-AUG-SEPT 2010

FRED KEIP, *EDITOR/PUBLISHER*
11428 WEST HWY G
FRANKSVILLE, WI 53126

PHONE: 262-835-7714
(AFTER 6PM CDT)
EMAIL: fredkeip@aol.com

ED FISHER'S SONERAI I "BLUEBERRY"

This is Ed Fisher's Sonerai I "Blueberry" in its final paint scheme.. This scheme was incorporated around 1990 after Ed sold the airplane to Jim Vliet. After racing the airplane at Albuquerque the year before, he received many comments from people at the race that it was hard to see on the race course in its original scheme. So, after the sale to Jim, JIm and Charlie Terry sanded the airplane down and repainted it in this blue, white, and orange design. Then, it REALLY showed up on the race course. For the final installment on the history of Ed and his airplane, see Ed's article elsewhere in this issue.

ARE YOU COMING TO AIRVENTURE 2010?

Oshkosh AirVenture 2010 is almost here. Are you ready?

The dates for the grand event are July 26 thru August 1, so if you're coming, and haven't started planning yet, you'd better get to it.

I hope you can bring your Sonerai this year. I'm leaving mine at home again this year, as I've retired her from making the trip. She's been to OSH for about 20 of the last twenty-four years, so I think she's paid her dues. It's time for some of the newer airplanes to come up and show off. Not only that, but now that I'm on the Homebuilt Aircraft Council (HAC), my duties during the convention will preclude spending any time with her if she was on the flight line.

As usual, there will be some Sonerai oriented things to do at AirVenture this year:

- I'll be hosting the Sonerai Builder's Forum again on Wednesday, July 28, at 1:00 PM

in the 017 Workshop Classroom next to the Engine Workshop.

- I'll also be presenting a forum on "Building and Flying the Sonerai" on Thursday, July 29, at 2:30 PM in the new Homebuilder's Hangar (see my comments below).
- And I'll be presenting a forum on "Building a Wag-Aero Wag-A-Bond on Tuesday, July 27, at 2:30 PM also in the Homebuilder's Hangar.
- For those of you who would like to race your Sonerai, Ed Fisher is presenting a forum on "Sportsman Class Racing" on Tuesday, July 27, at 4:00 PM in Pavilion 1.
- Steve Bennett will be running his four-day VW Engine Building Seminar from Tuesday, July 27, thru Friday, July 30, at 2:30 PM to 3:45 PM in the Engine Workshop. He'll be covering VW engine selection on Tuesday, VW block assembly on Wednesday, VW engine accessories on Thursday, and VW baffling, carbs, and fuel on Friday.
- John Monnett will be presenting his forum on the "AeroVee Engine and AeroCarb" on Thursday, July 29, at 11:30 AM in Pavilion 3.
- Jeff Lange will be hosting the 7th Annual Sonerai Picnic Wednesday evening at his hangar on the northeast side of Wittman Field. The cost is $5.00 per person. Please RSVP to Jeff via the Sonerai.Net website.
- Although not targeted specifically at the Sonerai builder/flier, the Homebuilder's Dinner is scheduled for Thursday evening, July 29. This is a pretty good time, with good food, cold beer, and a good speaker. This year, John Monnett has agreed to speak to us, so get your tickets at the Homebuilder's Headquarters, and join us.
- And one other Homebuilder event for you early risers is Homebuilder's Donut Day at Homebuilder's Headquarters on Thursday, July 29, at 8:00 AM. The donuts and coffee are free, so come out meet those of us on the HAC, and other bright-eyed, early-morning homebuilders.
- And finally, be sure to check the schedule of events for other forums and presentations that you might find interesting. The amount of information being disseminated during the week of AirVenture is mind boggling.

Be sure to check out the Great Plains Aircraft Supply booth in Building D in the commercial area west of AeroShell Square. Since Steve and Linda no longer bring a lot of stuff to sell, if you are planning to get something specific for your project from them, be sure to order it in advance of their departure from Omaha, so that they can bring it with them for you to pick up.

