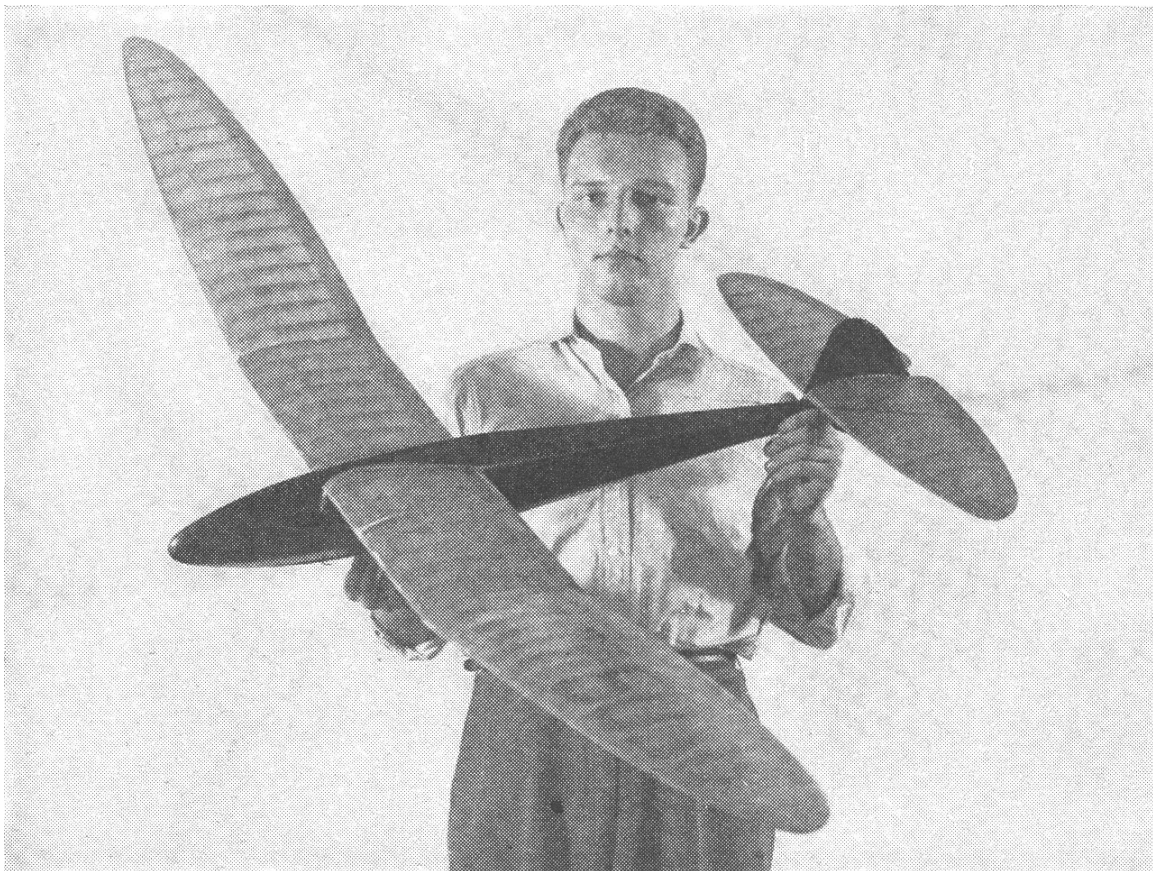


The completed high aspect ratio soarer

SOARING CHAMP

An easily constructed plane that gives out of sight flights with no motor trouble

By RAY BEAUMONT



The author with his soaring champ

THE airplane was developed from research with gliders and owes much of its subsequent success and high efficiency to tests made with soaring planes in many countries. The true aerodynamic efficiency of a plane can be easily determined when flown without a motor, for power is often substituted for efficiency - and makes inefficiency less evident.

