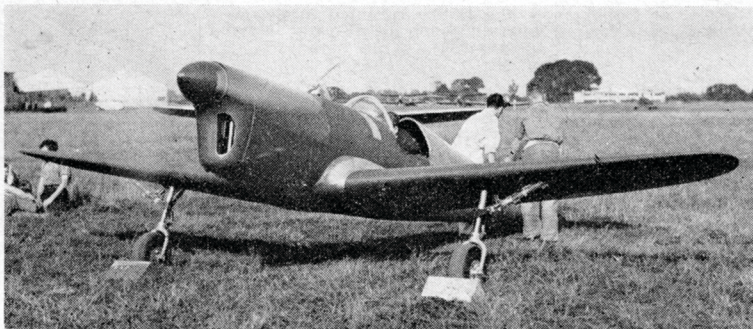


## Aircraft Described

### Number 192

By H. J. Robinson



# MILES M.13 "HOBBY"

F. G. MILES' mount for the 1935 King's Cup Race had been the first M.5 *Sparrowhawk*, an ingeniously extemporised design by Mrs. Miles with standard Hawk components cleverly modified to produce a most pleasing aircraft which recorded the fastest time in that year's Eliminating Contest and placed 11th in the Final. In January of 1937 Miles determined to build a small, really fast aeroplane that would retain the excellent qualities of the *Sparrowhawk*, test a number of his theories and provide him with a mount for the 1937 Race.

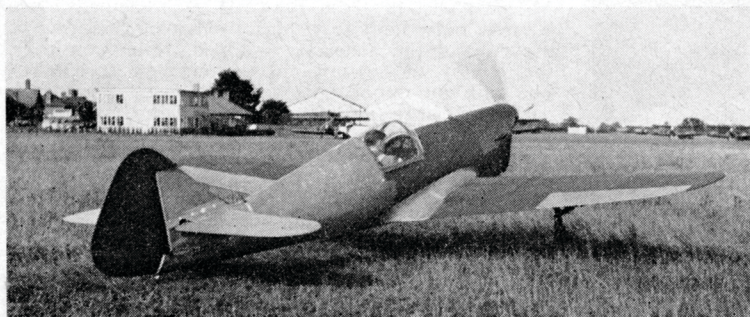
The new aircraft was to embody several aerodynamic improvements, including a semi-monocoque fuselage of oval section, fully enclosed cockpit and retractable undercarriage. Top speed was to be over 200 m.p.h. using the 140 h.p. Gipsy Major Series II engine turning a De Havilland 1000 variable pitch propeller. As the M.13 was purely experimental, F. G. and Mrs. Miles completed the basic design in their spare time and just two craftsmen began its construction. Named as usual after a member of the hawk family, the M.13 became the *Hobby*, a small, agile falcon fast enough to strike down a swift in flight.

Several weeks before the date for receiving its C. of A. it was realised that the *Hobby* would not be finished in time, so a number of enthusiastic assistants was recruited and a week before the race all hands began working night and day. Assembling the machine with only two days to go, it was discovered that the undercarriage would not retract into the

holes in the wing provided for it. Since design and construction of a retractable undercarriage is a specialist undertaking this had been sub-contracted, but somehow the essential liaison between Miles and the sub-contractor had broken down (it was never discovered where or how). Redesigning and rebuilding the wing within forty-eight hours was impossible, but on the night before its anticipated certification, the *Hobby*, its improvised undercarriage without cover doors and with retracting jacks outboard of the Oleo legs, was rolled out onto Woodley Aerodrome and F. G. Miles was only prevented from taking off in total darkness by the arrival of Mrs. Miles.

For its first flight on 4th September, 1937, the *Hobby* retained the improvised undercarriage and was largely unpainted, with red oxide primer on forward fuselage, wing and rudder. Miles found his aircraft 'satisfactory and very comfortable', although the landing speed was higher than anticipated. Later it was painted crimson overall with the experimental registration 'U2' in cream. By then the undercarriage had been modified with actuating struts fitted inboard of the Oleo legs and cover doors added. The aircraft never received its C. of A. and hence the allotted registration G-AFAW was never carried nor the racing number 2 applied.

Although the *Hobby's* wingspan was less than its overall length, wing area remained adequate for its weight. With an extremely thick aerofoil at the root, the one-piece wing tapered in both plan and thickness, with sharply dihedralled outer panels and a short,



Unusual outboard retracting jacks on the undercarriage are evident on the yet-to-be finished 'Hobby' at Woodley Aerodrome ('Flight' photos).

On test at Farnborough, the *Hobby* mounted in the 24 ft. Wind Tunnel for aerodynamic analysis (Crown Copyright photo).

