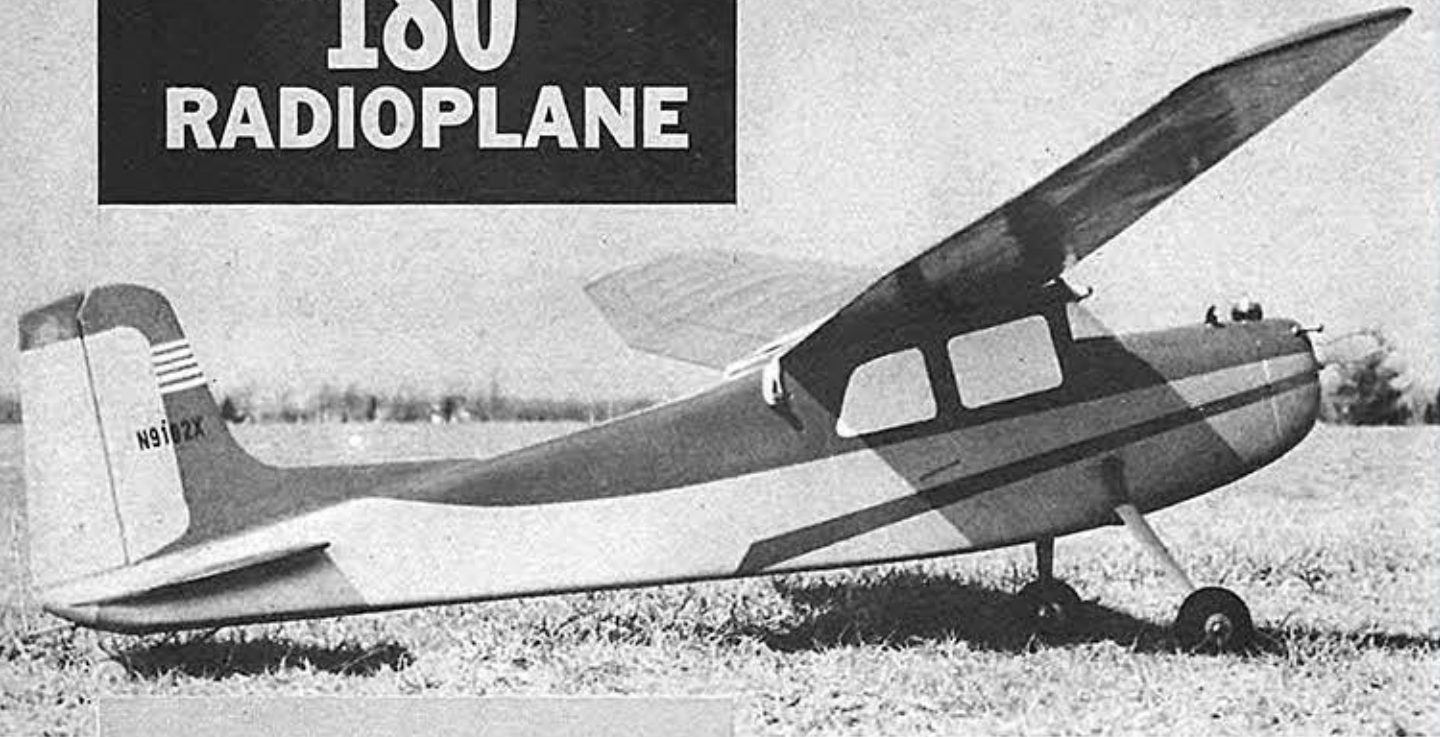


EASY-MADE CESSNA "180" RADIOPLANE



When the Cessna people designed the full-size craft they must have had novice radio control flyers in mind; their boxy high-winger scales down to a fine R/C project that takes most any 1-channel receiver

BY PAUL DEL GATTO

■ The Cessna 180 is particularly good for scale R/C. Its proportions provide the required stability. Model construction, despite the sleek appearance, is not much more difficult than the average.

