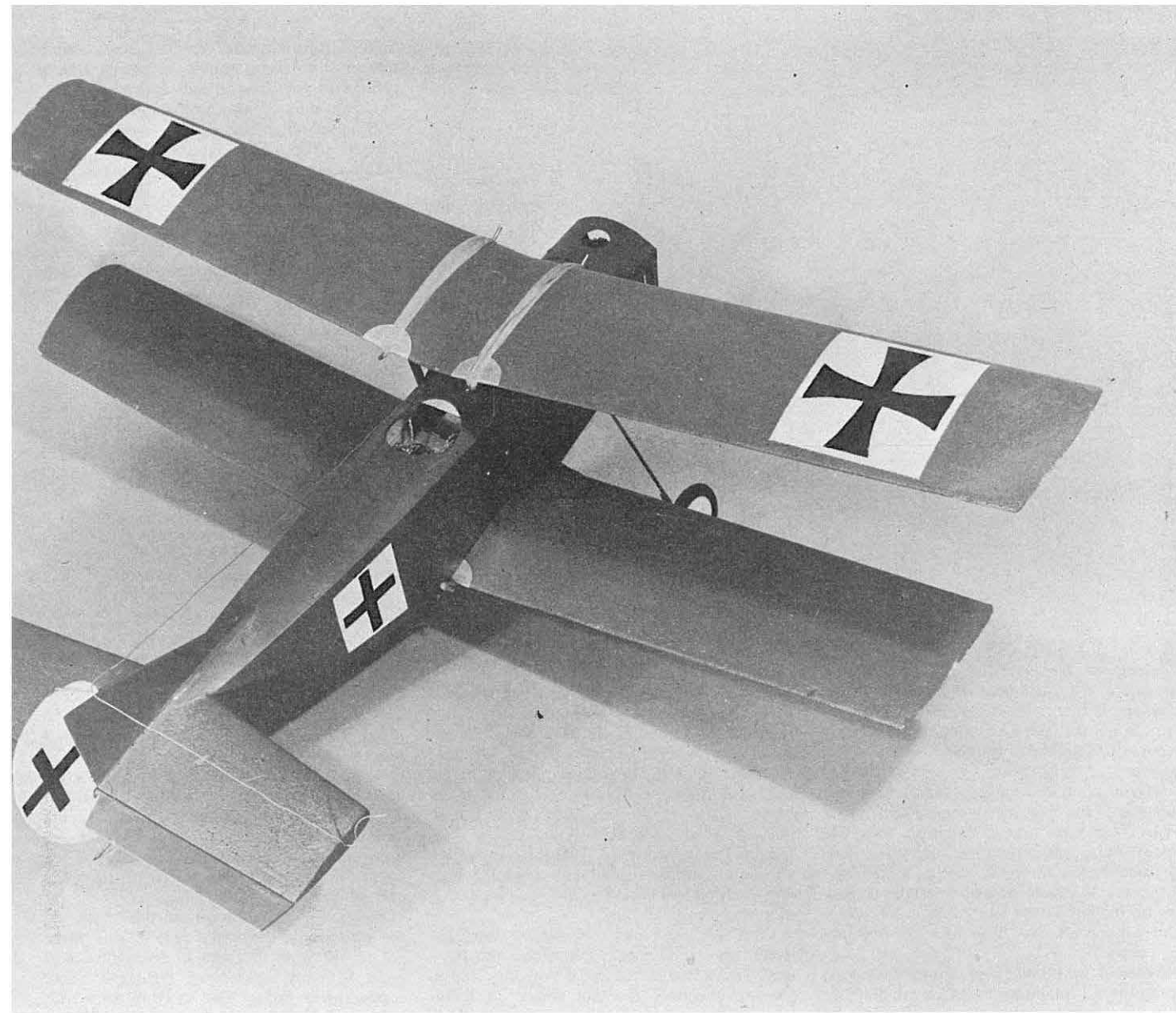
