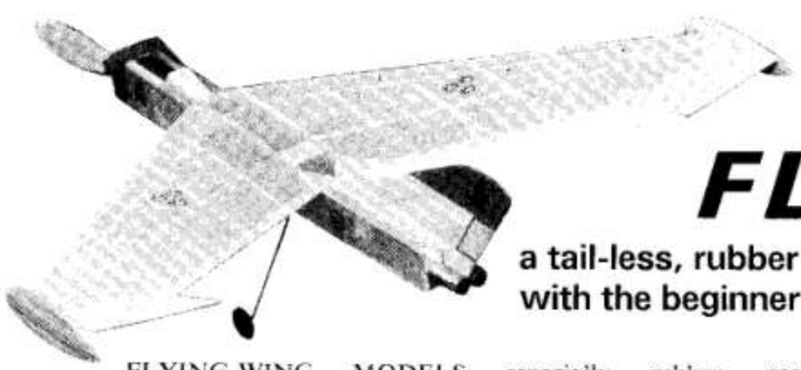


FLI-WING

a tail-less, rubber powered sportster, designed with the beginner in mind by . . .

RAY MALMSTRÖM

FLYING-WING MODELS, especially rubber-powered ones, seem to be a rather neglected type. This is rather a pity, because a flying-wing model will fly as well as any other more orthodox model aircraft – moreover they are delightfully stall-free when correctly trimmed. Because of their different 'profile' in the air flying-wings always attract attention on the flying field, so if you are feeling in need of a bit of attention!! – and some real flying, here is *Fli-Wing*, designed with YOU in mind.

Fuselage

Build two identical fuselage sides over the plan. Add 1/16 in. sheet pieces A.B.C.D. and gussets E.F. (Sketch 1); join fuselage sides with cross-pieces (see plan). Use a set square to avoid twists – Sketch 2. Add pieces G.H.J.K.L.M. and end-plate N. Cover with lightweight tissue, leaving open at wing position, and under bay at end for rubber motor access. Water shrink and give one coat of clear dope, thinned 50%.

Form the main undercarriage from 20 s.w.g. wire, bending the top portion, preferably in a vice, to give the backward angle to the legs. Fit lightweight 3/4 in. diameter plastic wheels, retained by a piece of tight-fitting electrical plastic tubing, or a blob of cement. Form the nose wheel leg in the same way. Cut a small wheel from 1/4 in. sheet balsa, sand to section, give two coats of dope, and retain on leg as for main undercarriage. The undercarriage units are cemented to pieces J.K. and retained in position by three layers of tissue doped on. Insert a length of 1/16 in. diameter dowel through holes in piece D. The cockpit canopy can be cut (as we did on our original *Fli-Wing*) from the end of a clear plastic toothbrush container or use a small commercial bubble canopy.

Fin

Cut from 1/16 in. sheet. Round edges and give one coat of clear dope. Cement to fuselage pieces L.M. and plate N. Cut and shape from block the two exhaust tubes P, and cut off a rear piece from each (Sketch 3). Hollow out the main section tubes and give a coat of clear, then silver dope. Cement exhaust tubes to end plate N. Do not cement rear piece onto tubes at this stage.

Noseblock-propeller Assembly

Cut noseblock (Q) and spigot (R) from 1/4 in. sheet. Cement together, drill to take a length of aluminium or brass tubing (internal diameter to fit 18 s.w.g. wire). Cut two 1/32 in. ply discs, and cement to front and rear to lock tubing in place (Sketch 4). Give noseblock three coats of clear dope, after sanding to shape. Bend a winding hook at the end of a length of 18 s.w.g. piano wire. The original model uses a *Veron* 5 in. diameter balsa propeller. These propellers are ready carved, and only require the back of the blades to be sandpapered a little to give a concave section, reinforced through the centre hole with a short length of aluminium or brass tubing, and given three coats of clear dope, sanding lightly between each coat. Unfortunately, these props are now no longer made, although your local shop may still have some in stock. As an alternative the *KeilKraft* 5 in. diameter plastic prop may also be used. Mount the propeller on the 18 s.w.g. length of wire, slip on two cup washers and finally the noseblock. Then form the hook for the rubber motor. Add a drop of oil to the propeller shaft and make sure it revolves freely.

