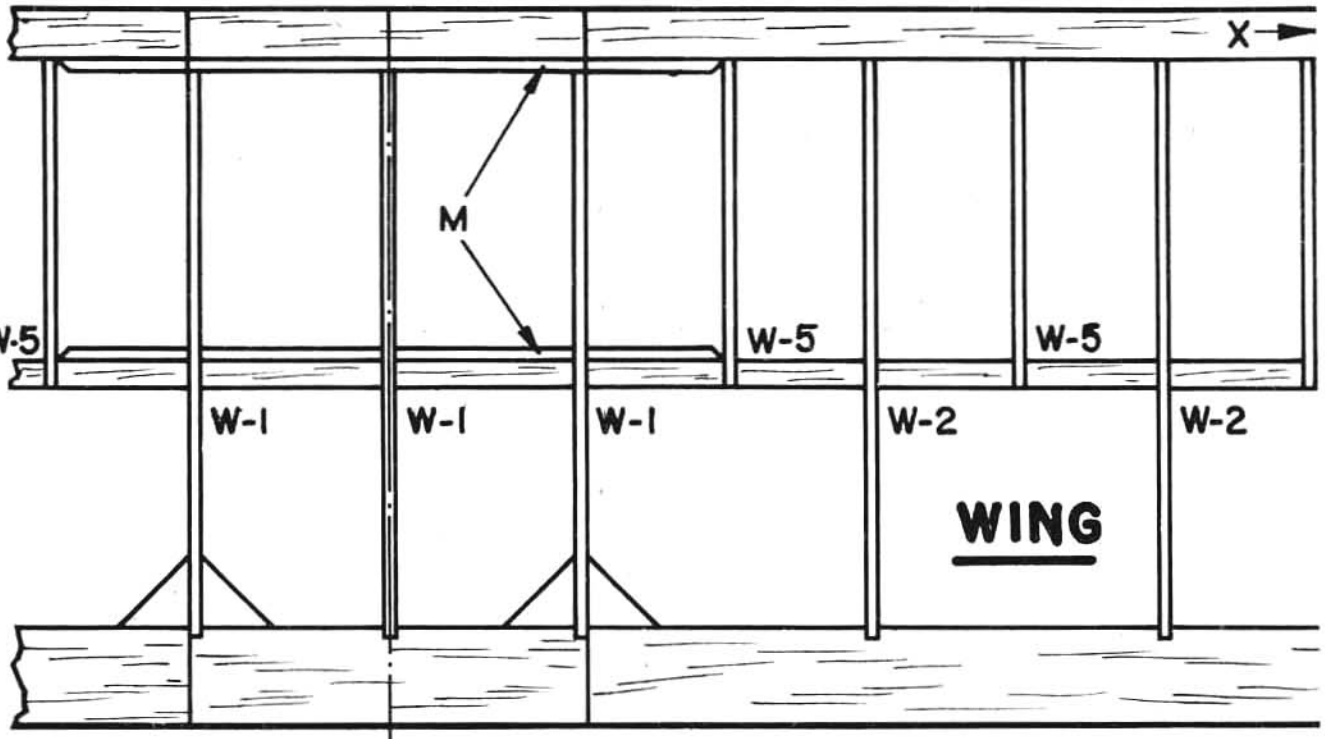
