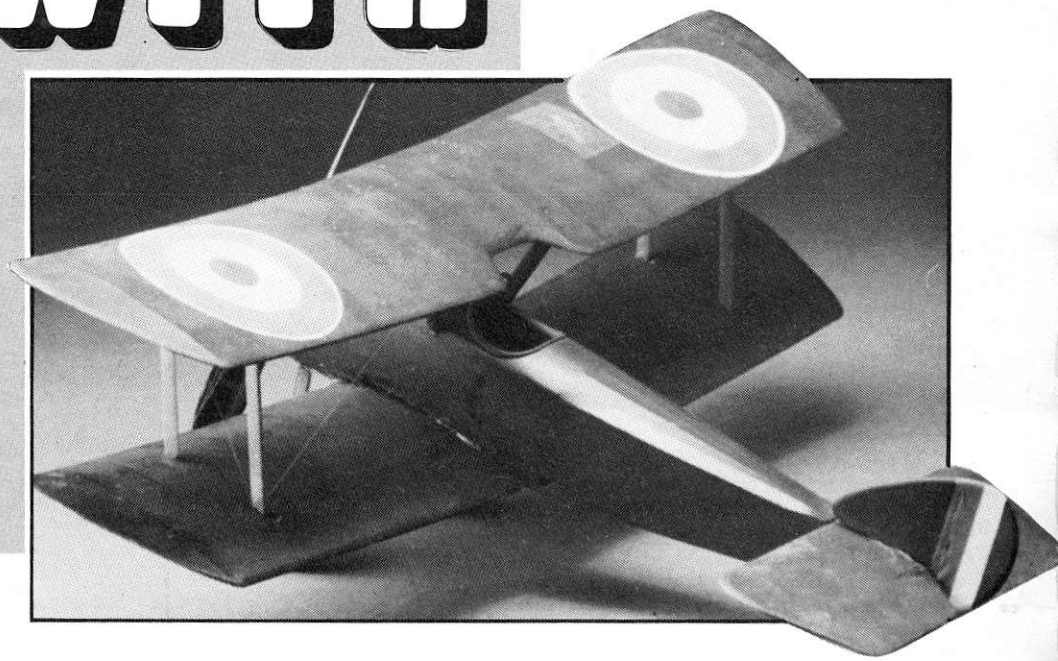
SOPWITH PUP

CO_2 powered 16 inch wingspan scale bi-plane designed by Jim Latham

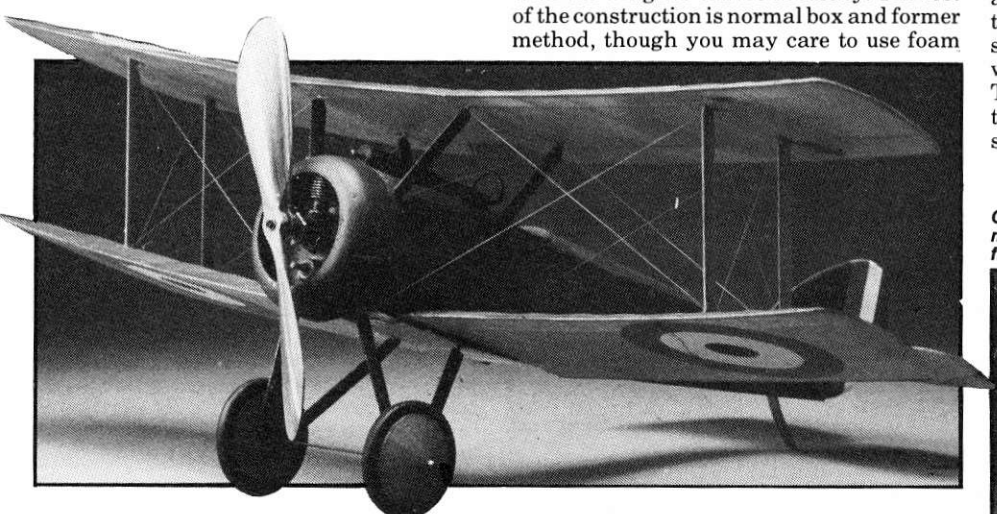
The Sopwith 'Pup' has always been an aircraft popular with modellers, this CO_2 version has no obvious vices and is a delight to see in the air.



