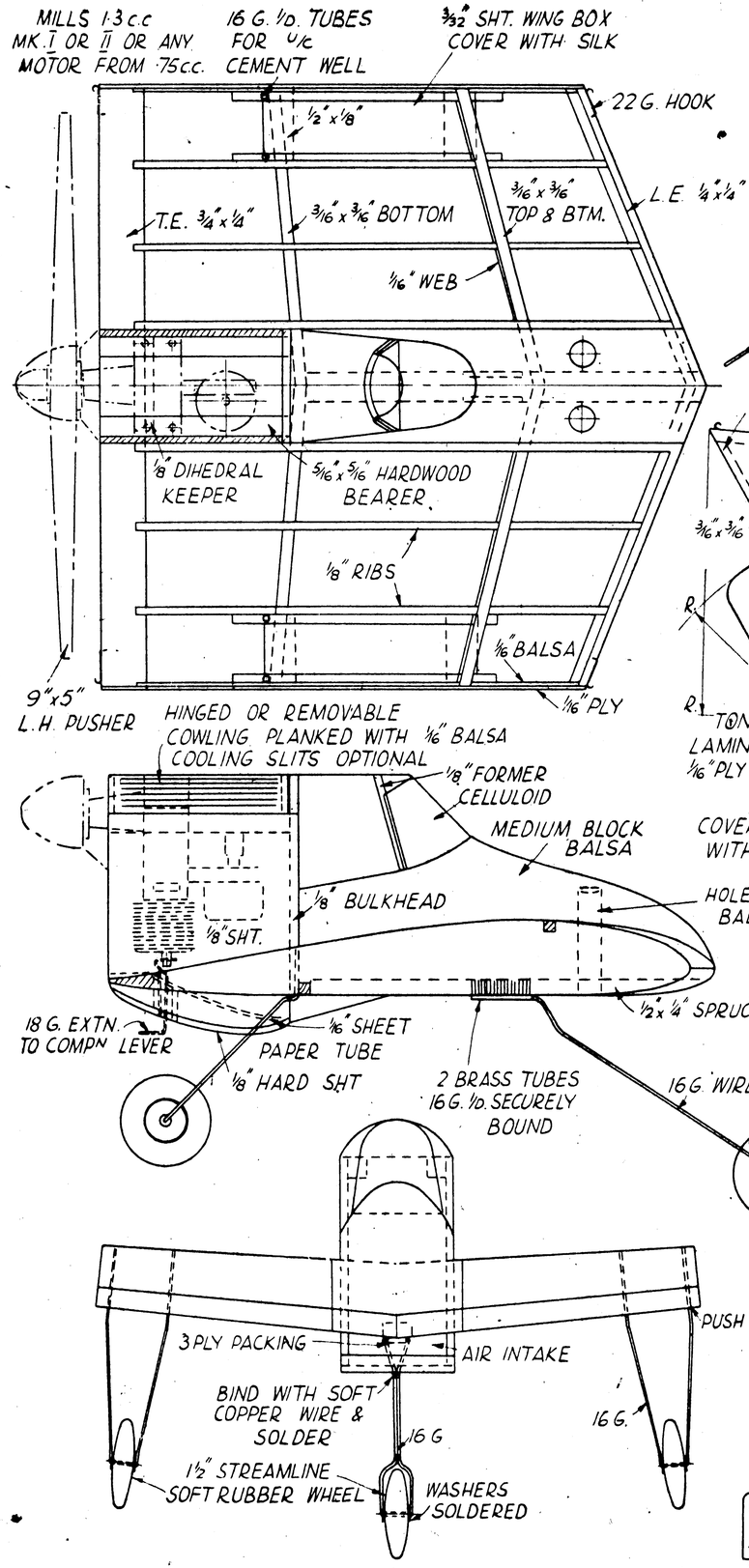