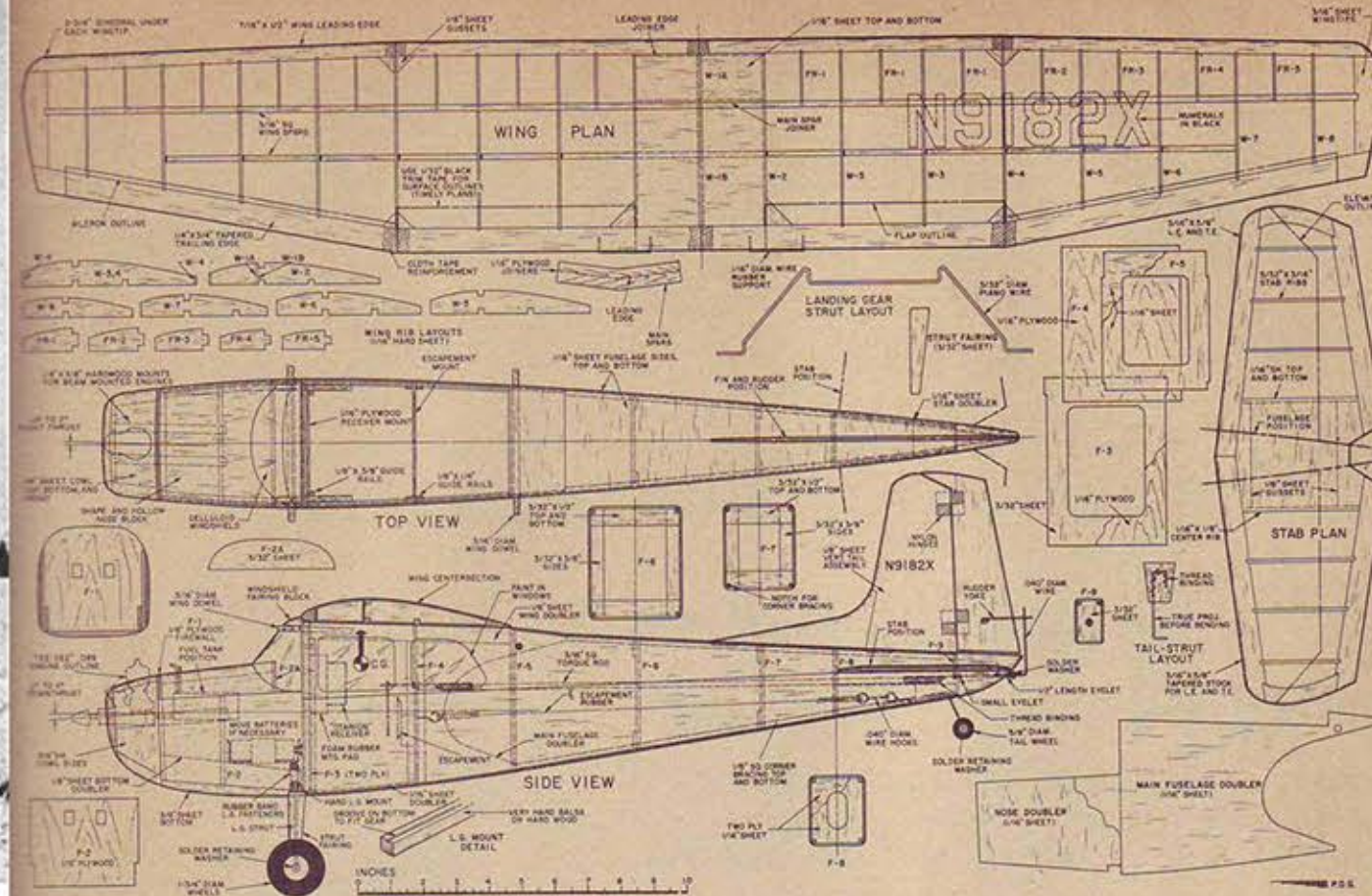
Our original craft was thoroughly tested to assure you plenty of enjoyable flying. An interesting feature of the real plane is its large vertical tail, which proved more than enough for the model. Usually, real aircraft have tail surfaces too small for radio model purposes. The dihedral shown is necessary for good spiral stability because of that big tail and the high torque of a powerful Half-A engine. Do not change it.

