11. COVERING, DOPING AND DETAIL

Cover model with tissue provided. Cut into pieces about 1" wider each side than panel of wing or tail to be covered. Use tissue-paste or photo-paste as adhesive. Apply only to outer edges of panels being covered, not to individual ribs. Dope tissue into place on fuselage panelling, rubbing with pad to remove wrinkles. Cover fin both sides.

Water spray wings and tailplane. When dry, give as many coats of thinned shrinking dope as found necessary to provide a gloss to the surface. Use coloured dopes or enamels sparingly.

Cut away tissue (on upper surface) between two $\frac{1}{8}$" centre ribs of tailplane. Cut slots in fin base to fit over tail spar, then cement in place - see sketches on plan. Check for vertical and alignment. Fit small $\frac{1}{8}$" (3 mm) locating dowel under tailplane - see plan.

Wheels are retained with small washers spot-soldered to axle ends - or small pieces of electrical wire (copper) looped and soldered.

Use fuel proofer inside and outside engine bay, specially if using glow-plug motor. Fit metal rectangular or plastic free-flight round tank above beams or against bulkhead F1. When fitting engine place 2 or 3 washers on rear bolts and under rear mounting lugs to impart downthrust to motor. Add more or remove as necessary when flight testing.

12. BALANCING, TEST GLIDING AND FLYING.

As engine weights vary considerably, it is essential that model balances accurately in gliding attitude (slightly nose down) when supported under the wing tips at the balance position indicated on the plan - and with fuel tank empty. Add strips of lead (or lead shot) to nose and cement in place if necessary.

Wings and tail should be retained with rubber bands over dowel pegs sufficient only to secure surfaces in place without movement in flight, but light enough to safeguard model in event of mishap.

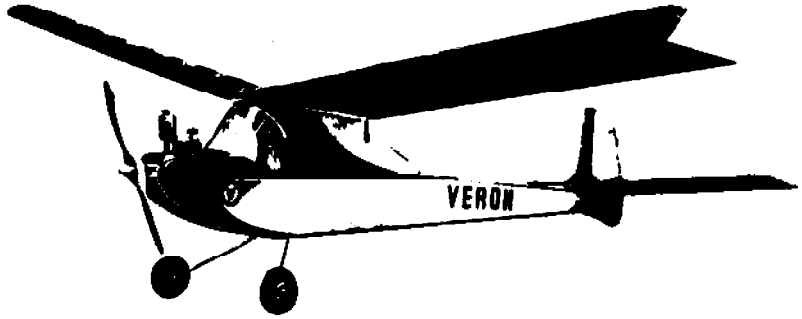
Accurately check line-up of all flying surfaces by viewing model from front.

When correctly balanced, test glide over grass in still winds only. If model stalls (noses up - then dives) add 1/32" (.8mm) packing under leading edge of tailplane. If model glides too steeply, add packing under trailing edge of tail. Check glide is straight and that no warps are creating turns.

If using 1 cc motors, put airscrew on backwards to reduce thrust for first flights. Add fuel only for 20 seconds motor run. Run motor on slightly reduced power. Launch directly into wind, level and straight ahead. Side-thrust should compensate torque so that rudder trim-tab should give a gradual turn to right on both powered flight and glide.

Adjust side and downthrust as found necessary to give a right hand spiral power climb with wider right hand circling glide. HAPPY LANDINGS.

VERON CARDINAL



BUILDING INSTRUCTIONS

The "CARDINAL" Free-Flight powered model has been designed as an extremely simple and easy-to-build model for small motors from .5 to 1 cc., diesel or glow-plug, which at the same time will give instructive and trouble-free stable flying.

The model has extreme inherent stability, and can be thoroughly recommended to the beginner to powered flight. So long as wing and tail surfaces are reasonably warp free, the balance correct and test glides carefully made to check incidences - then this model is capable of contest performance.

Study the plan carefully, and read these and all other instructions to ensure complete understanding of the sequence and method of assembly. Simple modelling tools and materials are needed. Use "BRITFIX 66" Cement or "BRITFIX 55" White P.V.A. adhesive for construction, also "HUMBROL" Clear Shrinking Dope and Coloured Dopes or Enamels for decoration. Accurately cut-out formers on printed sheets.

SEQUENCE OF ASSEMBLY.

1. Check accuracy of sheet fuselage sides and if necessary trim with balsa knife and steel straight edge. Lay pre-cut sides over plan and mark lightly, with pencil and ruler, the positions of the formers - see sketch on plan. Note that sides should be marked in pairs so that when assembling fuselage, marks are on inside of structure. Steam a curve in front ends of lower 3/32" x 3/32" (2.5 x 2.5 mm) - over kettle spout. Cement upper and lower longerons in place.

