

Author's wife, Jan, holds a pair of Phoebes aloft. She gave her all for this photo as it was a very cold day, still smiling gamely through it all!

Phoebe Sailplane

Simplicity, design and good looks combine to make the Phoebe an outstanding performer for thermal and slope soaring. Based on the Bolkow Phoebus, slightly modified.

BY DAVID THORNBURG

• Every now and then a design comes along that you just have to build, even if you have a full stable at the time. To me, the Phoebe was such a design. Basically a Bolkow Phoebus with slightly simplified lines, the little ship somehow captures all that's clean and neat and classic in modern sailplane designs. MonoKoted wings and a Hobbypoxy fuselage make the plane a real penetrator, and good penetration is an asset both on a windy slope and out on the flats when the time comes to abandon that fat thermal and head back upwind to the field.

The Phoebe's smooth lines derive from

her rolled plywood fuselage, which, with a sheet bottom, is easier to build than most. First cut out all formers, the rough nose block, both halves of the rudder core and the 3/16" sheet keel. The nose block can be tailored to your particular battery pack, as suggested by the dotted lines on the plans. Glue the nose block, the triangular strips, the formers and the rudder core pieces to the keel in that order. Install both nylon push rods. If you want to build a snug little box behind Former A for your receiver, now is the time to do so. Cut the fuselage shell from one of Sig's 1/32" x 12" x 48" sheets of birch

plywood, wet it along the turtledeck, and glue it in place with Titebond or other slow-setting adhesive. Sight across the wing platform and cockpit "gunwales" to insure good alignment. When dry, add the 1/2" belly pod, the 1/32" balsa rudder skins (a good idea to literally inundate the elevator Nyrod in glue as you install these skins) and the skid block at the fuselage rear.

Now for the cockpit—the item that separates the craftsmen from the flyers. A neat canopy frame can be custom-built on your fuselage from scrap balsa, ply or basswood.



Only 6 foot in span, the Phoebe looks and flies much like the larger planes.



Note extreme ($\frac{1}{2}$ " tip washout which makes smaller models easier to handle.

PHOEBE SAILPLANE

This takes time but it looks nice. Or you can wrap the cut-down Sig canopy around the hole, slip a rubber band over it to hold it in place and call it finished. I've done both.

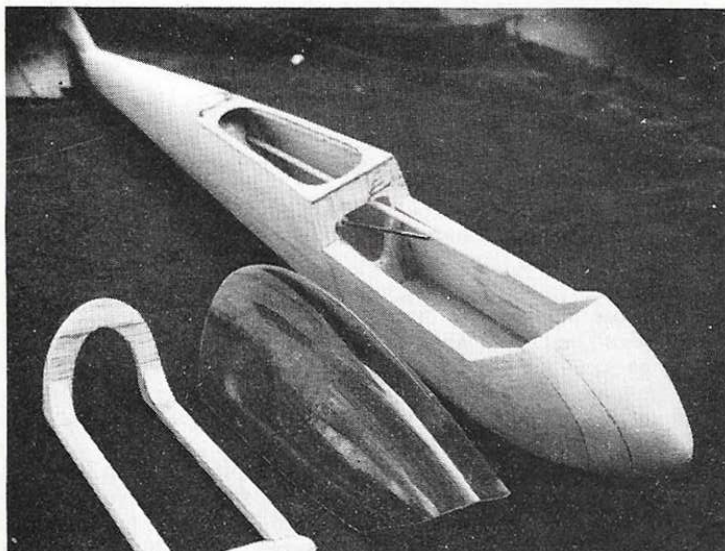
While you're making the big canopy decision, build the wing. Select eight pieces of $\frac{1}{16}$ " x 36" balsa, four of them 3" wide and the others, 4" wide. Glue them together in pairs, a 3" with a 4", using the masking tape method for speed and accuracy. (Find the edges which mate best, force them together and cover the seam with a strip of paper tape. Turn them over, hinge the joint open and apply glue; then weight them down on a flat surface until dry.) While the skins are drying, cut out the ribs. The preferred method locally is to bandsaw out two blocks, a left and a right, both about 1- $\frac{1}{2}$ " wide and tapering in shape from the largest rib pattern to the smallest. These can then be run back through the bandsaw in $\frac{1}{16}$ " increments to yield 18 to 20 ribs per block. Sound crude? The balsa skins cover all. If you prefer, you can cut the ribs individually or in pairs, using only the largest rib template for a pattern and rotating it down to the desired length for each rib. Note, however, that this also rotates the angle of the front of the rib, the part that butts against the pre-cut leading edge, and

this must be compensated for if the leading edge is to retain the same shape from root to tip.