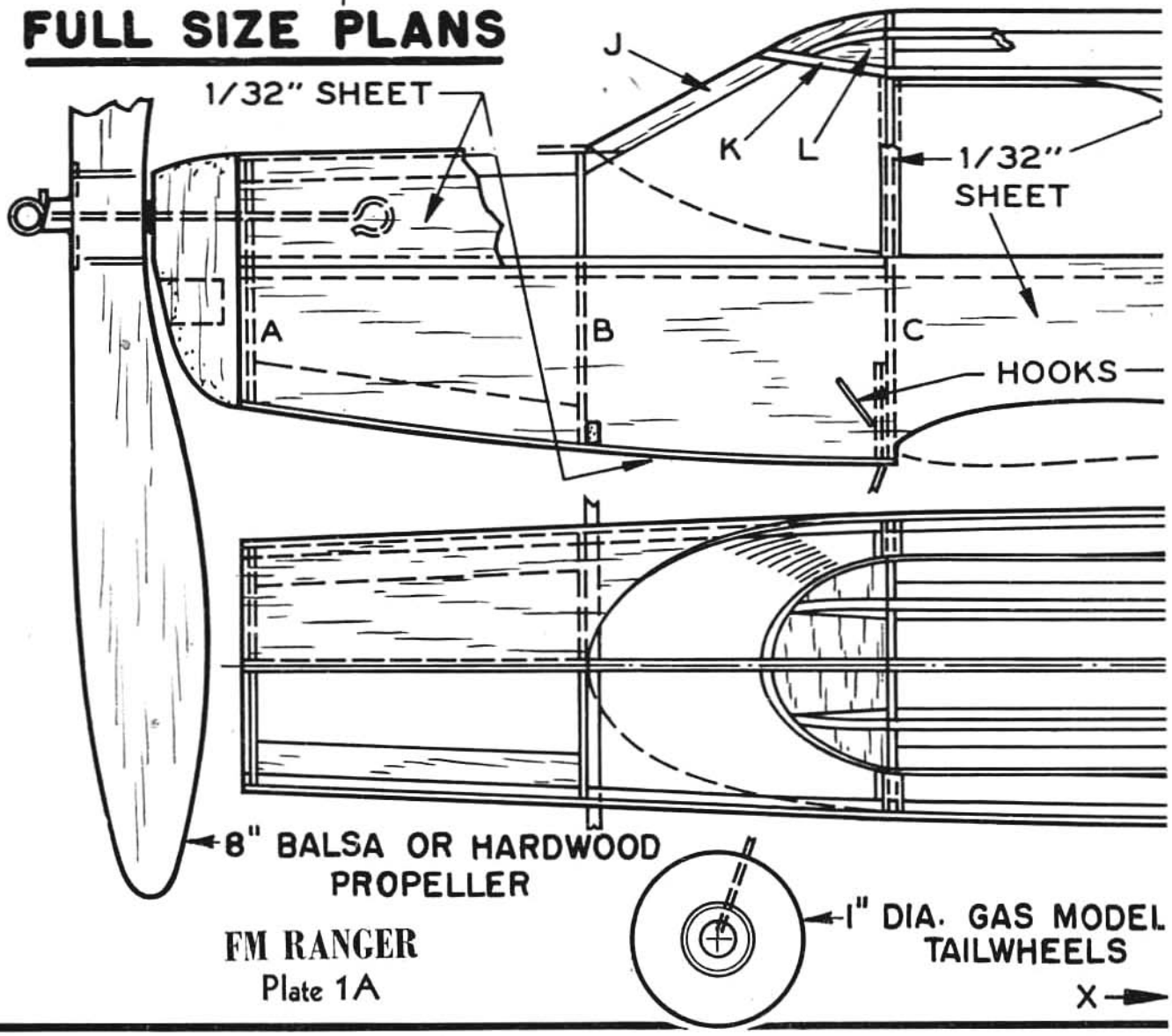


