

MILES M20

SCALE TEAM RACER
OF A SINGLE SEAT
FIGHTER

By W. H. Smith



THE Miles M-20 was designed during 1940 as a single seat fighter which could be speedily built in large quantities to take the place of front line aircraft, should supplies of these ever run out.

As a team racer it is an ideal design as the motor is totally enclosed within the need for any extra lumps and bumps.

When circulating it is a joy to behold, and with a 9×8 propeller and using Mercury Racing Glow Plug fuel, the speed is in the region of 70 m.p.h. It says something for the strength of this design that, while flying at Fairlop recently, the writer (Clumsy Clot) tripped over a tuft of grass and the M-20 nose-dived into the deck at full bore. The only damage sustained was a splintered port wing and a cracked spat, both of which were speedily repaired. The model is now in circulation again and has so far made a total of about 35 flights.

Wing

Butt join lengthwise, two sheets of 4 in. \times $\frac{1}{8}$ in. hard sheet balsa, and cut out one plan view of the wing. Cut two small holes in the positions shown and push the wire undercarriage through so that the crossbar lies along the inner surface. Cement all ribs into place and bevel the wing edges ready to receive the upper surface. Now butt join two more pieces of 4 in. \times $\frac{1}{8}$ in. hard balsa. Cut slots in the leading edge to take undercarriage frame and pin down flat on the edge of the building board. Cement the leading edge of the bottom half of the wing to the upper surface, pin down and leave to dry thoroughly. Remove from the board and repeat with the trailing edge and the wing tips, pinning down firmly each time. When dry, trim off surplus wood and sand all edges smooth. Cut slots as shown to take former F3 and keel members.

Fuselage

Cement formers F1, F2 and F3 to the engine bearers which should be drilled to take engine, and add the two crutch pieces. Add formers F4 to F6, and fix the tail block into position. The upper $\frac{1}{2}$ in. sheet spine can now be cemented into place.

The tail plane should now be cemented firmly

THE DESIGNER

Age 30...Cashier to a group of shipping companies... Married with four children...two boys, two girls (including twins)... Started aeromodelling 14 years ago... Has built all types, but prefers free-flight scale and semi-scale... Latest craze is for team racers—especially scale types... Other interests include gardening and collecting books... Also very interested in astronomy... Considers Radio Control the ultimate, and is thinking of tackling this branch soon.

into position. Add 29 c.c. fuel tank and bell crank assembly, and connect with the control horn.

Pass the assembled wing over former F3 and use plenty of cement to fix. Add keel members and fin.

The rear wheel assembly should now be constructed and bound and cemented firmly to the keel. Plastic wood is used for the fairing, and this should be applied carefully because of the high rate of shrinkage.

Bolt the motor to the bearers, using lock nuts, then connect to the fuel tank with plastic tubing. Two lengths of tubing should now be connected to the filler and vent holes of the tank, of sufficient length to enable them to protrude $\frac{1}{2}$ in. through the port side of the fuselage in the position shown on the plans.

Plug and socket electrical connections save a lot of time when starting a glow plug motor after re-fuelling, and the wiring for this should now be installed. The earth lead is connected to the rear bolt on the starboard side and taken along the engine bearer to the socket connection.

The lead from the plug is then connected to the other terminal as shown on the plan.

The fuselage should now be completely sheeted with $\frac{3}{32}$ in. hard balsa, taking care to cut the two small holes for the fuel tank filler tubes, which are cemented into position as the sheeting is fixed down.

The slots for the lead out wires should be cut at the same time, and should measure $\frac{1}{2}$ in. \times $\frac{1}{4}$ in.

Cut the small trap on the starboard side of the engine cowling, and make the door out of two pieces of $\frac{1}{16}$ in. hard sheet. This should be a tight push fit as it relies on its tightness to retain its position in flight.

Small tape hinges and a tape tab cemented to the inside of the door complete this assembly.

Cut out the cockpit next, and cement the cockpit floor and headrest into position. An instrument board can be fitted if desired, and would certainly add realism.

MODEL AIRCRAFT

The interior is finished with lightish grey matt dope and the headrest in black.

The pilot is quite easy to make and, if a little care is taken, looks most realistic. Carve the shape shown on the plan and from an odd bit of balsa block, and sand smooth. The helmet and flying togs are odd pieces of thin cloth which are stuck on the pilot first and trimmed up afterwards. The helmet is in three pieces—the middle piece $\frac{1}{2}$ in. wide, is taken from the neck over the top of the head to the forehead, and the two side pieces are taken from the neck up to meet the centre piece. The band at the front of the helmet is then added, and two small scraps of balsa, covered with the same material are cemented to the sides of the head. A small roll of cotton wool rolled tightly is stuck around the neck, and the outside of the collar is then added.

The face can either be carved and painted, or covered with an oxygen mask and goggles. The latter, I consider, is the easy way out, and certainly looks more natural in a plane of this type.

Cement the pilot into the position shown on the plan and fix the cockpit cover into place.

Spats

Each spat is built in two halves, and the groove for the undercarriage legs cut in each half.

The 2 in. solid wheels are mounted on the axles, flanked on each side by small washers. Cement the spats into place, binding with stout thread until dry when the binding can be removed. Finally sand to correct section.

Finishing

Well rub down the whole surface and finish with fine glasspaper.

Give three coats of Sanding Sealer, rubbing well down between each coat until a good surface has been obtained.

Two coats of coloured-glossy dope are then applied. Duck egg blue on the undersurface, and dark earth and green camouflage on the upper surfaces.

Standard roundels and fin flash are next added in the appropriate places, and the experimental number U.9, which was issued to this particular plane, is affixed to the fuselage aft of the roundel.

At least 24 hours should be allowed to elapse for the transfers to thoroughly dry out before using a good fuel proofer, otherwise "bubbling" may occur, and the finish be spoilt.

The *M-20* should balance on the forward line.

Flying

The lines used are 52-ft. standard light "Lay Strate" and I find it is a distinct advantage to have $\frac{1}{2}$ in. key rings at each end of the lines for attaching both to the handle and to the lead-out wires.

Have your motor running at slightly under top revs. for the first flight or so until you are familiar with take-off's and landings.

The *M-20* will unstick in about a quarter of a lap and will pull on the lines all around the circle, even in quite a fresh breeze. Keep under full control right up until you touch down.