Dozens of excellent flights were made with both the transistorized Citizen-Ship and Kraft receivers, both the relayless type and the Vari-Comp escapement. It is recommended that alkaline type batteries be used. We prefer nickel cadmiums for superior reliability. Recharged between flying sessions they will last a couple of seasons.

By using a 225-mah capacity battery pack which gives 3.6 volts, you will find escapement operation reliable at all times. A good battery supply is desired for receivers which have a common voltage supply with the escapement. The DEAC nickel cads performed very well for us.

By leading test wires from the batteries, and from the escapement, to exterior points on the fuselage sides (solder wires to small bolts protruding through the sides), you will have convenient check points for reading battery voltage, plus voltage at the escapement when signal is on. The escapement voltage check points will assist in tuning by use of a voltmeter during the ground check.

American Modeler — November/December 1963



Full size working drawings for the Cessna 180 R/C are part of Group Plan #1163 by Hobby Helpers, 1543 Stillwell Avenue, New York 61, N.Y. (85 cents).

CONSTRUCTION. Fuselage: Each side is assembled from a 2" and a 3" wide sheet of 1/16" balsa. Laminate 1/16" sheet balsa doubler to sides per side view. Glue 1/8" square soft balsa corner longerons to sides aft of cabin. Cement in 1/8 x 1/2" top cabin rails.

Construct cabin bulkheads F-2 and F-4. F-2 is laminated 1/16" plywood and 1/8" sheet balsa, F-4 from two plies of 1/16" sheet. Cut firewall F-1 from 1/8" plywood, make cut outs for 1/4 x 3/8" motor bearers. F-1A is 1/8" plywood. Glue fuselage sides to bulkheads F-2 and F-4 and allow to dry; check alignment before glue sets by placing work upon plan top view.

Carve 1-3/8 x 7/8 x 2" soft balsa tail block. Drill torque rod bushing hole, then enlarge hole from block front as per side view. Glue 1/16" sheet former F-8 to block front. When dry, draw fuselage sides together at rear and cement to F-8. Check sides for equal bend by placing work over plan top view . . . realign if necessary. Glue in one piece of 1/16" bottom sheeting just forward of bulkhead F-4 to hold work in alignment.

Pull sides in at the nose with a rubber band; cement sides to balsa lamination on F-1. Cement balsa nose doublers to fuselage sides. Install F-1A, then slide bearers into place, glue well. Mark engine bolt hole positions, drill for 3-48 machine screws. Install Dubro nuts.

Laminate bulkhead F-7 from two sheets of 1/16" balsa, then cement this in. Add side cross pieces (3/32 x 1/2") F-5 and F-6, follow with top and bottom cross pieces.

Before sheeting top and bottom, install escapement and torque rod—latter is hard 3/16" sq. balsa. Follow instructions given with your escapement. Rod slips into place through open cabin top. Note escapement mount can be removable. The 1/8 x 1/4" balsa runners (Station F-3) cement to fuselage sides far enough apart to admit escapement plywood mounting board. If 1/16" ply is used for this, glue two pieces of 3/16" sq. against its back face as a reinforcement, above and one below escapement.

When escapement installation is finished, cover unit with cloth to keep out construction dust.

