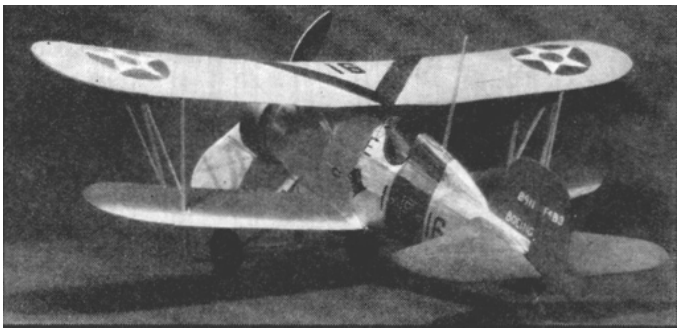
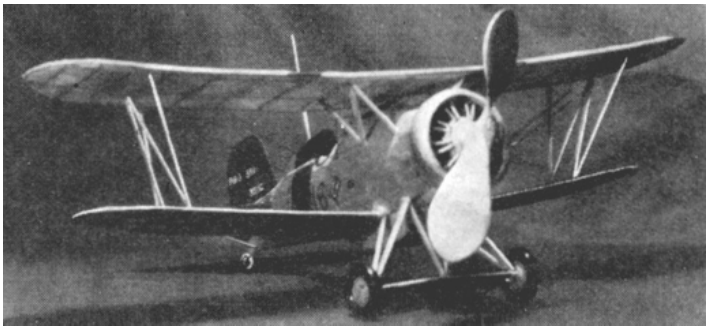


Attention to detail creates a fine appearance

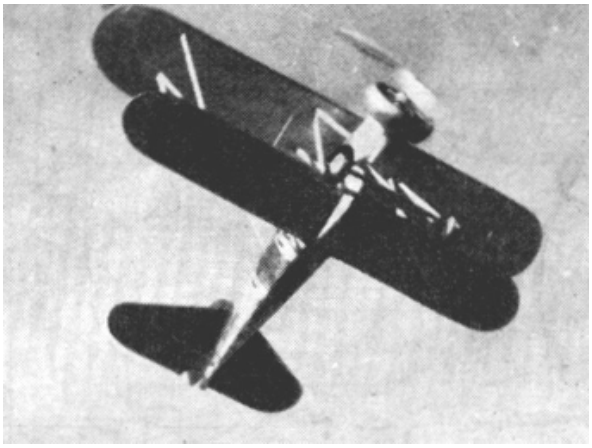


This ship will be a credit to your fleet

Build and Fly This Boeing Fighter

How You Can Construct a Flying Miniature of One of Uncle Sam's Greatest Navy Fighters

By WILLIAM WINTER



The model is an excellent flier. The large stabilizer aids performance

THE Boeing F4B-4 fighter needs no introduction as it is probably the most popular service ship of the day. Its every line suggests the ruggedness for which it is famous. It is noted in the air for the ease with which it withstands the most violent maneuver. The well known Pratt and Whitney "Wasp" rated at 420-550 hp. reliably meets all the demands of pursuit tactics.

The model like the real ship is synonymous with stamina. Despite the fact that pursuit ships usually make mediocre models, the F4B-4 is all excellent performer. It possesses stability to an unusual degree and will afford many hours of sure-fire flights with little or no repairs.

Fuselage

Cut all the bulkheads from 1/16" sheet balsa. Using the patterns given, cut the former stringers from 3/32" sheet. Cement the two side former stringers in place on all the

bulkheads. When dry, attach the top and bottom stringers. The auxiliary stringers are 1/16" sq. sanded to about 1/20" sq. They are placed in the proper notches and cemented. The rudder post is cut from a piece of 1/4"x 3/16" and glued in position. The rear hook is bent to shape from .028 music wire and sunk in the rudder post as required. The cockpit is formed by bending 1/32" sheet. The sheet is first cut to the necessary width and length. The lower edge is cemented to the stringer below the cockpit. When dry, the sheet balsa is bent the remaining distance and glued. The cockpit outline is marked with a pencil and cut out with a sliver of a razor blade. A small piece of 1/16" sheet, the pattern of which is given on the bulkhead sheet, is inserted between the extensions of No. 3 and 4 bulkheads and forms the center portion of the fillet,

To cover, use narrow strips of the best grade paper obtainable. Each strip runs the entire portion of the fuselage. The headrest also is covered with numerous narrow strips to avoid wrinkles. The finished covering is lightly sprayed and doped.