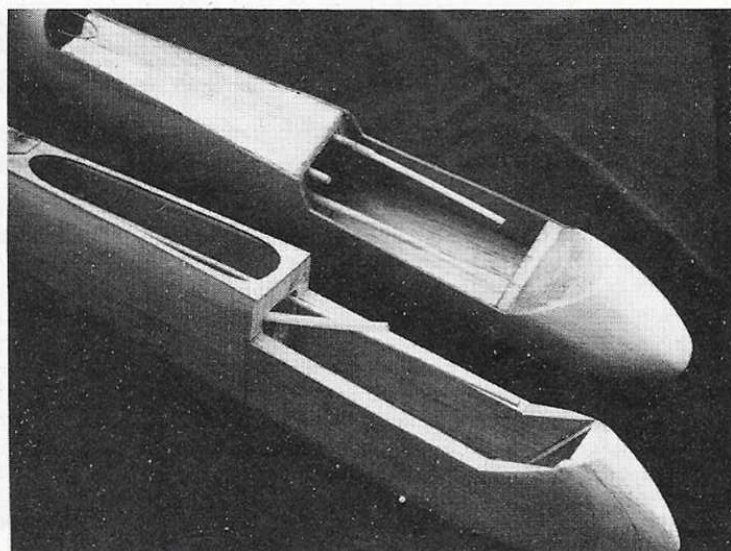
When ribs are completed, cut two of the skins to the exact wing planform shown. Glue the leading edge in place, using a rib to insure proper angle. (Masking tape works well on this joint, too. Put it on the bottom of the sheet first, then turn the sheet over, position the leading edge strip and press it firmly onto the tape before gluing.) Mark the rib positions (2" spacing) and glue all ribs in place. Saw the first two in half before gluing at the point 2- $\frac{1}{4}$ " back from the leading edge where the dihedral brace intersects them. I usually install the brace in one panel, glue on the top sheeting, then glue the whole "schmear" to the second panel before putting the second top sheeting in place. In any event, add the top sheets in this manner: First, position the bottom skin on a jig that will automatically provide about $\frac{1}{2}$ " of washout. A 1 ft. x 3 ft. sheet of $\frac{1}{4}$ " plywood, with three corners tacked to floor or workbench and the fourth propped up $\frac{1}{2}$ ", works well. With wing pinned to this jig, fit the top skin snugly to the leading edge, sanding or trimming as necessary to get a neat joint. Lay the skin in place, run

that ubiquitous masking tape down the joint, hinge it open, spread a slow-drying glue over everything; then slam her shut and weight it all over, using strips of wood such as yardsticks to distribute pressure evenly while the glue dries. Before leaving the panel, check again to be sure you have washout rather than washin, and no more, or less, than necessary. Once that top sheeting dries, you can no more retwist it than if you had cast it out of plaster of Paris.

Only one or two other details are less than obvious. The hole for the $\frac{3}{16}$ " dowel in the leading edge root can't be drilled until the soft balsa block is in place. You'll probably want to coat the entire inside of the balsa cave on the wing, that the rear wing hook slides into, with epoxy—it takes a beating. The stabilizer hinges ought to be sheet nylon or commercial hinges rather than tape or thread, because of the pressure placed on them in extreme elevator movements. The finish is your choice . . . flying buddy Don Spellum covered his fuselage with red MonoKote and it looked terrific. I used Hobbypoxy on my white one. The wings *always* get a MonoKote or a glassy dope finish—after all, they do the flying. ■



Cockpit frame of basswood and ply—note beefier nose in this early model.



Receiver area under wing can be made accessible from top, if so desired.