Rough shape and spot glue top and bottom nose blocks

American Modeler — November/December 1963

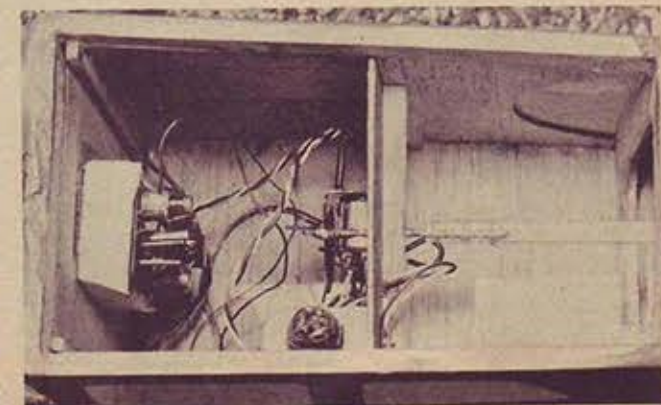
and carve to outline, then spot glue to nose. Sand nose to shape; remove cowl and top block. Fit tank, including any extension piping, feed and drain tubing.

Make 3/8" sq. pine landing gear block, noting groove for landing gear wire, install block and sand any protruding edges to match surface of plane. Place top nose block. Top and bottom of fuselage back to F-7 is covered with 1/16" sheet, grain across ship. Locate 1/16" balsa sheet doublers which support stabilizer and reinforce tail wheel mount (see detail).

Glue in top windshield block; shape as shown.

Fuselage cannot be finished until horizontal tail is in place. After tail is built follow this procedure: Cut through fuselage corner strips at F-7, continue cut down fuselage sides to bottom line of stabilizer location. Do same at F-8, then carefully remove cut-out pieces. After stab is glued in place, cut away removed sections as necessary to fit stab, then glue them back in position. Complete top and

(Continued on page 88)



In his prototype 180 model PDG installed an Otation receiver and Citizen-Ship PSN escapement. Craft can take variety of equipment.

37

Cessna

(Continued from page 37)

bottom fuselage sheeting from F-7 to tail block. Cut slot in top sheeting for fin which slips through slot and cements to stabilizer top. Dorsal fin is added.

Fuselage can be partially sanded before tail is located, then finished-sanded, or you can do all sanding when tail is in position. Mark dowel locations and carefully drill holes.

Make the opening for winding escapement rubber and install rear rubber hook.

Tail Surfaces: Pin tapered stabilizer edges of 3/16 x 5/8" balsa to bench. Note three centermost ribs are only 1/16 x 3/32". Shape top and bottom center section pieces from 1/16" sheet balsa. Cement bottom layer to edges; pin it flat to bench and temporarily put in two 1/16" fill pieces shown. Cement 1/16 x 3/32" pieces on top of this, then locate top sheeting. Glue in remaining 3/32 x 3/16" ribs and 3/16" thick tip pieces.

When sanding completed stabilizer, round off leading edge and trailing edge (see section).

Fin pieces and rudder are cut from soft 1/8" sheet balsa, then sanded. Fin is rounded at front; rudder is tapered evenly to 1/16" thickness at rear, then rounded.

Cover stab before installation. Fin and rudder are not covered.

Wings: Make two panels, joined at the proper dihedral angle when ready for center section sheeting. Pin unshaped 7/16" sq. leading edge and standard triangle-stick trailing edge pieces (1/4 x 3/4") to the bench, double gluing joints where taper begins. Pin down two 1/4" sq. bottom spars, use rib to check locations. Cut all ribs from 1/16" sheet balsa, four center section ribs (two at centerline) are shallow by 1/16" on both top and bottom to allow for sheeting. Do not place center line ribs at this time, but locate outer center section ribs, placing scraps of 1/16" sheet beneath them for proper elevation.

Cement in all ribs, then locate 1/4" sq. top spars; note butt joint where taper begins. Locate small false ribs and 3/16" thick wing tip pieces.

To incorporate dihedral, bevel-sand butt ends of each panel so they meet at correct angle. Use 1/16" plywood joiners to check alignment. Pin one panel to bench, then cement two joiners in position; attach other panel, supporting tip until cement dries, then add two center ribs. Complete top and bottom 1/16" center section sheeting. Carefully shape leading edge, then sand wing.

Covering: Use either lightweight silk or heavy Silkspan (suitable for small models). Material may be applied either wet or dry. Run grain lengthwise on all surfaces, cover fuselage as well. Colored material will save weight. Give fin and rudder three coats of clear dope.

