

# BUILDING THE GREMLIN

by BOB KUGLER

Jordan and I deviated from the plans when we installed the spars and wing mounting blocks. Jordan felt that this part of the plane was over-engineered. Since the wings haven't folded yet, I guess he was right.

The parts that you received conform to the modifications we made. The following procedure describes the changes.

## SPARS AND WING MOUNTS

1. Test fit the fuselage in the spars. The openings in some spars were cut slightly to small. Enlarge the opening as needed to provide a snug fit.

2. Test fit the spars in the wings. If the spars are too long (the wings won't come together with the spars installed), trim the spars equally at both ends. With the spars temporarily installed in the wings once again test fit the fuselage. Trim the spars as needed. Don't be overly concerned with fit now. Since you're working with foam, you can block sand the opening after the wings are joined.

3. Using 5 minute epoxy, glue the two 1/4" x 1/2" x 2 1/2" spruce wing mount blocks to the front and rear spars. These blocks should be located with a 1/4" side against the front center of the spar, flush with the top of the 2 1/2" cutout for the fuselage. Let them harden thoroughly.

4. The plans call for making rather large slots in the bottom of the wings to accept the spars and wing mounts and then filling these with balsa plugs. Instead, we cut small slots in the center of the wings in the cutout for the fuselage to accept the wing mount blocks.

5. Place the two wing halves on a flat surface with the roots together and the fuselage slot facing up. Remove the foam saddles from the top of each wing half.

6. Slide the spars, as far as they will go, down into the long grooves with the wing mounts facing the leading edge of the wing. The wing mount blocks will need to be recessed into the foam.

7. Using a felt tip pen, draw lines marking the area of foam covered by each wing mounting block. Remove the spars from the wings and set them aside. Using a sharp razor or hobby knife, cut into the foam along the lines just drawn to a depth of 1/4".

8. Using a hobby knife, or small flat blade screw driver, gently and carefully use a picking motion to remove enough foam to allow the wing mounts to be recessed into the foam. These must be flush with the rest of the fuselage slot.

## JOINING the WING HALVES

1. Place the wings on a flat surface with the roots together and the fuselage cutouts facing up. Place a piece of waxed paper under the center of the wings to prevent the epoxy from permanently bonding the wing to the table. This has proven to degrade the performance of this foil. Remove the top foam saddles from the cores.

2. Place a yardstick or other long straight-edge on the top of the wings. You'll notice by the gap at either one or both ends of the wings that the top of the wing does not form a straight line from tip to tip. However, this is your goal. When the top of the wing is straight across from tip to tip the bottom of the wing angles up toward the tips. This creates a few degrees of dihedral and makes the plane more stable in flight.

3. Remove the wing saddles from the bottom of each wing core. Cut, or break off, a 6 inch piece of each bottom saddle at the tip end of the foam saddles. These will be used to support the wings while the epoxy hardens and to shim the wing tips.

4. Place the 6 inch pieces of foam wing saddles back under each wing tip. Repeat step 2 and slide the 6 inch saddles toward or away from the wing tips until the line across the top of the wing is now straight.

5. Coat the front spar front and back and the wing roots with 20-30 minute epoxy. Align the wings as in the prior steps and join the wing halves and install the front spar. Be sure the wing roots come together, the top is level, and the rear spar slots are aligned. If you work quickly you can coat the rear spar and install it at the same time. Use plenty of epoxy. You don't want the wings to fold while doing those high-G loops and dives during combat.

## ATTACHING THE FUSELAGE

1. The fuselage should only be attached to the wing after installing the engine, fuel tank, radio equipment, and fins to the fuselage, and glassing and/or covering the wing. This must be done last, since attachment of the fuselage determines the Center of Gravity. Any equipment or finishing materials added after this point will affect the CG. Since the CG is located only 1.6" to 2" from the leading edge, most of the airplane's components are located behind the CG. Any additions here will move the CG aft and could make the plane extremely pitch sensitive.

2. Locate the CG with the plane inverted for much more reliable results. Once the CG is properly located, drill 3 holes through the fuselage into the spruce wing mount blocks. Alignment is easy since the wing mount blocks are located just in front of the spars, and the spars are visible through the top of the wing. Tap these holes to accept 1/4-20 nylon bolts. And that's all there is.