And finally, I'd like to plug something new at the convention specifically targeted at you the homebuilder. That is the new Homebuilder's Hangar. The Homebuilder's Hanger is located just north of the Workshop area next to the Aces Café (for those of you familiar with the area, it used house the NASA display). The idea of the Hangar is to provide a central gathering place for all homebuilders, and to provide a location for the new Homebuilt Showcase/Review. The building will contain a stage, with bleachers, a sound system, and video screen for the Showcase, an area with tables and chairs, and drinking water, for those who would like to rest, or just sit and chat, bulletin boards for posting messages and for sale items, and a kiosk manned by EAA staffers and HAC members. The inside walls will be decorated with displays commemorating all of the grand champion homebuilts from 1953 to the present.

The new Homebuilt Showcase/Review will take place twice a day, at 10:00 AM and 1:00 PM. Each review will feature a specific airplane and its designer or builder. For example, on Tuesday afternoon, Burt Rutan will be there to talk about the Vari-Eze and Long-EZ which are celebrating their 35th anniversary this year. Be sure to the check the events schedule to see who is featured each day. The Review/Showcase stage will also be used throughout the week for other forum-style presentations as well. So, again check the schedule. I hope to see you there.

A LOOK BACK AT THE SONERAI I – PART 2 by Ed Fisher

I had elected early on to not be the race pilot for #77 until a more experienced race pilot had checked it out. Two days before the Cleveland races I flew it out to Lakefront Airport in formation with a friend's Bonanza, with dad sitting in the right seat, his eyes glued to me the whole time. Once at the races, the tech inspection began, and we talked around the idea of having a Formula 1 pilot wring it out for qualifying. Veteran midget racer pilot Bob Downey agreed to fly Blueberry, and that was a thrill for us, especially dad, as he watched Bob race Midgets in the Goodyear days.

It was a great week, and although I did not have a racing prop, and had an engine turning 3 to 4

hundred rpm less than the others, it was great to have Blueberry now in the record books, and thrilling to see my airplane racing with Steve Wittman.

Blueberry on the Start Line along with Steve Wittman's VeeWitt.

That fall, I started experimenting with different prop combinations and carb settings, and further clean up programs netted about 5mph more speed. Pulling the wings off to display it in a mall show in November, I had no idea that this would be the last time, for ten years, that I would have any association with Blueberry…

In 1979, I took a different job, which greatly changed my personal time schedule, and we bought another house, which regrettably, forced me to sell #77 to a pilot about 75 miles away. I tried for the next year to keep up with his adventures with Blueberry, but found that during that time he only flew it twice, and sold it quietly to a man, sight unseen, in Las Vegas, Nevada. When he got it home, he couldn't fit in it, so it was "for sale" again.

During the rise of Formula V air racing, Charlie Terry, Jim Vliet, and Rick Leonard were the real troopers who developed the Vees into a very competitive, low cost racing class. I stayed involved as much as possible, started designing the "Veebee", worked on some of them, and officiated at races as a pylon judge or timer whenever I could. I helped the late Chip Shafer finish building the #20 Sonerai "Sunbeam", and did all the preliminary test flying before it joined the racing circuit. So, I was busy, but was not in the action as much as I wanted. I had heard that Blueberry had been sold again to a friend of Charlie's, Richie Reichelt, and the airplane was gonna race again. I ended up going to that race, got to help assemble her and be part of the crew. More fun, then the airplane got sold again, and was now in Connecticut. I talked with Jim Vliet, and told him I would like o be involved again, and he told me to call Bob Bailey and he would sell it to me.

January 1989, long story short, I was in New Jersey with Jim Vliet the following week, and we drove his van with a trailer over to Connecticut where we looked #77 over, made an offer, and loaded it up. Jim loaned me some of the money, and even offered to supply delivery to Ohio..!!