Model soarers provide a simple, inexpensive and interesting means of experiment and the flight time of a well designed ship is seldom inferior to power driven craft. They also eliminate the disadvantages of motor trouble, fire, breaking rubber and complication.

This model soarer is no exception and provides out of sight flights when the slightest thermal is present: it has demonstrated such ability in a thrilling manner on many occasions.

The construction is simple and similar to powered planes, and only a few hours is required to complete it. Building instructions follow.

FUSELAGE - The first step is to scale the plans to full size; all the necessary dimensions are given on the plans as well as the scales. Fuselage formers and wing ribs are given full size for convenience. When the plans are completed you are ready to begin construction by first building the two sides of the fuselage directly on top of one another so as to insure two equal sides. If you are particular, cover them with wax paper as this is a great aid in preserving them. Be sure to do all your building on a perfectly flat board to secure a perfect model.

All longerons and stringers are made of 1/8" x 1/8" balsa, also the uprights between stations 1 and 10. The uprights between stations 11 and 18 as well as all diagonals are 1/8" x 1/16".

When the sides are dry remove from the plans and separate them with a razor blade. Then wrap a piece of sandpaper around a block of wood and sand both sides of the fuselage lightly to remove all glue lumps. This will also make poorly fitted joints smooth.

Now join the two sides together starting at station 19; then join at stations 11-9-7-5-3-2, respectively. This will automatically give the fuselage proper top view shape.

Next step is add the remainder of the cross braces. Then follow by adding the fuselage formers which are 1/16" sheet balsa. Cut the landing skid to proper shape and add to the fuselage. When this is thoroughly dry add nose block and sub-rudder, then add top and bottom stringers which are 1/8" x 1/8" balsa.

Now make the ballast box in the front of the ship between stations 2 and 3 of 1/8" sheet balsa. Add the 1/8" x 1/8" diagonals between "H" and "J" and then insert the 1/16" sheet. Follow this by sanding the fuselage thoroughly. Fuselage is now ready to apply the 1/16" sheet planking in 6 pieces; first the two sides of the formed hexagon, then the two top sides of the hexagon and then the two bottom sides. When planking has dried sand the fuselage thoroughly and add the tow-line hooks which are screwed in the skid and glued. Now insert the 3/16" dowel sticks to hold the wing in position. No further work can be done on the fuselage until the wing has been completed.

WING CONSTRUCTION - There should be no great difficulty in constructing the wing, as all wing ribs are given full size. First step is to cut the leading edge from 1/4" sheet balsa. This is 1/4" x 3/8" for the center section and 1/4" x 3/8" tapered to 1/4" x 3/16" at the tip. Now cut the center spar from 3/16" sheet. This is 3/16" x 1/2" tapered to 3/16" x 1/8" at the tips. Now cut the tips and trailing edge from 3/16" sheet, making them 3/16" x 1-1/8". Be sure to notch the trailing edge at each place a rib is to be inserted. Follow this by cutting out all wing ribs. The center section requires 17-C-1 and tips require 2 ribs each from T-1 to T-17.

Now all the necessary parts are ready for assembling. The wing should be constructed on a perfectly flat board to prevent warps. When cement has dried, sand thoroughly and put 6" dihedral in each tip. Be sure to add gussets at dihedral joints. Next apply the 1/16" sheeting to the leading edge of the wing. *This sheeting proved as necessary as the paper covering after a few flights with the original model.* The extra weight did not affect the ship in any way; performance was improved. When the cement is dry, sand the wing thoroughly and cover.

STABILIZER CONSTRUCTION - The stabilizer should be made in similar manner to the wing except all tapering should be done from center of stabilizer to tips. The sizes of material are given on the plans. Be sure to add the 1/16" sheet balsa in the center of stabilizer on the bottom as shown on the plans for a gluing surface when applying stabilizer to fuselage. When completed sand and cover.

