



Your **FREE** Plan

**TYRO**

A 45 in span sports model  
for single or lightweight  
multi R/C

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**T**HE Tyro was designed with the basic aim of providing a model that was easy and relatively cheap to build and possess flight characteristics suitable for a beginner to be assured of reasonable success. I do not pretend that this is a supremely beautiful model or that it includes any revolutionary features, it is a simple honest design enabling the average aeromodeller to get in hours of enjoyable flying.

Of eight models of the Tyro that I know to have been built, four were flown by absolute novices to R/C. In all cases they received a satisfactory introduction to the sport through this design. Providing a reasonable amount of care is taken in the construction (including following the instructions) you should finish with a model that, although it cannot guarantee you success, will put you well on the way to accomplished R/C flying.

Familiarize yourself with the drawing and ensure that all stages of the construction of the aircraft are thoroughly understood. Cut out all sheet parts before commencing construction as this will save time at a later stage. P.V.A. glue is recommended for all the construction with the exception of engine bearer joints to the plywood formers, where Araldite should be used. The constructional design of this model is amply strong, and therefore, light grades of balsa wood can be used except in the maximum stressed areas. This will help to keep the complete weight to a minimum, care should also be taken in selecting wood of equal quality where paired, i.e. fuselage sides.

### Fuselage

Glue to the  $\frac{1}{16}$  in. sheet sides the  $\frac{3}{16}$  in. square longerons and uprights, the  $\frac{3}{8}$  in. nose doubler and  $\frac{3}{16}$  in.  $\frac{1}{2}$  in. wing platform doubler and  $\frac{3}{16}$  in. lower fuselage doubler. When the sides are thoroughly set, mark out the positions and glue on the engine bearers, pre-drilled to receive engine plate, making sure that these line up with one another.

Glue formers F.1, 2, 3 and 4 in position to both sides together with the full width  $\frac{3}{16}$  x  $\frac{5}{8}$  in. cross members. Ensure that all formers are square and left aside until set. Bring together the rear ends of the fuselage sides and glue into position the  $\frac{1}{2}$  in. square end block, making sure that both sides have an equal curvature. Add the remaining cross members followed by the top and bottom  $\frac{1}{8}$  in. ply,  $\frac{1}{8}$  and  $\frac{1}{16}$  in. balsa sheeting. Bend from 16 s.w.g. piano wire the tail skid. Sew to  $\frac{1}{16}$  in. plywood and glue to the underside of the fuselage as shown.

Fit the scrap of T.E. stock to the top of the cabin area and the  $\frac{1}{2}$  in. sheet to the cabin front. Sand the whole fuselage thoroughly and apply sanding sealer, sanding between coats until a perfectly smooth finish is obtained.

### Undercarriage

Cut the undercarriage blank from 16 s.w.g. Dural and bend by heat treatment. Drill to receive 6 B.A. or 4 B.A. wheel bolts—these should be high tensile steel bolts. Alternatively, the undercarriage can be constructed from 12 s.w.g. piano wire and faired with  $\frac{1}{8}$  in. balsa.



Whichever way you see her, Tyro is a neat, purposeful R/C design, capable of giving long and useful service. Prototype used Mills 1.3 motor.

## Wings

Wings are constructed in two sections and joined together with dihedral braces. After soaping the drawing, pin down a piece of  $1 \times \frac{1}{8}$  in. trailing edge. Cut  $\frac{3}{8}$  in. square hard lower spars to length and pin in position.

Glue  $\frac{1}{8}$  in. and  $\frac{3}{8}$  in. wing ribs in positions shown and check that all are vertical except for the root rib which should be angled from the root rib template. Glue the top spar in position. Fix the top trailing edge in position and glue the leading edge in place. When dry remove from the plan and add  $\frac{1}{8}$  in. sheet vertical webbing from top to lower spar. Sheet in the upper surface of the wing from the rear of the top spar to the leading edge and from root rib to tip. Add  $1 \times 1$  in. soft balsa tips and sand together with the leading edge to smooth contour.

Construct the second panel in a similar manner.

