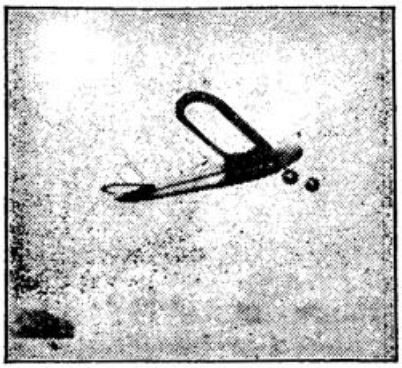
*"She's off!" And appropriately enough, our "Cumulus" heads happily up toward the mounting banks of clouds for which she was named. And there's plenty that's cloud-like about her, too—for she flies "free as the wind" in spite of her rugged structure.*



o o o

## NEW SHERESHAW-DESIGNED GAS JOB!

**"Switch on! . . . Switch off! . . . Contact!" There's no thrill to compare with the joy of handling a real airplane in flight! But perhaps the nearest approach is to launch a sky-scooting gas job into the air. And great indeed is the enjoyment if the gas fan has made his plane himself. You are assured of satisfaction and success in gas model flying, if you'll build this new ship of Shereshaw's—the "Cumulus"—for she's inherently stable. And what's more—she's easy to build!**

o o o

# Construct the "Cumulus"

**By Ben Shereshaw**

IN designing this "Cumulus" model for FLYING ACES gas model fans, I have tried to combine scale appearance with contest performance. In other words, the "Cumulus"—named after the massed cloud formation—is a ship that not only looks good, but also has "what it takes" when it comes to satisfactory performance.

Because of her high thrust line, she is an extremely stable flyer and you can depend upon her every time—if you carefully follow my instructions for building her. She has a good glide ratio—around fifteen-to-one with "power off."

In preparing these instructions, I have assumed that the out-and-out amateur would not yet be ready to build this gas model. So while the "Cumulus" is really an easy ship for the chap who *has* had a little model making experience (Herb Denaci, who built the original model from my plans—is sixteen years old)—I have glossed over the details that such a model hobbyist would normally know and have stuck entirely to the straight, practical end of the construction.

If, however, any reader *should* run into difficulties in connection with this model, he has only to drop me a note with a self-addressed, stamped return envelope and I'll do my best to straighten him out.

*And here Herb Denaci, a friend of the author's, poses with the "Cumulus" gas job he built from the original plans. From this photo, you can get a swell idea of the ship's general make-up. And by the way, sixteen-year-old Denaci hastens to point out that the black circles showing where his eyes ought to be are merely dark glasses and not the result of any "argument" with his well-built plane.*

### FUSELAGE

THE first step in building the fuselage is to lay out the side elevation. This is done by "scaling" the side view up to full size, with an architect's or mechanical engineer's scale.

The longerons are made of ¼" by ¼" hard balsa, and are selected for their uniform texture and even bending characteristics—since longerons having variable bending qualities are apt to distort the fuselage.

The fuselage sides should be assembled on a piece of plywood or similar material, which must be absolutely level. Cut the compression members to size, and insert them at the proper stations as indicated on the plates. Then, cut your diagonal braces, and be sure to cut them so that part of the diagonal rests against both the longerons and the compression members. You will note that the diagonal bracing at the nose is of ¼" by ¼" balsa, and the diagonal bracing backward from the wing is of ⅛" by ¼" balsa.

See that each member makes a snug fit, and do not try to correct a poor fit by filling the crevice with cement. Use the very best cement available, and proceed by cementing all the compression and diagonal members securely in place.

The next step is the assembly of the fuselage. Our top longeron being straight and the lower one curved, it is easier to assemble the fuselage "inverted." Start by cutting the cross-members, then cementing the center portion of the fuselage together. Be sure to cement both the top and lower members to the fuselage sides at the same time. Following this procedure, work back until you have reached the stern post.