Cut all the blocks X (7/16" x 1-1/16" x 7/16") and Y (1-1/16" x 1" x 1-1/16"). Block X is cemented flush with the front face of No. 3 bulkhead. Block Y is attached in the same manner to the rear face of No. 4 bulkhead. If any care is exercised in the carving of these fillet blocks, no trouble will be had in their attachment.

The auxiliary gas tank adds very little weight but much in appearance. The side patterns are cut from 1/32" sheet and cemented to the bottom of the fuselage at the required position. The lower covering or bottom of the tank is also 1/32" sheet. It is bent to shape as it is glued in place. Cement one end and allow to dry. Bend a bit further and allow to dry again. In this manner there can be no cracking. Block Z is cut from a soft block 1-3/8" x 1-3/16" x 7/16" and is attached at the position shown in the side view.

The entire fuselage unit, if painting is desired, should be silvered. The markings are easily discerned in the pictures. Though the painting adds weight, the F4B-4 will fly well.

The windshield is celluloid. Directly in front of the windshield at the position noted on the side view, the telescopic sight is located. A strip of 3/32" is cut to the required length and rounded. The sight is painted black.

Landing Gear and Tail Wheel Assembly

The main landing gear strut is cut from 1/8" x 3/8" stock and streamlined. The small fillets shown are made from 1/4" sheet and attached with bamboo pins and cement. Do not dispense with the pins as they are necessary. The main struts are attached to the fuselage as required. It would be use to cut away a tiny opening in the paper so that the strut will have a firm contact with the wood of the bulkhead. The rear struts, the spreader bar and the struts marked M are all cut to the required lengths and streamlined from hard 1/8" x 1/4". The spreader bar is attached to the bamboo pins at the lower extremities of the main struts. There should be a small clearance between the wood of the bar and the main strut. The 1-7/8" wheels are mounted on .028 music wire axles. The axles are attached to the spreader bar in such a manner that their ends sink into the wood at a point just below the attachment of the M struts. The axles are bound with thread and cemented.

The 1/2" tail wheel is mounted on an .014 wire axle. The wood mount seen on the side view is a piece of 3/32" sheet attached to the cut away portion of the rudder post.

Tail Assembly and Mounting

The main spars are 1/16" x 1/8" and are pinned directly to the bench. The crosspieces are cut to the required lengths from 1/32" x 1/8" and are cemented in place. The lowest cross-piece of the rudder is cut from 3/32" sheet. The edges of both stabilizer and rudder are formed by bending 1/20" sq. bamboo to shape around a candle flame.

Cover each side of both stabilizer and rudder with separate pieces of tissue. Dope the finished surfaces lightly.

The fillets are cut to shape as shown from two blocks 3-1/16" x 5/8" x 5/16". They are attached to the fuselage with very thick cement. If necessary, expose a quantity of cement to the air until the desired consistency is attained. If any crevices result from a variation of construction, carefully fill them with this thickened cement as they are to be painted over. Attach the stabilizer halves to the fillets with cement. The tail braces are cut to the given lengths and cemented in position. The rudder is cemented to the top former stringer and braced with black thread.

The tail unit, including the fillets, were painted a solid red on the model. The lettering was done with white oil paint.

Center Section Struts, Wings and Interplane Struts

The center section struts are cut to the lengths required from 1/8" x 1/4 " and streamlined. The ends are slanted before the struts are cemented in position.

The spars for the top wing are 1/16"x 3/16". They are pinned to the bench as evenly as possible. The ribs are cut from 1/32" sheet, pinned together and sanded to a similar outline. The notches are cut while the ribs are pinned together to insure their accuracy. Cement the ribs in place on the spars. The special tip sections required are shown on the wing plan in dotted lines. The leading edge of the top wing is 1/8" sq. stock, half rounded and cemented in position. The trailing edge is 1/16" x 3/16" stock. The tips are 1/20" sq. bamboo, bent by candle flame to the

desired shape. To incorporate the 1/4" dihedral in the top wing, it is necessary to crack the spars and leading edge at the point of angle. The wing tips are supported at the proper height by small blocks until the cemented cracked portions have dried. There is no dihedral on the scale Boeing's top wing. The smallest degree advisable has been added to the flying model.

The lower wing panels are built one left and one right hand. It is necessary to slant the innermost rib of each panel to allow for the 1/2" dihedral. Small pieces of 1/16" stock are inserted between the two inner ribs of both panels to prevent their distortion by covering. The leading edge is 3/32" sq. The spars are 1/16" x 1/8" and the trailing edge 1/16" x 3/16".

Cover the bottom of the top wing with one piece of tissue. The top surface is covered with three pieces due to the dihedral angle. The top and bottom surfaces of both the lower wing panels are covered with separate pieces of tissue. It would be advisable to cover the tips with narrow strips to avoid wrinkles. The finished covering is lightly sprayed and doped. The upper surface of the top wing is colored yellow. Three inch stars are used.

