

SCALE
QUARTER FULL-SIZE

Trailing edge of
 $1/16 \times 1/2 \times 1/16 = 1''$ balsa

14 s.w.g. push rod

Control horn
(steel or nylon)

$1/2''$ balsa engine
bearer extensions

$3/8''$ thick Styrofoam
ceiling tiles

Nylon reinforcing strip

$1/8''$ hard balsa T.E.
extension

$1/8''$ medium/hard
balsa elevator

Nylon
hinges

Soft balsa tips

$7 \frac{5}{8}''$

20 s.w.g. lead out
wires

$3/4$ oz. balance
weight in right
tip

To suit
crank case

STYROBAT
DESIGNED BY PETER SHORT

Bearers and
posts - $1/2''$ sq. beech

$1/2 \times 1/8$ light/medium
balsa spar

Leading edge
laminated from
 $3/8 \times 3/4$ balsa
medium hard

$1/16''$ ply reinforcing
top and bottom

$1/16''$ ply bell-crank
mounting plate

$2 \frac{3}{4}''$

$2''$ bell-crank with
6 B.A. pivot bolt

Feed pipe

Fuel tank

$1/16''$ balsa lining in tank
bay

tear lumps out of the material, unless great care is taken.

Hot Wire Cutter

The best method is to use a hot wire cutter, (fig. 1) this can be made with a piece of resistance wire about 16 in. long (obtainable from any radiospare shop), bending it in half twice (giving a length of about 4 in.) and twisting the four strands together. Solder a length of twin

CEILING TILE COMBAT MODEL

flex to each end of the resistance wire, wrap the joints with insulating tape, and stretch the wire in a fretsaw in place of the blade, taking care not to short-circuit the wire to the metal frame of the saw. The resistance wire is connected via the twin flex to a supply voltage of about 6 volts (preferably from the mains through a step-down transformer, if available, although a battery will do providing the circuit is broken after each cut, to prevent excessive drain on the battery). The tool cuts best when the wire is at dull-red heat. If the wire is too hot, add a strand; if it is too cold, remove one.

Finishing

Nylon is the best covering medium and its extra weight compared with heavyweight tissue, is not detrimental to the performance as the uncovered model will be lighter than a comparable model using traditional construction. P.V.A. white glue should be used to apply it, although balsa cement/dope could be used providing care is taken not to allow this to come into contact with the styrofoam. The covering must be applied as taut as possible due to the fact that dope cannot and must not be used for shrinking or filling the pores. Tissue can, of course, be water shrunk.

Give the entire model one or two coats of emulsion paint of the desired colour to fill the pores, add trim with enamel paint, and fuel proof the entire surface.

Materials Required

Balsa One sheet $1/2$ in. x 3 in. x 36 in. hard. One sheet $1/2$ in. x 3 in. x 36 in. medium/hard. Two strips $1/2$ in. x $1/2$ in. x 36 in. medium/hard. One strip $1/2$ in. x $1/2$ in. x 36 in. light/medium. Scrap $1/2$ in. sheet 6 in. x 2 in. and triangular fillets behind bearers. Soft block for tips. **Plywood** Two pieces 8 in. x 7 in. x $1/16$ in. One piece $2 1/2$ in. x $2 1/2$ in. x $1/16$ in. **Hardwood** Two lengths $1/2$ in. x $1/2$ in. x $9 1/2$ in. beech. Three lengths $1/2$ in. x $1/2$ in. x $1 1/2$ in. **Styrofoam** Three 1 ft. x 1 ft. x $1/8$ in. thick ceiling tiles. **Miscellaneous** $1/2$ oz. lead tip weight. Two 21 in. lengths 20 s.w.g. piano wire. 8 in. 16 s.w.g. piano wire. Coleman's Mustard tin. $1/4$ in. copper for tube. Scrap brass tube for leadout guides. 2 in. bellcrank. Steel or nylon control horn.