FULL SIZE PLANS



FM RANGER
Plate 1A

FM RANGER

by H. A. Thomas, Jr.

Tired of constructing gas-powered models? Then get to work on this rubber-powered, butterfly tail, low-wing ship!

● It is not strange that only a comparatively few rubber-powered models are built these days, for it is actually easier to build, adjust and fly a control-line model. Consequently we have modelers with several years' experience who have never built rubber-powered jobs.

You have to try it yourself to know first-hand that rubber-powered models can supply a full share of thrills and satisfaction to their builders. The FM Ranger is meant to appeal to those who are willing to have a fling at a rubber job. The ship is a compromise in design, featuring realism on one hand and flying ability on the other. Construction is straightforward throughout and all plans are full size.

Since the hand-carved propeller will likely pose the only stickler in this project, we suggest it be tackled first. The firm balsa block is first scribed and sawed to the shape given in the front view (Plate 1C), then to the outline given in the side view as indicated on Plate 1A. With a sharp, long bladed penknife, start the carving on the under surfaces first.

Make diagonal slicing strokes and shape a slight undercamber, particularly toward the tips. On the upper surfaces, leave the blades thicker at the hub, tapering toward the tips and trailing edges. Use progressively finer grades of sandpaper to smooth the blades and bring them into balance. Drill or burn the shaft hole to freely pass the .032" wire. Dope the propeller several times, sanding lightly between coats.

If you do not wish to carve your own prop, a suitable hardwood or balsa propeller may be purchased in many hobby shops.

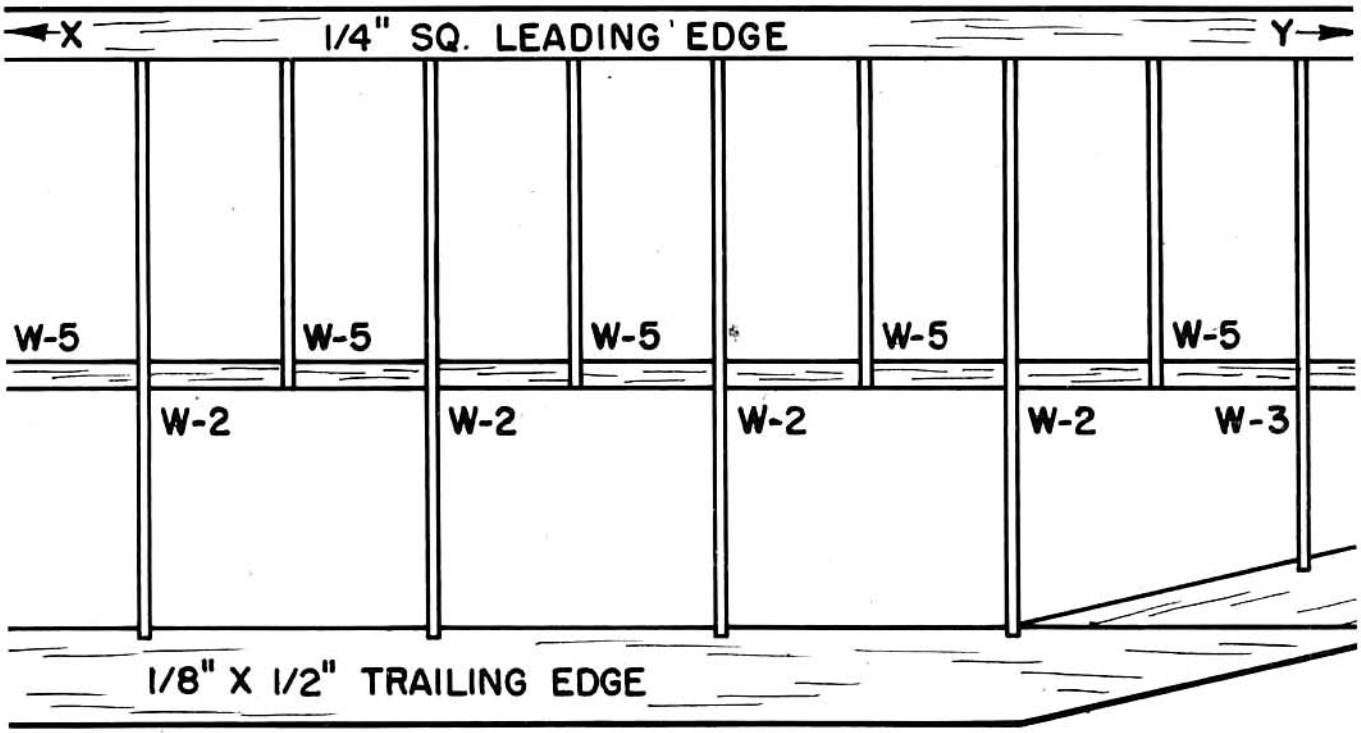
Construction will move faster if you are systematic about it. Why not cut out all parts, slice all strips, etc., at the beginning? Ribs and false ribs are cut around aluminum, plywood or celluloid templates, while the formers are cut by halves from two layers of sheet, lightly cemented together. We used a little file for notching, rather than a knife.