Chamfer (bevel) the vertical members at

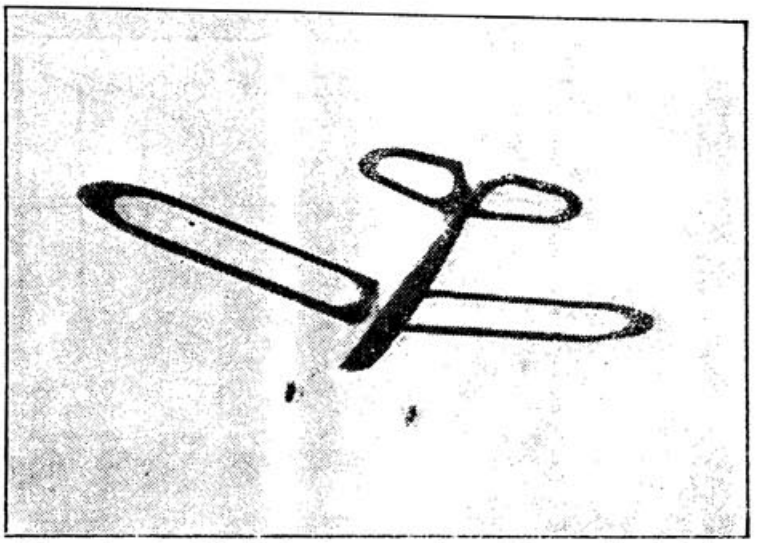
the stern to their correct angles. Flatten one side of the tail-skid and insert against the stern post, then bind both sides of the fuselage together with the skid between. Next, apply a generous coat of cement.

The nose of the model is then completed. Check carefully for alignment with a set of draftsman's angles.

This leaves us ready to insert our internal bulkheads at stations, A. B. C. D. E. The bulkheads are of balsa plywood, made up of two very hard 1/16" balsa sheets cemented together, with their respective grains running at right angles to each other. Then cut the notches which accommodate the motor bearers to size, and insert the bulkheads—using generous quantities of cement. Insert and cement the ½" by ⅞" pine motor bearers in place.

The landing gear comes next. The entire gear is made of .125 music wire. Scale all the views of landing gear to full-size so that the correct angles can be applied. In bending the music wire to shape, be sure that sharp corners are not formed, as such corners are apt to encourage crystallization in their vicinity. Bind all members as indicated on the plans, and wrap to fuselage cross-member with No. 8 silk thread.

It will be necessary to use a heavy needle to sew through the internal bulkheads. After a coat of cement has been applied to all thread wrappings, the struts are bound together with tinned wire and soldered with resin core solder.



*After a pleasant confab with her fleecy namesakes upstairs, our "Cumulus" dives for home—and allows us an intriguing glimpse of her fascinating silhouette. And those landing wheels aren't just "taggin' along," modelers—they're securely attached to a well-designed landing gear of piano wire construction.*

### Bulkheads

ALL bulkhead material is cut from 3/32" sheet balsa, medium grade. Cut all bulkheads in exact accordance with your full-size drawings, with the grain running *across* the fuselage. Do not cut the stringer notches until all the bulkheads have been cemented to the fuselage. Then, starting at bulkhead No. 4—from which the stringers are all plotted—cut all notches, inserting a stringer as you cut each notch. Scale the cockpit pattern to full size and cut from hard 1/16" sheet balsa.

The headrest, which is carved from soft balsa and hollowed out for lightness, is cemented in place *after* the fuselage has been covered.

Carve the nose block of soft balsa, and cement it to internal bulkhead A and motor-bearers.

### Rudder and Tail

A LIGHT grade of balsa is used throughout the entire construction of the tail group. The full-sized airfoil is used for both rudder and tail. The shaded portions on the drawings indicate that the leading edges are covered with 1/16" medium balsa, on both top and bottom. The sheet balsa leading edge is supported between the ribs by a very light balsa spar of ⅛" by ⅛" hard balsa. The tips of the tail surfaces should be of soft balsa. Box the entire spar structure of the empennage with 1/16" sheet balsa. Bamboo tissue or silk may be used for covering.

After covering, cement the horizontal tail to the fuselage longerons where the center ribs form a "V." Be sure that the horizontal tail possesses neither positive nor negative incidence. The rudder is next cemented to the top stringer and stern post, and should have neither incidence nor turn.

After the tail surfaces have been cemented and allowed to dry in place, dope them with three coats of nitrate dope.

