

SE5

by David Boddington



FEW aircraft made a greater contribution to the allied aerial war effort on the Western front in WW1 than did the SE5, and its development the SE5A. Not that it was immediately accepted by the experienced pilots at the front — new designs of aircraft were rarely welcomed without reservation and, with the history of obsolete and unsuitable machines being delivered to the RFC, this was hardly surprising. Captain Albert Ball was particularly scathing about the SE5 on his first acquaintance with it, views that were later slightly modified as he became better acquainted with the aircraft. Certainly the SE5 lacked the manoeuvrability of the Nieuport's and the Sopwith 'Pups' and 'Camels' and, in their original form, were sluggish in the climb compared with their adversaries. They were, however, a very rugged and stable aircraft and proved to act as an excellent gun platform, Mannock, Bishop, McCudden, McElroy and many other pilots flew the later SE5A with great distinction. Over five thousand SE5 and 5A's were produced and, apart from initial design changes to wing tip shapes, removal of 'greenhouse' cockpit and strengthening of the undercarriage, the main improvements involved the quest for more powerful and reliable engines. The development from the SE5 to the 5A was a gradual affair and there is little design change that automatically differentiates one from the other although the Viper engine had a different thrustline. As the '5A' had been modelled to a greater extent than its predecessor the plans presented here are based on the earlier '5' version, the changes needed to be made to bring the model up to the later status are few, involving only undercarriage, nose section and engine installations.

Doug McHard's one-twelfth scale free flight plan of the SE5A (FSP/682) has always been a popular design and has been converted for R/C operation, despite having a wing span of only 27 inches. One tenth scale was selected for the featured version, it offers more space for conventional R/C equipment but remains small enough to be easily transported in a fully rigged state. Although glow plug engines can be used, the diesel engine offers a number of advantages for this type of design, this SE5 has been considered as a two function model i.e. rudder and elevator. The ability of a diesel to swing a large diameter propeller increases the scale effect in both appearance and sound; the Mills 1.3cc has long been an absolute favourite and it is now commercially available again. Similar size engines could be used but may require a separate fuel tank to be installed. There is nothing to stop you fitting a third servo for engine throttle operation if this is desired, most mini-servos can be accommodated three abreast in the width of the fuselage.

Construction is quite conventional and results in a tough little model, you can afford to select light grades of balsa wood for all parts except for wing spars. Lightweight nylon covering will add considerably to the durability of the model but the tail surfaces should be covered in lightweight tissue to keep the weight down in the area. The fuse-

lage has been designed so that the top wing centre section and the undercarriage assembly can be fitted at the later stages of construction — easing the problems of sanding and covering the fuselage. Allow for installing the radio equipment during the building stage i.e. pre-drill servo bearers, hole in former for battery access (the switch can be incorporated in the cockpit area). A single piece top wing or, as shown on the drawing, plug in outer panels, can be constructed, the former is more prone to serious damage as the wing is permanently fixed to the cabane struts. Hardwood cabane struts were selected for the model as these are easier to align correctly — a notorious 'danger spot' for piano wire assemblies for many modellers. Rigging wires are non structural and shirring elastic is quite suitable for these wires. Greater scale fidelity interplane strut fixings, rigging fittings and control surface linkages may be devised to improve the overall scale standards. Outlines are correct and the model can be built as a basic sports scale version or taken to higher detailed scale standards. Ample photographic and written references exist for the S.E.'s, plus prototypes in existence, so you have a wide choice of colour schemes and decoration for the model, and for detailing.

Before flying, note the usual admonishments — check for balance point, for warps (equal washout is permissible), for correct operation of R/C equipment and for suitable weather conditions. Hand launching over grass is to be preferred to attempting a take-off for the first flights — the model is on the small size for take-offs, except from a very smooth surface. The SE5 is a good small field flyer (high drag) and is the ideal summer evening model: grab yourself the transmitter, a small can of fuel and off you go. If you stick with a slow revving diesel you are unlikely to upset any neighbours with excessive noise and the model will fit in the car boot; so avoiding complaints of that funny 'oily hospital smell' — as one lady was disposed to describe the exquisite aroma of diesel fuel.

