

THE ROYAL TURBULENT



DOUG McHARD was commissioned to build a solid scale model of H.R.H. The Duke of Edinburgh's *Druine "Turbulent" King's Cup Air Race* entry. We are pleased to feature not only plans of this original model, but also Doug's **FULL SIZE** working drawings, and photo illustrated instructions, for building a **Bambi** powered free-flight replica of the same machine

THIS year, H.R.H. The Duke of Edinburgh, entered an aircraft in the King's Cup air race for the first time. The type chosen was the little *Druine Turbulent*, a French design built in Britain by Rollasons' of Croydon. The Duke of Edinburgh's Equerry, Sqdn. Ldr. S. de Milt Severne, A.F.C., piloted the machine and placed very well in the qualifying rounds, only to be defeated by high winds, which favoured the more highly powered aircraft, during the actual race.

Before the news of the Royal entry was made public I was commissioned to produce a 1/36th scale replica of the *Turbulent* which was presented to His Royal Highness, and from which the racing colour scheme was selected. 1/48th scale plans and photographs of this model appear on page 320.

Eagle eyed readers will spot one or two differences between the model's original decoration and the colour scheme eventually employed. The most obvious of these is the racing number disc which was subsequently enlarged.

After producing this little solid job, I thought how effective a F/F flying model would look and shortly afterwards built one around a D.C. Bambi.

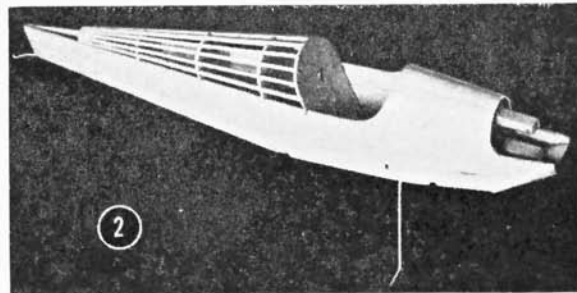
Full size plans are presented overleaf, and, together with the accompanying construction photographs, should enable any modeller of modest experience to produce his own King's Cup entry in miniature.

Construction

Build the fuselage first and start by cutting out all the formers, $\frac{1}{16}$ in. square crosspieces, both fuselage sides and engine bearers, from the material indicated on the plan. Before assembly

is started bend the undercarriage from 18 S.W.G. piano wire and sandwich it, with plenty of cement, between formers 4 and 6 using former sections 5 as locating and packing pieces. Allow to dry.

Cut the hardwood engine bearers accurately to the length indicated on the side view and note which is top and which is bottom. Drill the $\frac{1}{16}$ in. holes for the 8-B.A. engine mounting bolts and elongate them forward with a round "Abrafile" to enable thrustline



adjustments to be carried out later. The square engine bearer holes in formers 3 and 4 are intentionally off centre and the front face should be carefully noted. When the bearers are in position they will be offset to the right to give 3 deg. engine side-thrust and bring the propeller to the centre line of the cowl.

Thread the bearers through these formers and don't spare the cement!

Mark on each fuselage side the positions of formers 4 and 7. Cement the rear ends of the fuselage sides together, sandwiching between them the 18 S.W.G. tailskid, and hold with a rubber band.

Now cement former 7 in place and draw the two sides together at the nose, fixing formers 3 and 4 in position. Use rubber bands to prevent the sides from springing apart. Check the down-thrust angle of the engine bearers carefully on the side view before the cement dries.

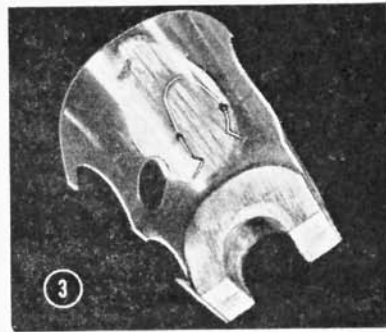
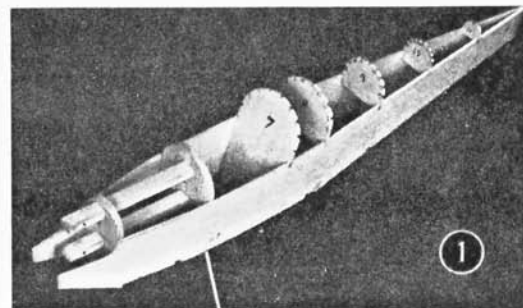
If the wood has been carefully selected, the fuselage assembly should be quite straightforward, but

should the side panels be rather difficult to bring together, they can be pre-bent by rolling a pencil along the inner side faces at former 4 position and between formers 7 and 8. Sight along the fuselage to make certain it is "square," insert formers 8 to 11, together with the lower $\frac{1}{16}$ in. square crosspieces and pin former 2 in position. This stage is shown in photo 1.