*Just as young Denaci thought his ship was about to land—and ran out to greet her—she took a sudden notion to zoom on a friendly thermal. Yep, up she went, permitting this fine, fast-lens camera "peek." Hang around, Herb, she'll be down in a minute.*

### Wing

WE start with the wing by cutting the main ribs. All ribs except the butt ribs are cut from 3/32" medium sheet balsa. The butt ribs are laminated, of two thicknesses of 3/32" hard balsa. It is best to first make a metal template, to assure accuracy in their cutting.

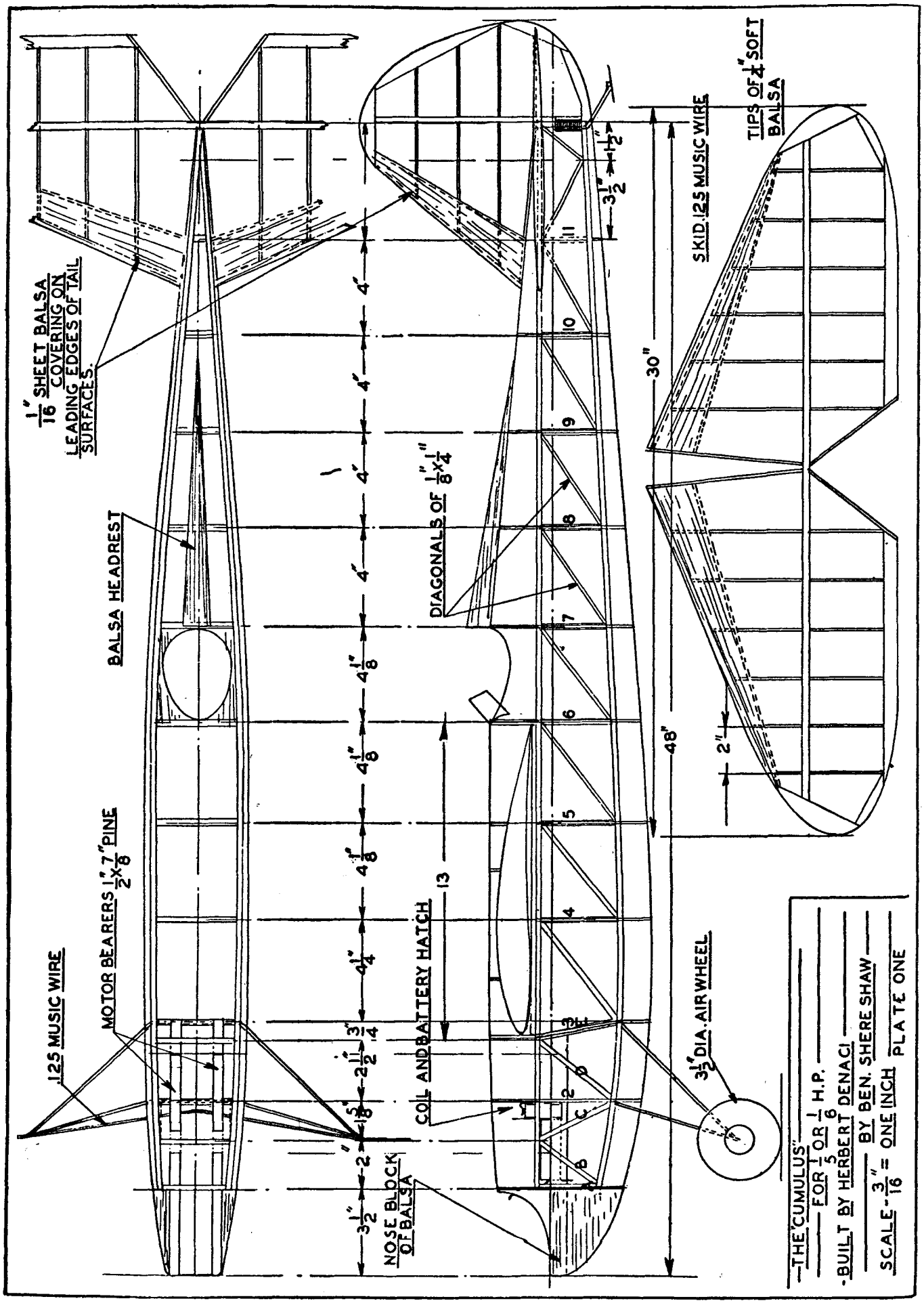
The tip ribs are scaled down as follows: We assume that one of our tip ribs is 70 per cent of the chord to that of the main rib; it would obviously then be 70 per cent of the depth along all stations to that of the main rib.

