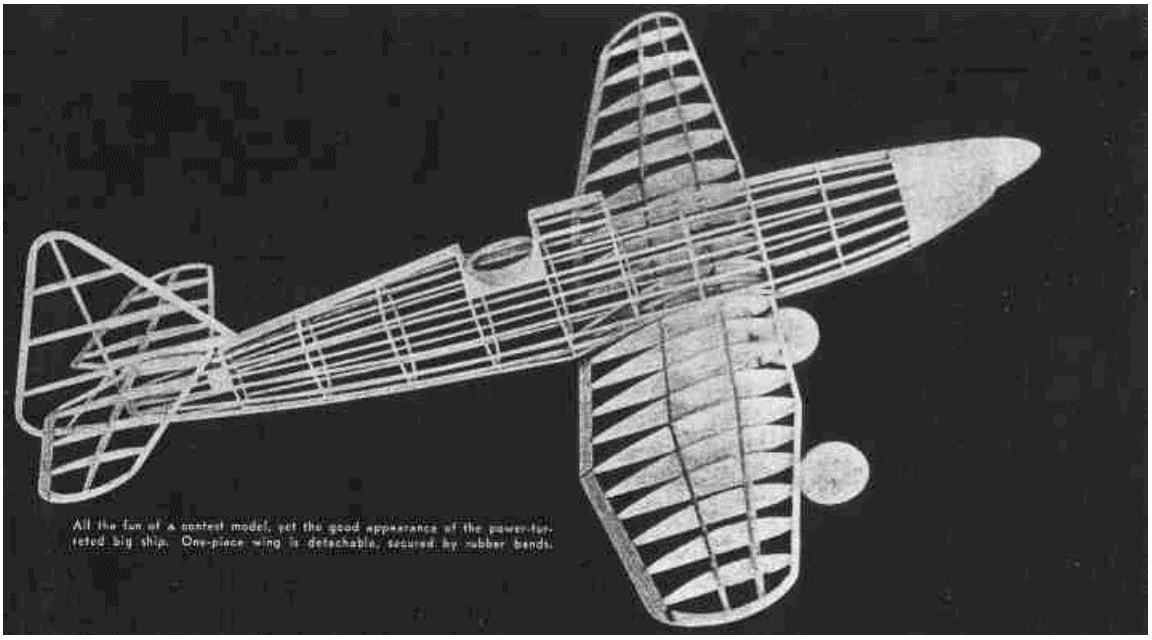
ONE of the most outstanding developments of the current war is the multigun, power-driven turret for fighters and bombers. The Boulton-Paul Defiant, which has gained an enviable reputation as a night fighter in the defense of England, was designed to take advantage of this formidable weapon. These two-seater pursuits attack by flying alongside and slightly below the enemy, then with a broadside from their heavy-caliber guns they rake the opponent from nose to tail instead of the usual tail on attack.

An odd angle is that the gunner is captain of the ship. The pilot, who has no guns in front, is just the pilot whose task is to put the plane where the captain directs him so he can deliver a knockout blow. In appearance the Defiant somewhat resembles the famous Hawker Hurricane. However, because of its greater size and weight, it does not quite match it in performance. A maximum speed of 320 m.p.h. is enough to overtake enemy bombers; cruising speed is 280 m. p. h., while landing speed is a comparatively slow 61 m.p.h. Top fighting ceiling is around 28,000 feet, and cruising range is over 850 miles. A Rolls-Royce engine of 1,030 h.p. driving a three-blade, constant-speed propeller powers this deadly scrapper.

Being a semiscale model, proportions have in a few instances been readjusted to assure maximum flight performance. Nevertheless, it is most realistic and captures the beauty of line of the prototype. If you doubt the flying capability of low wing models, this ship will surprise and please you with its powerful climb and speed. The author found his model to be exceptionally stable, even in rough air, and it is capable of making flights of creditable duration and distance.



All the fun of a contest model, yet the good appearance of the power-turreted big ship. One-piece wing is detachable, secured by rubber bands.

