



**NO – it's not a plastic!**

**Doug McHard, the maestro of mini-scale  
tells how to make a 1/36th scale rubber-driven**

# GLOSTER GLADIATOR

THERE IS NOTHING particularly difficult about building the *Gladiator* and all the information needed by anyone who has previously built a flying model, is shown on the full sized plan. Further details clarifying the basic assembly may be gleaned from the accompanying photographs.

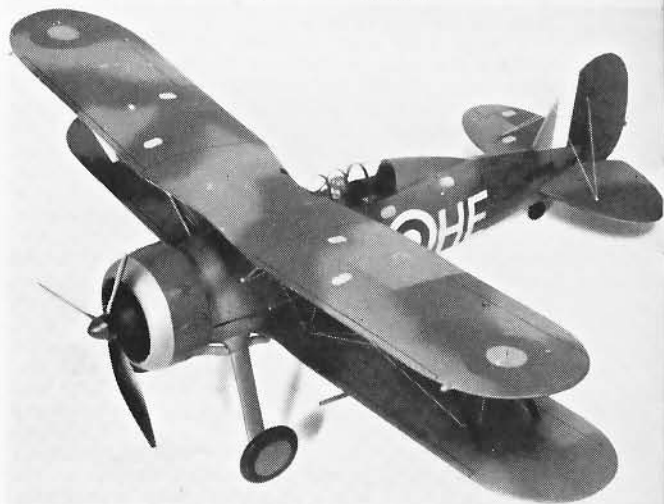
The model is not recommended as a first attempt, since workmanship must be accurate, and warps – a seemingly essential part of any first try – are to be avoided at all costs! It is also important to keep the weight to a minimum and, if adequate strength is to be maintained, this largely depends on careful material selection and the use of no more adhesive than absolutely necessary. Heavy wood, globs of glue and excess dope can double the weight in no time and this would destroy any chance of a satisfactory flying performance.

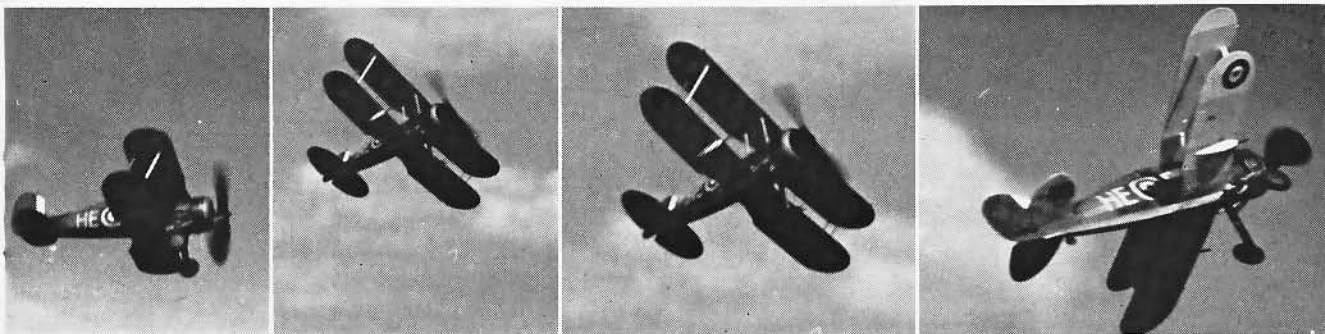
Don't be too discouraged by these remarks – just keep weight and workmanship in mind *all* the time and your Peanut Gladiator will be a winner.

In designing the model I have avoided oversophistication. For instance, it would certainly be possible to reduce the weight below the 18g (0.6 oz.) of the original, if (a) material cross sections were reduced and (b) colour dope omitted.

Fitted with scale propeller to take away the enormous paddle effect of the flying prop, Doug's *Gladiator* is difficult to distinguish from a well built static scale plastic model – or even the real thing at some angles. Colour scheme patches are from the 'Profile' monograph on the *Gladiator*.

However, the first would put the construction into the 'experts only' class, and the second would have reduced the model's photographic appeal. If though, you have no spray gun enabling the application of a *really* thin coat of colour, then don't use colour dope at all. The weight of even one brushed-on coat of colour dope will certainly reduce flying performance.





Use coloured lightweight tissue (Jap if you can get it), steamed to shrink it, and given one thin coat of clear dope to strengthen and seal the pores.

If you cannot get 1/64th in. sheet balsa for the fuselage forward covering, reduce thickness of some 1/32nd in. by using fine sandpaper on a flat block and sanding away from the holding point. Sand both sides to avoid warping unduly. Do this over a perfectly smooth surface and sand along the grain. You only need about a foot of 3 in. wide material, so this is not such a chore as you might imagine. If you are still not sure - use cartridge paper for the forward fuselage covering.

When constructing the wings, note that the rib spacing is not the same on both upper and lower wings although the span is uniform. Build the wings over the plan in the normal manner but do not fix the upper spar until the dihedral has been set.

The wing tips of the upper wing should be propped up  $\frac{1}{2}$  in. before cementing the leading and trailing edge joints at the dihedral break point. This will avoid the need to crack the wood. In the case of the lower wing, the leading and trailing edges should be cut and re-cemented where the dihedral commences (minor constructional differences will be noted between plan and photographs - follow the plan!). The wingtip and tail outlines are easily made by laminating 1/64th strips, using P.V.A. glue thinned 50/50 with water to produce a creamy paste. Soak the strips in the thin glue, then bend altogether round a waxed cardboard

or balsa former. Allow to dry overnight.

