A HALF-INCH SCALE FLYING MODEL OF THE T.K.2

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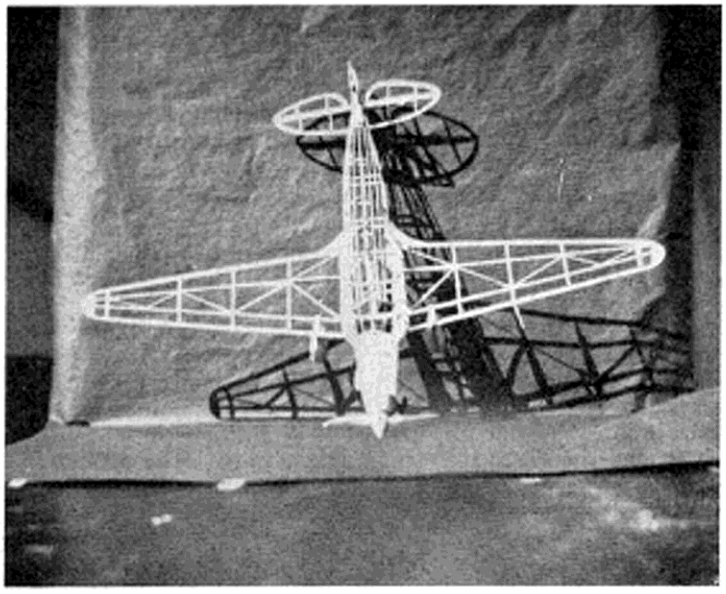

DESIGNED as a two-seat monoplane by the De Havilland Technical School, it was fitted with an extra tank in the second seat, and entered in the 1935 King's Cup Race. Fitted with a 140 h.p. high compression " Gypsy Major " engine, it was placed fourth in the final, at an average speed of 165·5 m.p.h.

Full size scale plans of this model are printed on pages 112, 113 and 115 of this issue.

Fuselage.

Build the lower part (in black) in the usual manner, direct on the side view. Build one on top of the other to ensure they are equal. The longerons, uprights and crosspieces are of well sanded $\frac{1}{16}$ in. × $\frac{1}{16}$ in. The diagonals of $\frac{1}{32}$ in. × $\frac{1}{16}$ in., placed in with the $\frac{1}{32}$ in. upwards from plan.

Carefully cut the two sides apart and place upside down, vertically, on the top view.

NOTE.—The " top " cross struts are halfway up the side (shown as white squares on plan), to allow rubber clearance. Put in all the cross struts and then trace and cut out the formers " A " to " H."

If one desires to fit a " step up " gear in nose such as a " Frog " assembly, the top struts may be put in usual position at top of longeron, since rubber shaft will be lower.

When all the formers are cut out and sanded smooth, strengthen " D " and " F " with $\frac{1}{32}$ in. × $\frac{1}{16}$ in. balsa cemented to rear face.

Mount formers " A " to " H " on top of fuselage or cement. Cut out a $\frac{1}{32}$ in. × $\frac{1}{16}$ in. main stringer and bend and steam to shape. When secure, fit all subsidiary stringers, of fine bamboo, in place.

Carve and sand a block to fit under cowl. Cement shaped exhaust pipes, cut from an ordinary drinking straw, to it. (See plan). Carve and fix tail-block and skid-block.

For all blocks use soft balsa.

Wing Anchorages.

To the rear of upright, below " C," and front of upright below " E," at position shown on plan (also see sketch), fix a piece of drinking straw with plenty of cement. When dry cut a piece of $\frac{1}{32}$ in. sheet shaped to fit (see plan) between the straws; use plenty of cement. Refer to the sketch for explanation.

Nosepiece.

Carve from medium balsa from dimensions on side, top and front views. Cut Z for good fit in open front. Drill not less than $\frac{1}{8}$ in. hole for shaft, and use a brass bearing bush.

Fin and Rudder.

Cut out spars and ribs, also leading and trailing edges from $\frac{1}{32}$ in. sheet. Put fin post in place *before* adding skid block, rig L.E. and add ribs. Make separately and fix to fin with aluminium rudder hinges.

Tail-plane and Elevators.

Size of main spars take from plan. Note the shape (though they can be made plain). Ribs, leading and trailing edges are from $\frac{1}{32}$ in. hard sheet. Construct separately, glueing leading (or trailing) edge to correct spar, and glue in ribs afterwards. Be sure the edges are true with the spars. Fix tail and elevators with aluminium hinges. Note type, if socketted spars are used.