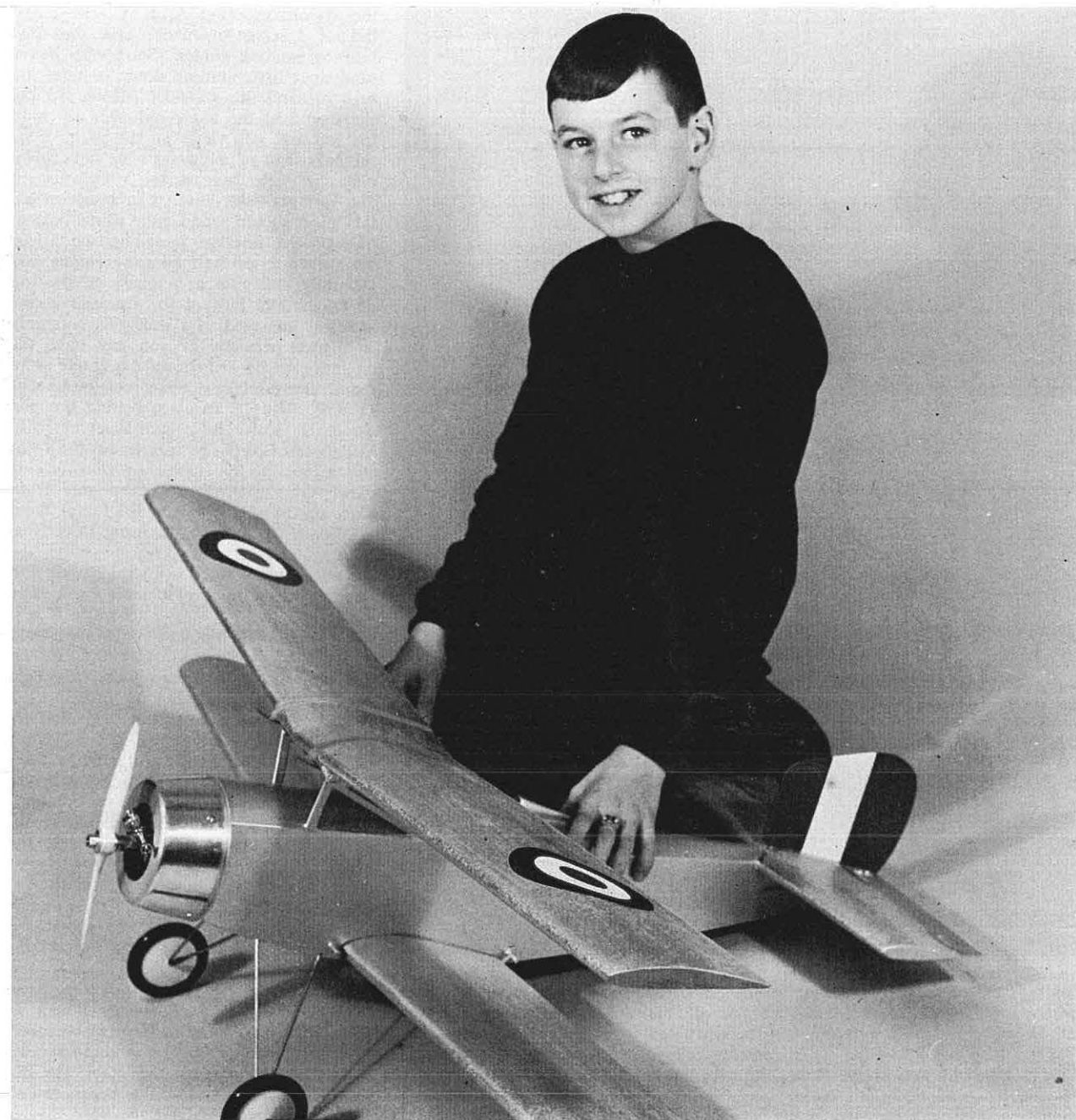




