A SPORTS FREE-FLIGH
FOR ·5-·8cc (·049cu ins)
BY COLIN READ

ISABEL

Easy construction and doci
characteristics makes this

OVER THE PAST 10 to 15 years the design of sports flying powered model aircraft has not changed to the extent of its big brother, the contest-type model. We utilise domestic items bought over the counter of any model shop, and indeed still use the well-tried 'box' fuselage type of construction which has been with us for so many years. *Isabel* was designed around items easily obtainable, and to suit the many engines in the 0.5–0.8 c.c. range, diesel or glow.

Construction is quite easy and straightforward, and is begun by cutting out all the fuselage sides and formers from good quality medium-hard balsa sheet. Do not select anything softer for the fuselage sides as with hard usage they may break. It should be mentioned here that careful selection of wood is very important, and this, combined with accurate construction, will result in a much longer 'life'. The designer's original model, and quite a few of his other designs published in *Aeromodeller*, have been around for up to eight years now, and still manage to look clean and in one piece.

Now bend to shape the 14 s.w.g. undercarriage wire, then bind it to former F3, cementing it well, and using two applications of cement. Formers F2 and F3 will be seen to have cut-outs for engine bearers to suit the D.C. Dart .5 c.c. diesel – other engines can be used but first check the width of the engine crankcase and vary the cut-outs to suit if necessary. The remaining formers may now be cut to size, noting the grain direction.

Mark the positions of the formers on the fuselage sides, then using a set square, cement formers F2–6 in position on one side. When dry, add the opposite fuselage side, checking for trueness. Next, cut the bearers to length and use an epoxy resin to cement in position. Join the sides together at the rear, then add the remaining formers (F7–11) checking the fuselage carefully for accuracy. Place on the drawing at regular intervals for checking the straightness. Glue the wing platform in position. Now drill the holes for mounting the engine, and insert the four 8 B.A. bolts. A piece of wire soldered between the slots of each pair of bolts will prevent them from turning. Add the fuel tank and upper cowling block followed by the cowl sides and F1. Sand to shape and then thoroughly fuel-proof the engine compartment. This is most important as one of the author's oldest designs, after some nine years of flying, completely folded its undercarriage despite its being bound and glued and really fitting tightly. Not enough fuel-proofer had been applied to the engine bay with the result that over the years the fuel seeped some 3 in.! Five or six coats of clear dope followed by two coats of fuel-proofer are ideal. Cover the top and bottom of the fuselage with 1/16 in. sheet, cross-grained, sanding to a final smooth shape when dry. Add the ply tail mounting and 1/16 in. dowel for the retaining band.

Retain the wheels on the axles by using 6 B.A. washers, soldered in position. Any good quality wheels can be used but they must be rubber and not plastic. Fitting the spinner will greatly improve the appearance – sanding the cowling lines to match its contours.

Commence wing construction by making the right-hand wing panel first. Select from pre-shaped balsa the L.E. and T.E. and pin these and the $\frac{1}{8}$ in. x $\frac{3}{4}$ in. spar over the plan.

Cut out W1 and W10 templates from 1/16 in. ply, and, using the sandwich method, cut out all the ribs. Add the ribs, trimming them to length as necessary. Add the top spars and ply dihedral braces followed by all the 1/16 in. sheet gussets which will greatly increase the strength of the wing. When dry, remove from the board and build the other wing half in an identical manner, less, of course, the dihedral braces. When this has dried, assemble on a flat surface, checking that each tip has the same amount of dihedral, and glue the dihedral braces. When completely dry add the L.E., T.E. and gussets of the centre section, and cover the top and bottom with the 1/16 in. sheet.

Sand the completed structure to a smooth surface and lastly add soft $\frac{1}{2}$ in. x $\frac{1}{2}$ in. wing tips. Use a good soft balsa here and carve and sand to shape.

When you are satisfied with the finished wing, sand it again, this time with a really fine grade of sandpaper. To obtain the finishes that one sometimes dreams about – only hard work and lots of sanding will do it – all joints must be smooth, and no ridges or bumps.

The tailplane is built flat on the building board in the same way as the wing. Sand the completed structure and add soft balsa tips, sanding to shape. Special attention must be made to the space between the ribs T1 as the fin slots in tight, but is not a force fit. Lastly cut out and sand the 3/32 in. sheet fin.

Before covering the model, assemble and check to ensure that all surfaces are true and free from bumps and the odd lumps of cement that can so easily happen!

Cover the entire model with lightweight tissue, and apply at least three coats of thin dope to seal the surface. Trim may be black tissue doped on – which gives a very pleasing effect without adding weight. The go-ahead modeller could dye his own lightweight Modelspan with Drummer or Dylon dyes to any of, say, 30 different colours!

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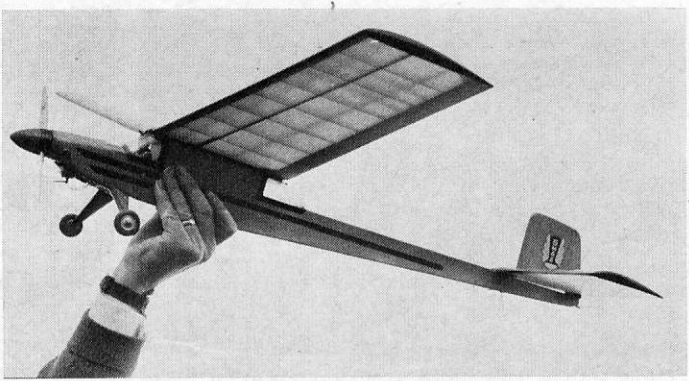

Now that the model is finished, add the pilot and thin celluloid windshields, plus the undercarriage fairings of scrap balsa sheet. The original used a Graupner pilot which was a little on the heavy side, but the head-and-shoulder type could be used. Woolworths is a wonderful place for such types and they only need a little trimming and painting.

It is far easier to leave these items until the model is finished as a 'tidy' cockpit appearance is well worth while. Trim the windshield outline in black and you are ready for flying.

Check that the centre of gravity is in the position shown and test glide, adjusting rudder if required. A wide left turn under power, quite fast, is the correct flight pattern – a little right rudder offset was all that was needed on the original model, flying in all but the worst of weather.