RUDDER - The rudder is simply cut from 1/16" sheet balsa, the grain running in a vertical position as shown in the plans. It should be sanded and covered with tissue.

INSERTING WING IN FUSELAGE - Lay a template of the airfoil section on the top part of the hexagon of the fuselage, with the bottom of the airfoil

section resting on the top longeron, between stations 5 and 9 and then outline with a pencil. Next remove template and cut away the 1/16" sheeting outlined by the template.

Do this on both sides of the fuselage and slide the wing through the fuselage and strap in place with rubber bands. When the wing is in proper position glue the top of the wing to the fuselage. When dry cut the top of the fuselage out between formers D-TD and back along the top longerons to former H. Then cut diagonally up to top of fuselage, between the 1/8" diagonals located between formers H and J, which will make the wing look as if it slides through the fuselage when it is ready to fly.

COVERING, DOPING, ASSEMBLING - Fuselage and rudder should be covered with tissue, in order to prevent the planking from splitting. Wing and stabilizer is covered with silkspan, the grain of the paper, running in the direction of the span. Then spray the entire ship with water to shrink the paper. When dry give the ship three light coats of dope, taking special care to prevent warps.

BALANCING AND FLYING - Before gliding, balance by hand, adding air-rifle shot in the ballast box, which is in the nose of the plane, (about 1 and 1/2 boxes should be plenty, depending upon weight of the wood used). The plane should be balanced at approximately 50%

of the wing chord. When you have your model balanced by hand give it a few hand glides, to see if any more ballast should be added. Now add a short length of towline to the ship until the plane is gliding properly.

The towline should be light but very strong; a lightweight fishing line is often used. Contest rules do not permit a line longer than one hundred feet.

There are two methods of making a towline: 1- Bend a hook from piano wire and attach directly to tow line; 2 - 75% of towline can be string and the balance rubber with the hook attached. With No. 1 the plane must be drawn completely overhead before the towline will release itself. No. 2 has the advantage that you can release the glider at any time, just by giving the towline a quick jerk which releases the hook.

Two hooks are placed in the glider, one in front used in windy weather and a rear hook for calm weather. When adjusting your glider to circle you do not have any torque problems, so it makes little difference which way the plane circles. The rudder should be set so that the ship flies in about 100 ft. circles; flights average between three and four minutes on a hundred feet of towline without the aid of thermals. Proper care and patience will give you hours of pleasure and valuable experience, so get in the swing and "start 'em flying."

Bill of materials

10	1/8" x 1/8" x 36" balsa
2	1/16" x 1/8" x 36" balsa
2	sheets 1/8" x 3" x 36" balsa
8	sheets 1/6" x 3" x 36" balsa
4	sheets 1/6" x 2" x 36" balsa
3	sheets 3/16" x 3" x 36" balsa
2	sheets 1/4" x 3" x 36" balsa
1	nose block 1-1/2" x 1-1/2" x 2-5/8"
8	3/16" dowel
1	pint nitrate dope
4	oz. glue
2	straight hooks
2	boxes air-rifle shot
3	sheets Silkspan
2	sheets tissue