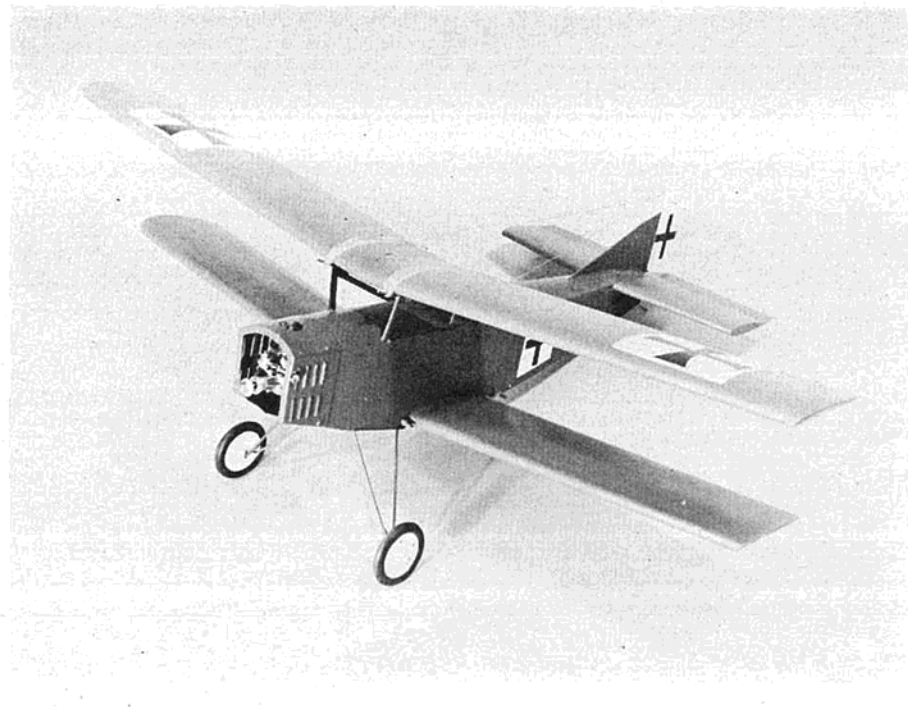
By Bob Kendall

*easy*



## *BIPLANES*

*Easy-to-build and easy-to-fly, these not-so-scale WW I biplanes are designed for .15 to .19 engines and Midwest molded foam wings and stabs. Suitable for Galloping Ghost or the new small proportional systems. A Sopwith, anyone?*



**A**S the first light of dawn breaks over the Eastern horizon there is the sharp crackle of a Le Rhone as man and machine rise up to meet the day halfway, on their way to another perilous mission into enemy territory. The Dawn Patrol is on the prowl again.

If you, as I, have always had a touch of nostalgia for biplanes, especially World War I biplanes, now is the time to relive again those glorious days of yesteryear. (I think I may have my stories mixed up.) Anyway, Midwest has now made it easy for all biplane lovers by making foam wings and taking all the "fun" out of building two wings!

When I first saw these wings I decided to design a biplane for my 15 year old son, Tim. I decided to use the foam wings, to take the work out of building, and the Min-X Rand combination to put reliability in Galloping Ghost. I thought this also would be a good opportunity to make a plane as simple and easy to build as possible for the kids. One they could be proud to take to the field. Don't get me wrong, this is **not** just a plane for beginners. By putting a "15" in it the kids can handle it and also do stunts instead of just going in circles. The more experienced R/C'er can put a "19," Galloping Ghost, reeds, or proportional in it and have a ball.

Since this is a plane that can be easily built by beginners, I will give detailed building instructions. So, if you are ready, "Contact!"

#### Construction

Start by cutting out all parts, fuselage sides, doublers, formers, servo rails, cabane struts, fin, rudder and elevators. Be sure to cut the right fuselage side  $\frac{3}{16}$ " shorter at the nose than the left side. Contact cement the doublers to fuselage sides starting at the nose and working back. Be sure to start  $\frac{1}{4}$ " from the nose with the first doubler in order to leave space for the  $\frac{1}{4}$ " firewall. Use white glue for the servo rails. Don't forget to make right and left sides and taper the doublers where cabane struts fasten to sides. Use white glue or

cement for cabane struts. Glue  $\frac{1}{8}$ " long-rons and braces to sides.

Install formers B, C, and D. The formers fit against the offsets of doublers to make it easier to line up. Be sure the fuselage is square. When dry, pull the tail together and glue. Put in the wedge piece with the tail skid installed. Now glue firewall in place. Glue on the rear top formers and bottom  $\frac{1}{8}$ " cross braces. Glue the  $\frac{1}{4}$ " ply landing gear block to bottom. Bolt the aluminum motor mounts to firewall. Use nuts behind mounting plates to lock the mounting bolts in place.

