

AT THE 1974 NATIONALS, the engine run for the  $\frac{1}{2}$ A power event was to be restricted to seven seconds' duration, instead of the normal ten permitted, while the flight maximum was reduced to two minutes, and so this model was designed with these factors in mind.

The restrictions seemed to dictate a fairly small model, but my findings with previous small-area  $\frac{1}{2}$ A class models suggested experimentation in other directions, as the result had been inconsistent glide performance. Using a variable incidence tailplane plus auto-rudder would probably be the ideal, but a simple, easy-to-build model was required, so an attempt was made to build VIT characteristics into a straightforward design. The idea was to have a reasonably sized model, climbing fairly straight, with a good pull-out at the cut-off stage. The thin, flat section, low pylon and large fin appeared to give the required climb characteristics, while the auto-rudder meets the good pull-out requirements. American experts have decided that moderate areas, combined with low aspect ratio wings with thin sections, give a good glide, coupled with a reasonably quick, viceless climb. Also, the three-piece wing system is quick to build, light and fairly rigid – considering the section.



# DOUBLOON

winner of the  $\frac{1}{2}$ A Power class at the 1974 Nationals, this 38 in span, straightforward design is ideal for high performance 0.049 cu. in. glow motors.

By EWAN JONES

It is possible to fly this design with a forward centre of gravity, which improves stability and glide, and practise has shown that a 70 per cent position seems to be about right.

Fortunately, the prototype seemed to have all the right characteristics, and with the usual adjustments to auto-rudder and tailplane packing it consistently turned in over two minutes on a  $6\frac{1}{2}$ -second engine run, increasing to 3:30–3:50 minutes with 9.5 seconds of power.

Construction is best commenced with the wing and tailplane, as it gives these components time to 'age' somewhat while the fuselage is being assembled, which all helps prevent the bogey of warps appearing. Also, the fuel proofer has a chance to fully harden – important if high nitro content fuels are to be used.

## Tailplane

This features very straightforward construction which hardly needs elaboration. The original was covered with lightweight, Modelspan tissue and given two coats of 50/50 dope and thinners, followed by a couple of coats of Ripmax *Tufkote* fuel proofer. Do not skimp the finish, as 50 per cent nitro exhaust spray will rapidly rot the wood and tissue, and add a lot of weight.

## Wings

Again, these are very straightforward to build, and the three-piece system cuts down building time quite a lot. Construct the centre section first, using PVA glue, and keep it pinned down flat on the board until it is nearly dry, then remove pins from the leading edge (apart from one at the extreme left hand of the LE) and packing-up the right-hand corner  $\frac{1}{16}$  in. to provide the necessary wash-in. Allow to dry for about a day.

Build the outer panels completely except for the spars, then sand LE and TE to the correct dihedral angle and epoxy to the centre panel; then add the spars. The ribs are made by chopping off the rear of a standard rib, and

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Ewan displays his contest winning design which features simple construction for rapid assembly. Only 'gadget' employed is the use of an auto rudder to provide good glide recovery after the power run. Moderately large wing area employed for consistent glide performance.

then trimming the underside so that the rear ends correspond with the trailing edge. The original wing was covered with lightweight Modelspan, and given four coats of 50/50 dope and thinners plus one coat of *Tufkote* fuel proofer all over, with a second coat on the underside of the wing just above the engine's exhaust. Do not forget the dowels to locate the wing on the pylon.

### Fuselage

Cut bearers to length, bolt to the engine and angle to give approximately  $2-3^\circ$  of downthrust. Add former F1. When dry, remove the engine and glue this assembly to the remainder of the fuselage. Add dowels and dethermalizer snuffer tube, as well as the D/T line guides. Cut out the auto-rudder, sew in place to provide a free-moving hinge and add all wire components.

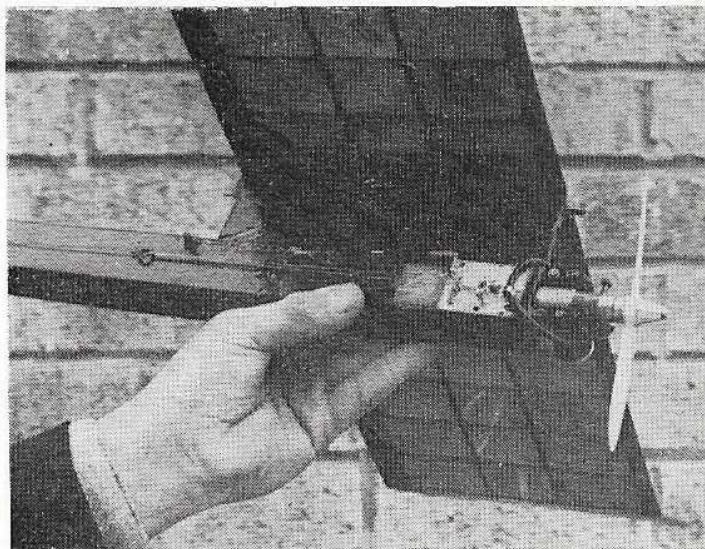
At the front of the model, cut out slots and add both tank and timer. Cut out the pylon slot slightly elongated.

Construct the pylon completely, finishing as per fuselage. Bolt engine and prop. to model, attach tailplane, attach wings to pylon, then insert pylon into slot and slide backwards or forwards until the correct centre of gravity position, and angle of attack is ascertained. In this way, the correct C.G. position can be arrived at with the model almost in flying condition.

After the pylon has been glued in place, finish the whole fuselage with two coats of *Tufkote*, then add the auto-rudder and D/T lines.

### Trimming

Pack up the LE or TE of tailplane until a reasonable glide is obtained from a gentle hand launch. The auto-rudder on the original was set at about  $\frac{1}{16}$  in. left for power, and about  $\frac{1}{8}$  in. right for glide, and comes in approximately half a second before the engine actually cuts.



Ewan is left-handed, hence the engine timer is mounted on the starboard side for ease of operation at launch, and engine is mounted to keep exhaust gases away from it - plan however shows these items reversed for 'normal' operation.

On the lowest power possible, launch the model with about a seven-second engine run; if in doubt, shorten the run and fly over nice long grass! The ideal is a slow right turn under power; if it tends to go straight or left, reduce left rudder. Too quick a swerve to the right, then add more left rudder. At the same time, watch the glide and aim for a wide right-hand circle. Do not cure a stall by tightening the turn: instead, add packing under the tailplane's leading edge.

On full power the model should climb steeply, turning slightly right, with about a quarter of a turn on 6.5 seconds of power and about half a turn on 9.5 seconds engine run.