

## WHISPER

Designed by Randy Wisley

Aircraft type	Sport Sailplane
Wingspan	60 in.
Wing Chord	7 in.
Total Wing Area	400 sq. in.
Dihedral	3-3/8 in. each tip
Overall Fuselage Length	35-1/2 in.
Radio Compartment	3/4x1-15/16x8-1/4 in.
Stabilizer span	20-1/4 in.
Stabilizer Chord	3-5/8 in.
Stabilizer Area	70 sq. in.
Vertical Fin Height	3-1/2 in.
Vertical Fin Width	6 in.
Required number of channels	2
Weight ready to fly	8 ounces
Wing loading	2.87 oz./sq. ft.

• This article details a different type of sailplane. *Whisper* looks like a European free flight glider, circa 1948. The very slim fuselage has only enough room for the Cannon Super-Mini or Super-Micro type radios. (Bantam Midget servos will fit.) Even so, the model spans 60 inches and has 400 square inches of wing area. The real difference between the *Whisper* and other gliders of this size is the ready to fly weight. This machine weighs eight, count 'em, eight ounces! Friends, that's a wing loading of 2.87 ounces per square foot. If you thought five ounces per square foot rode light air, just wait till your try three!

The model's light weight, combined with an "undercambered" airfoil, means this is a very slow flying glider. I also used a small vertical fin and sharply angled wing tips. These features add up to a very flat, almost "bankless" turn. (*Having flown the Whisper, I can vouch for this. wrf*) All of the above contribute to *Whisper's* ability to stay up in lift so light the others can't even see it. The elevator is seldom used in flight, usually only to correct the pilot's mistakes.

*Whisper* also makes a great trainer. My wife soloed on "ours," even making her own hi-start launch with only verbal assistance. (By hi-start, I mean 50 feet of 1/4-inch rubber and 200 feet of six-pound test fishing line. That's all it takes to haul an eight-ounce sailplane up.)

About the only thing you wouldn't want to do is fly your *Whisper* when the wind blows more than 10 mph.

Now, a word to you would-be hand launchers. Yes you can, but please put some 1/32 shear webs in the center first.

As for construction, it's very simple. Use all adhesives sparingly. Take some time to sand the model well before covering. Tissue (*Or Micafilm. wrf*) would knock an ounce of dead weight off the total. I chose an iron-on film, however, because it's faster and doesn't warp the light structure. I also used an Ace-100 mah battery pack (Part No. 38K42F), combined with my Cannon Super-Mini radio. Don't pull any components out of their cases, it isn't necessary.

At this point, you should be all fired up, so read on, and I'll tell you how to build one.

### FUSELAGE

Cut two identical sides from medium-

soft 1/16 balsa sheet. Cement the 3/32 x 3/32 hard balsa stiffeners in place top and bottom, then add the 1/32 ply doublers at the tail. Make the formers from hard 1/16 balsa. Lay one fuselage side down on a flat surface. Glue formers two through five in place using a triangle to align them perpendicularly. The servo compartment floors are now installed. Check to be sure that your servos fit before you progress. When the glue dries, cement the two fuselage sides together. Taper the stiffeners down to nothing at the tail and cement the tail together. Add formers six, seven, eight, and nine, then finish off the job by installing former one. Bend the towhook from 3/64 music wire, epoxy it to the 1/16 ply mount, then epoxy the works in place on the fuselage. Plank the entire bottom with 1/16 balsa applied cross-grain. Fit the pushrods in place before you plank the top. The wing mount is made from 1/16 ply. It keeps the wing from rocking around. Glue the noseblock on and make up the hatch. The grain runs lengthwise on the latch. The T-pin and balsa catches on the bottom allow you to spring the hatch into place. The hatch should be in place while you sand the fuselage smooth. Drill the holes for the wing attachment dowels, but don't install them till after covering.

