

Try this tough
48-inch low-wing
design for .75-l.c.c.
and enjoy hours of
trouble-free flying



By JOHN G. TRINDER

FOR SOME YEARS it has been apparent at various rallies that the majority of aeromodellers fight shy of low wing models. It is said that they are unstable and difficult to trim. The original Mudhopper, a somewhat functional design with constant chord wings and tailplane was built to prove that this need not necessarily be so. Moderate dihedral, coupled with a low C.G. and not too much power was sufficient to ensure stability and with these points in mind, the design was tidied up to produce the latest version presented here. Since the local flying field is rough moorland dotted with bushes and ringed with trees, a canal and factory areas, the construction of the model is somewhat robust and this has paid off on two occasions, when flights have ended in spiral dives following displacement of the tailplane from its keying. No damage resulted at all. The design incorporates torsion sprung undercarriage legs, and plug-in wings. The entire fuselage is covered with $\frac{1}{32}$ in. sheet which enables a good finish to be obtained as well as making it fairly fingerproof. The total weight of the original is $21\frac{1}{2}$ ozs. and it has an ancient E.D. Bee up front. This provides ample power to take the model up in wide gently climbing circles.

Assemble the basic fuselage sides over the plane, one on top of the other and allow to set. Before separating with razor blade, cut hole for wing tongue box. Place sides upside down over the plan and join together with $\frac{3}{32}$ in. square spacers and F.9. Glue bearers to ply formers F.3 and F.4, bolting the engine into place before the assembly has set to ensure a good fit when the model is completed. Make tongue box, periodically checking that the tongues are a tight push fit. Reverse the basic fuselage box and add formers F.7, F.8 and the bearer assembly. Bind tongue box with thread and insert in slots. Add $\frac{1}{4}$ in. fillets around box. Insert $\frac{3}{32}$ in. sheet from F.4 and F.9 on underside of fuselage. Bind tailwheel wire to F.13 and install. Shape lower cowling block, hollowing for cylinder head and making hole for compression screw and exhaust duct and fit in place. Add sides and top of exhaust duct. Shape side cowling blocks remembering to shape these to fit around the cylinder and bearers. Attach F.1 to front of cowl. Cement remaining upper formers into position and add stringers cut from $\frac{1}{16}$ in. sheet. Cover upper decking from F.3 to F.5 with $\frac{1}{16}$ in. sheet. The remainder of the top decking, the whole of both sides and the underneath of the fuselage from F.3 rearwards is covered with $\frac{1}{32}$ in. sheet. Note that where sheet needs to be rounded, wet the outside of the curve with damp cloth.

Carve upper cowling from block. Fit canopy support F.6 and add windscreen. Mould and fit remaining portion of canopy. If this moulding is not attempted, fit headrest as shown on plan. On the original, neoprene tubing is led from the air intake of the engine out through the bottom cowling to enable the engine to be choked without removing upper cowling. Insert paper tube at rear of fuselage retaining bands.

Shape main inner and outer wing spars from $\frac{1}{2}$ to $\frac{1}{8}$ in. balsa. Cement ply wing brace to inner portion and pin in place over plan. Add ribs W.1 to W.3, packing scrap $\frac{1}{16}$ in. sheet under these. Fit leading and trailing edge and top spar. Insert ply tongue and cement securely. Allow these panels to set securely before removing from plan. Fix outboard main spar and notched trailing edge over plan and add ribs W.4 to W.13, the leading edge and top spar. When set, join panels with dihedral brace raising W.14 $3\frac{1}{2}$ in. Cut leading edge sheeting slightly oversize and cement in place. Meanwhile bend u/c legs to shape and bind to front of ply spar. Cement this to balsa spar and insert the whole into position under inboard panel. Secure end of u/c leg to underside of wing tongue with thread. Apply coat of cement over all thread binding. Sheet top and bottom of inboard panel. Add ply end rib and hollowed wing tip. Sand L.E. to correct section. Solder piece of thin wire to u/c leg to prevent movement of fairing. Cement both halves of fairing into place. Cover remainder of leg with neoprene tubing. Secure wheel.

Construct tail in a similar manner to outboard wing panels. Add fairing block after tissueing. Shape tips from scrap block. Make two fins from $\frac{3}{32}$ in. sheet, letting in inserts as shown to prevent warping. Cut rudder in one fin only and hinge with metal strips cut from cocoa tin.

Sand entire model with fine sandpaper and when satisfied, cover wings with heavyweight tissue and the remainder of the model with lightweight. Cement fins and tail tip blocks to tailplane before tissue is water-shrunk or doped. Apply two coats of thinned dope over all followed by two thinned coats of whatever colour you decide upon. The original is black with white registration letters, $4\frac{1}{2}$ in. high on top and bottom of wings and $1\frac{1}{2}$ in. on fuselage sides. To obtain these, first draw them on ordinary paper. Slip two layers of lightweight tissue underneath this and cut around letters outlines. Resulting tissue letters are doped in place and give an easy line to follow. Finally, give entire

model a coat of good fuelproofener, paying special attention to inside of cowl and exhaust duct and the area where the exhaust duct comes out on underside of fuselage. Key the tailplane. This is most important as its position must not be allowed to alter. It is advisable to pin down the outboard wing panels and tailplane and allow them to set for a day or two.

Ensure all flying surfaces are unwarped and that the C.G. is in the position indicated. Launch into wind and using $\frac{1}{2}$ in. scrap, pack up T.E. of tailplane if the model tends to dive and the L.E. of the tailplane if it stalls, until the glide is shallow and straight. Next with engine at half revs., observe the pattern of the powered glide, correcting any tendency to turn right or to turn too sharply to the left with small amounts of opposite rudder. The prototype flew in wide left-hand circles under power and on the glide, without need of adjustment. The glide is sufficiently good that with slight life around, long flights are possible as was proved at the last "All Britain" Rally when on a 40-seconds engine run, the model covered the length of Radlett aerodrome. It is advisable to print your name and address on the wing tongues, just in case. One final plea. Please fit a pilot (the touched up head and body of a cheap celluloid doll will do) as scale and semi-scale models flying around with empty cockpits do look distinctly unscalish.