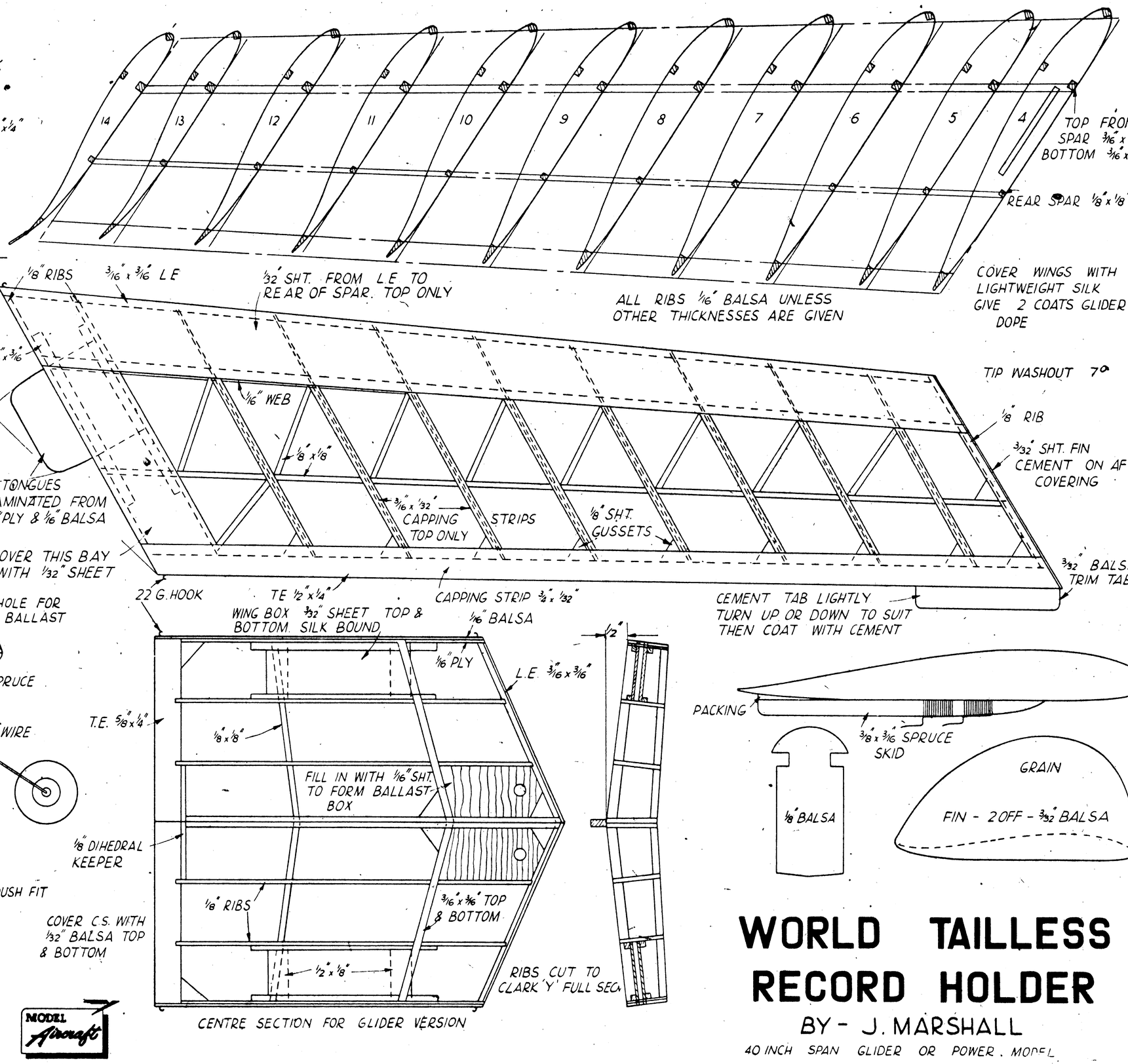
WORLD TAILLESS RECORD HOLDER