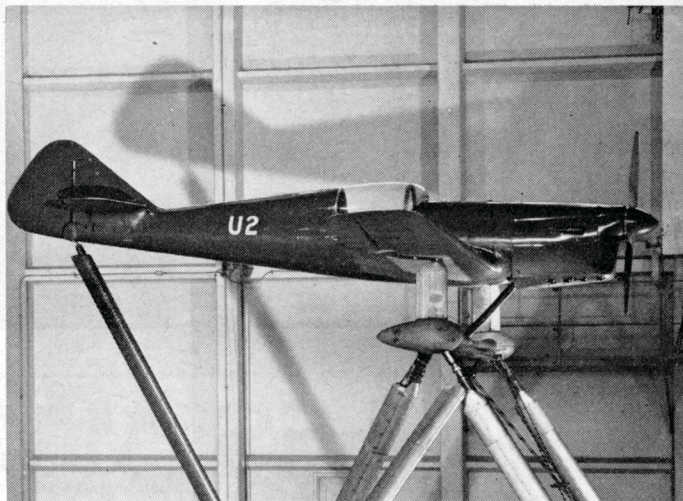
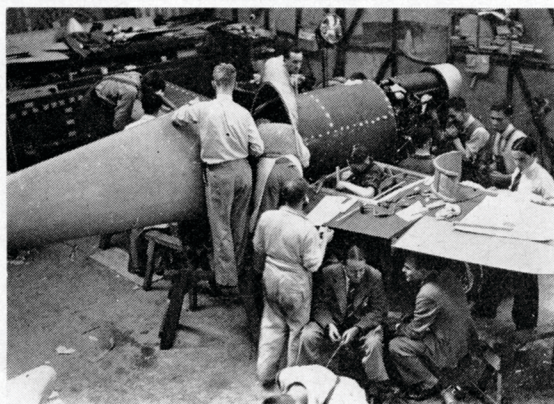
flat centre panel almost buried in the fuselage. Two box-spars of spruce flanges and birch plywood webs were joined by plywood ribs with spruce capstrips, corner blocks and uprights, while additional nose ribs were fitted to the upper surface between the front spar and the spruce leading edge. Vacuum operated landing flaps were carried on a short, false spar of solid spruce and the entire wing was covered with birch plywood.

Each aileron was constructed on a spruce spar with plywood ribs and covering, with a mass-balance weight mounted off the front face of the spar and housed within the wing where a hole in the lower plywood covering allowed passage of the weight and upward movement of the aileron. Control was by cables operating through a large external horn at the inboard end of each surface.

The gracefully tapering fuselage was built about two tapered spruce longerons set immediately below the cockpit canopy and a number of oval plywood formers. This basic structure was reinforced by spruce stringers and covered with birch plywood. Formers were paired about each wing spar to form a slot, with both formers and spars suitably reinforced and bolted together. Between these two sets of double formers the fuselage was occupied by the fuel tank. The steeply sloping windscreen was typically Miles, and the large transparent cockpit canopy was a well-contoured one-piece moulding.

The shapely tail surfaces were constructed of spruce spars and plywood ribs, plywood covered except for the fabric covered upper section of the rudder. The fin was integral with the fuselage and the balanced rudder cable operated through external horns. The tailplane was mounted in line with the top of the fuselage, and the entire fin/fuselage/tailplane junction was faired with a large duralumin fillet. Both elevators were mounted on a single spar which ran through a hole in the fin. The curved steel tailskid was hinged off the rear face of the rudder post and sprung by bungee cord in tension. The Gipsy Major Series II engine was carried on a mount of welded steel tube. Side panels of the tapered cowling were hinged along their upper centre line for engine access and held in place by quick-action fasteners.

Haste of the moment can be detected in this view of the *Hobby* under construction. Note the chap standing 'through' the wing! Design conference obviously taking place on the tool chest. ('Aeroplane' photograph.)



Each wheel of the wide-track undercarriage was carried in a forked Oleo leg, raked forward when extended and swung aft by the radius rod during retraction to lie between the wing spars. Pneumatic retracting jacks were finally located inboard of the Oleo legs and operated from an air bottle mounted behind the pilot's right shoulder. The central portion of the cover door was pin-jointed to the moving Oleo leg, with inner and outer sections hinged from the underside of the wing. In the original undercarriage design a single cover door was mounted on the Oleo leg with a hinged flap covering the lower half of the wheel. The early improvised arrangement was retained until after the aircraft was fully painted with the experimental registration 'U2'.

The *Hobby* had been built principally for the 1937 King's Cup Race and as this was now past, F. G. Miles was happy to dispose of her to the R.A.E., who wished to use the new 24 ft. wind tunnel at Farnborough to analyse its drag and investigate ways of reducing it. Lift and drag were measured between  $-2$  deg. and  $+10$  deg. angle of attack, first with the undercarriage retracted, and with wheel wells and cooling openings covered and gaps to control surfaces and cowling panels sealed. Covering and sealing reduced drag but it was decided that the main source of drag was the 22 per cent thick wing root aerofoil. Nevertheless, airflow at the wing/fuselage junction was good with negligible drag rise. In flight tests the top speed was 196 m.p.h., well below the anticipated maximum.

After the test programme the *Hobby* was bought by Miles' Assistant Test Pilot, H. V. Kennedy, who wanted only its Gipsy Major engine. This was removed and the airframe scrapped. Miles considered the *Hobby* to be 'not one of our best aeroplanes', but with no opportunity to prove itself this wholly delightful little aircraft scarcely deserved such an inglorious end.

The author wishes to thank D. L. Brown, Esq., who enlarged and checked this article, Mr. and Mrs. F. G. Miles and Messrs. E. E. Stott and A. W. Hall of R.A.E. Farnborough.

Reprints of this feature plus 1/24th scale dye line print of the drawings are available as plan pack JH 2904, price 2/6d. plus 6d. post, from Aeromodeller Plans Service.