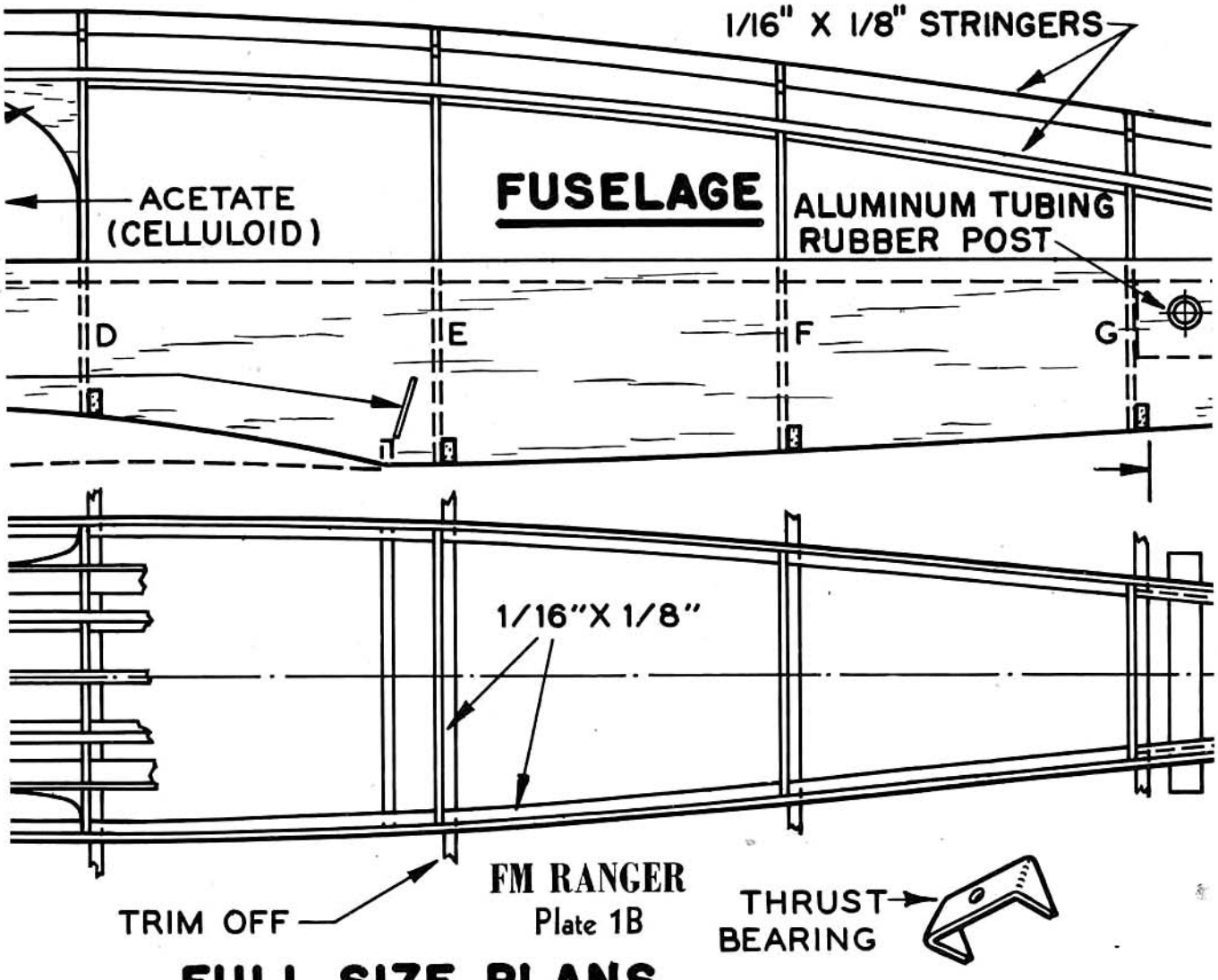
After cementing the strip reinforcements inside the fuselage sides, join them with formers C and D. The landing gear, incidentally, may be sandwiched to former C at this time. Later, add all other formers and the strip cross pieces.