Fuselage

Cut the basic fuselage sides from $\frac{3}{32}$ in. sheet and glue the $\frac{1}{16}$ in. sheet doublers to the inside of the sides — grain diagonally. Cut slots in the doublers for the servo bearers and chamfer internally for the cabane strut positions. Glue $\frac{3}{8}$ in. sq. engine bearers to doublers (position and depth of former F3 will depend on the type of engine used). Add $\frac{1}{8}$ in. sq. lower longerons to fuselage sides. Glue formers F2 to F10/F11 to sides (except F8) F4 and F7 positions are critical. Add formers F12 to F15, keeping the curvature of the sides equal. The slot for the tailplane may be cut in the rear of the fuselage after the basic construction has been completed.

Fitting the cabane struts will be made easier, and more accurate, if the wing top centre section is constructed at this stage — it can then be 'offered-up' to the struts as a check for alignment. Temporarily fit the fin before positioning the rear stringers, $\frac{1}{16}$ in. sheet infill is fitted at the top and bottom at the rear fuselage end. Bending the .4mm ply-

wood decking should not present any difficulties but can be assisted by dampening the outside and doping the inside. Check the fit of the decking before finally gluing in position, the top front cowling is constructed separately and held in position by a short dowel at the rear and clips at the front. Bend the undercarriage components to shape — note that the tubing for the rear strut must be slipped onto the wire before the second bend is made (it is in two parts to give room to hold the wire for bending). Position on fuselage and solder joints. F8 and the undercarriage need not be fitted permanently until the fuselage is ready for covering — and the wing top centre section until covering is complete. Glue the 1.5mm edging to F1 before shaping, the radiator grilles are formed from .4mm plywood. Cut scale slots in the underside nose sheeting to assist cooling and for draining excess oil and fuel.

Wings

Note that the rear spar positions are different for the top and bottom centre sections — all ribs can be made by the normal sandwich method and the additional slots cut out afterwards. Stock trailing edge may be used or cut with a razor plane from rectangular material, ensure that the rear edge of the ribs are slightly proud of the trailing edge and not vice-versa. No nose ribs are shown but these may be added ($\frac{1}{32}$ in.) if scale appearances are to be improved. Build the centre and outer wing panels separately, angling the root ribs of the outer panels for the dihedral angle. The rear spar of the lower centre section extends beyond the root ribs to act as a dihedral brace when the wing panels are joined. Slots for the main 1.5mm plywood dihedral brace are cut in the ribs *after* joining the panels. Lower wing fixing to the fuselage is by two dowels at the leading edge and a single 4 b.a. (or 3.5mm) bolt at the rear — $\frac{1}{8}$ in. dural dowel is to be preferred for the front dowels and these should extend rearwards through the plywood dihedral brace. Final epoxying of the dowels should be undertaken with the wing in position. Glue a piece of aluminium tube through the wing structure to act as a sleeve for the rear fixing bolt. Where a one piece top wing is to be used, the plywood root ribs may be dispensed with. Strut and rigging hooks must be fitted before covering is commenced — unless a surface fitting is devised — and the wings temporarily rigged to check the strut accuracy. If scale considerations are less important than structural integrity the wing spars can be changed to top and bottom front and rear spars ($\frac{3}{16}$ in. sq. and $\frac{1}{8} \times \frac{3}{16}$ in.) this will reduce the risk of upwards bowing of the wings after covering but, the spars will show through the covering.

Tail surfaces are shown constructed from $\frac{1}{8}$ in. medium balsa sheet but they may be built up construction for lightness and authenticity (the Coates method of using a thin sheet balsa core with strip leading and trailing edges, tips and rib positions added to both sides, would be particularly applicable here). Thin plastic hinges (mylar or nylon) will suffice for hinging the tail surfaces — remember that most models of this type tend to end up tail heavy, so reduce the weight down at the rear end.

There are no problem areas in the construction of the SE5, providing that you think ahead, work neatly and methodically, and use the correct grades of materials. A fully painted finish is a probability with the model (Heat shrink films do not look right on this vintage of aircraft) and it is very important to keep the application of paint as thin as possible — enamels and dopes are diesel fuel proof but one coat of matt polyurethane clear enamel is also recommended. Some of the decorations on the SE's were quite colourful and this, together with a bit of 'weathering' and details such as guns, pilot, exhausts etc. will provide you with a model having tremendous character. *Watch out for the Hun in the sun!*