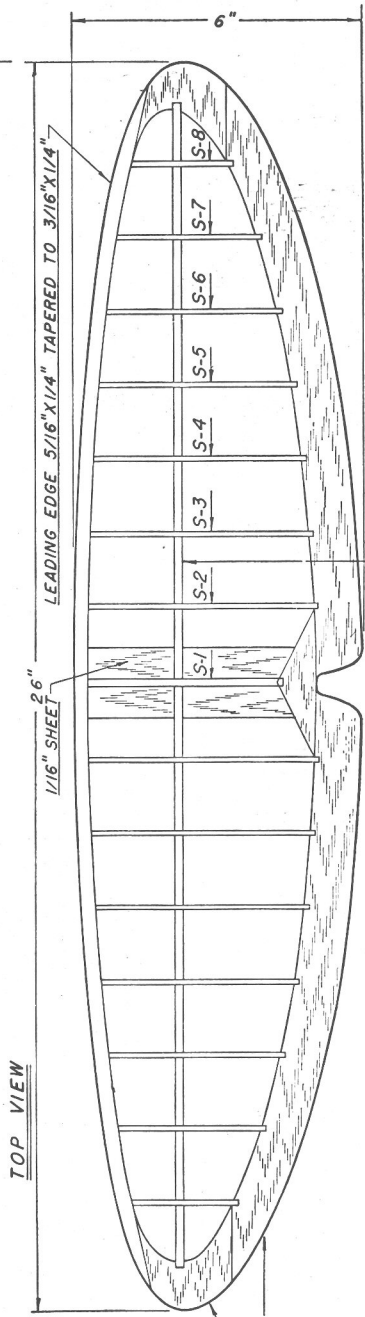
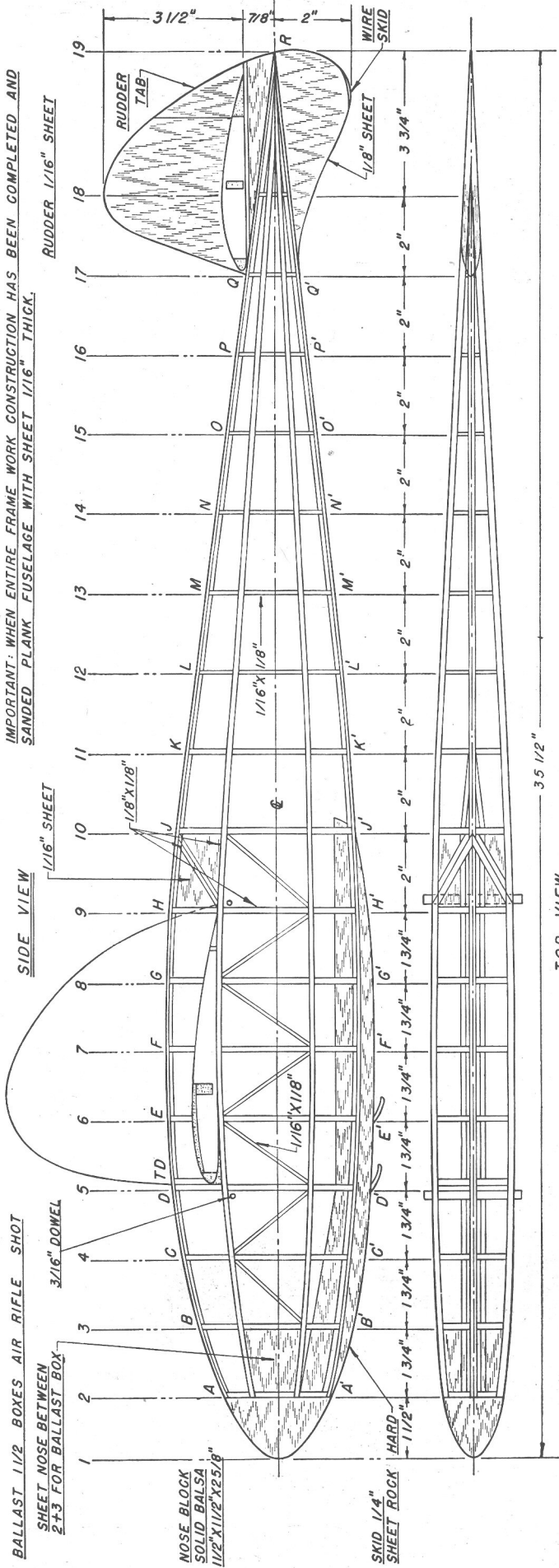
NOTE - All dimensions are given in fractional parts of an inch.

VICTORY

Scanned From March, 1943

Model Airplane News

IMPORTANT - WHEN ENTIRE FRAME WORK CONSTRUCTION HAS BEEN COMPLETED AND SANDED PLANK FUSELAGE WITH SHEET 1/16" THICK.