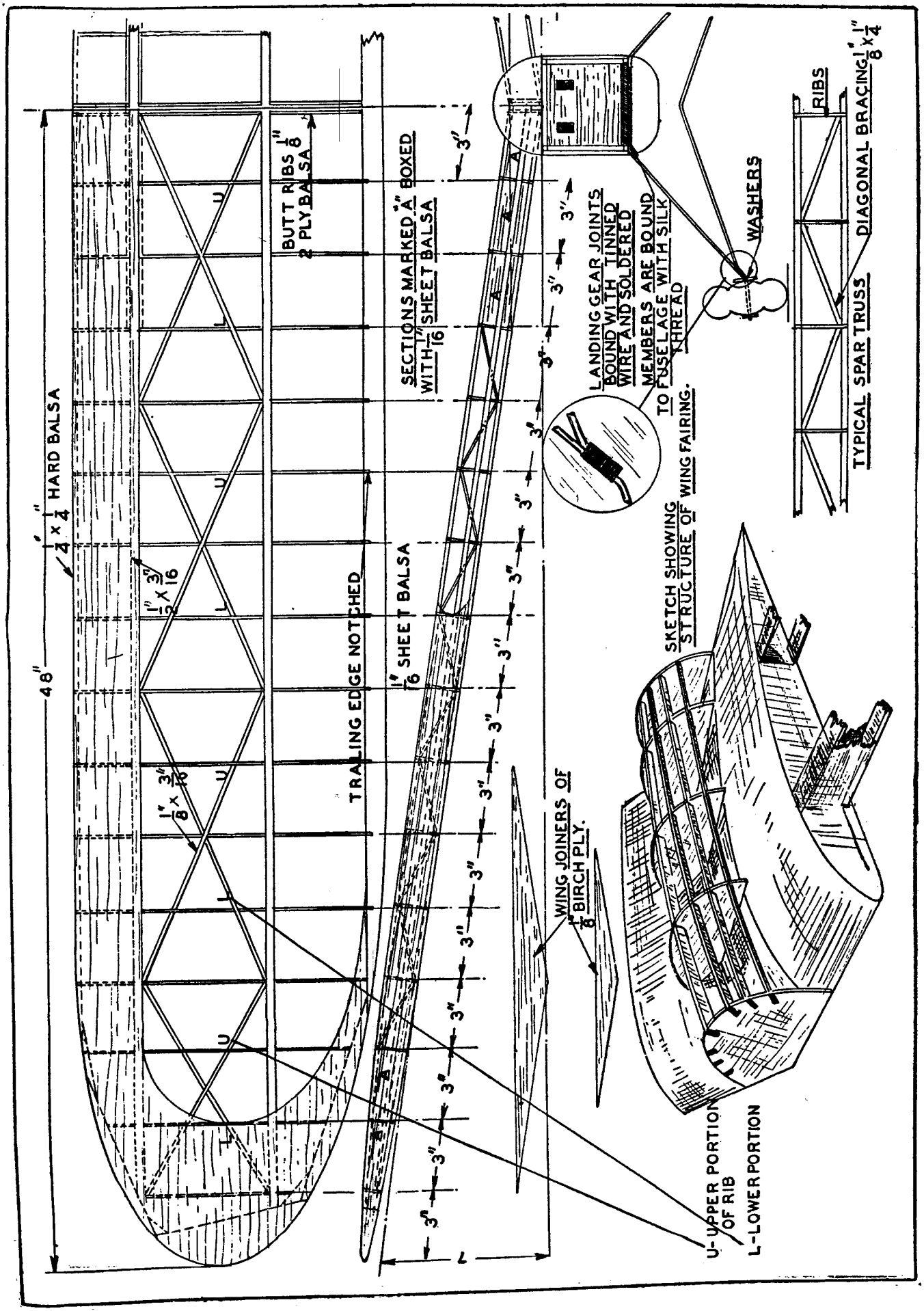
Draw a layout exactly as you see it for the full-size rib, and for each tip rib chord. Divide them into the same number of vertical stations, except that you alter the distance between each station as the chord varies.