Glue  $\frac{1}{4}$ " balsa block in the bottom, between ply landing gear plate and the firewall. Take two pieces of  $\frac{3}{32}$ " medium balsa for top sheeting, run hot water on them for a few minutes and wrap around a quart fruit jar, hold in place with strips of rag. Let these dry overnight and they will retain their curvature. While they are drying, sheet the rear bottom of fuselage with  $\frac{3}{32}$ " medium or hard balsa, running the grain lengthwise. Mark and center punch the motor mounts for the motor of your choice. I used an "Enya 15 T. V." on one and a "Veco 19" on another. Drill the motor mounts with a #43 drill and tap with 4-40 tap. Use a little oil for easier tapping.

Sand the flashing from foam stab with fine sandpaper. Make elevators by gluing length of  $\frac{3}{8}$ " dowel in the insert in front center edge. Keep the elevators straight and flat while gluing. Drill holes for the thread hinges, using a #58 drill. Holes in the foam should be  $\frac{3}{8}$ " in, and  $\frac{3}{16}$ " apart, and  $\frac{3}{16}$ " in and  $\frac{3}{16}$ " apart on the balsa elevators. Sew hinges with button and carpet thread, using figure 8 hinge. Coat the thread with white glue on top and bottom. Try not to get any glue between the elevator and stab. Don't pull too hard on the thread when sewing, or you will cut through the foam. Glue the stab and elevator assembly to fuselage using white glue. Be sure the stab is centered and straight horizontally to the fuselage.

Insert a 9 inch length of Midwest nylon

tubing through the firewall and notch former B to recess tubing in place. Epoxy cement to the firewall and former B.

Using one of the precurved pieces of  $\frac{3}{32}$ " balsa, notch one side  $\frac{3}{16}$ " to fit around cabane struts. Slip around cabane struts, making sure it overlaps the fuselage side. Now mark and cut notches for the other side. Run sheeting from the front to halfway of former D. The front half of sheeting may now be glued in place.

Use the second piece of curved sheeting for the rear. Hold in place and mark from underside. Cut a little over size. Mark where the straight line contacts the foam stab. This will be a cut and fit operation. The underside of sheeting will have to be tapered to fit the foam stab. When you have it cut to fit, glue rear in place. Use white glue where the decking contacts foam stab. White glue may be used for the entire sheeting if you wish. Don't worry about the sides overlapping, they can be trimmed and sanded flush later.

The cockpit may now be cut out. Mark a spot 2 inches forward of the sheeting joint and in the center of the fuselage. Use a compass and make a 3 inch circle. Cut along this mark for the cockpit.

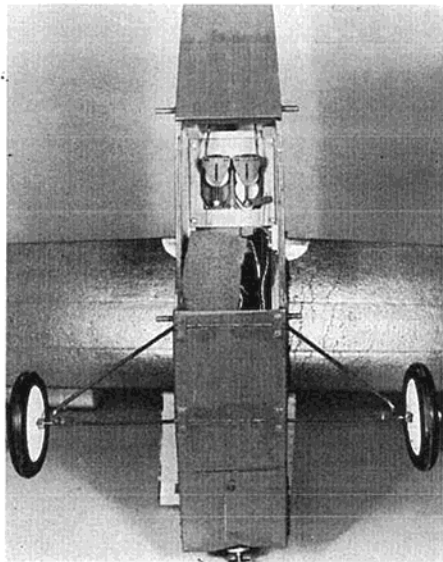
Now round off the edges of the cabane struts, using a 2-0 grit paper. Don't round off the top edges as the wire brace will fasten to them to form wing seat.

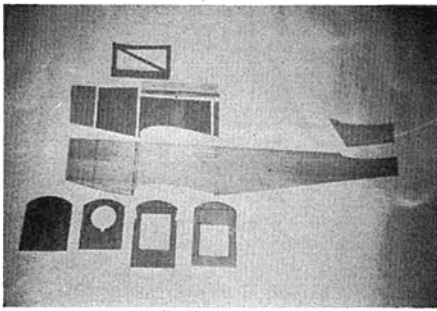
Round off front and top of fin. Drill #58 holes  $\frac{3}{16}$ " in and  $\frac{3}{16}$ " apart for rudder hinges. Sew the hinges the same as on the elevator. Mark a center line on the top of the foam stab, and with a razor blade, cut a  $\frac{3}{8}$ " slot in the top of the stab for the tongue on the bottom of the fin. Glue the fin to the foam stab, using white glue. When dry, sew the bottom of the rudder onto the rear of the fuselage.

