



OLYMPIC 650

A TWO-METER CLASS R/C TRAINER



BUILDING INSTRUCTIONS

WARNING

Improper use of this product may result in personal injury or damage to the product. Read and follow the instructions carefully. The user shall determine the suitability of the product for his or her use and shall assume all risk and liability in connection therewith.

Introduction

The Olympic 650 is a high performance R/C sailplane featuring easy assembly and convenient size. The design was developed with the novice in mind, with a simple to build and rugged structure and forgiving flight characteristics. The Olympic 650 is quite stable and is recommended for those with no previous experience with R/C models.

The structure of the Olympic 650 is quite similar to that of the Olympic II, and has proven to be strong enough to survive poor landings and to be easily repairable in the event of a crash. The three piece wing design employs a one piece center section which is virtually indestructible, while the plug in tips serve to make the wing easily transportable even in small cars. In fact, when built with the removeable tail option, the entire airplane can be transported in a box measuring 4" x 14" x 40". The fuselage is a simple slab-sided box which utilizes $\frac{1}{8}$ " air-ply sides and floor for strength and light weight. The tail is a straight forward anti-warp structure with separate control surfaces for simplicity. Details are shown for glow and electric powered versions. The Olympic 650 performs well with either of these power systems, but the simpler sailplane version is recommended for the novice.

PRE-CONSTRUCTION NOTES

To build the airplane you will need a flat work surface at least 11" wide and 48" long, into which you can push pins. A sheet of Celotex, or similar composition board material, works well. Whatever you use, be sure that it is straight and unwarped.

Construction

A few simple tools will also be needed. These include a model knife and/or a supply of single edge razor blades, a razor saw, pliers, a small hammer and a hand drill and drills. You will also need hardwood sanding blocks and assorted grades of sandpaper, a small block or razor plane, a supply of straight or tee-pins and masking tape.

The types of adhesives used are a matter of personal choice, but we don't recommend normal model airplane cement. For general construction, we suggest the use of aliphatic resin glue such as Wilhold or Titebond. Slow drying epoxy such as Hobby epoxy II or Sig will be required and 5-minute epoxy will be useful. We built the prototypes with Jet and feel that the time and weight saved is worth the extra cost. Be sure to follow the warnings on the bottle and check that all joints fit tightly.

Be sure to cover the plans with Handi-Wrap or similar material before starting construction so that the structure does not become glued to the plans.

STABILIZER

- 1) Cut the stab trailing edge from $\frac{3}{16}$ " x $\frac{1}{4}$ " balsa and pin in place over the plans. Be sure that the trailing edge is straight from tip to tip when viewed from above.
- 2) Cut the leading edge pieces from $\frac{3}{16}$ " x $\frac{1}{4}$ " balsa and use aliphatic resin glue to laminate the $\frac{1}{16}$ " x $\frac{3}{16}$ " spruce doublers in place. Allow 5 minutes for the glue to set-up, then trim the ends for the center joint and pin the leading edge in place.
- 3) Cut the leading edge brace from $\frac{3}{16}$ " x $\frac{1}{2}$ " stock and cut to fit tightly against the leading edges. Work carefully to

- ensure that the joint is tight and glue brace in place. Install the $\frac{1}{16}$ " x $\frac{3}{16}$ " x 3" spruce trailing edge reinforcement.
- 4) Cut the $\frac{3}{16}$ " x $\frac{1}{2}$ " center ribs to length and glue in place. Be sure that the ribs are properly aligned and are spaced $\frac{3}{16}$ " apart for the rudder root rib. Use a piece of $\frac{3}{16}$ " thick stock to check the spacing.
 - 5) Cut the stab tips from $\frac{3}{16}$ " x $\frac{3}{4}$ " stock and fit snugly between leading and trailing edges. Apply glue to joints and pin tips in position.
 - 6) Cut the stab ribs from $\frac{3}{32}$ " x $\frac{3}{16}$ " strip starting from the center. Be sure that the end cuts are angled to fit tightly against the leading and trailing edges and that the ribs fit snugly. When all ribs have been fitted, glue them in place. Allow the stabilizer assembly to dry thoroughly before removing from the plan.

