

Two or three years ago I built a little R/C airplane called *Pong*. (FLYING MODELS May, 1981). It was designed to fly in the front yard and had a ping-pong ball for a spinner to eliminate any damage to houses or windows in case of mis-adjusted controls. It did its job well and provided hours of fun. Old age, trees, and weeds reduced it to a series of odd shaped patches and seams of glue: exit *Pong*! The design was a good one, if a little old-fashion, and seemed a good place to start for a replacement.

The wing design was retained because it had proven to be light and strong; the fuselage was modified for a low wing to bring its looks up to date and the tail was changed slightly to afford a little snappier control response. Enter *Pong Two*, or son of pong, still powered by a Golden Bee, still just two channels, and even more fun than its predecessor.

Pong Two will nearly fly itself. It will recover from some of the most awkward positions almost without help, or in spite of help from me. It is a good trainer and most of its early flights were made by my grandson. It is easy and inexpensive to build and will fly quite nicely on 10% nitro fuel. There is plenty of wing area to support a third channel if you should want to add a servo and Ace throttle sleeve.

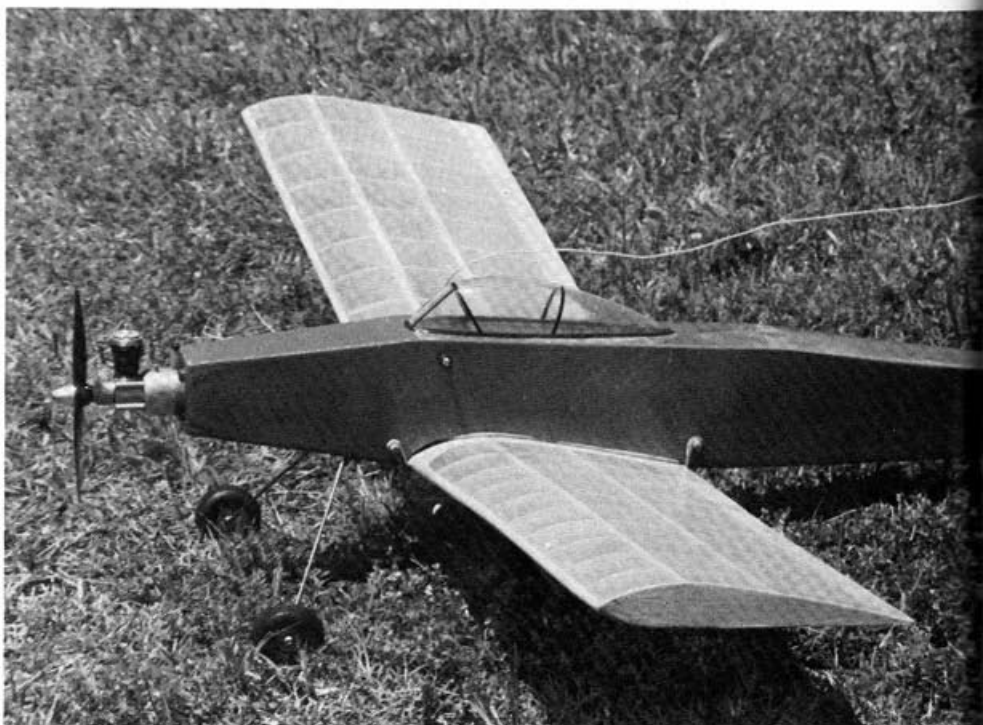
Construction

Trace the fuselage sides onto medium $\frac{1}{16}$ inch sheet balsa, cut it out, and add the long-erons, uprights, and doublers. Pin the two sides together and sand them to the same outline. While pinned together drill the holes for the wing mounting dowels. Build up the cabin formers and cut the firewall from $\frac{3}{16}$ inch plywood. Glue the two cabin formers to one of the fuselage sides and make sure they are perpendicular to the side and in the proper position. Glue the other side to these formers right over the first and check that both sides are properly aligned. One of the cyanoacrylate adhesives with an accelerator makes short work of this as well as gluing the firewall in place. Pull the tail together and sheet the top of the fuselage with gross grain $\frac{1}{16}$ inch balsa.

Before sheeting the bottom, glue the plywood landing gear mount in place in front of the wing cut-out and run the Gold-N-Rod guides for the elevator and rudder push rods. Position the guide support about half way along the fuselage between the aft cabin bulkhead and the tail. Complete the bottom sheeting and sand the completed fuselage.

