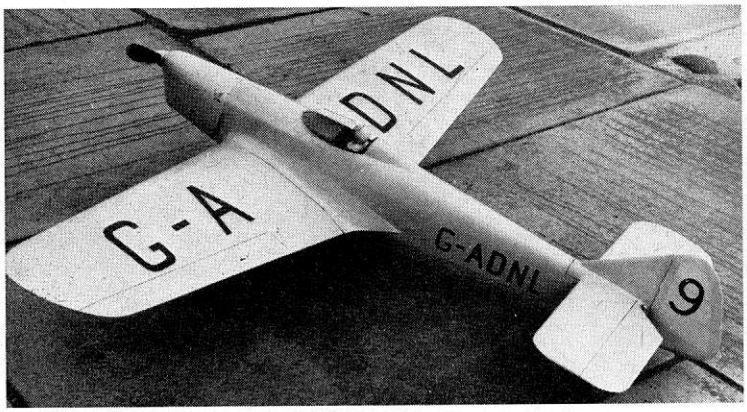


A 1¼ in. equals 1 ft. free flight scale model for .5 to .8 c.c. engines, designed by D. M. COLLIN

MILES M.5 SPARROWHAWK

THE GENERAL PROPORTIONS of the *Sparrowhawk* immediately struck the designer as nearly perfect for a free-flight scale model, when he discovered a three-view drawing in *'The Book of Miles Aircraft'*, a Harborough publication, no longer available and much treasured by collectors.

The first model built utilised a D.C. Dart .5 cc. diesel, and weighed 14½ oz. In this form it was underpowered and would only just maintain height – although no doubt a lightweight version with a powerful .5 cc. engine would be quite satisfactory. However, the resulting flight would be unrealistically slow, and thus a .75 to 1 cc. engine is advised.

Originally, the model featured pendulum-operated rudder, but later experiments proved that stability was *increased* by using a fixed fin and trim tab. To check this, an A.M.10 diesel was substituted for the Mills .75 cc., and it was found that providing the model was trimmed to glide straight (or with just a gentle turn), it would fly successfully in quite a strong wind. Even with the model trimmed to stall heavily on the glide there was no tendency to spin-in. It would appear that pendulum control is fine on a relatively slow flyer, such as the B.A. *Swallow*, but on faster models any sudden change in direction due to air turbulence etc., causes the pendulum to swing outwards under centrifugal force and tighten up the turn into a spiral dive. This caused quite a few inexplicable random crashes while the pendulum was in use.

The only known deviation from true scale is that the dihedral does not start immediately outboard of the wing fillets.

The *Sparrowhawk* has extensive sheet areas, so choose soft or medium balsa to keep the weight down. Use P.V.A. adhesive for joints involving hardwood or ply.

Cut out the fuselage sides and cement on the ⅛ in. square edging strips. Build up the wing tongue box and glue between F3 and F4. Stand the assembly upright on a flat surface and carefully check for squareness. When this is quite dry, cement the sides to F3 and F4 but do **not** put any cement on the joint where the wing tongue box goes through the fuselage sides until after the tail end of the fuselage has been pulled together. This is essential as otherwise the fuselage will not be able to assume the correct curvature between F3 and F4. When cementing the tail end together, and when inserting the other formers, carefully check that the fuselage remains symmetrical and untwisted. The rest of the fuselage is straightforward. The curved top decking is easy if you use soft, straight grained sheet wetted on the outside and doped on the inside. Engine bearers are glued into F2 and F3 and before pulling-in the front part of the fuselage sides around F1. Check that the engine can be installed at this stage of the construction and leave off the bottom part of the engine cowling until the engine is finally fitted. As the model is likely to be tail heavy, a piece of pine can be used for the front cowling, which can better absorb impact damage than the hardest balsa. Wing fillets are built up from soft ¼in. sheet cut to the side view shape. Profile them to match the fuselage sides, carve and sand out the concave surface before cementing in place.

The wings are conventional although care should be taken that the root ribs for the port and starboard wings have the slots for the wing tongues cut identically. If soft block is not used for the wing tips they should be hollowed out as much as possible. The fillets for the undercarriage legs are fitted after covering the wings. Remember that the undercarriage spats are vertical and are not perpendicular to the undersurface of the wings. The joint onto the wing surface can be neatly made by rubbing the fillet spanwise on glasspaper wrapped around the wing.

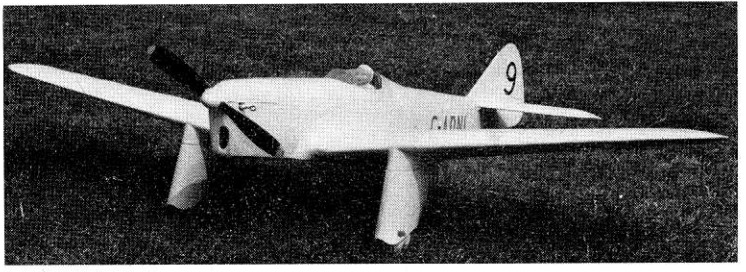
Cover the wings with heavyweight Modelspan and

all the rest, including all sheet areas, with the lightweight grade. A couple of coats of clear dope followed by two coats of cream colour dope thinned with their own volume of thinners gives a reasonable lightweight finish. Registration letters are painted on with Humbrol enamel (so that mistakes can be corrected). The fuselage was also fuel proofed with particular attention given to the engine bay.

Before flying make sure that the plane balances as indicated on the plan, preferably on the forward limit. The original model required nearly one ounce of nose ballast. Probably due to the thick wing section and the in-built wash-in towards the tips the stall is very gradual, more of a 'mush'. This is just the job for the full size version, but rather tricky for the first test glides as there may not be sufficient height for the stall to develop. If possible, launch down a gentle hill slope and trim out any tendency for the glide to level out, which is really the start of a stall. The glide is quite fast and should also be quite straight.

With power on, adjust the sidethrust to give a slight turn to the left – a gentle glide turn either way seems quite safe. If the glide is satisfactory but the model flies fast under power without gaining height, try a spot of UP thrust for the engine. A high thrust line in a low wing model produces a nose down couple under power, which may prevent the model from climbing.

The designer has no experience of radio control in this model although there is plenty of room. The model is very robust and is reasonably stable, but it is expected that at least a 1 c.c. engine would be needed.



The clean, attractive, lines of the Sparrowhawk, combined with the very smart cream and red colour scheme, make this racer a 'winner' in all respects. Incredibly, Mrs. Miles devised and directed the construction of this aircraft in just eight weeks – using mainly modified Hawk components and a 140 h.p. Gipsy Major engine – so that her husband could compete in the 1935 King's Cup air race.