TOW HOOKS MADE FROM STRAIGHT HOOKS SCREWED IN SKID AND GLUED

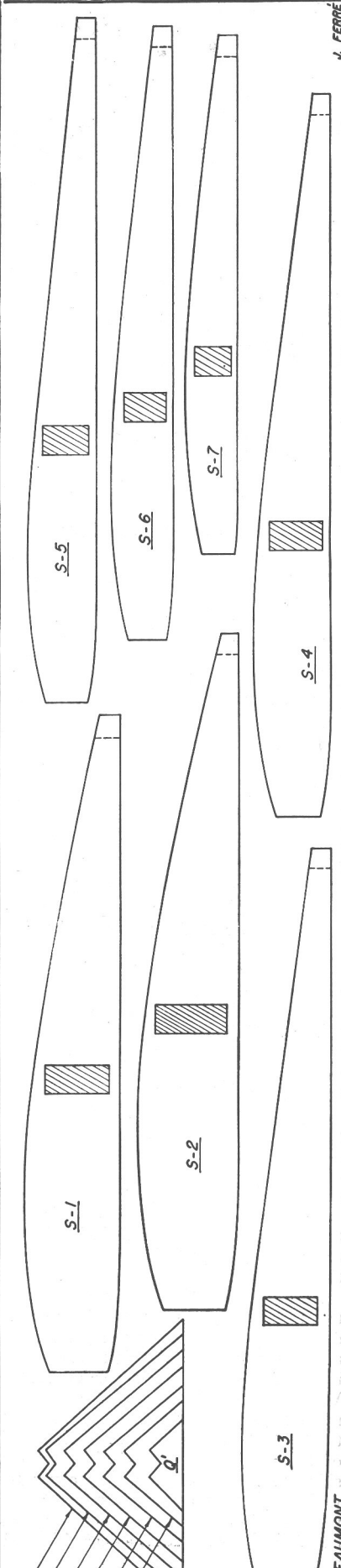
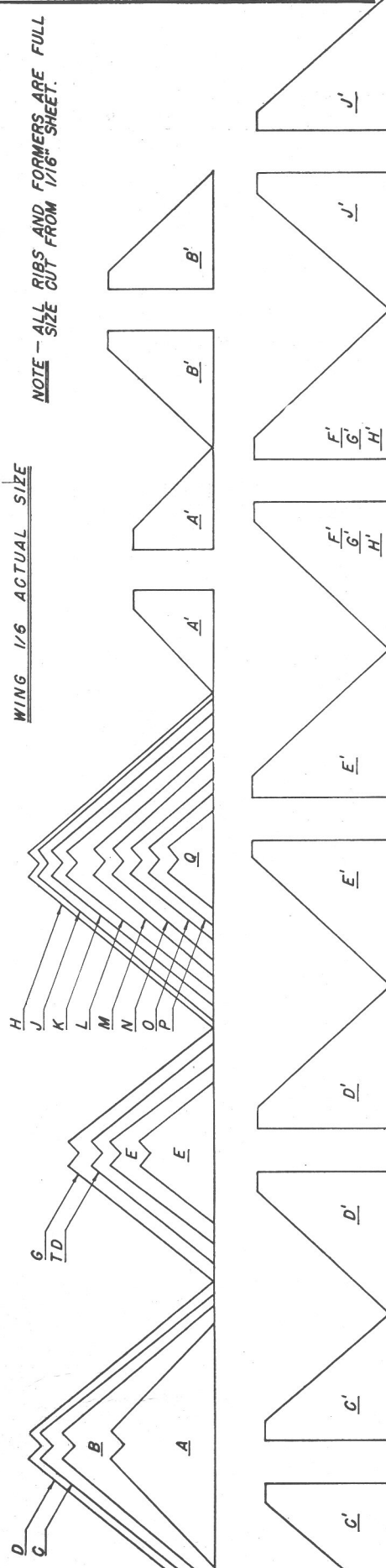
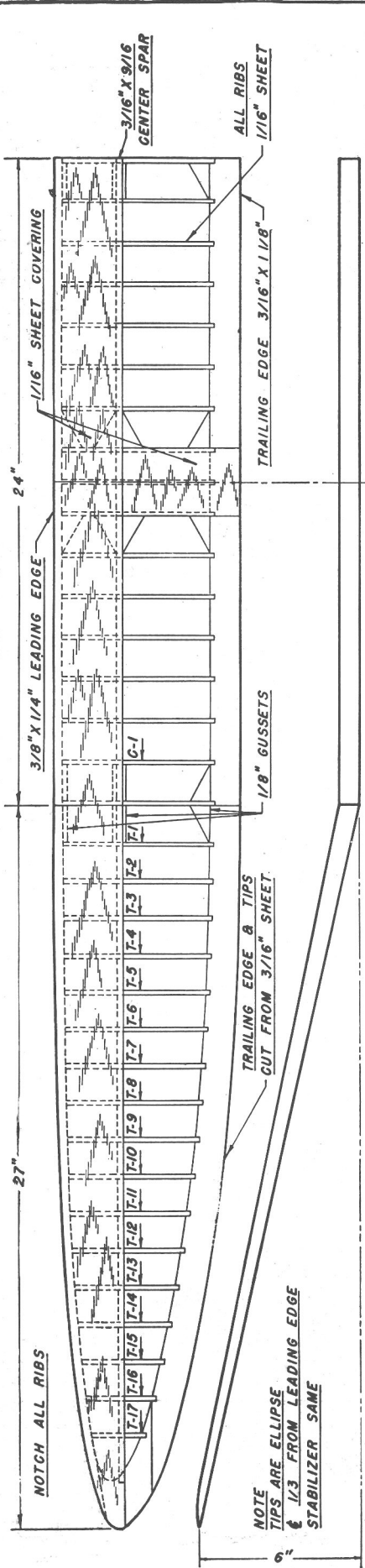
STATIONS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Ø TO TOP LONGERON	X	11/16	1	3/16	13/16	7/16	7/16	3/8	5/16	5/16	3/16	1/16	3/8	5/8	3/8	1/2	3/8	1/4	0
Ø TO TOP STRINGER	X	7/16	2	23/16	23/16	23/16	23/16	23/16	23/16	23/16	23/16	23/16	23/16	23/16	23/16	23/16	23/16	23/16	23/16
Ø TO BOTTOM LONG.	X	7/16	3/4	7/8	15/16	1	1	1	1	15/16	7/8	3/4	5/8	3/4	5/8	3/4	5/8	3/4	0
Ø TO BOTTOM STRING.	X	1/4	15/16	15/16	21/16	21/16	21/16	21/16	21/16	21/16	21/16	21/16	21/16	21/16	21/16	21/16	21/16	21/16	21/16
Ø TO BOTTOM OF SKID	X	1/4	17/16	23/16	23/16	23/16	23/16	23/16	23/16	23/16	23/16	23/16	23/16	23/16	23/16	23/16	23/16	23/16	23/16
WIDTH	X	1 1/2	1 3/4	1 7/8	2	2	2	2	2	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/8