She was in bad shape. She was completely apart, some fabric missing, parts bent or gouged, and another race was on, because it was less than 6 months till the Formula V races in Albuquerque. There was a lot to do. I first formed a race team, Dave and Scott tore the engine down, while I tore into the airframe. I sent off the entry form and check, acquired materials, and began the rebuild. Working most every evening after the day job and all weekends, we had it licked, and ironically, on May 31st, 1989, exactly 11 years after the first flight, I tested it again. My boss's short sod strip was fine to get off and climb out, but I didn't want to attempt a landing there, so I flew over to the old airport where I originally tested her 11 years earlier, and landed there. Taxiing back to the hangars, I had a total loss of directional control, opposite rudder and brake were no help, and I did a lazy ground loop to the right. My brother drove up and we towed it back to the hangar. The steering arm on the tailwheel had broken, but by the afternoon we were fixed and ready to fly again.

As we prepped for the New Mexico races, we did a series of tests and mods that helped a bit, but all too soon it was time to pack up and leave. This was going to be an ordeal… Three days before departure, my Bronco tow vehicle developed some fairly serious engine problems. We were loaded in the trailer, but had no tow vehicle. Again, the generosity of the Formula V guys came thru, as Charlie Terry loaned me an extra tow vehicle. The only problem was that it was in Long Island, I was in Ohio, and we had to leave for New Mexico… No problem, he also provided me with a friend, Paul, who would drive out with me, and help crew the airplane!

This became a wild adventure, as we were supposed to meet up with a couple of the race teams in the Midwest, and caravan along, but Charlie's tow vehicle developed its own problem, and we found ourselves boiling over every 75 miles or so. The caravan idea was out the window. We started collecting water jugs, and would just stop every 60 miles or so and "fill er up" with water. We got there…

At the airport, we all helped each other with assembly, the carb adjustments for high altitude took some time, but all the tech inspections took place and qualifying began. When I went up I

couldn't believe the takeoff roll, it took forever, but once in the air, the groundspeed looked fast. I was going thru this test flight, then the next day would do my rolls and get down on the course for an actual timed run. Once again, fate would change my plans. On landing, I noticed that the brake on the left was weak, and the right one not far behind. We took it apart and found recent bad wear, maybe the higher landing speeds helped. They were Azusa wheels/brakes, every Sonerai owner knows that these brakes are not "ideal", but they are inexpensive. I had no brake parts with me. The next day changed everything.

Blueberry on the Pylon

I woke up with a stopped sinus, and my head was pounding. I ended up feeling sick for most of 3 days, so I elected once again to let other pilots fly #77. John Bregar took it up, then came down, and said he had a chance to fly a faster airplane, so declined. I then had Carl Swenson, F-1 pilot, and Bob King, Vee pilot, race it for me. All in all, we had a good week there.

Formula V was rolling along well now, and my career was rolling along pretty good, so I had less and less time, and actually loaned #77 to Charlie and Jim for a season, and as Charlie kept saying that Blueberry really needed a good race engine, I reluctantly sold her to Jim, and watched her leave my life again.

The next spring, #77 was getting faster, and so were everyone else, but the final modification to that airplane and engine got it up as close to a successful racing airplane as it would ever be.

With the success that Charlie and Jim were having with her, I got the urge to build a very light Blueberry clone, and had a barn not collapsed and totally destroyed the fuselage and tail, that might have ended up being one of the lightest, cleanest Sonerai I's ever built. So, at that time, I began construction of the "Veebee" which I still have today.

Blueberry went on to be a reliable racer, and holds the record of having entered and flown in more FV races by more pilots than any other Vee. At the end of the year 2000, Jim Vliet donated #77, N77KE, to the American Motorsports Hall of Fame Museum in Detroit, Michigan.

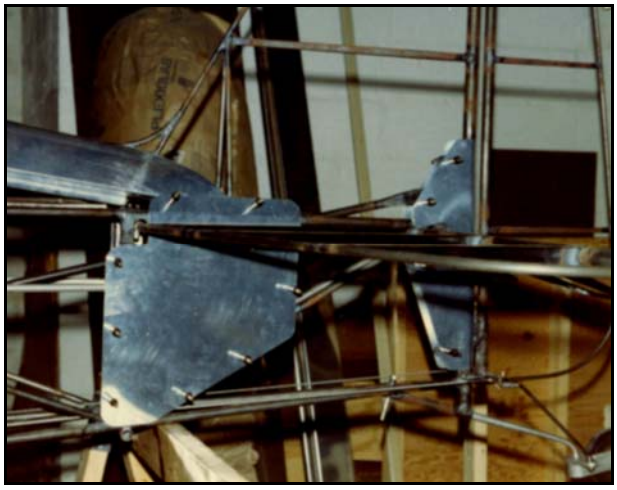
The Sonerai I has been, and still is, one of my favorite airplanes, and still is being built in decent numbers. It amazes me, and I am sure that it still amazes the art teacher, turned respected aircraft designer, who created it.