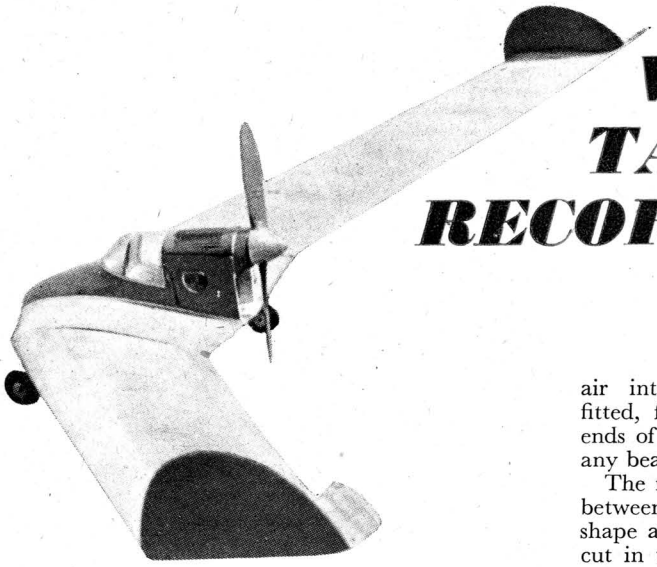
BY - J. MARSHALL

40 INCH SPAN GLIDER OR POWER MODEL

MODEL Aircraft







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By J. Marshall

THIS model was designed primarily as a duration contest model and is the result of experience with a long line of tailless models. To date its achievements are as follows :—

S.M.A.E. Tailless Contest, 1948 ... 3rd place
Isle of Man Rally, 1948, President's Cup 1st place
Isle of Man Rally, 1948, Phillips Cup ... 1st place
British Tailless Record Holder—1949.
World Record Holder (Category 111B)—1949.

Construction

Wing—First cut out a set of ribs for the outer panels, the slots for the spars, etc., being cut at an angle. Assemble ribs, spars, leading edge, and trailing edge on the plan. The latter is not slotted, but is cemented on to the ribs with the bottom surface packed up to continue the lower contour of the root rib (4).

Cement in the trailing-edge gussets and carve the trailing-edge to shape with a sharp knife. From ribs 4-8 most material is cut from the top surface. At rib 9 a symmetrical amount is cut from the top and bottom. From ribs 10-14 carve away the underside progressively and sand away a little of the top surface between ribs 12-14.

Pack up the tip rib to −7 deg. incidence and sheet the leading and trailing edges. This will maintain rigidly the washout. The diagonal struts prevent the wing from closing up like a trellis—a thing which heavily swept wings are prone to do !

Cover wings and dope the undersides. When dry pin down on a flat board and pack up to the correct washout angles. Dope the top surface and allow to dry overnight before removing from the board.

Centre-Section—The centre-section for the power version is assembled on the plan, ribs 1 being square to the board and the other ribs square to the spars. Cement in the sides of the engine bay to ribs 1. These side-pieces extend right through to form the air intake walls. The bulkhead may now be fitted, followed by the engine bearers. The open ends of the bearers can be sprung in to suit almost any beam-mounted engine of around 1 c.c.

The nose portion is cut from a block ; cemented between the ribs, then carved to a smooth curved shape and sanded well. A groove $\frac{1}{2}$ in. × $\frac{1}{4}$ in. is cut in the belly and the spruce member (with the undercarriage tubes attached) is let into it. Two holes $\frac{3}{8}$ in. diameter × $1\frac{1}{2}$ in. deep are made near the nose and $\frac{3}{8}$ in. diameter lead washers pressed in for ballast as required. The cabin is fabricated from thin celluloid sheet.

The wing tongues are retained by very small rubber bands passed round hooks. The bands can be made from slices of cycle valve tubing.

The glider centre-section needs little mention, but care should be taken to see that the dihedral angle is correct ; the boxes and the wing tongues being in line.

Trimming—This is very easy with engines of approximately 1 c.c. No thrust line adjustments having been found necessary, the original model climbing in an almost straight line with a Mills Mk. II engine.

The c.g. position will vary with the degree of washout used, but is designed to be at 60 per cent. of the chord at the C/L rib. Slight nose heaviness has been found to be more conducive to straight flight.

Care should be taken to adjust the tabs to give a wide right turn with torque, they may also need correction for variation in r.p.m.

Some ballast will be required in the glider version to conform to F.A.I. regulations.

Table of weights

Power version :	
Centre-section	4 oz.
Undercarriage	$1\frac{1}{2}$ oz.
Mills Mk. II engine (with prop.) ...	4 oz.
Outer wing panels	4 oz.
Total	$13\frac{1}{2}$ oz.
Glider version	
Centre-section	6 oz.
Outer wing panels	4 oz.
Total	10 oz.