2. MOTOR BEAMS.

   Check that beam locations on plan are correct for engine to be used. Adjust cut-outs on Formers F1 and F2 if necessary. Mark positions of two formers on beams and cement in place, double cementing the joints. Add two ready shaped $\frac{1}{8}$" (3 mm) side nose panels. See sketches on plan for packing adjustment necessary for narrower

3. FUSELAGE ASSEMBLY

Join two lower sides against two formers thus laminating the nose sheeting. Pin in place whilst drying. Pull and clip rear end together (with clothes-peg) after chamfering to ensure line-up and with F6 in place. Then add remaining formers F3, 4 and 5.

Add the upper side sheeting, then the forward Cabin top F7 (joining the two halves on the printed sheet). Insert rims of 3/32" x 3/32" (2.5 x 2.5 mm) along inner edges of cabin top between F2 and F3.

Note that when fitting radially mounted engine, beams are shortened and 1/16" (1.5 mm) ply bulkhead (NOT SUPPLIED IN KIT) is inserted against beams and between laminated sides - see sketch on plan.

At all times check that fuselage structure is square and in alignment.

UNDERCARRIAGE

Bend undercarriage wire to shape as detailed on plan. The strut length from lower bend on ply to axle bend is 3½" and raked well forward; check against fuselage side aspect on plan. Attach to ply bulkhead as indicated in sketch on plan by binding firmly with thread through 1/16" holes with a darning needle. Recess spots on F2 to accommodate binding on ply former, double coat ply with cement then locate undercarriage. Check for firmness when set.

5. FUSELAGE COMPLETION.

Add lower cross-grained 1/16" (1.5mm) balsa sheeting only from F1 to F3. Add forward lower sheeting AFTER locating engine bolts. Add top sheeting from F3 to F4.

Cement strips of 3/32" x 3/32" (2.5 x 2.5 mm) along top outer edges of cabin area to permit correct seating of dihedralled centre section of wing. Fill in lower surface of rear bay with sheet to permit securing of balsa under-fin. Drill ⅛" (3 mm) holes for dowel pegs for wing and tail attachments, inserting dowels, making tight fit so permitting replacement. Cement forward dowel under F7.
Cut out celluloid windshield to pattern on plan. Cement rim of 3/32" x 3/32" (2.5 x 2.5mm) to top of F1 then cement windshield in position. Make sharp bends at points marked "X" without splitting celluloid. Roughening surface at edges of celluloid will facilitate adhesion to sheet balsa cabin sides.

6. MAINPLANE CONSTRUCTION.

Mark and cut out 1/16" notches for ribs in ½" (13 mm) trailing edges. Lay over plan above waxed tissue, pinning in place. Also position spars, ⅛" x ½" (3 x 13 mm) set upright on edge with pins supporting upright (but not piercing the wood). Locate ribs in place to check their fit and if correct, cement in place to spar and trailing edge. When all are located, set leading edge of 3/16" x 3/16" (5 x 5 mm) into diagonal slots in ribs. Do not forget that base ribs must be canted for dihedral (to template on plan), also that outer ends of leading edges and spars have extended portions to permit fitting of tip sheet. Chamfer spar ends and also lower edge of tip sheets W.T.1; check for fit and if correct, cement in place. Add extra brace WT2 on top of spar extension, also base rib corner gussets. Allow wing structures to set before removing from board.

7. JOINING WING HALVES.

A 1/16" (1.5mm) ply dihedral gusset is supplied for bracing butt-jointed wing at root ribs. Cut 1/16" (1.5 mm) slots behind spars through base ribs. Cement gusset to one side first. Lay flat on board. Add other wing half, cementing faces of base ribs and with outer tip supported on block to give 2½" dihedral under each wing tip - a 5" block under end rib on one side. Pin base ribs together and ply dihedral gusset to spars until set.

8. TAILPLANE CONSTRUCTION.

First mark and cut out the 1/16" (1.5 mm) and two central ⅛" (3 mm) slots on ⅜" (9 mm) wide trailing edge. Pin in place over plan above waxed tissue. Also locate leading edge of ⅛" x ¼" (3 x 6 mm) set flat. Cement and set in place all ribs, pinning upright whilst setting. Then add upper ⅛" x ¼" (3 x 6 mm) spar. Allow to set then remove from board, trim ends of spars and add tip-blocks of ½" x ½" (13 x 13 mm). When firm, carve and sand to streamline. Sand whole structure smooth. Cover tailplane before adding fin.

9. LOCATING ENGINE

Set engine in place allowing about 2½° right side-thrust. Mark position of holes with pencil; drill through beams, ⅛" (3 mm) for 6B.A. and 3/32" (2.5mm) for 8BA bolts. Solder tin strap under bolt heads to prevent turning (or piano wire soldered across slots). Locate bolts from underside, cementing in place. Add lower cross-grained sheeting on underside of engine bay. Model should be covered and doped with engine bay fuel proofed before finally locating engine. Cut small oil drainage hole under nose bay.

10. FIN

Sand to streamline. Add trim tab with soft iron (or copper wire) hinges.