Ed Fisher.
raceairdesigns@hotmail.com

FUSELAGE CONSTRUCTION – PART 6 THE FINAL DETAILS

OK, let's get the final little bits and pieces welded in:

The Tabs for the Rear Access Panels:
There are two access panels on the rear of the fuselage. One is on the left side just below the horizontal stabilizer to provide access to the front horizontal stabilizer mounts, and the other wraps around the vertical tail post just ahead of the elevator to provide access to the elevator push-pull tube connection to the elevator horn. There are several tabs and a bent angle bracket that get welded to the tubes. Size these tabs and drill them so that you can install nut plates for the #8 fasteners that will secure the access panels. Now is also a good time to fabricate those panels so that they can be drilled to match the holes in the tabs. I used left over 0.025" 2024-T3 aluminum from the wing build.


Rear Access Panels

Rear Battery Supports:
The Sonerai IILTS plans show a set of support brackets for mounting a battery in the rear of the fuselage at the rear access point. Now, would be a good time to install these. Even if you don't plan to install a rear battery, these mounting points can be used to mount ballast if it becomes necessary to correct an out-of-balance condition.

Tailwheel Spring Support Tube:
Positioning the tailwheel spring support tube properly will require that the fuselage be mounted on the main gear, so that the correct angle of the tube can be determined. With the tailwheel spring mounted in the tube, position the tube so that the threaded portion of the spring is perpendicular to the ground. This will position the tailwheel swivel in the proper orientation to minimize tailwheel shimmy. The angle of the support tube may be such that it does not contact the bottom of the vertical stabilizer spar. In that case it will be necessary to fit and weld a short piece of ¾" x 0.035" tubing into the lower end of the spar to allow the attachment of the support tube.


Tailwheel Spring and Support Tube

The Stringer Attach Tubes:
To accommodate the attachment of the side stringers, short pieces of 3/8" x .035" tubing are welded to the diagonals just aft of the instrument panel station and to the vertical tube just in front of the leading edge of the horizontal stabilizer. They are located 4-3/4" down from the centerline of the top longeron for the low wing airplane, and 8-3/8" down for the mid wing machines. The reason that stingers are used is to keep the fabric away from the vertical and diagonal tubes in the fuselage, and to round out the overall shape of the sides and bottom of the fuselage.

The intent of the little tubes is to provide points over which you can fit a piece of ½" x .035" wall 6061-T6 aluminum tubing. Once the aluminum tubing is in place, there is no need to fasten it further, because once the fabric is installed and shrunk, the stringer is locked in place. The one thing that I found useful when I built mine, though, was to weld a saddle at the stringer location on each side to hold the middle of the stringer in place at the 4-3/4" or 8-3/8" dimension. The saddle is just a third of a piece of 5/8" x .035" wall tubing tacked at the location. (Note that in the early version of the Sonerai II plans, hat section stringer material is called out. It is perfectly acceptable to use it, but you'll find that it is more expensive than the aluminum tube.)


Stringer Saddle

The center bottom stringer is mounted similarly, with the main difference that you need to provide standoffs at each of the bottom cross members and diagonals to provide clearance for the elevator bellcrank and push-pull tube at the rear end of the control torque tube assembly. The standoffs are made from pieces of 3/8" x .035" wall tubing with a 5/8" x .035 wall saddle welded on the end. Although the plans don't show them, I'd recommend installing a standoff at each diagonal as well as the cross members to help keep the stringer as straight as possible when the fabric is shrunk.