In sheet-covering the nose, moisten the fitted sheets on the outer sur- *(Turn to Page 62)*

Note the neat, easy-to-build lightweight framework. The false ribs not only strengthen the wing, they also improve the airfoil and appearance.

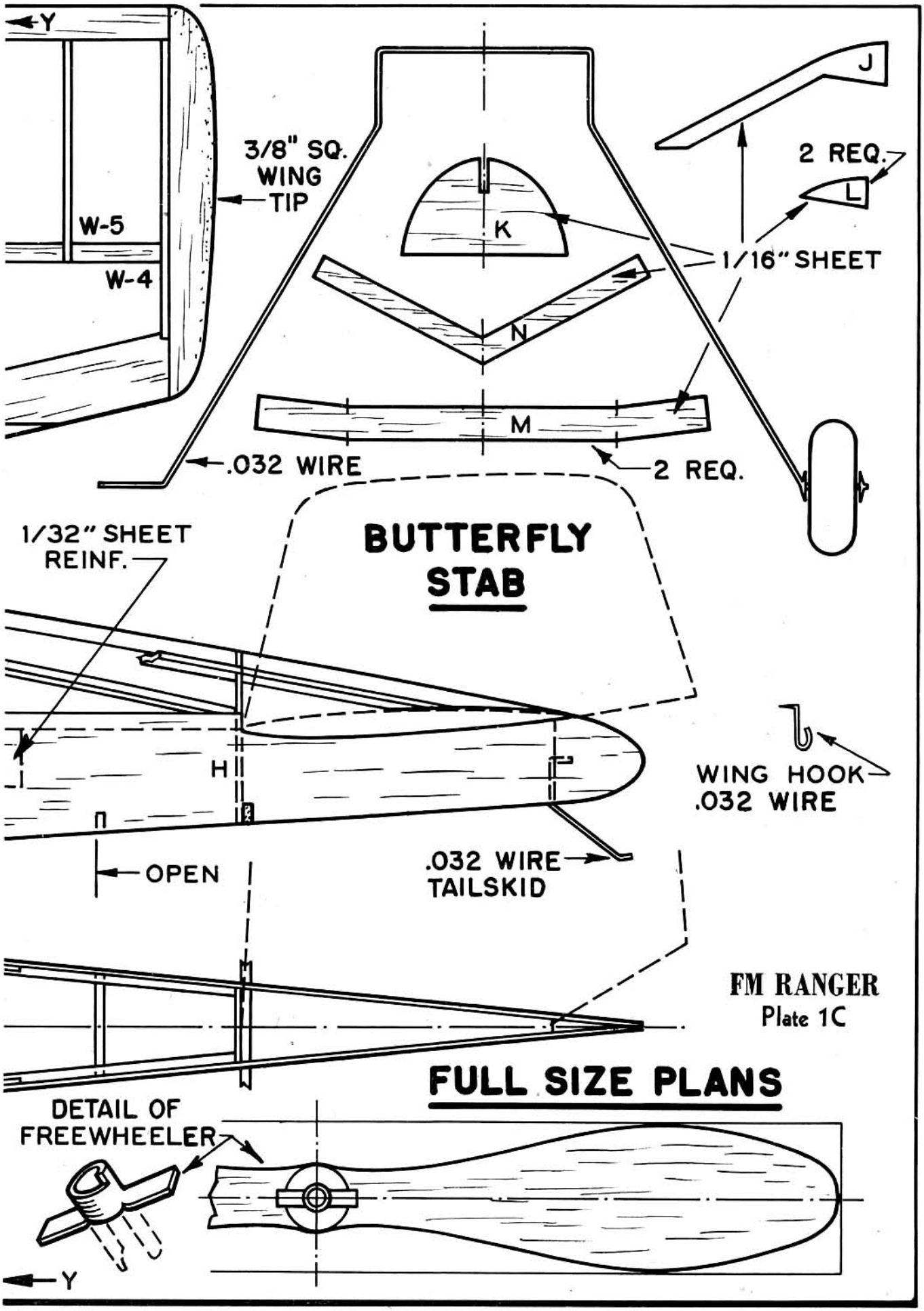
A hand-carved balsa prop or a ready-made commercial prop with a free-wheeling unit may be used. Six strands of rubber supply the power.