To complete the fuselage add the $\frac{1}{16}$ in. square hard balsa stringers to the rear decking and bend the upper nose decking to fit over formers 3 and 4. (see photo 2). Moistening the outside of the sheet will assist this operation.

The most intricate part to make is the removable engine cowl. Cut out two of former 1, cement together, cross-grained, and sand slightly to conform to the nose taper. Cut out the cowl from thin acetate sheet to the pattern shown, heat it and bend over a broom handle to the approximate section. Temporarily fit the engine and adjust the cowl openings to allow everything to "seat" nicely. Cement formers 1 to the acetate cowl, adjust the 18 S.W.G. cowl clip to grip the top engine bearer firmly and securely cement the scrap balsa fairing over it. (See photos 3 and 4.)

Now make the fuel tank (which represents the dummy starboard cylinder) from thin acetate. Heat a $\frac{1}{8}$ in. wide strip and bend it around a piece





Above: Instrument panel and modified windscreen of G-APBZ. Left: Position of Tiger Club badge on starboard fuselage side (G-APNZ). Right: The Royal Crest on port fuselage side below cockpit (G-APNZ).



of $\frac{3}{16}$ in. dowel to form a tube. Overlap the edges by about $\frac{3}{16}$ in. and cement thoroughly. Drill two $\frac{1}{16}$ in. holes for filling and fuel tube entry. Cut a $\frac{7}{16}$ in. diameter disc from acetate and cement over one end. Over the other end, cement a stouter piece of acetate $\frac{3}{8} \times \frac{7}{16}$ in. to form a mounting flange. (See drawing.)

Use plenty of cement and when thoroughly dry place the tank in position, and drill a hole in the flange for the engine mounting bolt. See photo 4.

The worst is now over! Construction of the wings is quite conventional. Pin the leading and trailing edges to the plan remembering to pin each side of the wood, not through it. Cement the wing ribs in position then the wing tip. When dry, cement the spar in the rib slots and add the $\frac{1}{32}$ in. sheet to the upper leading edge, holding in position with pins until the cement dries. Don't forget to tilt the root rib to allow for 1 in. dihedral at the top.

The tailplane is cut from $\frac{3}{32}$ in. sheet sanded to section and assembled to the rudder with the $\frac{1}{8}$ in. sheet fairing. (See photo 6 for completed framework details).

Cover all parts (except the fuselage underside) with lightweight tissue before assembly, and when this is completed the wings should be firmly cemented to the fuselage sides. The front face of the wing spar being securely cemented to the rear of former 6. Cut the leading

edge level with the fuselage underside and brace across the joint with a piece of $\frac{1}{8}$ in. square hard balsa. Make certain that the wing tips are packed up 1 in. at each side before the cement sets. When dry, cover the fuselage underside. Give one coat of clear dope and a thin spray of white dope over all. Fuel proof the front end of the fuselage at least, paying particular attention to the inside of the engine bay. Cement the windscreen in position and apply decoration.

If necessary add weights to the completed model until it balances level when supported at the wing spar. Attach the tailplane temporarily with a rubber band until glide trimming is completed.

Test glide, and adjust tailplane until a straight gentle descent is obtained. Now pin and cement the tailplane securely before power flying!

Fly first with low power over the longest grass you can find and cure any stalling tendency by tilting the engine down slightly. Cure turn by applying slight opposite rudder. The model should be trimmed to fly in left-hand circles under power, and glide to the right. The Bambi has lots of power for this model, particularly if the prop pitch is slightly increased over that recommended by the manufacturers, so treat it gently!

It's lots of fun to fly this model tethered round the pole in the clubroom too. Use at least a 4-ft. line attached to the right wing tip, which will need slight reinforcing, just behind the main spar and use left rudder to ensure that the line keeps tight. If you want to fly the model in the opposite direction then the left wing tip must be reinforced and right rudder used.

Why not run a club winter competition by building several *Turbulents* and running your

own King's Cup race? The models can be timed over say ten circuits each, or by limiting fuel capacity see who can get the most circuits from one tank.

Don't forget to open at least one window when running your indoor races; even a Bambi can produce a mighty anaesthetic atmosphere in a surprisingly short time!

By the way, you can see the original model on the M.A. stand at the National Models Exhibition where we shall be pleased to see you and answer your queries.

Full size 'flying' plans overleaf — $\frac{1}{48}$ th 'solid' plans and photos on page 320