Bend  $\frac{3}{32}$ " music wire to the shape of the bottom of the wing. Make this piece  $\frac{3}{4}$ " music wire to form cross braces and wrap to wing hold-down wire with soft copper wire. Solder  $1\frac{1}{4}$ " in from each end.

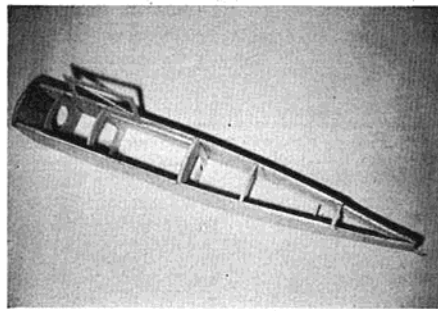
Drill #58 holes  $\frac{3}{4}$ " down from the top at each end of the cabane struts. Place the wire hold-down between cabane struts, and sew through holes to the cabane struts

Rand Dual Pak installation in Fokker. Viewed from lower wing access area.

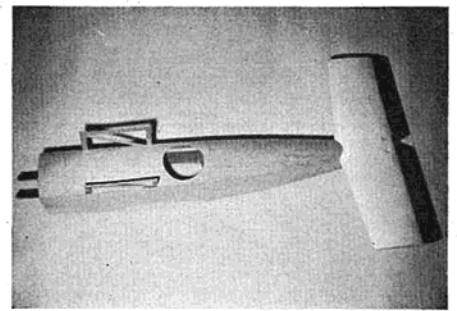




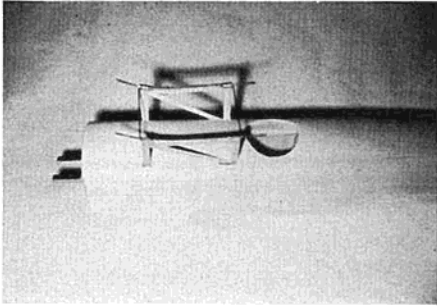
All fuselage parts cut out.



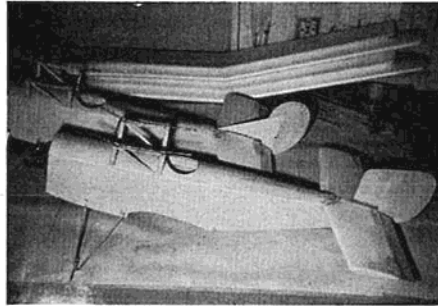
Sides joined and all formers in place.



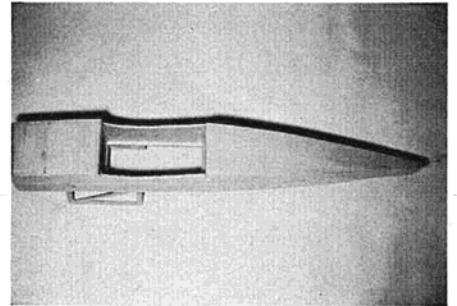
Top sheeting and stab and elevator in place.



Wing holddowns and wire braces fastened to cabane.



Rear bottom sheeting, nose and L.G. block added.



Nieuport and Fokker nearing completion.

themselves. When all four corners are sewn, epoxy along the wire and cabane struts. Bend  $\frac{1}{8}$ " main landing and  $\frac{3}{32}$ " front wire gear. Place in slots in ply landing gear block and wrap with soft copper wire and solder where they come together. Mark holes for Midwest gear straps. Drill the pilot holes and fasten gear to plywood plate, using 4 straps and wood screws. Keep the straps as close to the bends in landing gear wire as possible to keep landing gear from slipping sideways.

Use a  $\frac{1}{8}$ " diameter nylon bottle such as is found in hair coloring sets. Cut off  $\frac{1}{2}$ " of the neck, and using a #1 rubber cork, drill 2 #38 holes  $\frac{3}{8}$ " apart. Insert one straight piece of  $\frac{1}{8}$ " diameter copper tubing,  $1\frac{1}{2}$ " long. Use another piece of tubing  $2\frac{1}{2}$ " long. Use yet another piece of tubing  $2\frac{1}{2}$ " long and bend a curve on one end. Push this through the other hole in the rubber cork. Leave about  $\frac{5}{8}$ " of tubing extending out of the front of the cork. To the straight tubing, fasten a length of fuel tubing long enough to extend to the rear. Put a  $\frac{3}{4}$ " length of copper tubing into the rear of this piece of fuel line to act as a weight. Put the cork into the neck of the bottle and push in as far as it will go. You now have a fuel tank. Install in place in your plane with the tubing extending through the firewall. It is also a good idea to put a piece of Midwest Fuseal around tank where it comes in contact with former B.

