

Supermarine Sparrow



A simple to build 1/12th scale model of a pre-war ultra-light for 5-75cc engines, which includes pendulum control to the rudder and ailerons to aid stability.

by
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WHILE LOOKING for a scale model suitable for flying in a small field, I discovered the range of delightful light aircraft designed for the Air Ministry Trials held at Lympne between 1924 and 1926 and decided to build the MkII version of the Supermarine Sparrow.

This was the first design by R. J. Mitchell who later became famous for a range of aircraft he designed for Supermarine culminating in the Spitfire.

For model work, the Sparrow offered a considerable challenge in trimming, due to the lack of dihedral, so it was necessary to

1/8" medium balsa. Start by marking the positions of the formers on the inside surface of the fuselage sides. A fibre tip pen is ideal for this job. The next step is to glue F3 and F5 to one side of the fuselage, making sure these formers are square. An old set square with the corner cut away to clear the cement joint is the best tool for the job.

Next, glue former F4 to the other side of the fuselage, allow a good half hour for the formers to set and then join both sides together. Lay the centre top edge of the fuselage onto a flat surface to ensure that

both sides are parallel. Fix all the other formers in place making sure that the engine bearers have 3° side thrust and 3° down thrust.

Bind the undercarriage to a piece of scrap 1/4" sheet and cement well to the fuselage. Glue the wing struts to formers 2, 3 and 4a and use balsa cement or a small amount of epoxy. Now sheet in the bottom of the fuselage with the grain going across the width of the fuselage. The tail skid can now be glued in place.

Fitting the pendulum torque rod is a bit tricky. First, cut the 1/8 in. square torque rod to the correct length and bind the rear fitting with its tube bearing in place. This rear bearing can now be fitted through the rear end of the fuselage but *not* epoxied at this stage. Now bend the front fitting of the

Left: note the position and relative sizes of the racing numbers. Our wheels were turned from aluminium with Mecanno tyres but suitable tyres can be made from rubber tube joined with a cyanoacrylate glue.

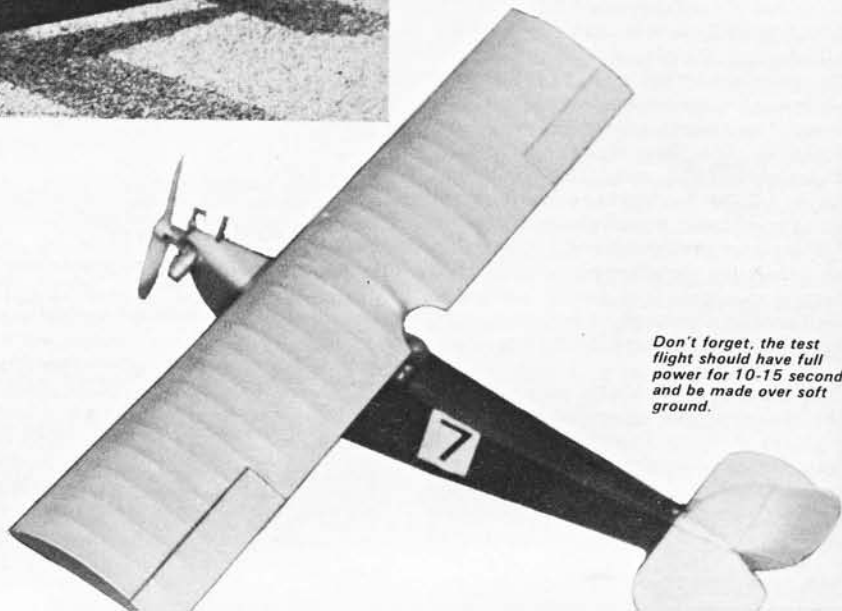


fit a pendulum control system. Pendulum control was developed to a fine art by the late P. E. Norman during the '50s. He was able to make pendulum controlled free flight models perform considerable aerobatic feats, but in our case, we are using the pendulum just as a stabilizing device.

The Sparrow flies well, but is essentially a calm weather model — just the thing for a warm summer evening — aeromodelling at its most enjoyable in fact.

CONSTRUCTION Fuselage

Cut the fuselage sides from 1/16" sheet medium soft balsa and also formers 4 to 9. Former 1 is from 1/8" ply and F2 and F3 from



Don't forget, the test flight should have full power for 10-15 seconds and be made over soft ground.

torque rod, and cut length of brass tube for the bearing and fit through the front of former F5. The front fitting can now be bound to the torque rod and both front and rear bearings epoxied in place, making sure no epoxy gets into the brass tubes. Now epoxy the pendulum bearing in place and make sure everything works freely. Although it is not shown on the plan, an adjustable pendulum weight is a good idea. The end of the earth pin from a mains plug could be used.

Cut off the end that takes the wire and slide it onto the pendulum rod using the screw to retain it in position. You will probably require a weight of about a 1/4 oz or more which can be soldered on to brass fitting as required.

Wings

These are quite uncomplicated and are made in one piece using hard 3/32" sheet for the spars and undersurface of the ribs. For the upper surface of the ribs, cut a ply template and cut all the ribs required from 3/32" sheet medium balsa.

When the wing is complete, fit the pendulums, making sure that the control rods do not bind at any point. The ailerons should have about 1/8" of up at the full extent of the pendulum swing.

Tailplane

Cut from 1/16" sheet medium balsa and cement on strips of note paper to represent the ribs before covering with lightweight tissue.

Finishing

Cover the entire model in lightweight Modelspan tissue and give two coats of clear dope. The original plane was coloured dark blue for fuselage and struts while wings and tail surfaces were aluminium doped.

The MkII aircraft carried competition No. 7, painted black under both wing tips with the top of the figure at the wing leading edge and again black on a rectangular white panel on the fuselage sides behind the rear cockpit.

Flying

The original was powered with a .5cc D.C. Dart and had a dummy cylinder turned from aluminium to preserve the scale appearance of the original horizontally opposed engines. The dummy cylinder weight helps to get the C.G. in the right place, which should be 30 — 40% of the chord from the leading edge. Test glide over long grass and trim by adding weight to the nose or tail, not by altering the incidence of the tail. There should be no suggestion of a stall on the glide as this could lead to a side slip on a powered flight.

Make the first powered flight with full power, but for short engine runs only (10-15 secs.) over long grass. To control any violent turns, adjust the engine's side and down thrust. Remember it is essential to fly this model on a calm day, at least until the trim is set up.

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