

I sheet 1/32 in. medium.

sheet 1/16 in. medium (all 1/16 in. strips are cut from this).

I sheet 3/8 in. medium.

I sheet 3/32 in. hard.

I sheet $1/8 \times 12$ in. long, medium.

5 strips 1/8 in. square, hard.

MATERIALS LIST

16 S.W.G. wire, 18 in. long.

18 S.W.G. wire, odd scraps.

20 S.W.G. wire, 8 in. long. Scraps of 16 and 18 S.W.G. brasstubing.

16 S.W.G. thrust race.

2 16 S.W.G. brass bushes.

2 3/4 in. bobbins. 1 3/4 in. double bobbin. Tinplate, Celluloid, Lightweight Modelspan, Japanese tissue, Cement, Dope, Rubber.

2 lengths 1/4 in. square hard.

18 in. of 3/16 in. square hard.

FULL SIZE WORKING DRAWINGS ARE OBTAINABLE FROM YOUR LOCAL DEALER, OR BY POST FROM THE "MODEL AIRCRAFT" PLANS DEPART-MENT, 19-20, NOEL STREET, LONDON,

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KARIN

by R. LINTON

A contest winning rubber model with eye-catching lines. Build it with the help of these detailed instructions.

Fuselage

THIS is quite straightforward. Selecting hard, straight-grained stock, pin the two main longerons on to the side-view of the plan, placing the pins on either side of the strip and not through it. The lower longeron will have to be spliced near the tail to make up the length. Cut four nose pieces from 1/8 in. hard sheet, making sure that they are all identical and add one to the longerons and also the tailpiece and motor mount. Now simply fill in the Warren spacers. Sandpaper the upper surface when it is dry, cover with greaseproof paper and then build the second half over it. Separate the two halves and add the ply facing to the motor mounts. Prepare two of the formers "A" and cement them to one fuselage side, checking their alignment with a set-square. When dry, cement the other half on to the formers, checking the alignment of the nose sections as before. Cement the two remaining nose pieces on to one section of the nose and, once they have dried thoroughly, draw the whole nose together and cement well, binding with cotton thread. Add the spacers.

Make up the pylon sides as for the fuselage and assemble them over the top view of the fuselage with four horizontal spacers. The forward fairing comprises two semi-circles of 1/32 in. sheet and a wall 1½ in. deep the rear fairing is a simple triangular box. The pylon is cemented onto the fuselage and

the fairings then added.

Form the outline of the fin from $\frac{3}{16} \times \frac{1}{16}$ in. strip and the ribs as detailed on the plan. It will be seen that the ribs are divided, one half being $\frac{1}{16}$ in. deeper than the other and slotted at the ends. These deeper sections are pinned on to the outline on either side of the spar. The rib F.1 should be checked with a set-square, as the alignment of the fin on the fuselage depends on the accuracy of the rib setting. Remove the finished part from the building board and add the remaining ribs.

The spacers above and below the fuselage at the tail should be slotted to receive the fin mounts; these are simply strips of $\frac{1}{16}$ in. let-in flush with the top and bottom surface of the

fuselage.
Wings

Carve the trailing edge section before assembly, but leave the leading edge until afterwards. Pin the edges on to the plan, propping up the inner faces with 1/32 in. (L.E.) and $\frac{1}{16}$ in. (T.E.). Add the ribs and the upper spars and taper off the edges at the tips, ready for the tip winding. Place modelling pins along the inner outline of the tip, apply cement to the edges and bend the first strip of $1/32 \times \frac{1}{16}$ in. around them, pinning this in place. Once this has set, apply cement to the strip and add the next one, pinning this in place, repeating until the fine laminations are complete.

Cut the dihedral braces from 1/32 in. ply, cut through the wing at the dihedral break, prop up the tip to its dihedral of 3 in. and cement in the braces on either side of the upper ribs. When dry, remove it from the board and add the lower spars. Prepare the other wing panel in the same fashion and join the two panels together, giving a dihedral of 1 in. under each inner panel. The tips should now be carved to a smooth curve, to meet the lines of the edges in side view, and the L.E. carved to shape.

The webbing utilises 1/32 in. medium sheet, in panels $\frac{5}{16} \times 1$ 11/32 in., but the latter dimension should be checked in every rib space, as the gaps are unlikely to be exactly equal. It is important that the grain be vertical.

Tailplane

Quite simple. Shape the trailing edge prior to construction, then pin down the two edges and add the ribs. As the section is flat-bottomed, there is no need to pack the edges during construction. Remove from the board and add the lower spar and 3/32 in. tip plates (these are the same shape as the rest of the ribs).