All the wing ribs are the same size so they can be cut with a metal template, or traced around a card stock template with a felt tip pen to make a printed sheet or carved from a block and band sawed. I'm old fashioned and usually not in a rush so I go the printed sheet route because I can get more ribs per balsa sheet that way. If one of the first two methods are used, pin the cut out ribs together and stack sand them to the same outline. Enlarge the notches in the four center section ribs to take the dihedral braces and trim $\frac{1}{16}$ inch from the top and bottom of each so the center sheeting will be flush with the other ribs. The easiest way to notch the trailing edge stock is by taping a couple of hack-saw blades together so they are about $\frac{1}{16}$ inch thick and sawing the notches into the wood. Cut the webs from hard $\frac{1}{16}$ inch sheet paying attention to the grain.

Cover the left wing plan with wax paper or



PHOTOGRAPHY: L.F. RANDOLPH

Pong Two

By L.F. Randolph

This descendant of "Pong" sports a low wing design for even more small field R/C fun!

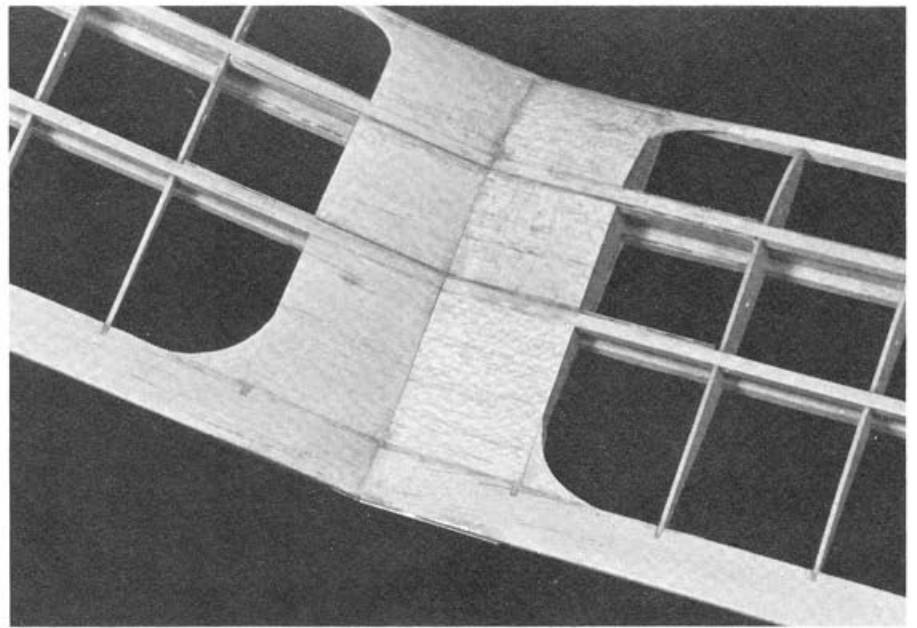
plastic film and pin the trailing edge and bottom spars in position right over the plan. Glue the ribs in place. Put some scrap $\frac{1}{16}$ inch balsa under the two center ribs to hold them up and make way for the sheeting that is added later. Use a right triangle against the ribs so they don't lean to one side or the other. Add the two top spars, the webs and the leading edge and when the glue has set, remove the wing from the plan. Turn the plan over and build the right wing on the back in the same sequence.

When both wing halves are finished, join them at the center with the plywood dihedral braces. Lay one wing half flat on the bench and raise the tip of the other wing six inches and support it with a block of wood parallel to the ribs. Glue the top dihedral braces in place, and when the glue has set, lift the wing and glue the bottom braces in the same way. Sheet the center section with medium $\frac{1}{16}$ inch balsa. The sheeting goes between the spars from the leading edge to the trailing edge. When the sheeting is complete, bend a piece of $\frac{1}{16}$ inch music wire to match the dihedral angle and glue it to the trailing edge. This keeps the rubber bands that hold the wing on