STYROBAT was intended to present a radical change in model design. The shape is very similar to current combat models for it was thought that use of a proven shape of known performance would illustrate any increase of the advantage of lighter and stronger construction.

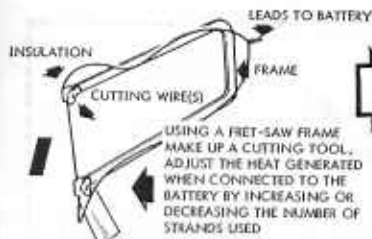
Materials

The moulded expanded polystyrene wing is not new in the field of aeromodelling, but home-made mouldings are difficult to produce accurately. Styrobat uses three ordinary styrofoam ceiling tiles $1/8$ in. thick and one foot square, with the minimum of cutting and shaping. The weight of these tiles is negligible compared with the weight of a set of ribs, which they replace, and they cost only two pence, at 6d. to 9d. each.

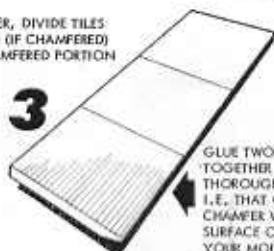
Adhesives

It must be stressed before commencing construction that only a limited number of adhesives can be used. Balsa and polystyrene cement, as well as "Bostik", "Evostik" and "Durofik" are quite unsuitable, and a P.V.A. white glue or special E.P. adhesive should be used for best results. Only wood to wood joints should be suitable for these adhesives. Engine bearers and spacers should be "Araldited" in place. Similarly, cellulose or butyrate based dopes should not be used when finishing the model.

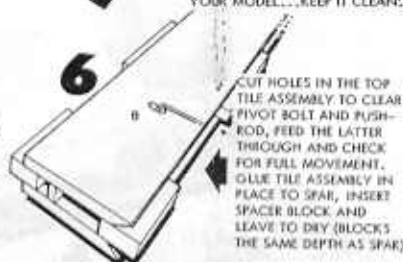
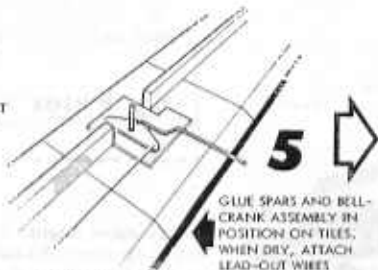
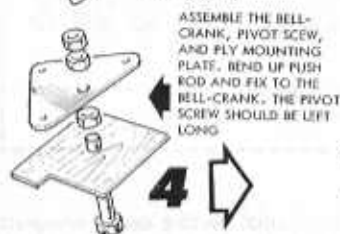
Firstly, the styrofoam panels should be cut to size. All that is necessary here is to cut each tile exactly in half, forming six pieces each 6 in. x 12 in. These could be cut using a sharp knife or razor blade, but this tends to



USING CUTTER, DIVIDE TILES IN TWO AND (IF CHAMFERED) REMOVE CHAMFERED PORTION



GLUE TWO SETS OF THREE TILES TOGETHER AND ALLOW TO DRY THOROUGHLY. THE FLAT FACE I.E. THAT OPPOSITE TO THE CHAMFER WILL BE THE OUTER SURFACE OF THE WING ON YOUR MODEL...KEEP IT CLEAN!



WHEN THE LEADING EDGE IS DRY, USING THE SAME METHOD GLUE TRAILING EDGE TOGETHER AND THE 1/2 x 1/16 VERTICAL TRAILING-EDGE MEMBER IN PLACE