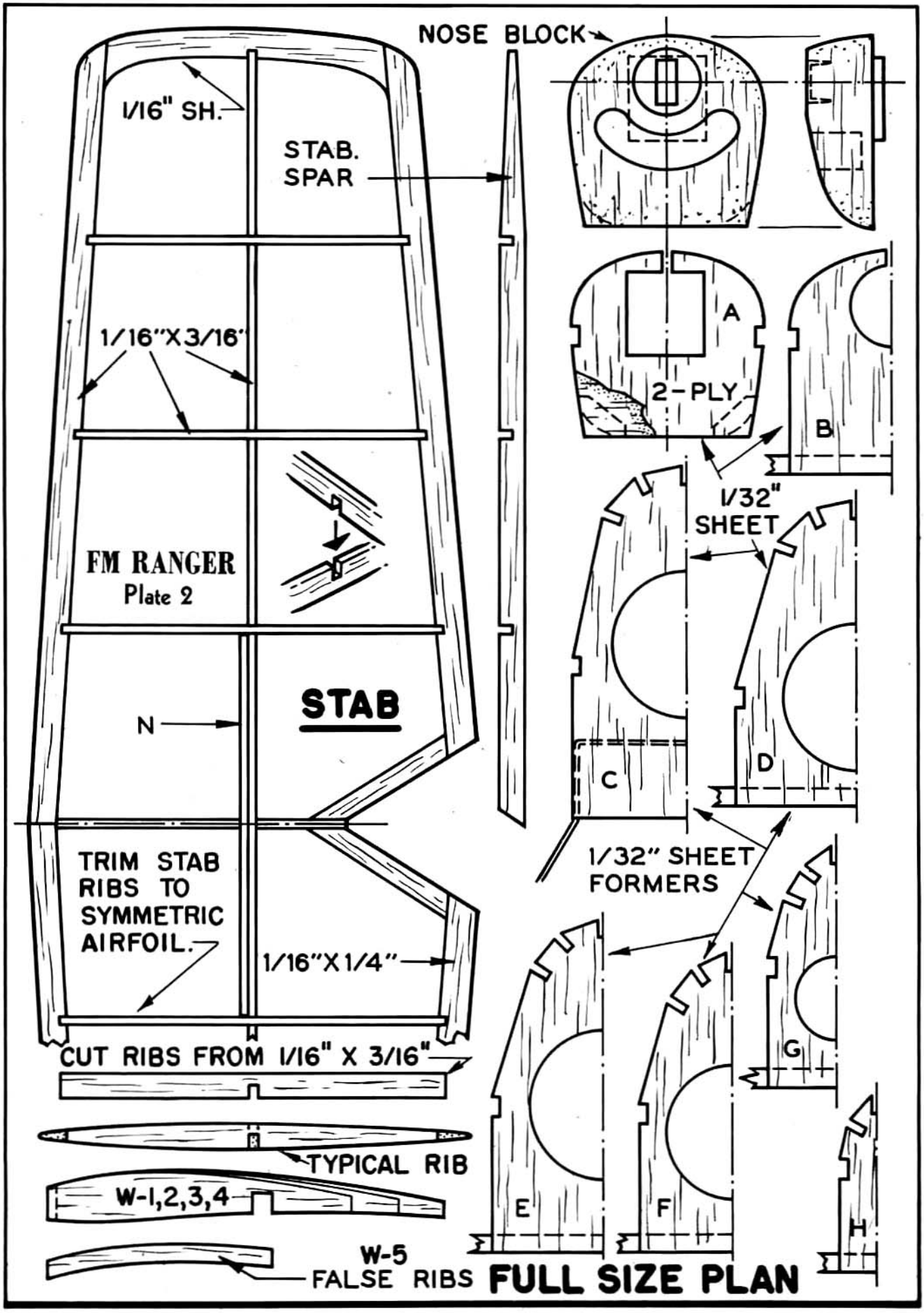




FULL SIZE PLANS

X Y


Y
W-5
W-4
3/8" SQ.
WING
TIP
K
J
2 REQ.
L
1/16" SHEET
N
M
.032 WIRE
2 REQ.
1/32" SHEET
REINF.
BUTTERFLY
STAB
H
WING HOOK
.032 WIRE
OPEN
.032 WIRE
TAILSKID
FM RANGER
Plate 1C
FULL SIZE PLANS
DETAIL OF
FREEWHEELER
Y


NOSE BLOCK
1/16" SH.
STAB. SPAR
1/16"X3/16"
A
2-PLY
B
1/32" SHEET
FM RANGER
Plate 2
STAB
N
C
D
TRIM STAB RIBS TO SYMMETRIC AIRFOIL.
1/16"X1/4"
1/32" SHEET FORMERS
CUT RIBS FROM 1/16" X 3/16"
G
TYPICAL RIB
W-1,2,3,4
E
F
H
W-5
FALSE RIBS
FULL SIZE PLAN

FM RANGER

(Continued from Page 32)

faces and they will more easily curve into position. Add the stringers atop the fuselage, the parts forming the cabin above the windshield, and the soft, triangular-section stock inside the lower edges of the nose. This permits rounding off the nose.

The wing and tail are of simple construction, requiring no special comment. Strive for perfect alignment and sand the surfaces smoothly prior to covering them with jap tissue. After water-dopping the wing, tail and fuselage, brush on a first coat of thin dope to which a few drops of castor oil have been added. This adds luster and gives a certain elasticity to the covering. A straight coat of thinned dope can follow.

Cement the stabilizer to the body, check alignment, and add the strips to complete the stringers over the center of the tail. Shape the nose block, recessing it for the dummy air intake, and adding the balsa plug to fit snugly into former A.

Make the free-wheel ratchet and rear "dowel" of aluminum tubing, and install. Add wing hooks bent from straight pins, with spurs forced into the wood and the wire tailskid. Fit paper patterns to the window and windshield areas, transfer to thin acetate, and cement the acetate in place. We suggest you limit striping or decorating to the body only, to keep the weight down.

Install six strands of ⅛" flat lubricated rubber and make test glides over grass. Add clay to the nose or tail as necessary for a smooth glide. Warp the tail tips to govern turns and shim up behind the sides of the nose block to control the direction of power turns.