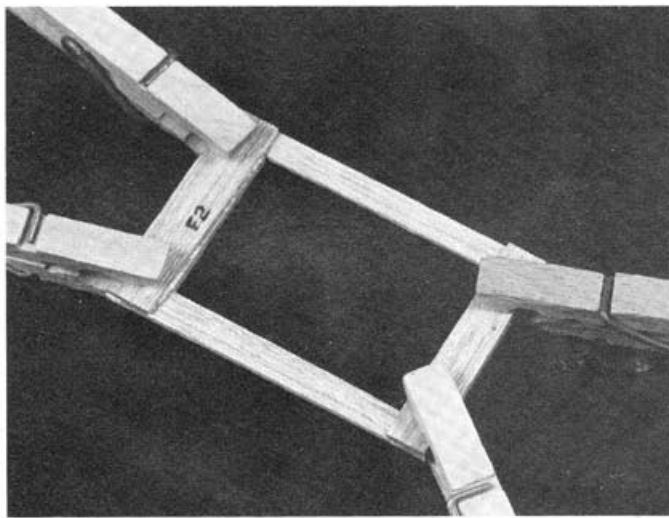
from digging into the trailing edge. Add the balsa tips and sand the complete wing.

The stab and rudder are built right over the plan; the $\frac{1}{8}$ inch outlines have proven to be quite strong enough. Don't omit the diagonals in the stab. Before the rudder notch is cut in the trailing edge of the elevator, glue a piece of $\frac{1}{16}$ inch music wire into the leading edge as shown and when the glue has set, make the cut-out. Round and sand all edges and surfaces.

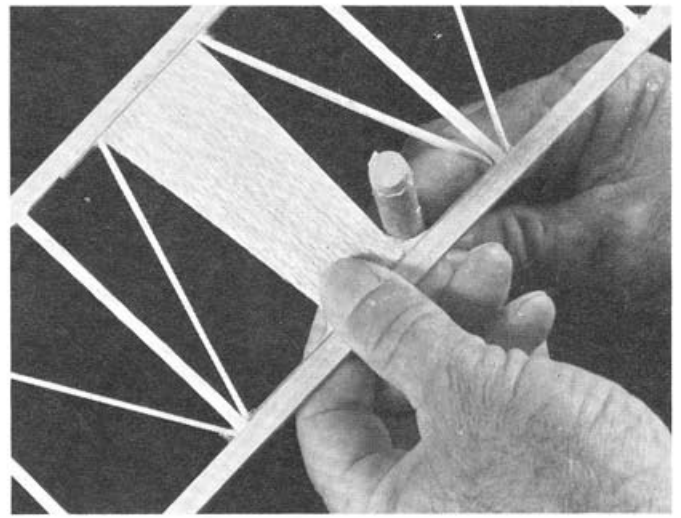
The airplane is covered with MonoKote™ and the hinges on the elevator and rudder are of the same material. The firewall is painted with fuel proof dope to match the fuselage. Cover the entire stab; then, set it on the fuselage and mark the area that touches the fuselage and rudder and strip the covering from these areas so the glue joints are wood to wood. Mark the edges of the canopy where they touch the fuselage and prick the covering with a pin every $\frac{1}{16}$ inch or so along the mark. Markings on the canopy are made inside it with sticky trim tape; then it is nestled in a bead of cyanoacrylate that has been laid over the pin holes. Glue the wing hold down dowels through the fuselage and give them a



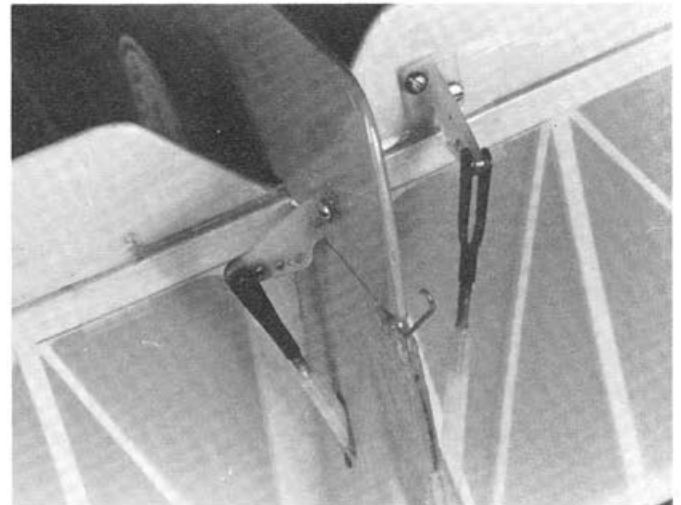
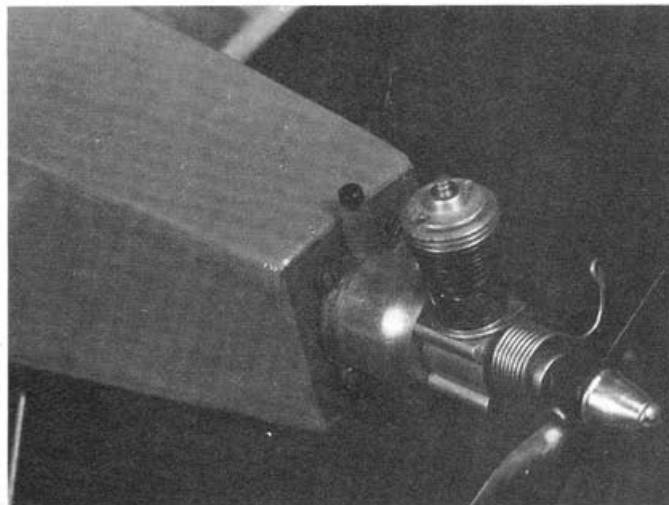
The wing center section sheeting is glued between the spars. To do this, the center ribs are reduced in thickness $\frac{1}{16}$ inch, top and bottom, to allow the sheeting to lie flush with the top spar surfaces.