ELEVATOR

- 1) Notch the leading edge of the elevators for the $\frac{1}{8}$ " dowel tie. Align the elevators behind the stabilizer trailing edge and check that the tie is flush with the elevator. Pin elevators in place and epoxy the dowel in position. Be sure to let the epoxy cure completely before removing from plan.
- 2) Use a small plane to bevel the leading edge of the elevator to the Vee-shape shown on the plan. Be sure that the Vee is centered on the edge and is the same angle on both sides. Use a sanding block to finish the edge being careful not to sand a curve in the leading edges. Check fit the elevator against the stab trailing edge to be sure that the edges fit tightly without gaps.

HORIZONTAL TAIL ASSEMBLY

- 1) Position the stabilizer over the plan and mark the locations of the hinges on the trailing edge. Also mark the hinge locations on the elevator leading edge. Mark the centerline and cut slits in the stab and elevator to receive the hinges. This can be done with an X-Acto knife and No. 11 blade, but we suggest that the hinge slotting kit, Cat. No. HSK-1, from Carl Goldberg Models will make this step easier and is well worth purchasing.
- 2) Cut the individual hinges from the molded tree and fold them back and forth a few times to break-in the hinges. Slip the hinges into the elevator until the hinge line is flush with the leading edge, and then push the hinges into the stab slots until the two surfaces touch. Work the elevator up and down to be sure the hinges work smoothly without binding. Correct any problems by moving the hinges or enlarging the slots. When you are satisfied that the alignment is correct, use Hot Stuff or 5-minute epoxy, to secure the hinges in the stabilizer. Work the elevator up and down while the adhesive is drying to avoid gluing the surfaces together. When dry, cut off the excess hinge stock on the stabilizer side. Leave the elevator in place, but do not glue hinges yet.
- 3) Use a sanding block to blend the stabilizer and elevator tip shape into a smooth continuous curve. Lay the assembly flat on your bench and block sand the surface of the stabilizer until all joints are smooth and flush. Turn over and sand the other surface. Now sand a slight taper into the elevators and stab trailing edge so that they blend together. Be careful to keep the trailing edge of the elevator $\frac{3}{32}$ " thick or it will be easily warped when covering.
- 4) Use a plane; or knife, to carve the stabilizer leading edge and

tips round. Finish shaping with the sanding block blending the tip contours and then round the elevator trailing edge. Final sand with fine paper and separate the stabilizer and elevator. Mark the location of the elevator control horn holes and use a 3/32" diameter drill to drill through the elevator. This completes the assembly of the horizontal tail surface which is now ready for covering.

FIN

- 1) Cut a piece of 3/16" x 1/2" balsa as shown in detail "A" to form the fin root rib, then pin the root rib in place. Cut the fin trailing edge and spruce doubler to length and laminate together. Note that these pieces extend to the fuselage bottom surface. Pin the trailing edge in place, then glue the root rib against it and pin in place.
- 2) Cut the fin leading edge to length from 3/16" x 1/4" stock, apply glue to the forward end of the root rib, then pin leading edge in place. Cut and fit the 3/16" x 1/4" tip rib and glue in place. Cut the gusset from 3/16" x 1/2" strip with the grain direction as shown for maximum strength and glue against the root rib and fin trailing edge. Cut and fit the 3/32" x 3/16" ribs and glue. Leave the fin pinned in place over the plan until the rudder has been assembled.

RUDDER

- 1) Cut the 3/16" x 1/4" rudder outline pieces to length and pin the center vertical spar in place against the fin trailing edge. Pin the trailing edge and leading edge in place then cut the 3/16" x 1/4" rib and glue in place, allowing a gap between this rib and the fin tip rib. Cut the tip ribs from 3/16" x 3/4" stock and glue in position. Be sure that the rudder vertical spar butts tightly against the bottom of the rudder tip.
- 2) Cut the corner gussets from 3/16" x 1/2" strip and glue in place. Cut and fit the 3/32" x 3/16" ribs, then glue these in place. Allow to dry completely before removing from board.
- 3) Bevel the leading edge of the rudder to a Vee-shape from the bottom of the 3/16" x 1/4" rib to the lower end. Work carefully and finish up with a sanding block. Check that the edge is straight and fits tightly against the fin trailing edge.