Simple yet sturdy construction is featured in the semiscale Defiant, so any builder with previous flying scale experience will find assembly easy. Read all instructions to fix the method of construction in mind before starting work, then select all materials carefully. Finally, make the structure as accurate as possible.

If you are working from the magazine, plans must be enlarged to full size, otherwise work right over the large plan.

CONSTRUCTION

The method of fuselage construction calls for the use of four keels cut to shape from 1/16" sheet balsa. To obtain their patterns, trace the top, side and bottom outlines of the fuselage. Bulkheads, also of 1/16" sheet, are cut in accordance with the patterns given. Cut only the notches shown, leaving the remaining ones to be cut as a later operation. However, mark their positions for reference.

Pin the top and bottom keels to position over the side view and then cement half of the bulkheads in place. Attach the side keel. When dry, remove from the plan and add the remaining bulkheads and keel. Stringers are 3/32" square firm balsa; attach the ones nearest the side keels first, cutting the notches with a pointed razor as required. Always attach stringers to corresponding positions of each side to prevent pulling the structure out of line.

Between bulkheads D and G, where the wing fits in, pieces are cut from 3/32" sheet to the shape indicated. Once the wing is finished, these pieces are trimmed so they will fit snugly to the wing's upper surface. Small blocks of 1/8" sheet are cemented between the stringers in the rear to anchor the rubber motor. Bamboo splints of about 1/16" diameter are cemented across the fuselage at the position shown so rubber bands can be wrapped about the ends and under the wing to hold it in place.

To represent the metal cowl of the real ship and strengthen the model at the same time, the nose is filled in. Accurately cut pieces of soft 3/32" sheet and cement them into the spaces between stringers and bulkheads A and B. The nose block is made from two pieces of 1/4" sheet cemented cross-grain. Cut out the center for the nose plug, then roughly cut to shape and cement to bulkhead A. When dry, the whole nose is cut and sanded to a smooth, accurate shape.

The turret mount is simply a circular ring of 1/16" sheet balsa; it is shown on the top view. Fill In the section indicated on the plan with 1/32" sheet. Next cement the circular former to the upper stringers. A piece of sheet with the grain running vertical is fitted from the filled-in section to the round former on each side to complete the mount. Small triangles of 1/16" sheet are placed against formers G and H to fill in the corners not covered by the turret.

Little explanation is required for the tail surfaces. Build the stabilizer in one piece, working right over the plan. If the builder does not have strips in the sizes indicated, they can easily be cut from sheet of the proper thickness. When the structure is assembled, ribs are cut to an airfoil shape as indicated by the sketch. Taper the leading and trailing edges to conform with the rib shape.

A rudder frame is made using sheet outlines and 3/32" square spar and ribs. Later soft thick strips are cemented to each side of each rib. Once the cement has hardened, the ribs are cut to make a rudder of streamline cross-section.

Wing and landing gear are removable for convenience and to help prevent damage in the event of a crash. Ribs are cut from medium grade 1/16" sheet, two of each are needed, except No. 1 as noted. Sand the ribs smooth, then cut the notches with accuracy. Inner parts of the leading edge are 1/8 x 1/4" strips, and the outer, tapered sections are cut from 1/8" sheet. Assemble all parts right over the plans, except for adding the two upper spars and the landing gear spar. When dry, crack the spars and elevate the tips, as shown. Recement the joints and attach the two upper spars. Join the wing halves so the dihedral at each tip is 2-3/4". Add the hard-balsa landing-gear spar, reinforcing the splice necessitated by the dihedral. Finally, trim the leading and trailing edges to conform with the airfoil shape.

Construction of the landing gear is shown in detail. Bend the two parts of each strut from .049 music wire and join them by soldering. Incidentally, be sure to make a right and left strut. To attach the landing gear struts, bind the one leg of the strut to the spar, using thread; the other leg is attached right to the rib by sewing with needle and thread. Cement the thread wrappings and adjacent structure thoroughly. Other details of the landing gear are completed after the model is covered.

Balsa-wood wheels are used. They may be made from laminated disks of 1/8" sheet, or they can be purchased. Cement bearings or washers to the sides so they will revolve smoothly. Apply several coats of clear dope with light sanding between each, then color the centers and tires.