The top wing is attached to the center section struts and checked for alignment. The lower wing panels are cemented to the fillets built into the fuselage. It is to be noted that the incidence of the top wing is 3/32" and that of the bottom 1/16". The interplane and aileron struts are cut to the required sizes, streamlined and cemented in position. The interplane struts are 1/16" x 1/4" and the aileron struts 1/16" x 1/8". Fillets R and S are cut to the detailed size front 3/32" sheet. Black thread bracing wires are used. All load and lift wires are double. The remainder of the wings and all the struts are painted silver.

Drag Ring, Propeller and Motor

The drag ring is built up of six layers of 3/16" balsa sheet. Each layer is cut to the required outside and inside diameters and glued up cross grain. When dry, the contour of the outside is accomplished by shaping with a razor blade. A thorough sanding is done with fine paper. The main dimensions of the key layers are tabulated on the plan. The hole cut to receive the dummy motor or removable nose plug is square to prevent turning.

The crankcase proper is rounded from a block slightly larger than the 1-1/2" sq. one actually required. The nine spacings for the cylinder attachments are accurately marked. The crankcase must be flattened slightly where each cylinder is to be attached. This is clearly shown in the motor detail. The three circular additions to the front of the crankcase are made from 3/16" and 3/32" sheets as required. The bearing shown is cut from tin and sunk in as well as cemented to the crankcase. The cylinders shown are built up of scraps. The lowest portion of the cylinder is 1/16" sheet. The piece immediately above is 3/8" in diameter and 1/4" in thickness. The top of each cylinder is rounded as seen in the cross-section of the ring. The rocker arm housings are small pieces cut to shape and glued into notches cut in the cylinder head. The pushrods call be made by rounding 1/16" sq. balsa. The square plug piece at the rear of the crankcase is a piece of 3/16" sheet.

The propeller blank is cut along the diagonals that run along each side of the blades and extend beyond the confines of the block shown. These diagonals are for a block 2-1/4" wide. The excess portions are not shown on the plan. Do not shape the tips until the carving has been completed. Sand carefully after the balancing has been completed. The proper balance is essential to the performance of the model. The shaft is bent to shape from .028 wire. It is of course necessary to locate the shaft in the propeller, imbed a bearing in the rear face and to place a loose washer on the shaft as well as the plug before the hook is bent. The front of the shaft is bent U-shaped to permit its firm hold in the prop base. The prop is silver in color as is the drag ring and crankcase. The cylinders are black and the pushrods silver.

The motive power is eight strands of 1/8" flat rubber. Lubrication and winder winding will increase the flight duration if high performance is demanded.