Assemble the free-wheel as shown on the plan. Fit the noseblock propeller assembly in place, making sure that it is a good push fit, but not *too* tight.

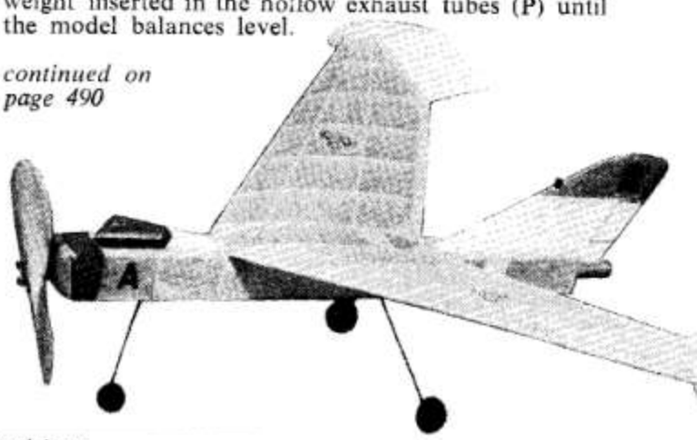
Wing

The wing is built in two outer panels and a centre-section which are constructed over the plan. Use the 3/32 in. sheet wing rib jig to obtain the correct incline of the wing panel roof ribs (R1-Sketch 5). Assemble completed panels to centre-section, noting reinforcing piece S on centre-section. Use the wing dihedral jigs (3/32 in. sheet) to ensure that you have equal dihedral under each wing tip – Sketch 6. Sandpaper leading- and trailing-edges to correct section. and cover with lightweight tissue, water shrink, and give one coat 50/50 dope and thinners. Pin each panel, raised on small balsa blocks, to the building board while drying to avoid those old enemies – warps! Cut two ailerons from thin card, score lightly along the dotted lines, and bend to the angle shown on the side view, and cement to the *undersurface* of the wing tip trailing edge. You may have to adjust the angle of the ailerons during test flying but the angle shown is the one we have on our original model. Cut the tip fins from 1/16 in. sheet, round edges and give one coat of clear dope. Cement tip fins to wing-tip ribs (R7) as shown in Sketch 7. Cement completed wing in place.

Balancing

Before balancing *Fli-Wing* make up a 9 in. loop of 1/16 in. flat rubber strip, lubricate well, and install between the propeller drive hook and rear dowel rod. To balance the model tie a length of cotton to a pin, and push the pin into the centre-section piece S at the Balance Point shown on the side view. Add weight inserted in the hollow exhaust tubes (P) until the model balances level.

continued on page 490



FLI-WING

continued from page 486

Flying

Carry out all glide and power-on flight tests over long, or soft grass, on a calm day. Trimming is carried out by altering the angle of the ailerons. Bend the ailerons up slightly to correct a dive, lower them slightly to correct a stall. Turn adjustments are effected by raising the aileron on the same side as you require the model to turn. Right aileron raised for right turn, left aileron raised for left turn. With a satisfactory straight glide achieved, wind on about 150-200 turns on the test motor. *Fli-Wing* should climb away, make a short flight and come in on a flat glide. If the model stalls under power insert a 1/32 in.-1/8 in. square strip along the top of the noseblock. If it dives insert a 1/32 in.-1/8 in. square strip along the bottom of the noseblock. Under power *Fli-Wing* may (ours did not, by the way), turn sharply to the left under torque (model viewed from the rear). If so add a 1/32 in.-1/8 in. strip to the left-hand side of the noseblock as shown on the plan.

With satisfactory flights on the test motor, you can now discard it, and install the flight motor. This is two loops of 1/8 in. flat rubber strip, 14 in. long, or one loop of 1/4 in. flat rubber strip, also 14 in. long. Well lubricated and run-in, these motors should take about 600 turns. Take your time trimming your model, and in a very short time you'll be 'flying on a wing' – and no prayer necessary!