The Rudder Cable Fairlead Tubes:
To guide the rudder cables from the rear rudder pedals back to the rudder horn, the plans call for the use of Piper cable fairleads. They are two-piece nylon bushings that hold the cables in position and help keep the cables from slapping against the fuselage tubes. To mount the fairleads, ¾" long pieces of 7/8" x .058" wall tubing are welded at station 79-3/8 and 172-3/8 on the stretch fuselage and stations 73-3/8 and 154-3/8 on the standard airplane. A heavy tack weld on each side of the tube is all that is needed. And be sure to thoroughly clean the inside of each tube to allow a smooth fit for the fairlead.

The Wing-fold Cross Tube and Static Port:
The wing-fold cross tube is welded at station 127-3/8 in the stretch and 115-3/8 in the standard airplane. The function of the tube is two-fold. The first is provide a place to slide the 5/8" diameter steel rod that supports the wings when they are folded back against the fuselage. The second is to provide a static port for your airspeed indicator, altimeter, and rate-of-climb indicator if you have one. The static port connection is provided by a short piece of ¼" or 5/16" x .035" wall tubing welded perpendicular to the cross tube. I'd suggest the static port be welded about 2" off the center (rather than on center as shown in the plans). That way when you wrap the end of your Y-type shoulder harness around the tubes, it'll be on the centerline of the airplane. Once the welding is complete use the short tube as a drill guide and drill thru one wall of the cross tube. Make sure that the cross tube is long enough so that it can be trimmed flush with the fabric. (Be sure to do this before the fabric is installed.)

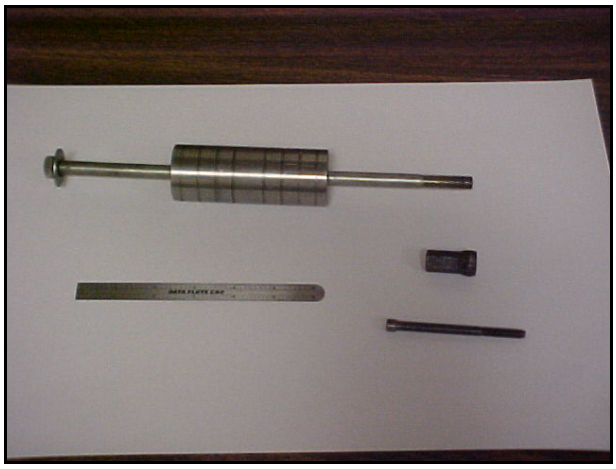
On my airplane I used ¼" ID Tygon tubing for the static line, and ran it thru the left side stringer. A window was cut in the stringer just forward of the static port, and just aft of the front end of the stringer. To get the vinyl tube to pass thru the length of the stringer, I coated it with thin layer of dish washing detergent, and it slid thru without problem.

The Longeron End Caps:
Once the welding to the longerons is complete, it's time to corrosion proof their insides and seal them up with end caps. As it turns out, the bottom longerons are already capped at the vertical tail post, but you'll need to cap the aft ends of the top longerons. For these caps, cut a pair of 5/8" diameter .032" thick 4130 discs, and weld them on.

For the front longeron caps cut four ¾" diameter discs. Before you weld them though, you'll want to prep the inside of each of the four longerons using a product like Poly-Fiber "Tubeseal". It is basically a boiled linseed oil product that fully coats the inside surface of the tubes, and hardens over time to prevent rust from forming. Pour a small amount of the Tubeseal in each longeron as directed on the can. Tip and roll the fuselage around to insure a complete coat. Pour out almost all of the excess, leaving just a little behind. Then, weld on the front end caps, and after the welds have cooled, tip the fuselage forward to coat the newly welded areas.

The fuselage is now welded, for the most part, and ready for cleaning and priming. I didn't cover the installation of tabs for additional engine controls, like a vernier mixture, carb heat, and so on. Nor, did I talk about forward battery mounts, radio mounts, ELT mounts, and things like that, because each of these installations is unique, and you'll have to figure out what the mounting tabs will look like and where they will go. I also haven't covered building the canopy frame and the installation of the hinge and latch bushings, the control stick assembly, nor the tail surfaces. I'll do that next time.