Flight Directions

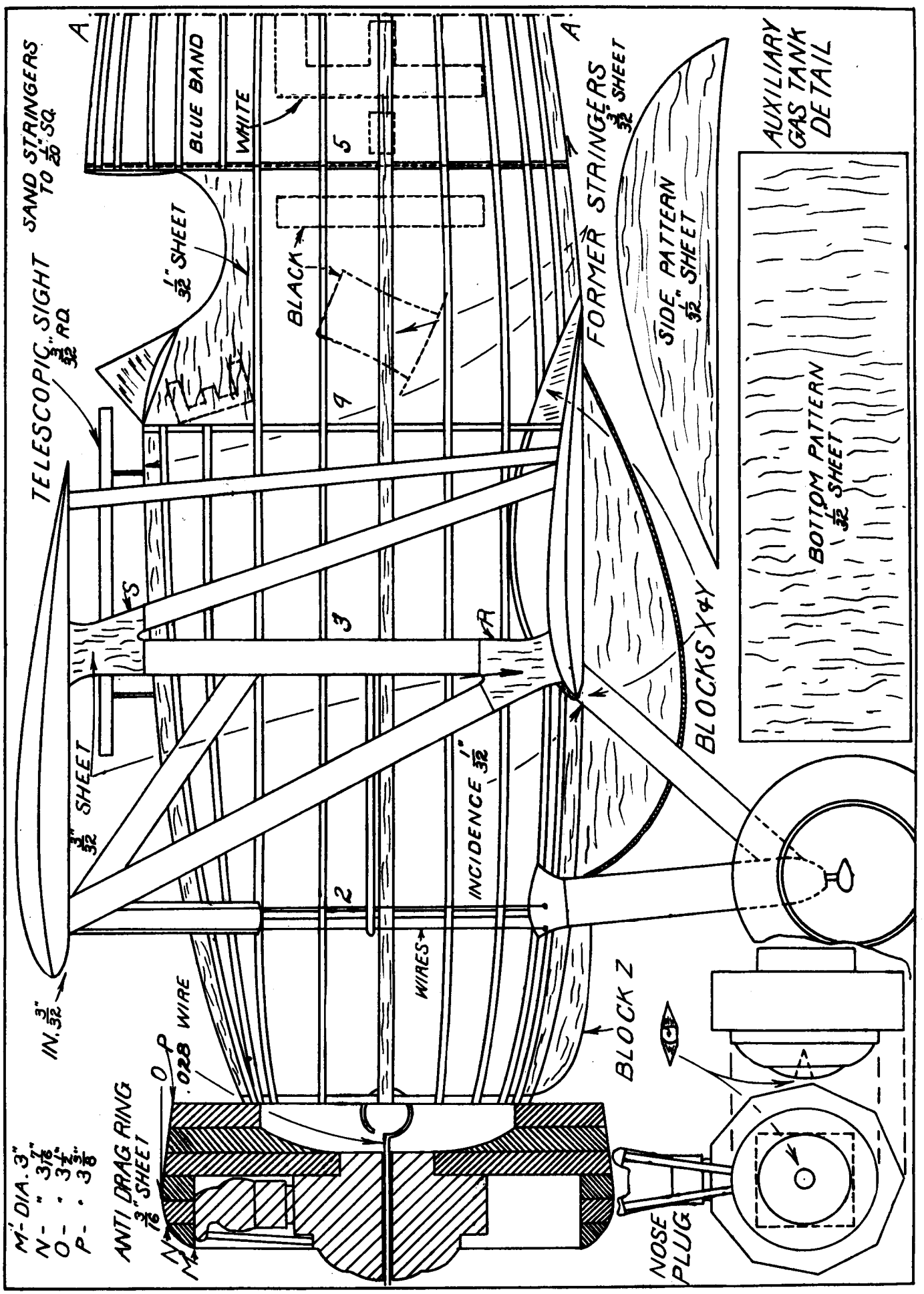
Balance the model by flying it over deep grass. If none is available, fly the ship on a few turns R.O.G. As the correct balance is ascertained, the number of turns is gradually increased. A small weight is invariably needed in the nose to balance the flying scale model despite all the possible methods of design and construction unless the proportions of tail surfaces are interfered with. Though the F4B-4 has a short rubber length, it is capable of flights a few hundred feet in distance if accurately built and wisely flown. You are bound to be pleased with the unexpected distance and stability of this little fighter.