Wings.

Leading edge, $\frac{1}{8}$ in. × $\frac{1}{8}$ in. shaped after construction. Trailing edge, $\frac{1}{8}$ in. × $\frac{1}{16}$ in. shaped before. Front main spar, $\frac{3}{8}$ in. × $\frac{1}{16}$ in., taper to $\frac{3}{16}$ in. × $\frac{1}{16}$ in. Rear $\frac{1}{16}$ in. × $\frac{1}{4}$ in., taper to $\frac{1}{16}$ in. × $\frac{1}{16}$ in. Ribs from $\frac{1}{16}$ in. sheet. Construction : Fix the two spars firmly into the largest (root) rib and cement. Next fix the L.E. and T.E. Fix the wing tips ($\frac{1}{16}$ in. sheet), cut the ribs vertically down the centre of the spar slots. Cement in each in three separate pieces. Rib " W.F." is from $\frac{1}{8}$ in. sheet, and shaped to suit undercarriage fillet. The webs between spars are of $\frac{1}{32}$ in. sheet, and make a wonderfully strong girder brace.

Wing Fillets.

Carve one right and one left hand from soft balsa block. The hump underneath front keeps it set square, and can be made separately and cemented to fillet.

Cut holes for dowel pins $\frac{1}{8}$ in. square balsa, which go through " straw " tubes.

Cement root rib to fillet, fix dowels to one side and make them a tight fit in the other. This will provide a safety factor in event of a " cartwheel " landing.

Landing Gear.

Digest plans. Carve centre from $\frac{1}{8}$ in. hard, add a $\frac{3}{32}$ in. lower shape on *each* side, sand the *inside* smooth, and add a $\frac{1}{16}$ in. lower full shape each side of that. Sand the outside to shape, drill centre *up* to top, fix an oversize piece of bamboo in. Add fillet to top (unless you carved it in with centre leg), make the wheels of 3 in. × $\frac{1}{8}$ in. discs, each $\frac{3}{4}$ in. diameter, well sanded and cemented. Fix on a pin axle.

Covering.

From " A " to " B " on fuselage cover first with bond (writing) paper; cover from L.E. to front spar same. Wash the emulsion from an old negative (ask a chemist how), and use to cover cabin. Cover flat sides first, then bottom, next each side of rounded top decking. Cover fin, rudder, tail and elevators separately. Cover wing underside first.

Colours, etc.

Colour left to builder; any two-colour scheme, such as red-yellow, red-silver. Use darkest colour for fuselage and fin, and lightest for wing and tail. All silver with red scalloping is ideal, as long as it is *neat*.

Identification numbers, etc., cut from black (or a contrasting) tissue, or paint with cellulose on kitchen greaseproof and stick on. Colour the noseblocks, etc., the same as fuselage and landing gear, and exhaust stubs black.

Erection.

Fix rudder to fin. Cement tail in place, and fit elevators to it. Fit struts under tail. Fix the landing gear with bamboo well dug in and cemented. Add pitot head scoop and venturi tube (coloured as bases).

Flying.

Pitch of prop. and power used will depend on weight of machine. Trials will tell.

Add lead (in nose or tail) until centre of gravity is at front main spar. Glide on few motor turns over (or in?) long grass until balance is correct.

Above all, read plans carefully.

Material for T.K.2.

Sheet.

One $\frac{1}{16}$ in. × 2 in. × 36 in. balsa (medium).
One $\frac{1}{32}$ in. × 2 in. × 12 in. balsa (medium).

Block.

5 in. × 1 in. × $\frac{3}{4}$ in. hard balsa for prop.
One 12 in. × $\frac{1}{2}$ in. × $\frac{3}{4}$ in. soft balsa for fillets, tail blocks, etc.
One 12 in. × $\frac{1}{8}$ in. × $\frac{1}{2}$ in. medium.

Strip.

One $\frac{1}{8}$ in. sq. × 18 in. medium.

Bamboo.

6 ft. of $\frac{1}{16}$ in. sq. × 12 in. for stringers.

Tube.

1 in. 20 S.W.G. brass Length of 20 S.W.G. wire.

Rubber.

6 yards of $\frac{1}{8}$ in. flat.
Tube of cement. One sheet of white tissue.
Small bottle of clear dope. Two $\frac{3}{4}$ in. dia. wheels.

Sundries.

Drinking straw, used negative or cellophane.
Strip of thin aluminium.