START THE MODEL by making all the laminated parts and putting them aside to dry for as long as possible. Cut formers from 1/8in. or 1/32in. balsa, wax the edges, pin down onto a flat board covered in *clingfilm* and glue the balsa strips with P.V.A. adhesive. A thin plastic strip on the outside of the assembly will stop any weak points caused by pins cutting into the balsa. If any of the assemblies warp when removed from the board replace them!

Wings

Make a rib template from thin brass or aluminium. Select soft wood for the riblets and medium for the full ribs. A few very hard balsa or ply full ribs help stiffen the wings without too much weight penalty.



This view of the 'Pup' clearly shows the rigging wires, see text for their use as a trimming aid.

Lower wing root ribs are hard sheet or ply. If you have a saw bench the spar slots can be cut by assembling the ribs and gluing on false leading, trailing edges and ends to the ribs, then proceeding as though you were dealing with a solid block of wood. If using this method be sure to mix up the different wood densities. The actual construction of the wings should present no problems but use adhesive very sparingly and scrape off any excess. With so many joints to be made the glue could weigh more than the timber!

The recommended trailing edge is made from three thicknesses of 1/64in. hardwood veneer, glued together and used with the glue lines perpendicular to the plan. If you wish to use a wider balsa t.e. make the necessary adjustment to the rib template. Dihedral is 3/8in. at each tip.

Fuselage

Cut the root plate from 1/16in. sheet and cut out the slots for the wing spars, checking with the wings to ensure accuracy. The rest of the construction is normal box and former method, though you may care to use foam blocks sanded to shape instead of the 1/32in. sheet decking. Stringers for the rear and side decking can be strips or you can cut long triangles from sheet and trim to shape. When fitting the alloy tubes for the undercarriage and cabane struts epoxy them securely as the landing shocks are very high due to the cross axle catching in the grass and tripping the model up abruptly. The step is formed from two pieces of 1/32in. sheet formed over a dowel. When dry cut off a slice and glue to fuselage.

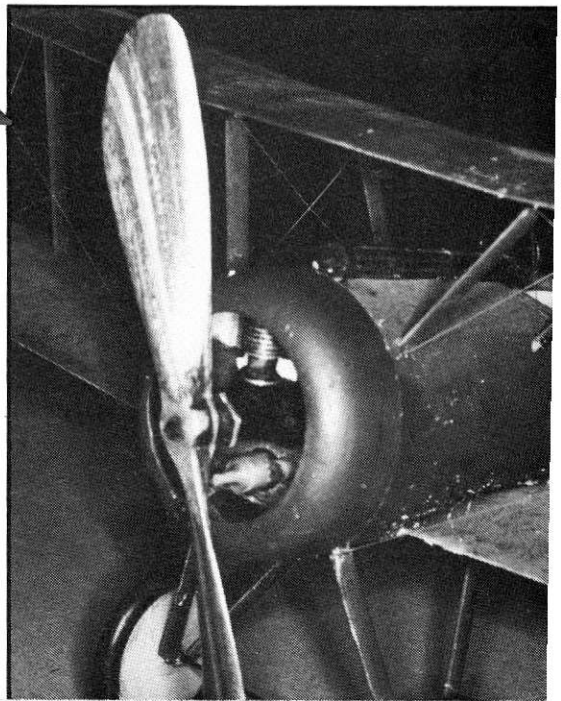
Fin and Tailplane

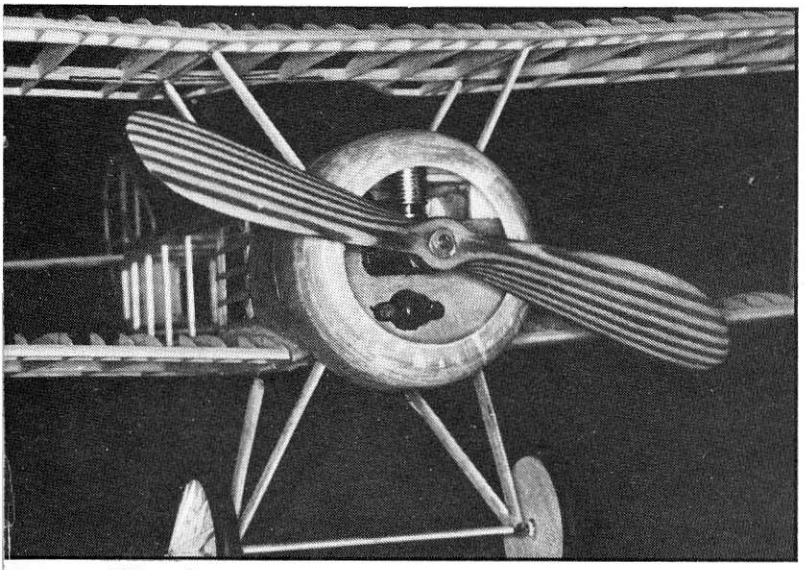
These should present no problems but keep them as light as possible. They are rather fragile so it helps to make and carry spares.