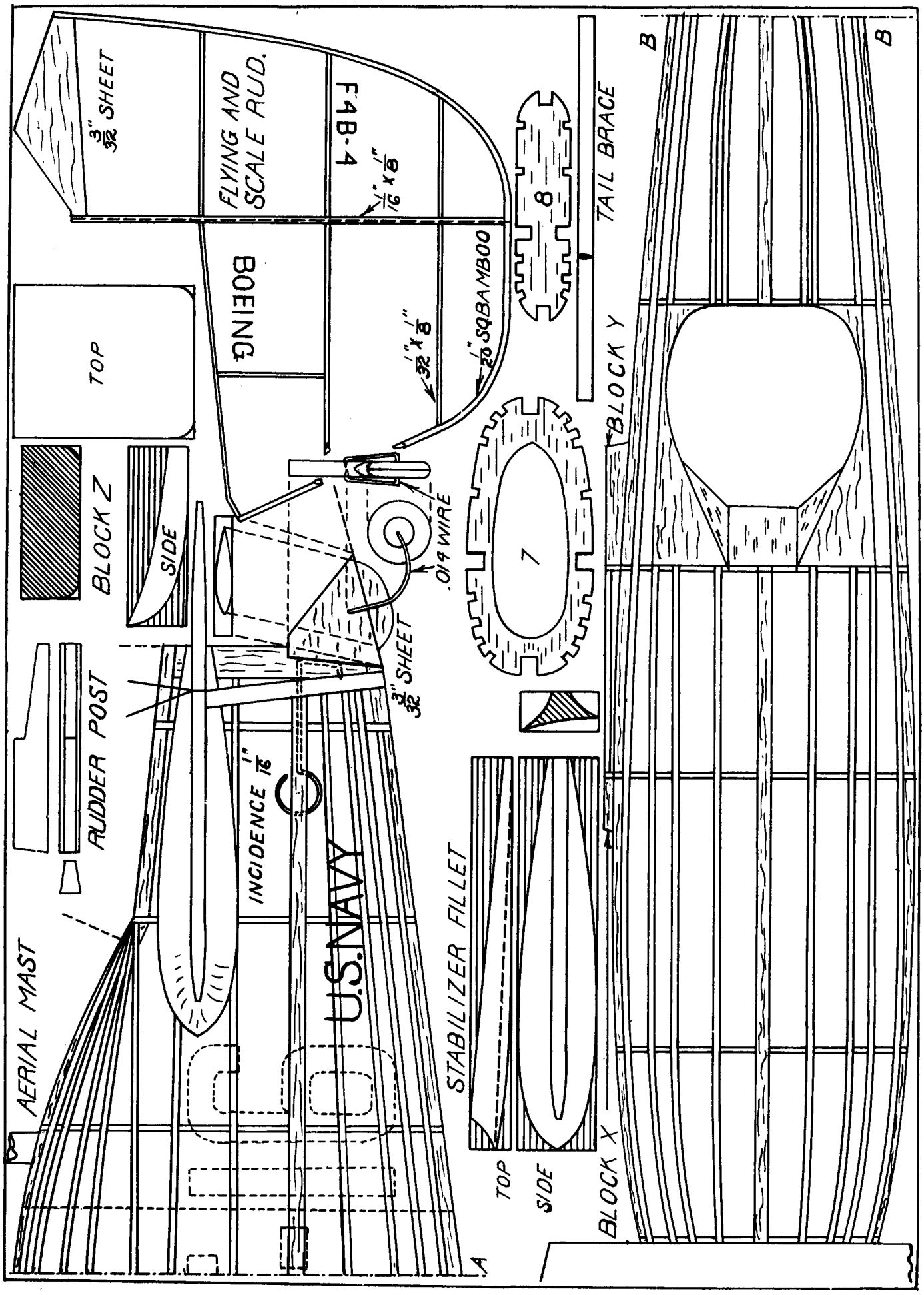
Bill of Materials

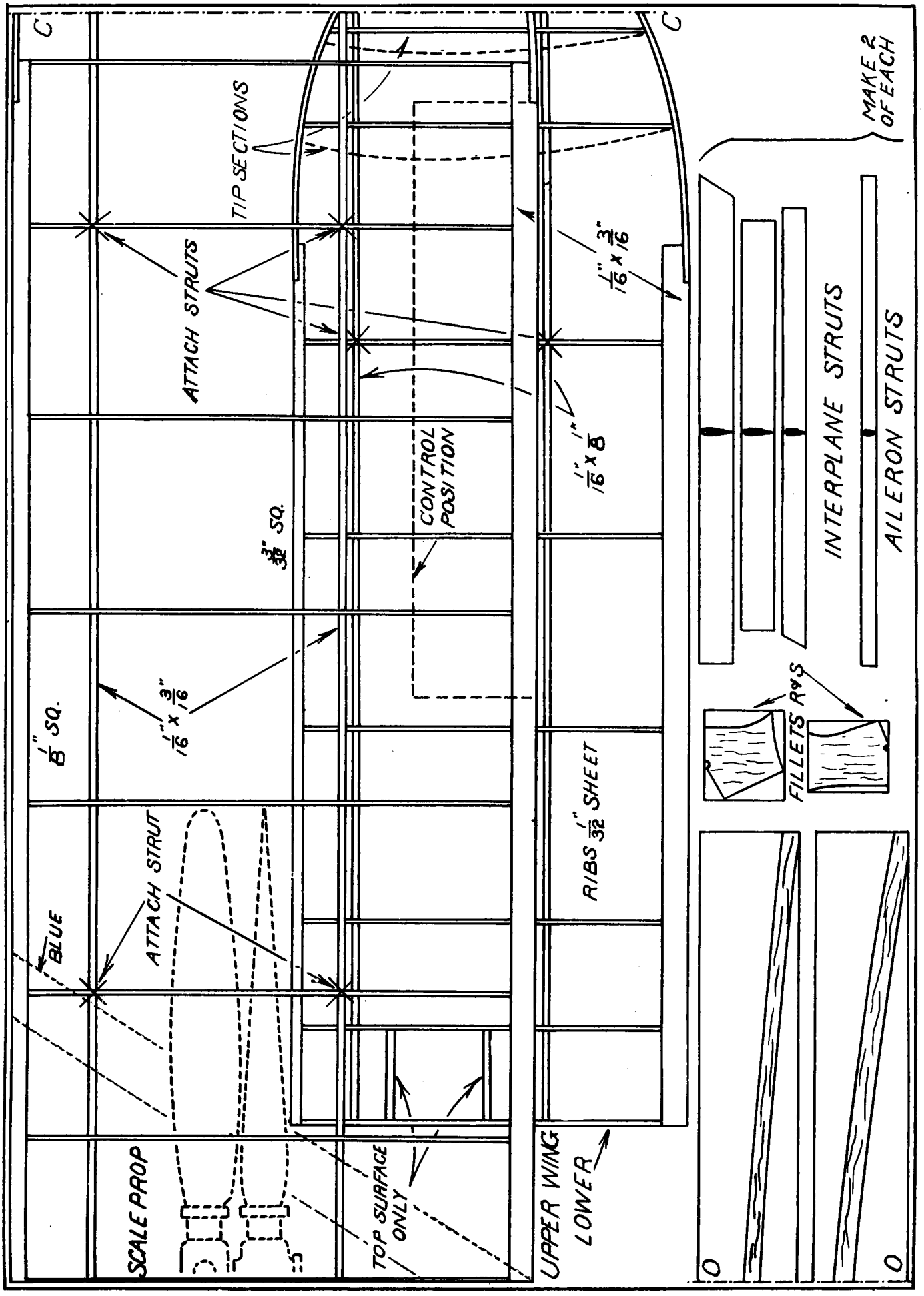
1	1/16" x 2" x 24"sheet balsa Bulkheads.
1	1/32" x 2" x 24" sheet balsa Wing ribs and cockpits.
1	3/32" x 2" x 24" sheet balsa Auxiliary gas tank. Former stringers, strut fillets and tail wheel mount.
1	3/16" x 2" x 24" sheet balsa Drag ring.
7	1/16" sq. x 36" strip balsa Stringers.
3	1/16" x 3/16" x 36" strip balsa Top wing spars and all trailing edges.
2	1/16" x 1/8" x 36" strip balsa Bottom wing spars, aileron struts and tail spars.
1	1/32" x 1/8" x 24" strip balsa Tail crosspieces.
1	1/8" x 1/4" x 36" strip balsa Landing gear and center section struts.
1	1/l6" x 1/4" x 24" strip balsa Interplane struts.
1	1/8" x 3/8" x 6" strip balsa Landing gear.
2	1-1/16" x 1" x 1-1/16" Block balsa Fillets Y.
2	7/16" sq. x 1-1/16" block balsa Fillets X.
2	5/16" x 5/8" x 3- 1/16" block balsa Stabilizer fillets.
1	1-3/8" x 3/8" x 1-3/16" block balsa Block Z.
1	1-5/8" x 1/4" x 3/l6" block balsa Rudder post.
1	1-1/2" sq. x 1/2" block balsa Crankcase.
1	8-1/2" x 1-1/2" x 1-1/16" block balsa Propeller blank.