BILL OF MATERIALS
(Balsa unless otherwise specified)

2—¼" x ¼" x 18" (medium)..... Leading edges
2—⅛" x ⅛" x 18" (medium-hard)..... Spars
2—⅛" x ½" x 18" (medium)..... Trailing edges
3—1/16" x ⅛" x 36" (medium-hard)..... Fuselage stringers
1—⅞" x 1⅛" x 8" (medium)..... Prop block
5—1/32" x 2" x 18" (medium-hard).... Sides, formers, etc.
3—1/16" x 2" x 18" (medium).... Ribs, stab tips, etc.
1—⅜" x ⅜" x 6" (soft)..... Wing tips
1—½" x 1½" x 1½" (soft)..... Nose block

18" piece .032" diameter steel wire for gear, shaft, etc.; two 1" diameter gas model tailwheels; 2" piece 3/16" O.D. aluminum tubing for freewheeler, rubber post; 2 pieces jap tissue or light silkspan; Thin acetate for windshield; Dope; Thinner; Castor oil; Colored dope or decal for trim; Sandpaper; Washers; Thrust bearing; 6½ feet ⅛" flat brown contest rubber; Rubber lubricant.

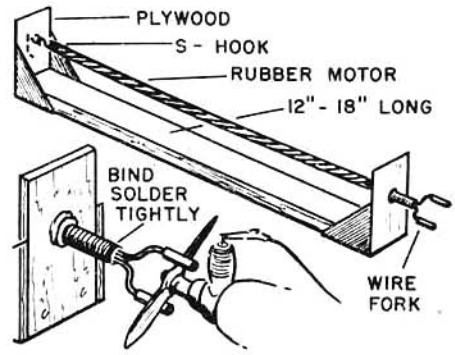
HANDY HINTS

(Continued from Page 44)

of the sheet. Pick your wing panels from the same or very similar sheets so there will be little difference in grain, weight and stiffness. When dry, the dummy ribs can be removed and used to duplicate this procedure for the other wing panel.—EDWARD HECKER, Indianapolis, Ind.

Engine Starter

Starters usually mean motors, batteries, carts and small putt-putts. However, this one is intended for use with *small* engines, and therefore is slightly less complicated. Construction can be of scrap ¼" plywood or pine shingle. Nail and cement all joints. See sketch. Vary the amount of rubber according

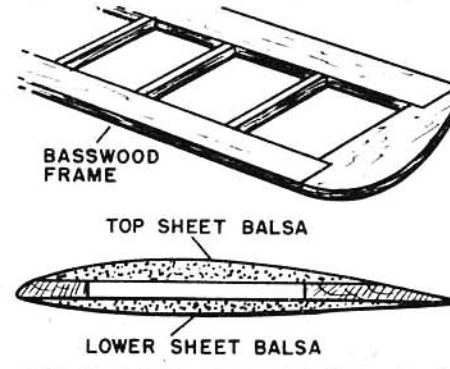


to the size of the engine. Use 3/32" or ⅛" diameter steel wire for the starter fork. Put an "S" hook in the other end of the rubber motor for easy attachment to a winder for winding the rubber motor. Slide short lengths of neoprene tubing onto the fork ends to prevent marring your propeller.

To use, place the fork on the sides of your prop as shown, and release. Pull the fork out when the engine starts. Put a stop on the fork end of the rubber motor to keep the motor from unwinding between starts. This stop can be simply a long nail dropped through the hook so that it rests against the frame sides.—HOWARD ZALKIN, Los Angeles, Calif.

Speed Wings

Strong, easily built wings for your speed job can be turned out using the procedure shown. Lay out basswood leading and trailing edges, add ribs and tips, and let cement dry thoroughly.



Add sheet balsa top and bottom sheets and carve to airfoil shape. This makes a durable lightweight wing that can be carved to sharp edges where needed.—EVERETT L. BARLOW, Albuquerque, N. Mex.

Prop Shaft Holes

Modellers using engines with large crankshafts or prop-spinner adapter nuts (such as the McCoys and Ohlsson "60") generally have a little trouble at one time or other in making the shaft hole on the prop fit easily and accurately. Of course modellers having a drill press can easily solve this problem, but some of us are not so fortunate.