TAPER PIN PULLER by Theo Mattingly



This is a picture of a taper pin puller that I use working on CNC lathes and mills. The parts consist of:

- 3/8 x 10" bolt
- 3/8 coupling nut (with a 1/4 nut welded to one end)
- A sliding weight (approx. 1 lb.)
- Socket head cap screw (SHCS, sized to fit tapped hole in taper pin, and the head ground to fit inside the coupling nut but large enough not to go through the 1/4 nut).

The only critical fits are the SHCS must obviously fit the tapped hole in the taper pin and the head of the SHCS must fit inside the coupling nut but not go through the 1/4" nut.

Some builders may find it easier to adapt a dent puller for this application. This puller works very well for me and it is adaptable to different sizes of pins, just use a different size socket head cap screw.

To use it, slip the SHCS through the coupling nut and thread the SHCS into the taper pin. Try to engage the SHCS at least 6-8 threads. Slip the weight onto the 3/8 bolt and thread the coupling

nut onto the 3/8 bolt. Slide the weight to extract the taper pin.

I have had to use the screw method to jack out pins. It works better in places where the puller won't fit. But if the puller can reach the pin, I always use the puller.

Theo Mattingly
IILT

Freditorial Comment: Pulling taper pins that have been installed for a long time, or have been over-tightened, can be a real challenge. One the real secrets to easy removal of the taper pins is to not over-torque the nuts that hold the pins in place. Remember that the taper pin's function is to carry the shear loads from the spar to the carry-thru box, and all the nuts do is keep the pins from backing out. When you install the pins, just tap them in until they are snug. Then, slip the AN975 taper pin washer over the threaded end, and install the AN364 nut. Tighten the nut only enough to keep the washer from turning.

TUBING SPECIFICATIONS

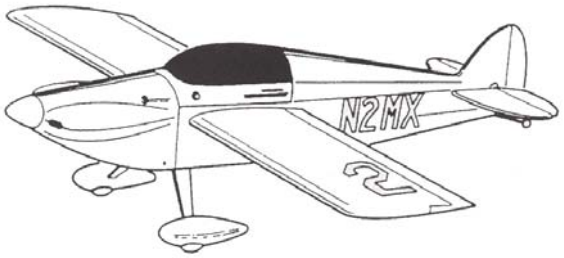
Here's a set of the latest piping specifications that you can use when ordering the tubing for your fuselage:

1. All pipe is to be made of a long hole, surrounded by metal centered around the hole.
2. All pipe is to be hollow throughout its entire length.
3. All pipe is to be of the very best quality, preferably tubular or pipular.
4. All acid-proof pipe is to be made of acid-proof metal.
5. The O.D. of all pipe must exceed the I.D., otherwise the hole will be on the outside of the pipe.
6. All pipe is to be supplied with nothing in the hole so that water, air, or hydraulic fluids can be put inside at a later date.
7. All pipe is to be supplied without rust as this can be more readily put on at the job site.
8. All pipe is to be cleaned free of covering such as mud, tar, barnacles, or any form of manure before putting up, otherwise it will make lumps under the paint.
9. All pipe over 500 feet in length must have the words "LONG PIPE" clearly painted on each end so that the Engineer will know it is a long pipe. Pipe over two miles in length must also have these words painted on the middle so that the Engineer will not have to walk the full length of the pipe to determine if it is a long pipe or not.
10. All pipe over six inches in diameter is to have the word "LARGE PIPE" painted on it so that the Engineer will not use it for small pipe.
11. All pipe fittings are to be made of the same stuff as the pipe.
12. All pipe closers are to be open on one end.
13. No fittings are to be put on pipe unless specified. If you do, straight pipe becomes crooked pipe.

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:

- Arlington, Arlington, WA 7/7-11
- AirVenture, Oshkosh, WI 7/26-8/1
- Rocky Mountain, Denver, CO 8/28-29
- MERFI, Urbana, OH 9/11-12
- Copperstate, Casa Grande, AZ 10/21-23
- SERFI, Evergreen, AL 10/22-24



See You At Oshkosh!