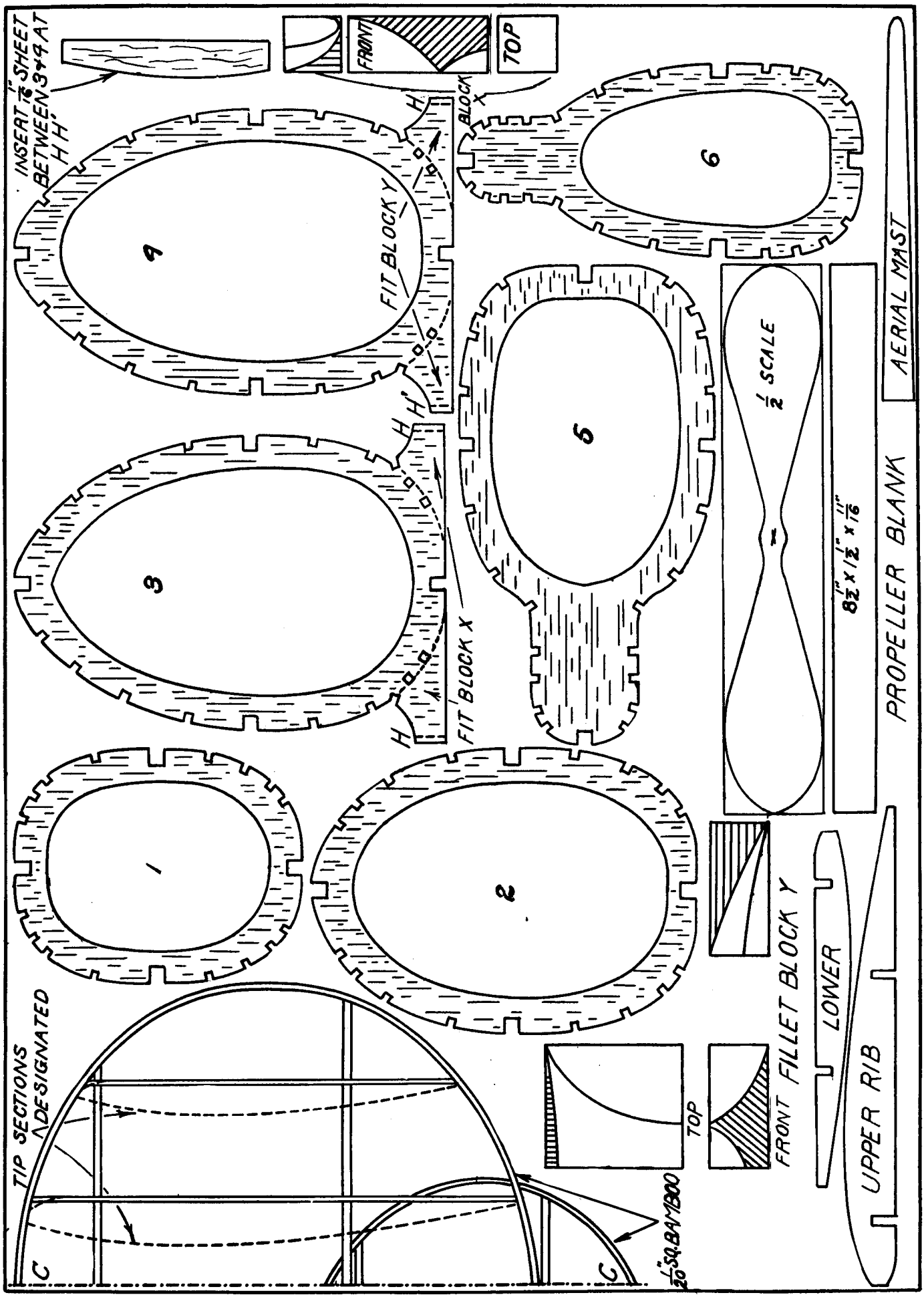
Miscellaneous

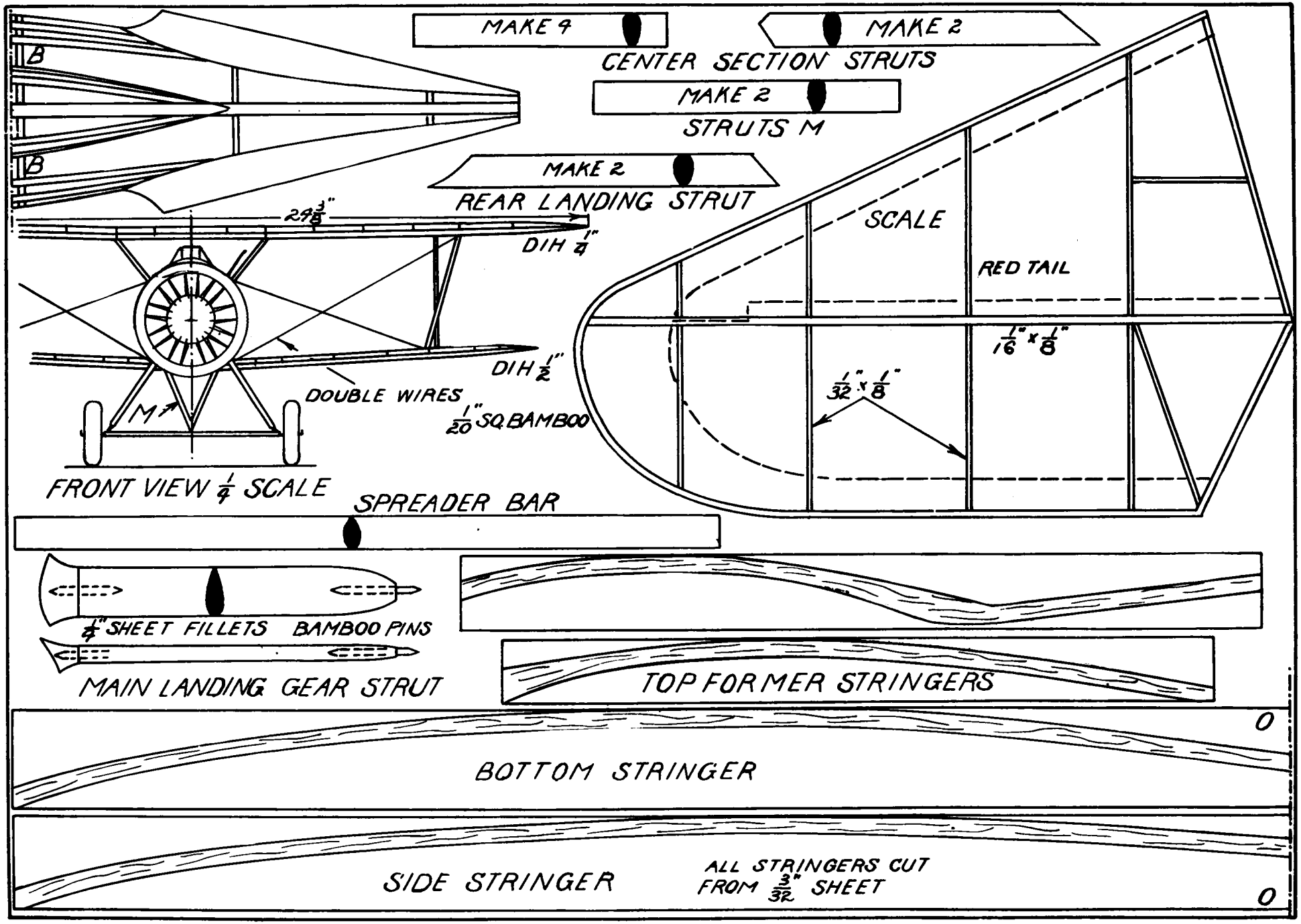
1	1 oz. cement
2	sheets white tissue
1	pr. 1-7/8" wheels
1	ft. .028 music wire
1	1/8" washer
1	scrap sheet celluloid
8	ft. 1/8" flat rubber
1	2 oz. clear dope
2	unsplit bamboo (1/4" x 1/16")
1	1/2" tail wheel
1	3" .014 music wire
1	scrap tin for bearings.
	Black thread for bracing
1	1 oz. yellow paint (lacquer or dope)
1	1-1/2 oz. silver paint (bronzing powder and dope)