ADD REMAINING 1 x 1/16 TRAILING-EDGE MEMBERS AND WHEN DRY, TRIM OFF THE PROUD EDGES OF THE TILES

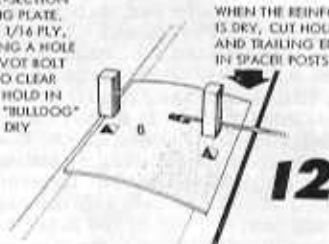
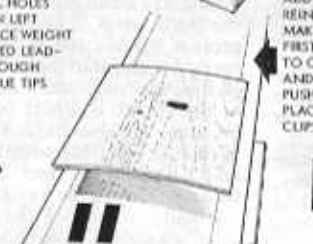


MAKE WING TIPS. DRILL HOLES FOR LEAD-OUT WIRES IN LEFT TIP AND ADD BALANCE WEIGHT IN THE RIGHT. FEED LEAD-OUT WIRES THROUGH HOLES. GLUE TIPS IN PLACE



ADD CENTRE-SECTION REINFORCING PLATE. MAKE FROM 1/16 PLY. FIRST DRILLING A HOLE TO CLEAR PIVOT BOLT AND SLOT TO CLEAR PUSH-ROD. HOLD IN PLACE WITH "BULLDOGS" CLIPS UNTIL DRY

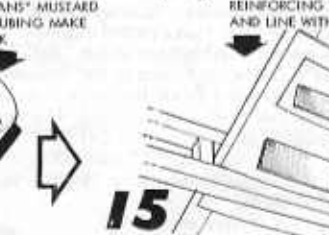
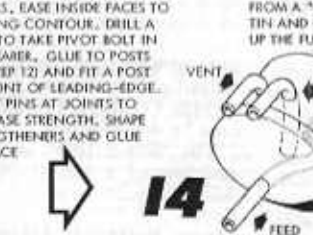
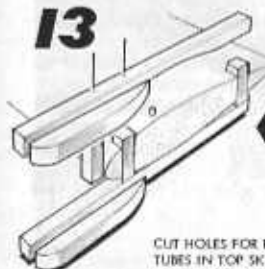
WHEN THE REINFORCING PLATE IS DRY, CUT HOLES AT LEADING AND TRAILING EDGES AND GLUE IN SPACER POSTS. LEAVE TO DRY



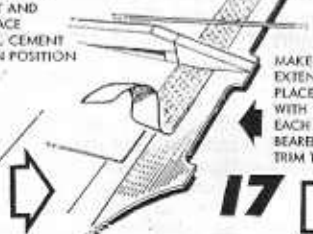
USING A JIG, ASSEMBLE ENGINE BEARERS. EASE INSIDE FACES TO FIT WING CONTOUR. DRILL A HOLE TO TAKE PIVOT BOLT IN TOP BEARER. GLUE TO POSTS (SEE STEP 12) AND FIT A POST IN FRONT OF LEADING-EDGE. INSERT PINS AT JOINTS TO INCREASE STRENGTH. SHAPE STRENGTHENERS AND GLUE IN PLACE

FROM A "COLEMAN'S" MUSTARD TIN AND BRASS TUBING MAKE UP THE FUEL TANK

CUT OUT TANK BAY LEAVING TOP REINFORCING SKIN COMPLETE, AND LINE WITH BALSA SHEET



CUT HOLES FOR FILLER AND VENT TUBES IN TOP SKIN AND FEED TUBE IN LEADING-EDGE. INSERT AND SECURE TANK IN PLACE WITH "ARALDITE", CEMENT PLY COVER IN POSITION



MAKE UP TRAILING-EDGE EXTENSION, CEMENT IN PLACE AND REINFORCE WITH "NYLON" TAPE ON EACH SIDE. ADD ENGINE BEARER EXTENSIONS AND TRIM TO SHAPE

MAKE ELEVATOR AND HINGE IN POSITION WITH "NYLON". FIX THE CONTROL HORN AND PUSH-ROD. COMPLETE LEAD-OUT WIRES. FINALLY COVER THE ENTIRE MODEL WITH "NYLON" USING P.V.A. WHITE ADHESIVE. COAT WITH EMULSION PAINT AS A FILLER AND DECORATE WITH ENAMEL