Dope the fuselage, rudder, and fin with one coat of clear dope. When dry, sand lightly with 400 sandpaper. Mix two parts of clear dope and one part talcum powder and cover the balsa parts again with a heavy coat. Sand again and you are ready for the color coats. Two coats of color dope should be enough. When doping, be careful not to get dope on the foam stab as the dope will melt it.

Cut off two inches of each tip of lower wing at a 45 degree angle. Now sand flashing off of wings. Paint the wings and stab with enamel, such as Spray Ply.

Now you can put on the trim. The Nieuport was painted all silver with fin and rudder stripped red, white and blue. Red, white and blue roundels were painted on the wings. The Fokker is painted all red with black crosses on a white field.

The Nieuport cowling is made from a 5 inch aluminum sauce pan. Grind off the top ring and handle, and cut out the bottom by using an X-Acto knife, cutting around the bottom recess.

You need not cut all the way through, just score heavily, then by drilling a hole and working back and forth with a pair of long nose pliers, it will break on the scored line.

The Fokker cowling is made from a scrap piece of aluminum siding. Cut a strip the width of cowling plus  $\frac{3}{8}$ " extra and long enough to go around the nose of the fuselage. Bend to nose shape and notch  $\frac{3}{8}$ " deep at corners and about every  $\frac{3}{8}$ " at curved section. Now bend the front  $\frac{3}{8}$ " at a right angle all around. This will stiffen the cowling.

The cowling is fastened to the firewall by using Midwest nylon angles. Put one nylon angle at each corner and flush with the outside edge of fuselage. Fasten to the firewall with wood or sheet metal screws. Place the cowling on the plane and line up so it is square with the fuselage, then mark the position of the nylon angles and drill the necessary holes in the cowling for the screws. Drill a small hole through the nylon angle and fasten the cowling by using sheet metal screws into the nylon angles.

Install a Rand Pak, either single or double, to servo board with small bolts. Mark holes for fastening servo board to

servo rails. Put a length of Fuseal between the holes, and using wood screws, fasten to servo rails.

Put Midwest nylon control horns on the rudder and elevator by putting a piece of  $\frac{1}{16}$ " ply on the opposite side and running  $\frac{9}{32}$ " bolts through ply and balsa. Drill and tap the nylon control horns, then screw bolts into the nylon horns.

Make the pushrods from  $\frac{1}{4}$ " x  $\frac{1}{4}$ " hard balsa and put a length of bicycle spoke on one end with a Midwest nylon clevis. Fasten a piece of  $\frac{1}{16}$ " music wire to the other end. Bend at right angle at the correct length to line up with the hole in the Rand actuator.

The motor control rod is put through a nylon tube and bent to connect the throttle to the Rand motor control arm. Fasten this to the Rand actuator the same way as the push rods are fastened.

Wrap the batteries in foam rubber and place in position in the fuselage. Batteries may be moved back and forth to balance plane. Wrap receiver in foam and place in front of the Rand Pak. Drill a small hole in the top of the fuselage to run the antenna through. Make sure the antenna is not close to the motor push rod or any other wires.

If you want to make your plane more realistic, add a windscreen, machine gun, wing struts or any thing else you may have in mind.

To test fly, I would recommend hand launching for the first couple of flights. Although they track very well, there might be a chance of ground looping till they are trimmed out. All of the ones I built flew right off the board with very little trimming. With the "19" you can almost fly the pattern. They will loop and roll from level flight. With the "15" they will still stunt but you may have to dive a little

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before looping. Both configurations are very stable with the "15" being a little slower for the kids.

The beauty of this design is that by just changing the rudder, cowling and paint job, you can make a Nieuport, Fokker, S. E. 5, Spad or any other favorite WWI design. True, they may not be absolute scale but at 20 feet distance, they look like the real thing.

Well, now that you have a fighter, get your friends to build one too, and then fly combat. Who knows, maybe some one will make a model machine gun that works and then you can really shoot him down!

Look out Snoopy; here comes the Red Baron once again!