VERTICAL TAIL ASSEMBLY

- 1) Position the fin over the plan and mark the hinge locations on the trailing edge, then mark the rudder leading edge. Cut slits and install the hinges as you did for the horizontal tail.
- 2) Sand all surfaces and round the leading and trailing edge of the assembly. Round the tip and rudder base but do not round the two 3/16" x 1/4" ribs. Check the hinge action and locate and drill the holes for the control horn. Check the fit of the fin between the stab center ribs, sanding the fin if the fit is too tight. The vertical tail surfaces are now complete and ready to cover.

WING CENTER PANEL

- 1) Pin the 1/4" x 1" tapered trailing edge in place over the plan, using a pin every second rib to hold it securely.
- 2) Unpin the stack of W-2 ribs and use 2-3 ribs as spacers to locate the bottom spars. Press the rib aft end tightly against

the trailing edge and pin through the 1/4" x 1/4" balsa rear spar to hold it in place. Secure the spruce forward spar with pins placed straddle fashion. Don't pin through the spruce it will weaken the spar and may split the wood.

- 3) Install the outermost W-2 rib, then glue one of the 3/32" balsa shear webs to the inboard side of the rib and to the lower spar. Glue the next W-2 rib to the inboard edge of the shear web, allowing the shear web to determine the rib spacing. Proceed this way, rib-shear web-rib-shear web, until all of the W-2 ribs are installed. Try to apply the glue neatly and remove any excess with a balsa sliver. This will avoid large blobs on the lower surface which are hard to sand off later. Check that the ribs are straight from the leading to trailing edge and are square with the work surface.
- 4) Apply glue to the forward edge of the W-2 ribs and press the leading edge tightly against the ribs, using pins to hold it in place. Angle the pins backward to hold the leading edge, but don't pin through the strip.
- 5) Cut 3 pieces of 1/16" x 3" x 2-1/2" sheet from 36" stock. Trim these pieces to fit snugly between the spars and the spars and the leading and trailing edges at the center of the panel, with the grain running span-wise. Mark the location of the W-1 ribs on the spars, leading and trailing edge and install the sheet making certain that it is down tight against the work surface, pinning in place as required. Glue the three W-1 ribs in place over the sheeting.
- 6) Sharpen one end of the 3/16" x 3-3/32" long brass tubing and use this as a drill to cut a 3/16" diameter hole in the four W-3 ribs. Be sure that the hole is directly in line with the forward edge of the main spar notches and that the top edge of the hole just touches the bottom of the top spar notch. Now cut the 3/16" diameter hole for the 3/16" diameter rear alignment dowel. Drill the W-3 ribs in sets so that the holes will line up exactly when the completed wing is assembled. Glue the W-3 ribs in place using one of the W-11 ply shear webs as a gauge to tilt the ribs for the proper tip dihedral angle. Check to be sure the ribs are not bowed or twisted.
- 7) Apply glue to all rib notches and install the 1/4" x 1/4" spruce top spar. Be sure that the top surface of the spar is flush with the top surface of the ribs. Epoxy the W-11 ply web in place using clamps to hold it tightly against the top and bottom spar.

TIP PANELS

- 1) Cut a 36" length of 1/4" x 1" tapered T.E. stock into two 18" lengths then cut the inboard ends at an angle to fit against the center panel. Pin the trailing edge in place with the inboard edge protruding slightly beyond the joint line. Use W-3 and W-10 ribs to locate the 1/8" x 1/4" spruce spar and straddle pin the spar in place. Glue all the tip ribs, except W-3, in place. Make sure that they are square to the work surface.
- 2) Cut the tip drag spar from 1/4" x 1/4" x 6" balsa and pin in place, using the notch in W-3 to locate the spar. Install the W-3 rib, using one of the W-11 ply shear webs as a gauge to tilt the rib for the proper tip dihedral angle.
- 3) Apply glue to the front edge of all ribs and install the tip leading edge, with the inboard edge protruding slightly beyond the joint line. Apply glue to all spar notches and install the top 1/8" x 1/4" spruce spar. Be sure that the spar is flush with the top surface of all ribs.
- 4) Cut the tip spar filler from 1/8" x 1/4" x 6" spruce and glue it to the upper tip spar as shown in the tip joiner detail on the plan. Epoxy the W-11 ply shear web in place on the forward