Final Details: Make paper pattern windshield, when satisfied with the fit, cut a windshield from sheet celluloid. Complete all painting before cementing windshield to model. See detail for cowl- ing attachment. Bend landing gear wire to pattern given. Wheels are retained by soldered washers. Gear fits into slot in fuselage bottom and is held by small rubber bands wrapped around the wire and the landing gear fuselage dowels. Gear is both knock-off and shock absorbing. Attach tail wheel, retain it with a soldered washer. Rubber is attached with cloth tape hinges after control yoke is in place.

American Modeler — November/December 1963

Painting: Two coats of brushed-on colored dope should suffice. Don't weigh down the model, or get it tail heavy. It must balance at CG position shown; use solder in nose for ballast if necessary. If windows are simulated by white dope, put white on before darker colors and obtain window outlines by using masking tape. Windows also can be white craft paper cut to shape and cemented to finished model.

Flying: If a hot engine such as the Cox .049 is used, make first test flights with prop on backward. Avoid small diameter props because excessive engine rpm's can disturb some escapements. However, no vibration difficulties were found with our Vari-Comp. Time your engine run before flying so first test is made with not more than one-minute of fuel.

Test glide model before flying. Glide should be fast and flat, touching down two-point. If any traces of stall or "hanging flight" appear, ship probably will stall badly under power. If in the landing after the test glide the model flares out prettily, it is tail heavy. If CG is located where shown, rear edge of wing can be shimmed not more than 1/16" if she is tail heavy. Beyond that, correct by adding lead ballast to extreme nose. If nose heavy (improbable), shim leading edge of wing. Early turn correction can be made by bending rudder drive arm right or left. If glide shows too much of a turn, add or take away right thrust as required and adjust rudder for a very slight turn in the glide.

Always try to keep your Cessna upwind. Fly upwind far enough to complete turns in front of the transmitter. It is difficult to fly when the model is permitted to drift downwind. In the beginning, do not try sharp or complete turns. Begin a turn, allow the model to recover and then, if more turn is desired, renew the turn in the same direction. When you become used to the ship, then sharp turns and more advanced maneuvers are in order. If the model tends to turn badly in one direction, perhaps entering a spiral, make all rudder movements in the opposite direction until the flight is ended and an adjustment can be made.

BILL OF MATERIALS

(Balsa unless otherwise specified)

Seven pieces of 1/16 x 3" (hard)—Fuselage sides, top and bottom; wing ribs; fuselage doublers. (1) 1/16 x 3 x 24" (soft)—Wing and stab centersection planking. (1) 3/32 x 4 x 24" (hard)—fuselage formers. (1) 1/8 x 3 x 18" (med)—Fin and rudder assembly; cowl doublers. (1) 3/16 x 3 x 18" (soft)—Wing and stab tips; cowl sides and top; gussets. (2) 1/8 x 1/8 x 36" (med)—Fuselage longerons, stab. (1) 3/32 x 1/2 x 36" (hard)—Fuselage formers. (3) 3/16 x 3/16 x 48" (hard)—Wing spars, torque rod. (1) 7/16 x 7/16 x 48" (med)—Wing leading edge. (1) 1/4 x 3/4 x 48" (med)—Wing trailing edge. (1) 1/8 x 1/4 x 36" (med)—Stab leading and trailing edge. (1) 1/8 x 1/4 x 36" (hard)—Former tracks and bracing. (1) 3/32 x 3/16 x 36" (hard)—Stab ribs.

Also: .040" dia wire pins; .072" dia wire landing gear strut; soft block for nose; 3/8" soft sheet; celluloid; 3/16" dia dowel; 1/16" plywood; 1/8" plywood; cloth tape or nylon hinges; fuel tank; .049 engine; retaining washers; nuts and bolts; 1-3/4" dia wheels; thread for binding; Silkspan covering; clear and colored fuel-proof dope; decals and trim tape; R/C gear.

American Modeler — November/December 1963