To get maximum flight performance from your Defiant, the propeller must be most efficient. This immediately eliminates most machine carved and manufactured props. Carve your own propeller; it's not difficult and the finished product will be better than most of the ones you can buy! Select a hard block and cut out the blank as shown. Drill the hole for the shaft, then start to cut away the back face of the blades, which are nearly finished before starting with the front. Cut away the front until the blades are of the right thickness. Round the tips and reduce the depths at the hub. Use rough, then fine sandpaper to finish the job and bring the blades into balance. Apply several coats of clear dope with light sanding between each to smooth and toughen the wood.

Shape the spinner from a light grade balsa block. Once it is proportioned properly, it is notched to fit neatly over the propeller. A dogtooth freewheeler is made from brass, as shown; it is bent to fit accurately to the nose of the spinner. Firmly cement it fast and do likewise with a brass washer at the back of the prop so it will revolve freely and accurately.

The removable nose plug is made from laminated squares of 1/8" sheet balsa. The disk at the front is 1/16" plywood. Drill the hole so the thrust

line will tilt slightly to the right for proper circle under power. Cement washers to both the front and back to fix the line of thrust.

Before covering the parts, go over each with fine sandpaper to assure a smooth job. Colored tissue or Silkspan is used and it is attached with banana oil or light dope. It is best to use numerous small pieces of covering material on curved parts to avoid unsightly wrinkles; the fuselage requires many neatly lapped pieces, and wing tips and the like should have separate pieces. Once covered, parts are lightly sprayed with water to tighten the tissue; however, do not apply any clear dope until the parts are assembled.

Assembly of the various parts comes next. Tail surfaces are permanently attached with cement; the stabilizer being placed at the angle and position shown and the rudder is offset about 1/16" for it right circle in the glide. Tissue fillets are placed between stabilizer and rudder for a neater appearance. The pilot's enclosure is made from thin celluloid. Make paper patterns for trial fits before cutting out, then avoid cement smears when attaching to place. Making the turret may appear hard, but it really is not. Cut the celluloid, using the pattern given. To assemble, flow cement along one edge; butt the adjacent projection carefully against it and hold in place until dry. Repeat this procedure until you have worked the whole way around; it sounds harder than it actually is. The turret is fitted over the round mount and cemented fast. To complete the landing gear, slip rubber tubing of the correct diameter over the wire struts. Paint the struts black before attaching the wheels, which are held in place by washers soldered to the axles. The entire model should now be given one or two coats of clear dope.

Your Defiant cannot be considered complete until the more minor details are added. Thin strips of black tissue doped to the cockpit and turret as shown improve the appearance greatly. The four guns projecting from the turret can be made from thin dowels or balsa scraps; they are cemented right to the celluloid. Exhaust stacks and tail wheel are likewise made front scraps of balsa. Covers which hide the landing gear, when retracted, are cut front 1/16" sheet and covered with tissue to match the covering of the wing. These covers are cemented to the wing and not to the landing gear, thus permitting it to spring back and forth. The British Insignia and identification letters are cut from colored tissue. Control surfaces and similar details are represented by thin strips of black tissue doped to the covering. Propeller, nose plug and similar uncolored parts should be doped to match the color scheme of the model.

FLYING

The amount of power required will depend on the model's finished weight, the original flew well on ten strands of flat brown rubber. Lubricate the motor before placing it within the fuselage. A removable bamboo pin extending across the rear of the fuselage holds the rubber strands.

Make first flights over deep grass if possible. Test-glide to determine if the balance is correct; addition of a bit of weight to the nose or tail will correct

a stall or dive as the case may be. Once the glide is good, all power flight adjustments should be made at the nose plug. Tilt the thrust line down to correct a tendency to mush or stall, and to the right or left to control the circle. The model pictured flew best when adjusted to fly in large right circles. For maximum flights attach a mechanical winder to the hook on the prop shaft - stretching the rubber before starting to wind.

Get out in the wide open spaces to fly your Defiant, since it will probably fly in a manner to rival your endurance planes.