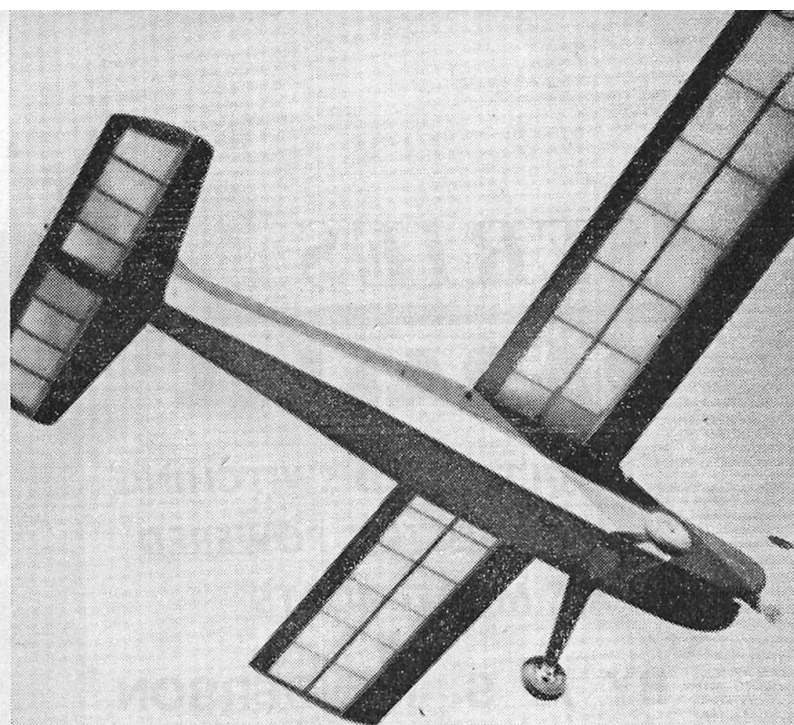
When both panels are set, cut slots in the first three ribs to receive the dihedral braces. Check these for accurate fit and then glue into position on one wing panel. When dry, add the second wing panel to the projecting dihedral brace, glue thoroughly and pin down. Prop up the opposite wing tip to  $5\frac{1}{2}$  in. to obtain the correct dihedral angle. Hold firmly in position until dry, pinning the two root ribs together. Sand and prepare for covering and glue trailing edge stock reinforcement.

## Tailplane

Construct the basic frame from  $\frac{1}{8}$  in.  $\times$   $\frac{3}{8}$  in. and  $\frac{1}{8}$  in.  $\times$   $\frac{3}{4}$  in. strips and  $\frac{1}{8}$  in. T.E. stock as shown on plan, remembering to prop up T.E. to allow for symmetrical section. When dry remove from plan and add  $\frac{1}{8}$  in. square to rib position and  $\frac{1}{8}$  in. sheet to centre section on aerofoil section.

## Fin and rudder

This is straightforward construction of  $\frac{1}{8}$  in. square and  $\frac{1}{8}$  in. sheet sanded to slightly tapering T.E.



and rounded L.E. The rudder and trim tab are from  $\frac{1}{8}$  in. sheet, the rudder having sewn hinges to the fin and the trim tab fixed with aluminium hinges.

## Covering and finish

The model should be covered in lightweight nylon for maximum strength although heavyweight tissue is satisfactory. Pin down all flying surfaces with dope to prevent warps. Colour dope should be kept to minimum as this represents wasted weight, but the model should be thoroughly fuel proofed to avoid seepage of fuel into the structure, particularly in the fuel bay. A 1 oz. polythene "clunk" fuel tank should be used.

## Test flying

Once the engine and radio equipment has been installed and everything tested and operating 100 per cent it is time to consider flying.

Providing the C.G. is correct, there are no warps and the incidences are as shown, there should be little to worry about. There should be no need to test glide. Have the engine running at least at three-quarter power and launch straight and fairly fast. Rudder movement should be restricted to about  $\frac{1}{4}$  in. either way. Trim out turning tendencies on the glide with trim tab and turn under power with side thrust. Adjust elevator trim with  $\frac{1}{2}$  in. packing according to wind conditions and penetration required.

Your Tyro should give you many hours of enjoyable and trouble free flying providing you always check thoroughly your model, equipment and flying area before each flying session.

View of the radio compartment of prototype model showing placement of batteries, MacGregor Minimac receiver and Elmic Conquest Escapement.