The bulkheads are built up from $\frac{1}{16}$ inch, hard sheet balsa (above). The clothespins hold the pieces in alignment while the glue dries. The small piece of fuel tubing over the needle valve (below) both seals against possible air leaks and against changed settings due to vibration.

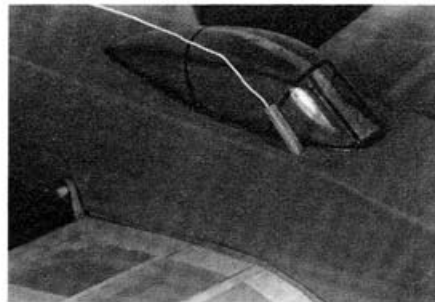
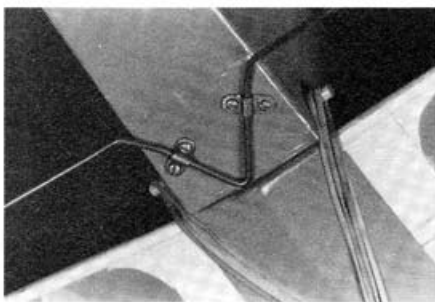


After all flying surfaces have been built over the plans, the gussets (above) are glued and then sanded concave with a sanding dowel. Both rudder and elevator pushrods exit the fuselage (below) under the stab. The tail skid prevents damage to the rudder during those "greased" landings.



thin coat of epoxy to eliminate any oil penetration.

The landing gear is mounted with $\frac{3}{32}$ inch clips and wood screws through the plywood mount. In the same manner, the engine is mounted to the firewall with wood screws. When the engine is mounted, place a drop of epoxy into each screw hole in the firewall, then run the screws home. They can be removed and there will be no oil entering the screw holes. Attach the horns to the elevator and rudder, run the Gold-N-Rod through the guides and install the radio. Route the antenna through the top of the fuselage beside the canopy. A piece of fuel tubing makes a good flexible mast. Check the movement of all controls and check the balance point, it should be just aft of the front spar. The airplane is ready to fly.



A closer view of the landing gear shows the necessary bends (above left) and the attaching clips. A short length of $\frac{1}{8}$ silicone tubing (above right) provides an antenna exit. The canopy is attached with cyanoacrylate glue. The *Pong Two* (below) is meant for hand launch from grass fields. Keep it light.

Flying

The landing gear is a little far forward to be really stable on the ground and although take-offs are quite possible I would suggest hand launching for the first flight. With the engine leaned out, *Pong Two* will almost fly out of your hand, a slight push, with the nose pointed at a spot on the ground about 100 ft. in front of you is ideal. Control response is good; not quick—good! The airplane is quite stable and rolls require a lot of forward stick but, once initiated, are fairly axial. Loops and snaps are in the bag of tricks and they are much better than its predecessor. The glide is flat and thermalling is good, landings are quite easy because the low wing is cushioned by the ground, and the airplane almost lands itself.

On those late summer and early fall evenings take *Pong Two* up to your neighborhood schoolground or park and get in a flight or two before dark. Fun... a cheap date too...

