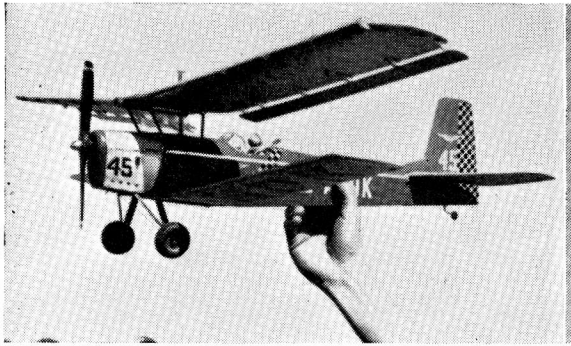

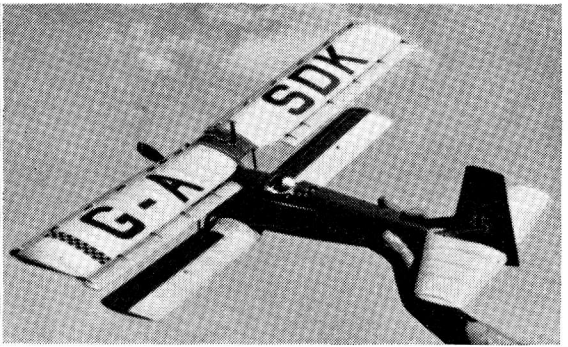

ENDEAVOUR

A Semi-scale biplane for .5-.9c.c. engines by S. KEMP

PREFERRING TO HEAR appreciative murmurs, rather than the usual "*Huh! look at this horrible thing Dad*", an attempt has been made to contrive a practical model of scale appearance, with Endeavour. But only after numerous pages of "Design for Aeromodellers" were worn out and many moons had come and gone, did the first reverberations of the power plant burst upon the neighbourhood, heralding a subsequent daily disturbance.

Endeavour has suffered many mods. during development, but the prototype is performing well in its present form with an inverted Mills .75 and repairs have not been called for frequently, despite its age of 8 years (almost senile).

Construction is quite normal; but first, do commence hostilities with a really sharp blade; plywood incision wears down the keenest of scalpels, so cut and carve all

balsa parts first then ruin the blade on the ply.

Bend main u/c leg over plan then bind in position on UB. Repeat for forward brace. Now invert UB on table and push main u/c legs rearwards out of vertical ($\frac{1}{4}$ in. at the axles). Now move over the forward u/c brace to contact the main legs but bend the last $\frac{5}{8}$in. of the forward legs so that on contact, it lays parallel with main u/c leg. Bind and solder. Make cross brace wires, but leave one looped end slightly open, thread other end on axle, now clip open end at root of opposite leg just above fairing position, now close loop. Repeat for second cross brace wire; fit wheels, cup washers, fairings, and the u/c is complete.

Two cabane struts are now bent over plan (true length shown dotted). For starboard struts, the dotted $1\frac{1}{4}$ in. ends are bent up perpendicular to the plan, the port strut ends are bent in toward the plan. Now overlap port and starbord $\frac{1}{2}$ in. bind and solder, and then make and fit cabane brace; now invert on table. Bend to shape FCS and RCS but do not form hooks yet (this is best left until the wing centre section is made and can be used as a guide). Locate in position $\frac{1}{2}$ in. from corners of cabane struts, bind and solder. Now file off binding on top of cabane struts to make smooth rest for wing centre section. Finally position assembly on EB and firmly bind in place.

The fuselage is started at the rear, cementing in rear fin tube while spacing sides at the correct taper by cementing in place F1 and 2 at the same time (holding while setting, with rubber bands or clips). Next F3, 4, 5 and 6 followed by 3/32 in. sq. strengtheners between F1 and F3 through F2. Lower wing runners WR are now fitted in place on inside of fuselage sides (coat edges well also; saves wear). Now firmly cement EB in place between sides but flush with top edge. Next the ply engine bay sides on inside of fuselage sides, but while setting, temporarily space sides at correct angle with unstuck UB (Lashings of bands at this stage again). Now cement UB very securely as it is the victim of shocks and great strain when coming in to land on the usual available tarmac. Resume the lashings. Time to try the noseblock for size, but don't glue, you haven't got the motor in yet. Previously marked fuselage sides at engine bay can now be removed. Fit the engine, and decide upon the tank type and fitting position. If, as with the prototype a Mills is used, a piece of fuel tubing can be fitted over choke tube to extend same and throttle assembly reset to starboard. Now cement F1A sheet balsa; top and bottom dowels, forward fin tube and metal cowling are fitted.

Tailplane is built directly over the mainspar that is pinned to the plan then trailing edge, ply strengtheners, ribs, L.E., tips, and finally centre section sheet are added.

On the fin, make sure the dowels are central on the mainspar, and fin strake, not forgetting to pack under T.E., for the same reason. See that lower part of FE clears rear fin tube on insertion into position. Sand dowels if at all tight, else damage may result on dismantling, but if already sloppy, thicken dowels with a film of cement and set aside to dry.

The wings will present no difficulty if the centre sections are built first. Upper wing TE is pinned to plan packing up with appropriate thickness. Pin down lower spar, now ribs, (don't cement W4 to centre section brace CS or DK yet). Next mainspar, then half-ribs, followed by LE up to W4 then tips. Now form dihedral of $6\frac{1}{2}$ degrees by packing up tip $1\frac{3}{4}$ in. under lower spar, and cement W4 to centre section, mainspar to CS brace, then leading edge of centre section; finally the $\frac{1}{8}$ sq. dihedral braces across W3 and W4 to W5. It only remains to cover centre section with sheet top and bottom.

Lower wing LE is pinned diagonally through to the plan and ribs are cemented to it, while supporting on each side with a pin near the TE end; next the main spar then TE up to LW5. Now add the half ribs. Form dihedral (from LW4). Finish off with dihedral brace, LE of centre section, and sheet covering across LW4s. The LE slats and TE flaps are attached after covering and doping the wings.

It only remains to sand, cover with heavyweight Modelspan, dope twice, and colour to taste.

Flying

You're ready to go, but wait—easy on the revs., to start with, there may be some resident gremlins about, that will require anti-warp tactics, to effect eviction.

With sufficient revs., Endeavour executes a perfect loop, but remember that the first one comes out perilously close to the ground!