Undercarriage and Cabane

Use 18 s.w.g. wire for the undercarriage and 20 s.w.g. for the cabane. After bending the wire to shape, fit u/c. to fuselage re-bending as necessary to get a good fit. Bind and solder axle. The cabane struts are bent to shape and checked against the model by setting up the wings with the jig. When the wire work is correct, epoxy the fairing strips. The fairings are 1/16in. sheet (slotted). When the epoxy is dry fill the fairings and sand smooth.

Close-up of the engine bay, sensible use is made of the engine bulkhead to mount the filler valve.





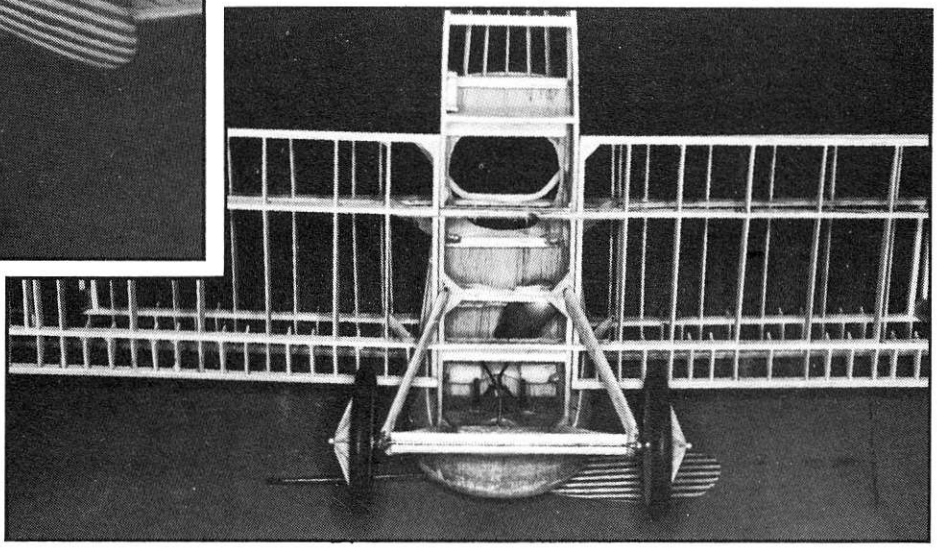
Left, the 'Pup' prior to covering. With all those riblets, take heed of Jim's warning regarding too much glue!

Assembly

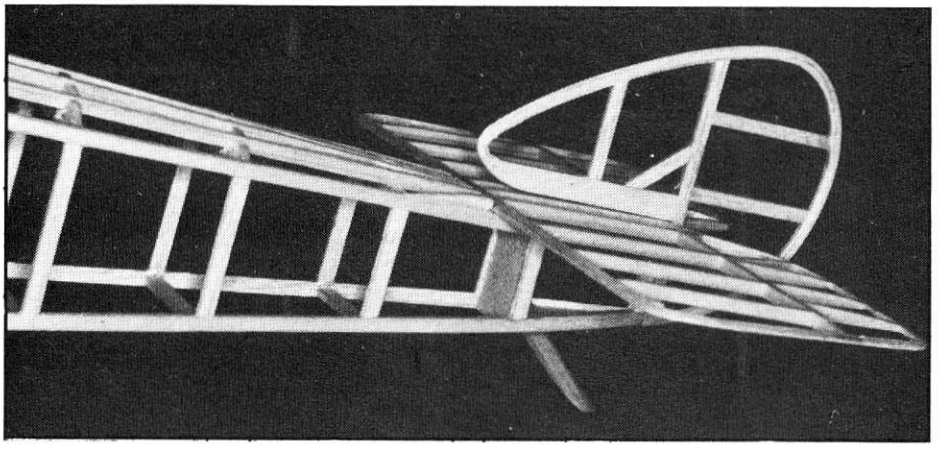
Fit lower wings and leave to dry. Fit the rigging jigs using rubber bands and epoxy cabane struts into place. Use balsa cement for interplane struts, if any mistake is made cellulose thinners can be used to unfasten the joint. When all is correct set aside to dry thoroughly.