### TAIL SURFACES

Look for a piece of 3/32 x 3 balsa sheet that's hard on one edge. Use the hard edge for the leading edge (LE) of the stabilizer. Cut the stab and elevators out and don't forget the lightening holes. They get real important this far aft of the balance point (CG). Join the elevator halves with 1/32 music wire. The rudder is cut from soft stock as is the fin and subfin. Sand everything smooth and round all the exposed edges.

### WING

Make a template and cut out the main ribs. You need 20, 1/16 balsa ribs and five, 3/32 balsa ribs. The lightening holes are optional, but look better through transparent covering. Pin the TE down on the plan. Cement the five, 3/32 ribs to it. Glue the leading edge in and add the rest of the 1/16 ribs. Check to be sure that the ribs remain correctly aligned.

To take the "droop" (optical illusion) out of the flat center section, raise each end rib up 3/8 of an inch before you cement the 3/32 x 3/32 spruce top spars in. Be sure to take all the pins out of the wing except those at the center. Bend the wing tips next. To do this, soak some 3/32 square spruce in hot water until it's bendable. Form the first piece to shape over the plan. Pin to either side of the spruce instead of through it. When the first one's done, bend the second one right over the first one. Allow them to dry overnight. Make a jig to raise each tip 3-3/8 inches. Use some Jet (or the like) and cement the wing tip bow to the LE and TE. Now you can add the filler-block at the TE, and the gussets up front. Cement the tip ribs in, then pick the wing off the board.

Install the 1/32 ply dihedral braces, then the bottom spar. All the spars in the tip are made from hard balsa and can be installed last. Do some sanding on the LE and make sure that the spars fit flush with the ribs.

### COVERING

Use caution covering the undercambered wing. The material must stick to each rib to maintain the contour. Other than not sticking the covering to itself in the lightening holes of the fin, rudder, stab, and elevator, the rest goes easy.

### ASSEMBLY

Cement the tail surfaces in place. Use sewing thread to sew the elevator to the stab, before you sew the rudder to the fin/subfin. The control horns are made from 1/32 ply and "jetted" into a slot cut in the control surface. The servos are installed with a piece of 1/16 foam double adhesive tape on the side. Hook up the pushrods and check the controls. The battery pack fits up front, padded with 1/8-inch foam. The receiver goes in the middle. Pad the area and route the antenna down the bottom of the fuselage. Put the hatch on after mounting the switch and see if anything binds. Balance the completed machine. (Shame on you if it's tail heavy!) To add weight to the nose, drill a hole in the nose block and insert solder. Charge the batteries while you make the hi-start.

### HI-START

Use 50 feet of Sig 1/4-inch flight rubber tied to 200 feet of six-pound test nylon monofilament fishing line. A paper clip becomes the ring and a screwdriver the stake. The works can be kept in an oatmeal box when not in use. Please don't try to use a standard hi-start ... this wing just won't stand the strain.

### FLYING

Well, after all those long hours of tedious building (*Both of 'em. wrf*), you've reached the pinnacle of panic! Run down to the school yard for some test flights. Hold the machine over your head and trot into the breeze. Bring your arm forward and release the model. If you don't stop running, you will most likely run right past the gliding *Whisper* and won't get to see if it's in trim! Stretch the hi-start out about 50 feet for your first attempt. The rudder is really effective on the way up, so try not to over control. You might use some trim, but up elevator isn't necessary during the climb. Once the flag drops, get ready for the slowest, most relaxing sailplane flights you've ever experienced.

### BILL OF MATERIALS

- 4 — 1/16 x 3 x 36 ribs and fuselage
- 1 — 3/16 x 3/16 x 48 balsa leading edge
- 1 — 3/16 x 3/4 x 48 balsa trailing edge
- 4 — 3/32 x 3/32 x 48 spruce wing spars
- 3 — 3/32 x 3/32 x 36 balsa stiffeners
- 1 — 3/32 x 3 x 48 balsa tail section
- 1 — 1/8 x 36 dowel pushrods
- 1 — 1/32 music wire
- 1/16 x 3/4 x 5 plywood
- 1/64 x 1/2 x 4 plywood
- 1/32 x 2 x 6 plywood
- 2 in. of 3/64 music wire