SOPWITH PUP

By JOHN BLAIR . . . One of the winners in our 1976 Parcel Post Proxy Peanut contest, this excellently detailed model is on permanent display in Model Builder's office. Also a fine flier.

• The Sopwith Pup is universally considered to be one of the all-time classics. In service from 1916 to 1917, it performed with considerable success; its superb maneuverability and ruggedness enabled the Pup to remain effective in action even after its speed and armament had been far surpassed.

The Pup also scales down well. Its proportions and flying qualities as a peanut are delightful. It looks "right", sitting on the table or circling overhead.

Along with most aircraft of the period, the Pup's construction was very model-like, and can be reproduced almost piece-for-piece without much sacrifice of flying ability. The plans, then, show almost exact scale structure, especially in the wings and tail. If a lighter, simpler model is desired, such details as false ribs and aileron structure may be omitted, and the ribs spaced farther apart. Built as shown, the model will weigh approximately .75 oz.; carefully omitting part of the structure could reduce this to .50 oz. or less.

The construction may be as straightforward or complicated as your choice of detail demands. The first step, however, is a departure from the customary. Begin by preparing some non-stock wood. If no balsa stripper is available, careful work with a good straightedge and a very sharp Uber Skiver will be OK. Prepare a supply of 1/32 x 1/16 strips for fuselage cross-members, stringers, wing spars, etc. Some 1/32 x 3/32 is required for elevator ribs and spar, and some 1/32 x 1/8 is needed for strut fairings. Sand a piece of 1/32 sheet down to about 1/64, for wing ribs and fuselage top decking. Strips of 1/32 x 1/16 basswood are required for laminating the flying surface outlines.

The fuselage "box" is built with 1/16 sq. longerons. The first three bays from the the nose have 1/16 sq. cross-members; from there back, use 1/32 x 1/16, except for the tail post. After former 1-A is positioned on the nose, remove bottom cross-pieces 1 and 3, and install the landing gear wire, with formers 1-B and 3-B sandwiching the wire in place. Next, install the cabane strut wires by gluing them directly on the top longerons. The top decking will cover and strengthen this joint. The top decking may be installed as one piece, but the side, from 1 to 2-S, is a compound curve, and will have to be planked with 1/32 x 1/4 strips. From 2-S back, the side streamlining is completed by three short 1/32 x 1/16 stringers, and is tissue covered. A corner of the side sheeting will have to be cut away to install the lower wing root rib, which is part of the fuselage. The wing panel is

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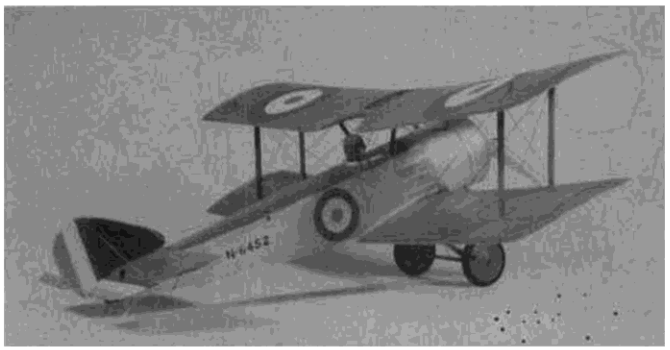

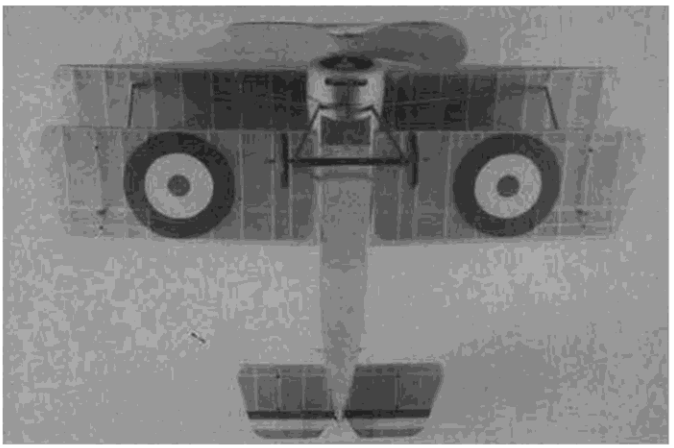

Second highest in scale points, WW-I, at the 1975 Model Builder Proxy Peanut contest, the Pup still flew 18 seconds, placing 4th. Note scale false ribs and spacing. Engine rotates. Carved hardwood prop.

butted directly against it.

Turtledeck formers and 1/32 x 1/16 stringers are installed next. Note the triangular gussets which fair the turtledeck into the stabilizer.

Cut a spreader bar for the landing gear from 1/32 wire, and an axle from 1/64 wire. Bind and solder the axle to the spreader and then the spreader to the landing gear legs. The result is a scale-action, shock-sprung landing gear. Glue the landing gear legs between two pieces of 1/32 x 1/8 balsa and streamline. The spreader bar can be faired with 1/16 sq. glued to the front and back, and then streamlined. Be careful not to glue the axle and foul its action. Cabane struts are faired in the same manner as the landing gear.