NOTE: BE SURE TO READ INSTRUCTIONS.

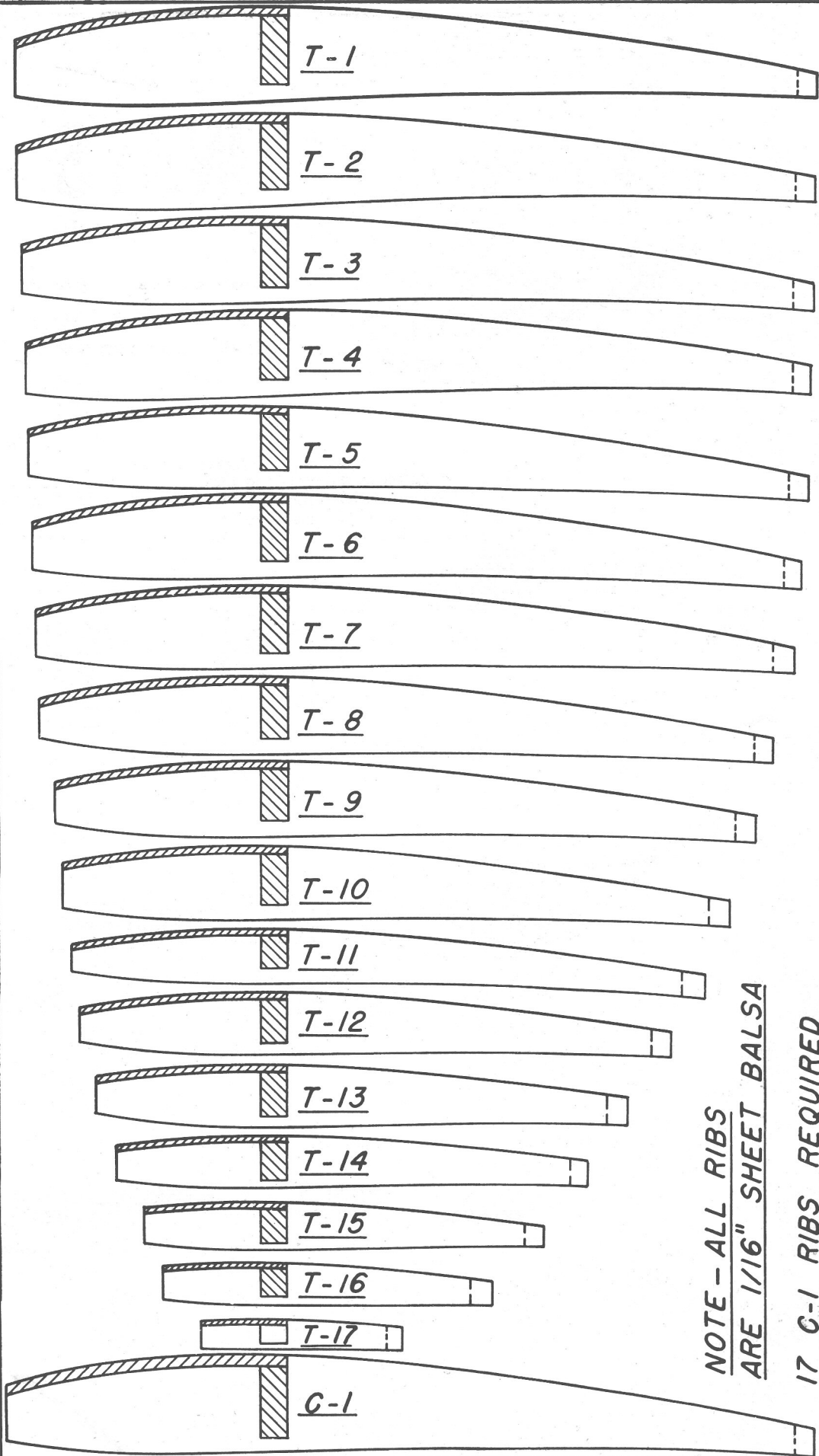
SCALE 1/4 SIZE

R. BEAUMONT

J. FERRÉ



J. FERRÉ



NOTE - ALL RIBS
ARE 1/16" SHEET BALSA

17 C-1 RIBS REQUIRED
2 RIBS EACH FROM T-1 - T-17

STABILIZER RIBS 1/16" SHEET
2 OF EACH REQUIRED

SCALE - FULL SIZE