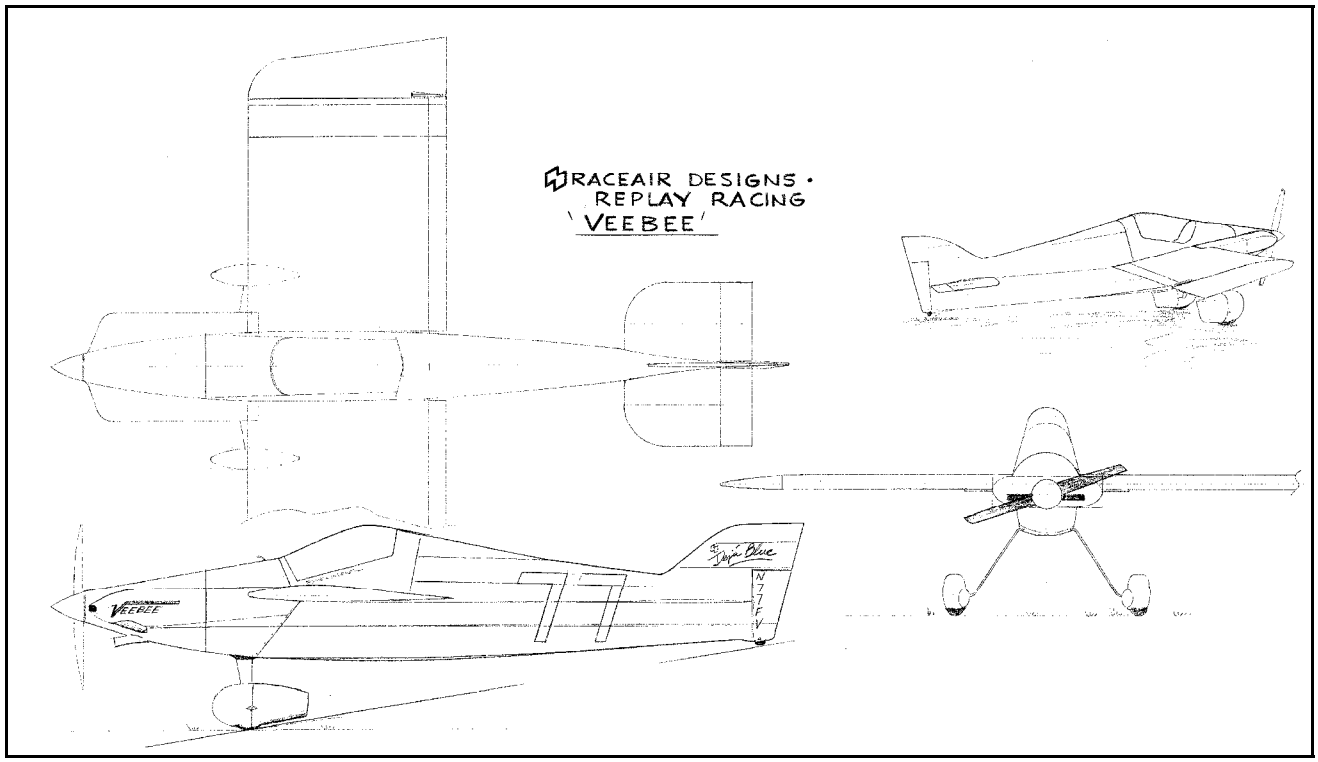
WANT ADS

These Ads are provided as a service to you, the subscriber, and are free of charge. I only ask to be informed when the Ad is no longer valid, and needs to be removed. Thanks.

SONERAI WING CONSTRUCTION MANUAL: There are 18 pages of text, 85 photographs, and 12 drawings, as well as a complete materials and a tools list. If you have an older set of plans (The manual is now included with the plans, so you new plans holders already have it.) and would like your own personal copy, send cash, check, money order, or PayPal) for $25.00. Postage is included. Fred Keip, (262) 835-7714, *fredkeip@aol.com*

BACK ISSUES: **Sonerai Newsletter** back issues are available in <u>three</u> 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*



A 3-View Drawing of Ed Fisher's "VeeBee"