This construction is strong and light but if you prefer, of course, you can form the tips by cutting sectional pieces of 1/16 in. sheet in the more conventional fashion. It's surprising how frightened modellers sometimes become when faced with a laminated structure like this. In fact, it's much easier than a sheet-fashioned shape; lighter, stronger and looks better, too - try it!

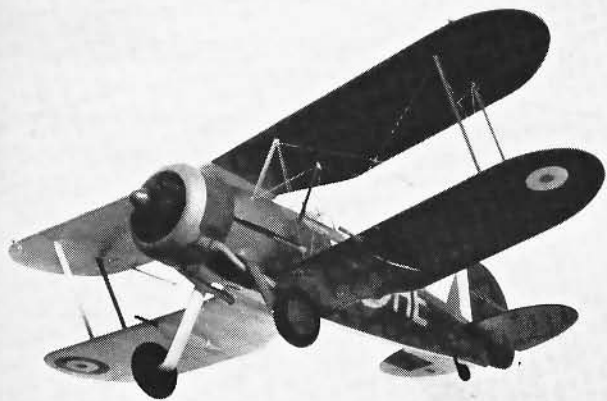
The whole cockpit blister (including the cabin fairing) is moulded from 5 thou. acetate over a wooden former, and is attached neatly to the fuselage by running thick clear dope round the join line. The cockpit can be fabricated from flat acetate if you don't like moulding. Do, however, use only thin acetate - it's heavy!

Wheels are balsa discs bushed with aluminium tube. Roll this tube from shim if you can't buy a fine enough gauge. Retain the wheel with a spot of solder in a countersunk wheel centre and cover the hub with a disc of acetate moulded to a shallow dome.

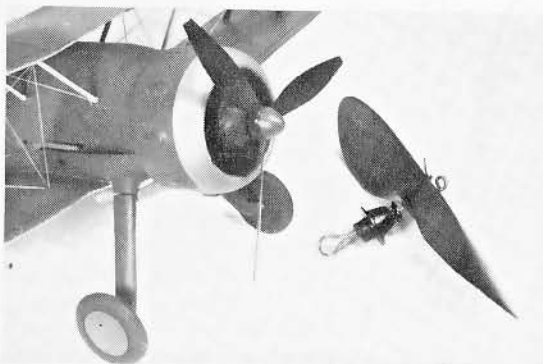
Leave a small gap at the top of the u/c leg fairings to enable the legs to flex to absorb landing shocks. Notice that the 22 s.w.g. wire passes in front of the lower ends of former 6, uprights, and behind the former 6 crosspiece at the top - cement well.

The whole of the fuselage underside between formers 6 and 8A is covered with sheet, which is later cut away to allow the lower wing to seat properly. The correct incidence angle is automatically achieved by butting the wing spar against the lower longeron, the trailing edge is located flush with the lower edge of former 8A.

When assembling the upper wing to the fuselage, sharpen the lower ends of the bamboo cabane struts, and carefully press them into the locally reinforced upper fuselage longerons at the angles shown. Coat the ends with P.V.A. glue before inserting. Press the upper strut ends into the 1/16 in. ribs R-1 and adjust the incidence angle before the adhesive hardens. Do not cement the upper ends of the struts, but allow the fuselage/lower strut joints to set, then remove the wing and cover it before re-inserting the struts in the original rib holes and securely cementing in place, carefully rechecking incidence and 'squareness' from all angles.



Undersides in black and white. Colour discs on the wheels, top surfaces camouflaged dark green and dark earth, the Gladiator is ready for action - at an all-up weight just a shade over half an ounce.



Above: the two propellers. 3-bladed for static appearance and the paddle blades for flight. Note the free-wheel clutch used on the big prop, see plan for details. Note also the angled drilling through the nose plug to obtain variation in thrust line trim.

P.V.A. or Aliphatic Resin glues give you time to adjust such settings before starting to harden and for thin sheet work there is not the shrinkage distortion that always results when balsa cement is used. These glues are strongly recommended for the entire construction of the *Gladiator*.

The angled bushing in the nose-plug enables the thrust line to be varied by rotating the plug in the cowling hole. When the position has been found - **mark it!** The plug should be a snug fit in the cowling to prevent its rotating in flight.

The *Gladiator* will fly in either left or right-hand circles, but left is perhaps safest for initial tests. Add a little Plasticine to the nose if the model stalls on gliding. The original needed no trimming at all with its 'Hangar flying motor' (four strands of  $3/64$  in.) but a little nose weight was required when an outdoor motor (two strands of  $1/8$  in.) was fitted.

Right: top to bottom. The basic structure of the *Gladiator* has been deliberately kept simple. First photo shows the side assembled directly over the plan. Utilise the hatched areas on the drawing to indicate the basic structure. Next photo shows the two sides at first stage of assembly, joined at the sternpost. Centre photo has the spacers joining the main frames at points 6, 7 and 8, with other spacers ready to be fitted. Then the  $1/16$ th and  $1/32$ nd frames are added to the basic frame, and in photo below right, rear fuselage stringers are fitted. Complete airframe, ready for covering is seen below. Encouraged? Come on, let's see those *Gladiators* airborne in the Clubroom.