Rigging

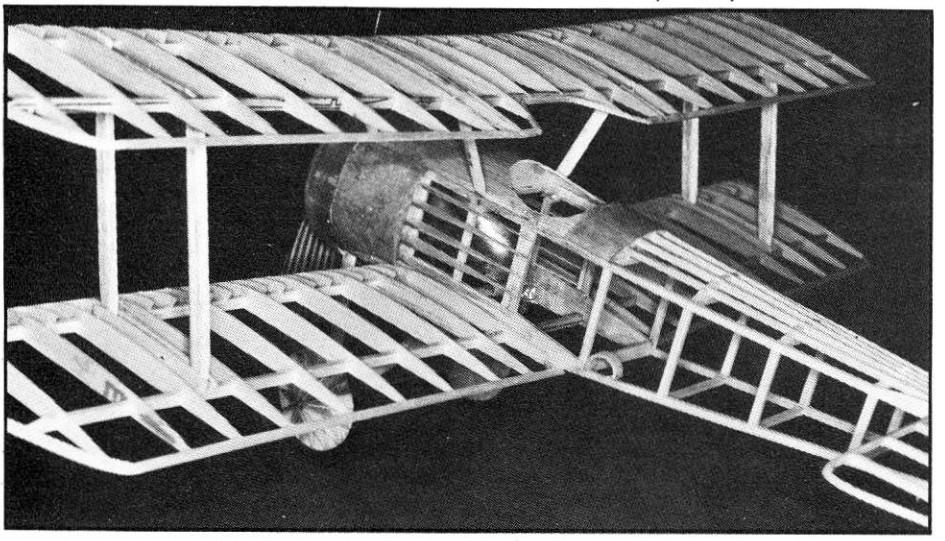
Use 0.015 fishing line which is pulled through a piece of sandpaper until it is rough. This gives better adhesive quality and gives a dull grey finish which looks better than the shine of the untreated line. Using a very fine pin vice and the smallest drill you can buy, drill holes in the correct places and thread the nylon line through the hole. Use cyano adhesive to fix the rigging in position. It can be useful to delay rigging until after the first flight as the tension of the rigging wires can be used to correct warps or increase dihedral!



Above, before covering the fuel tank may be eased forward to the front bay to allow for future access. Below, laminated rear skid is glued both to bottom sheeting and vertical 'filler' at rear bay.



Almost ready for 'jap tissue' covering, note simple construction of 'step' and 'spoked' wheels.



Wheels

Cut a ⅛in. balsa disc slightly oversize and epoxy to a length of 18 s.w.g. brass tube, ensuring that the disc spins true. Leave some of the tube protruding at each end. Epoxy triangles of obeche veneer or thin balsa to make the spokes. When dry clamp end of tube in drill or lathe and sand disc and spokes true. Sand a semi-circular groove on the outer rim of the disc. Cover wheel with jap tissue and dope well. The tyre is made from rubber tube joined with cyano adhesive and lightly expoxied to the rim.

Cowling

This is made from papier mache. Find or make a suitable former, cut strips of heavyweight *Modelspan*, make a number of slits along one edge. Cover the former with clingfilm and using heavy duty wallpaper paste, wrap the former with paper, brushing the slit edges forward over the front curvature. Do not try to make the cowling in one go. Offer it up, sand off the high spots and apply more paper as required. Do not sand until *thoroughly* dry.
Finally, sand smooth and dope.

Covering

Cover upper surfaces in lightweight green jap tissue and lower surfaces in white. Steam shrink and dope with 50/50 dope thinners. Spray or hand paint to chosen colour scheme. Roundels are made off the model and pasted on, as are squadron markings and serial numbers.

Flying

Trim model for as flat a glide as can be obtained, set the motor revs as low as possible. Trim out any tendency to a power stall with down thrust. Trim for a left hand circle. Increase revs when satisfied with the performance of the model. On a calm summer evening with the model set for low revs it is possible to have the model circling overhead at a low height and easing into a slow descent as the gas runs out. Very satisfying!