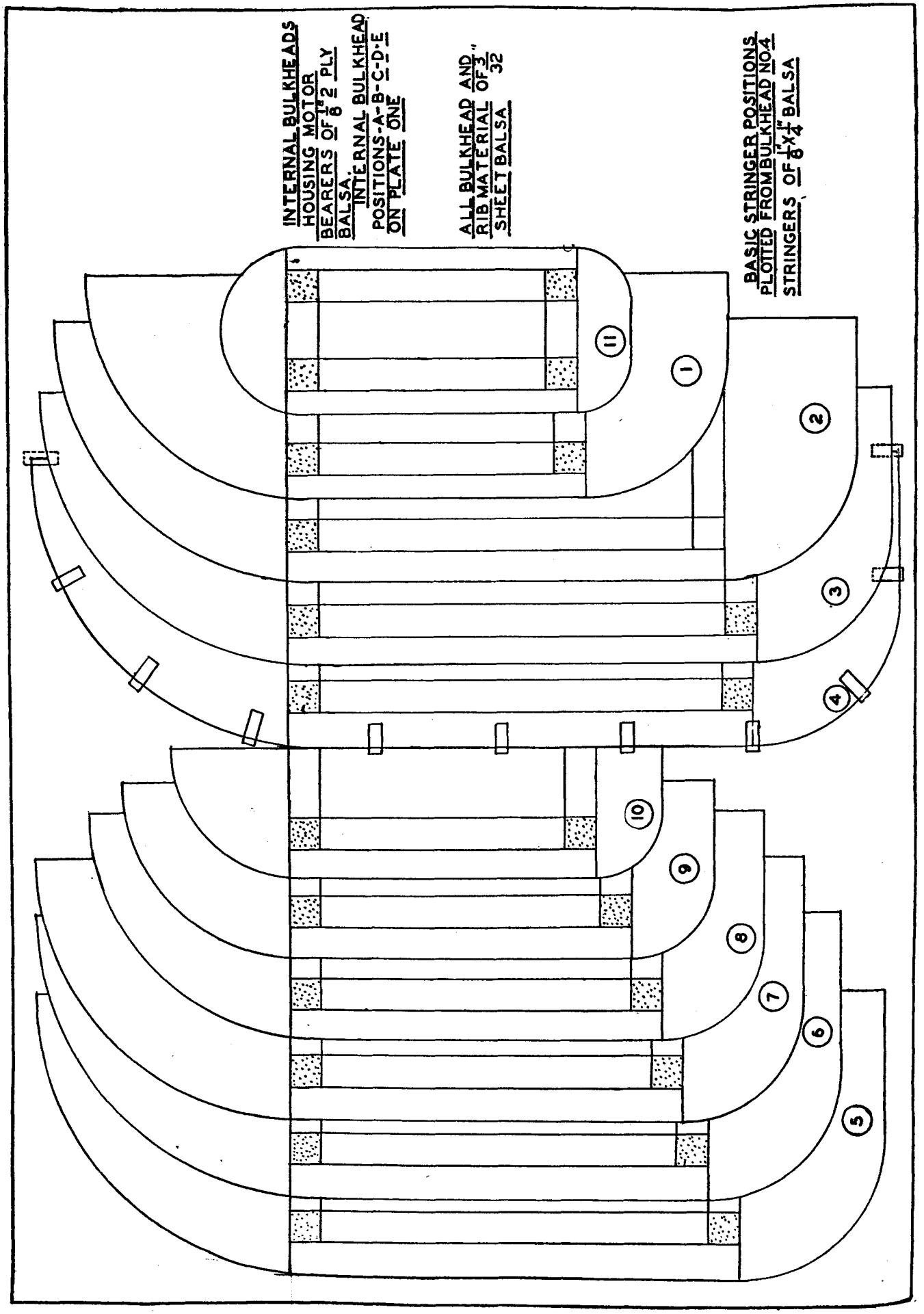
Then, proceed to plot each

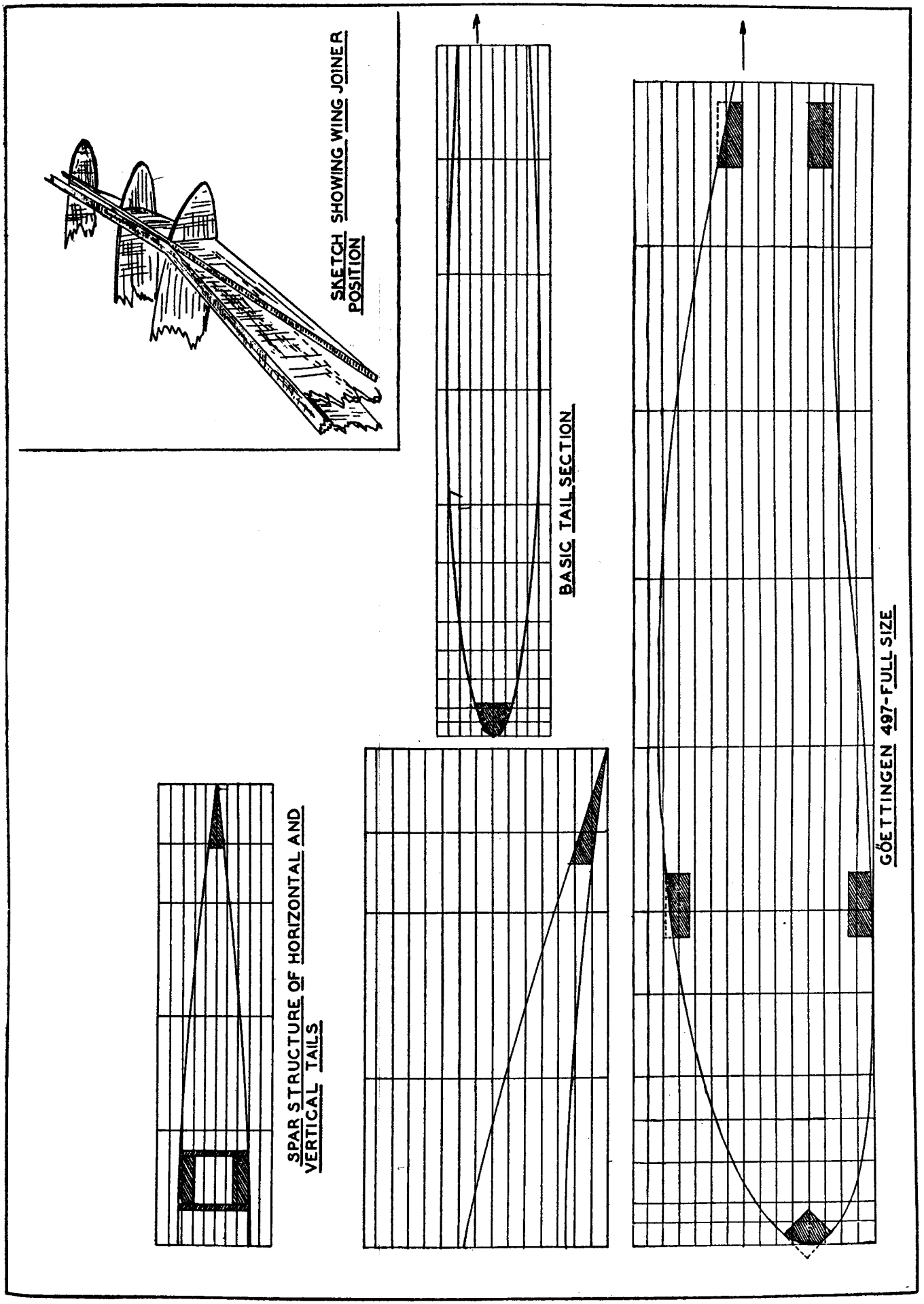
*(Continued on page 93)*

**Construction Plans**
**for this top-notch gas job will be found on the four following pages.**


1/16" SHEET BALSA COVERING ON LEADING EDGES OF TAIL SURFACES.
BALSA HEADREST
MOTOR BEARERS 1/2" x 7/8" PINE
.125 MUSIC WIRE
DIAGONALS OF 1/8" x 1/4"
COIL AND BATTERY HATCH
NOSE BLOCK OF BALSA
SKID .125 MUSIC WIRE
TIPS OF 1/4" SOFT BALSA
3 1/2" DIA. AIR WHEEL
30"
48"
2"
4"
4 1/8"
4 1/4"
3 3/4"
2 1/2"
1 3/8"
2"
3 1/2"
1 1/2"
13
THE "CUMULUS"
FOR 1/5 OR 1/6 H.P.
BUILT BY HERBERT DENACI
BY BEN. SHERESHAW
SCALE - 3/16" = ONE INCH
PLATE ONE


48"
¼" x ¼" HARD BALSA
1" x 3/16"
1" x 3/8"
TRAILING EDGE NOTCHED
1/16" SHEET BALSA
BUTT RIBS 1/8" 2 PLY BALSA
SECTIONS MARKED 'A' BOXED WITH 1/16" SHEET BALSA
WING JOINERS OF 1/8" BIRCH PLY.
3"
L
U- UPPER PORTION OF RIB
L- LOWER PORTION
LANDING GEAR JOINTS BOUND WITH TINNED WIRE AND SOLDERED
MEMBERS ARE BOUND TO FUSELAGE WITH SILK THREAD
WASHERS
SKETCH SHOWING STRUCTURE OF WING FAIRING.
RIBS
TYPICAL SPAR TRUSS
DIAGONAL BRACING 1/8" x 1/4"


INTERNAL BULKHEADS
HOUSING MOTOR
BEARERS OF 1/8" 2 PLY