A
A
BLUE BAND
WHITE
SAND STRINGERS TO 1/20" SQ
TELESCOPIC SIGHT 3/32" RD
1/32" SHEET
BLACK
5
4
FORMER STRINGERS 3/32" SHEET
SIDE PATTERN 3/32" SHEET
AUXILIARY GAS TANK DE TAIL
BOTTOM PATTERN 3/32" SHEET
3
FS
FR
3/32" SHEET
BLOCKS X4Y
2
INCIDENCE 1/32"
WIRES
IN. 3/32"
.028 WIRE
O
P
BLOCK Z
CG
ANTI DRAG RING 1/16" SHEET
NOSE PLUG
M- DIA. 3"
N- " 3 7/8"
O- " 3 7/8"
P- " 3 5/8"


3" 32 SHEET
FLYING AND SCALE RUD.
F4B-4
1/16 x 1/8"
BOEING
1/32 x 1/8"
1/8" SQ BAMBOO
TOP
BLOCK Z
SIDE
.019 WIRE
3/32" SHEET
RUDDER POST
INCIDENCE 1/8"
U.S.NAVY
AERIAL MAST
STABILIZER FILLET
TOP
SIDE
BLOCK X
BLOCK Y
TAIL BRACE
8
7
A
B
B


C
C
TIP SECTIONS
ATTACH STRUTS
3/32" SQ.
CONTROL POSITION
1/16" x 3/16"
1/16" x 1/8"
1/8" SQ.
1/16" x 3/16"
BLUE
ATTACH STRUT
SCALE PROP
TOP SURFACE ONLY
RIBS 1/32" SHEET
UPPER WING
LOWER
MAKE 2 OF EACH
INTERPLANE STRUTS
AILERON STRUTS
FILLETS
RIBS
O
O


INSERT 1/16" SHEET BETWEEN 3 & 4 AT H H'
FRONT
TOP
BLOCK X
FIT BLOCK Y
FIT BLOCK X
H
H'
1
2
3
4
5
6
1/2 SCALE
8 1/2" x 1/2" x 1/16"
AERIAL MAST
PROPELLER BLANK
FRONT FILLET BLOCK Y
LOWER
UPPER RIB
TOP
TIP SECTIONS DESIGNATED
C
C
1/20 SQ. BAMBOO


MAKE 4
MAKE 2
CENTER SECTION STRUTS
MAKE 2
STRUTS M
MAKE 2
REAR LANDING STRUT
B
B
29 3/8"
DIH 1/4"
DIH 1/2"
DOUBLE WIRES
1/20" SQ. BAMBOO
M
FRONT VIEW 1/4 SCALE
SCALE
RED TAIL
1/16" x 1/8"
1/32" x 1/8"
SPREADER BAR
1/4" SHEET FILLETS
BAMBOO PINS
MAIN LANDING GEAR STRUT
TOP FORMER STRINGERS
BOTTOM STRINGER
SIDE STRINGER
ALL STRINGERS CUT FROM 3/32" SHEET