Propeller

This is where the fun starts! Prepare a block $3 \times 10 \times 1\frac{1}{4}$ in. from $\frac{2}{3}$ in. and $\frac{1}{3}$ in. medium sheet and cut it diagonally across its broadest face. Join the two triangular pieces end to end with scrap block as shown in the sketches and you are ready to start carving. A diagonal across the end of the block is the pitch angle; hack away the block on either side of this line with saw and knife, to leave a blade about $\frac{1}{4}$ in. thick. Before touching the roots, drill a shaft hole for a 16 S.W.G. bush and another hole for a 16 S.W.G. tubing $\frac{2}{3}$ in. to one side of it. This completed, mark off a root section $2\frac{1}{2}$ in. long and carve it to $\frac{2}{3}$ in. deep,

leaving the rear face flat. Cut the undercamber in the blades—3/32 in. (a power drill and a fine sanding disc are a great help at this stage), place the blade template against the undersurface and cut out the blade pattern. Carve the upper surface, leaving the blade 3/32 in. thick at the most and tidy up the roots.

Cut a piece of tinplate ½ × 3 in. and drill it as for the prop centre. Cut two ½ in. lengths of 18 S.W.G. brass tubing and roll the ends of the tinplate round them so that they lie 1½ in. from the centre and perpendicular to the sides of the tinplate then solder securely. This plate is now bound tightly to the rear of the prop hub, and lavishly cemented. (Make sure that the holes

line up correctly!)

The hinges are cut from 18 S.W.G. wire, bent to the shape shown in the plan. Four are prepared, two per blade. One end of each is fitted into the brass tubing, while the other is pushed into the prop root and bound in place with cotton and cement. The blades can now be cut away from the hub at the hinge point. Screw a brass bush into the centre from the back and bush the eccentric hole with 16 S.W.G. brass

tubing

Prepare a freewheel clutch from 16 S.W.G. wire to the shape shown and wind the clutch loop onto the prop shaft. (Do not bend the bobbin mount on to the shaft yet; you've got to get the noseblock on!) Make up the noseblock from three laminations of 3 in. sheet, drill for a 16 S.W.G. bush and face the forward end with a tinplate disc of 13 in. diameter. A small hole is drilled in this to engage the freewheel clutch. On to the prop shaft thread the prop, a thrust race and then the noseblock; fit the clutch and engage it with the shaft; there should be a space between the end of the clutch and the tinplate disc, so that the prop can rotate freely. When it disengages, it should touch the disc; a spring of about 30 S.W.G. wire will push it down on to the plate so that it engages in the hole in the latter.

The action of this is as follows. Once the motor has run down, the propeller free-wheels and the clutch drops on to the disc. As the prop rotates, the clutch locks into the hole in the plate and stops the propeller, which then folds. The hole

is placed so that the blades fold neatly along the fuselage sides

With everything threaded on to the shaft, bend the latter into the shape shown on the plan. For the bobbin assembly, take two \(^3\) in. bobbins and a short length of dural or aluminium tubing, on which they will be a fairly close fit. Make a loop in a piece of 18 S.W.G. wire to fit the tubing and bend it to the pattern shown. Fasten a piece of 16 S.W.G. brass tubing on to the horizontal end of the wire with fuse wire and solder it well. This joint must be strong, as all the tension of the

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serves at the tail end.

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rubber is going to be applied to it. Thread this wire on to the dural tube and glue the bobbins on either side of it with Araldite. A double bobbin

and tail with Japanese tissue.

Finishing Cover the fuselage and prop with lightweight Modelspan and the wings

The fin structure is rather prone to warp and this is conveniently utilised in rudder effect: dope the starboard side first and let it dry before doping the rest this will produce a ghastly corkscrew effect on the fin, which in turn produces

a desirable corkscrew effect on the

Pack the nose with ply for the thrust offset: 1/2 in. down, 1/32 in. starboard. Power is 12 strands of 1 in. rubber,

well as the warp.

30 in. long. The rubber is made into two ropes of six strands and slung on the

climb. Add a trim tab to the rudder as

rear double bobbin. Each rope is pretensioned separately (80 turns) and the two ropes then looped on to the

motor shaft and allowed to tie themselves The centre of gravity is left just where

it happens to be when the model is ready to fly; I adjust my c.g.'s to suit the model, not vice-versa.

Trimming

in knots.

Put some tension on the rubber and test glide over the usual long grass.

conventional folding systems.

glide will cause no trouble with the

Play about with the tail incidence until

the glide is just on the stall. Now put

about 100 turns on and let her go. If

there is any tendency to spiral in to the

right, patch up the nose section and

remove some of the rudder trim. Work

up to about 75 per cent. turns in this

folding mechanism employed, there being no jerking as there can be with the

thrust and curb the power stalls with sidethrust. The final pattern should be a fairly slow, shallow helix, the model climbing on the wing rather than on the prop. Transition from power to

way. Power stalls are cured by downthrust and right spirals by reducing the rudder. If the latter part of the climb should deteriorate, reduce the down-