BALSA.
INTERNAL BULKHEAD
POSITIONS-A-B-C-D-E
ON PLATE ONE
ALL BULKHEAD AND
RIB MATERIAL OF 3/32"
SHEET BALSA
BASIC STRINGER POSITIONS
PLOTTED FROM BULKHEAD NO.4
STRINGERS OF 1/8"X1/4" BALSA
11
1
2
3
4
10
9
8
7
6
5


SKETCH SHOWING WING JOINER POSITION
BASIC TAIL SECTION
GÖETTINGEN 497-FULL SIZE
SPAR STRUCTURE OF HORIZONTAL AND VERTICAL TAILS

# Construct the "Cumulus"

*(Continued from page 45)*

tip-rib and tail-rib in proportion to their respective basic airfoils. Incorporate in the template the spar notches, so that these may be cut at the same time.

Select the wing spars for rigidity and grain structure. Scale the wing panels up to their full size, and lay the lower spars in their respective places. Then cement the ribs onto the spars—and *don't* spare the cement!

Next, cement the upper spars in place, and be sure that the ribs are perpendicular to the spars. Box the spars with 1/16" sheet balsa at the designated sections marked "A" between the ribs.

The spar truss is then built by inserting diagonal pieces of ⅛" by ¼" balsa between each rib. And the drag truss is made by first notching the ribs on top and bottom for ⅛" by ¼" strips, then inserting the drag truss strips and butting them against the wing spars.

The tips are cut from soft balsa, and should be cemented together before attaching to wing frame. Cover all shaded portions (leading edge and tips) with 1/16" medium balsa.

The two panels are now ready for joining. Be sure that the butt-ribs are cemented in place, so that the panels will have their proper amount of dihedral. Cut four joiners—two for each spar, as illustrated. Next, cement both panels together at the butt ribs. Notch the ribs to their proper depth and insert the joiners. Wrap the latter securely in place with No. 8 silk thread, and apply a generous coat of cement. The wings may be either covered with bamboo tissue or china silk.

### Motor and Test Flight

WITH a little adjustment of the motor mount, almost any standard, low-powered gas motor can be installed and will give good results.

Test flight should be made most carefully. Glide your "Cumulus" first, without power, until her plainest faults (if any) have been discovered and corrected. Then allow only enough gas for a three-or-five second power flight. Don't take any chances until you "know" your ship.