Wheels are made from 1/8 balsa. Stick a pin through the wood to act as a center. With a ballpoint pen in a school compass, scribe the diameter and rim lines on both sides of the sheet. Do the same for the cone-shaped outer disk. A short length of 1/16 brass or aluminum tubing serves as a bearing. Take care in locating the tube, in order to get a true-spinning wheel. After assembly, paint the "tires" flat black, and the rest of the wheel khaki.

The rotary engine is worthwhile, because you will certainly need the ballast. The cylinders should be made from 3/16 dowel, wrapped with thread. Push rods are bent pins, or scrap wire. If the engine is not fixed to the propeller, it will act as a bearing washer, and thus put no load on the rubber motor. The dummy engine is painted silver, and the cowling built around it. The engine will not go in through the front of a completed cowling.

Glue the 1/8 balsa plug and bearing support to former 1, and install the 1/16 tube bearing. Glue rings A,B, and C together, cross-grained for strength. Put engine in place on a temporary shaft. Locate the assembled front ring by lightly tack-gluing 2 or 3 pieces of scrap around the perimeter. As the covering of 1/32 sheet progresses, these locaters can be removed. Check carefully and frequently for true alignment. When completed, put the unit in place on the fuselage, and sand the cowling and fuselage nose as a unit to insure a perfect fit.

I like to make forms for laminating from cardboard, both to save expensive balsa and to make a permanent form which can be saved for future use. Shape the core of the form from corrugated boxboard, and cement a "rim" of thin cardboard around the perimeter. Make sure the rim conforms to the inside of the shape to be laminated. To use the form, place a strip of plastic wrap on it, followed by the white-glue-coated 1/32 x 1/16 basswood strips. Hold the laminations in place with pins and rubber bands. The plastic prevents sticking ... both laminations and form emerge undamaged.

Elevator tip trailing edges are laminated from 1/32 x 1/16 basswood. The leading edge is 1/16 sq. balsa. The front spar is 1/32 x 1/16, hinge-line spars are 1/32 x 3/32, and the rear spar is 1/32 sq. After installing the 1/32 x 3/32 ribs and false ribs, the stab unit is sanded to a slight lifting section. The rudder is built in a similar fashion, except that 1/32 x 1/16 material is used throughout. Note that when the model is assembled, the rudder is supported above the stab, and does not touch it.

Wing construction is quite conventional. The leading edge is rock-hard 1/16 sq., placed on edge. The tips are laminated from 1/32 x 1/16 basswood. The tip bows must curve (in side view) to conform to the undercamber of the wing. The spars are hard 1/32 x 1/16. The spars are designed into the top of the wing, both for turbulation and to prevent "sway-back" dihedral. Ribs are 1/64 sheet. The only way to cut this many ribs is by the "stack" method. Cut ribs from 1/16 sheet, to use as templates.

Aileron construction is a bit complicated. The strongest wing results when the aileron structure is built without cutting either the tip or trailing edge: the structure is there, showing through the covering, but cannot operate. Two full-depth aileron spars, 1/32 x 3/16, are pinned in place, packed up from the plan with scrap 1/32 (to preserve the undercamber). The wing ribs are then installed. Cut off those three ribs which involve the ailerons, and use the rear portions as aileron ribs. An additional aileron end rib must be cut from scrap. The rear wing spar ends and butt-joins with the aileron unit. The diagonal braces shown are 1/32 sq. The last parts to be installed are the false ribs. They are cut from 1/32 x 3/32 stock, and butted between the leading edge and front spar. When dry, they are sanded to the proper nose contour. Note that the lower wing is slightly different from the upper (dotted lines). The dihedral break shown is, of course, for the upper wing only. Scale dihedral is 5/16 of an inch under each tip, and is sufficient for indoor flying.

The covering is superfine tissue. If you can find some dull off-white tissue, it will match the unbleached cotton used on the real Pups. If you must use a bleached white, tint your clear dope with a few drops of brown (Try a sample to see how much).

I like to apply tissue with thinned-out white glue, especially on undercambered wings. After all units are covered and water-shrunk, give each panel a coat of the tinted, low-shrink clear dope. This is a good time to check that each wing panel has 1/16 of an inch of washout. You just can't appreciate how much this helps the flying qualities of a model until you try it!

Before final assembly, apply all insignias, numbers, etc. To determine which scheme to use in decorating your Pup, by all means get a copy of "Profile Publications, No. 13: The Sopwith Pup". My model is finished as a Naval Pup: khaki on all top surfaces, clear underneath. The photos in this publication also explain the rigging quite clearly, as well as that wealth of variation in detail which helps the scale modeler dress up his individual model.

In the final assembly of your Pup, try to mount the top wing with slightly less incidence than the lower. This prevents both wings from stalling at the same time, for increased stability. When everything is in place, install the interplane struts (1/16 x 3/16, doped khaki). Before permanently sewing and gluing the rigging threads in place, make sure that all washout, etc., is as you want it. There's no point in having to rig it twice!

My model uses a hand-carved pine prop, but a cut-down 6-inch plastic one will work fine.

Balance the model at the point shown. Adjust the glide with elevator, and powered flight by shimming the nose block. Power is a 12-inch loop of 1/8 rubber, if the heavy, detailed model is made. A more stark, lighter plane might fly on 1/16 rubber, with greatly increased duration.

Watch out, Red Baron!! •