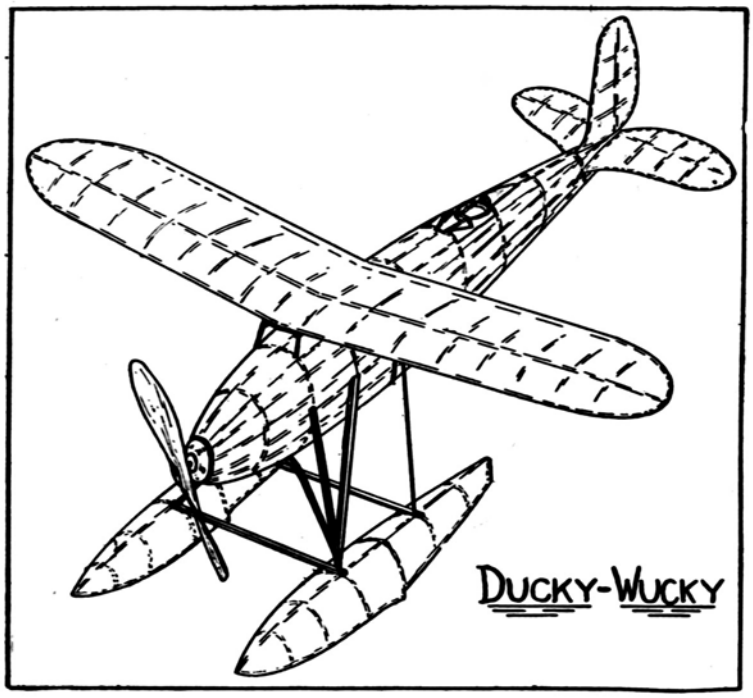
With the Model Builders

DEPARTMENT CONDUCTED BY

Gordon S. Light



STEP right this way, ladies and gentlemen, and see the aeronautical sensation of the century. It's colossal, stupendous. It's the very thing you've lain awake nights dreaming about. It's the powdered sugar on your model airplane strawberries; it's the peaches and cream of your balsa wood and Japanese tissue diet. Right this way, ladies and gentlemen——"

You must excuse me if I seem a little out of breath after that bit of verbal shadow boxing, but I think so highly of this month's model that I felt I could not do justice to it without resorting to the side-show spieler's wholesale handling of adjectives.

Take it from me, the Ducky-Wucky is just that. There's nothing to beat its smooth off-water flights and landings. It will take a hard-hearted modeler to remain calm when the

ship levels off a few inches above the water and gently settles down.

I predict that the Ducky-Wucky will be your biggest thrill since that memorable occasion when you glimpsed daylight between the ground and your first model air-plane.

The Ducky-Wucky is at home on water. Ruggedly built, it can stand a ducking and come up for more. But it should appeal equally well to land-bound modelers, for they need only substitute a pair of wheels for the floats and they have a corking land model. They may even choose to fly the Ducky-Wucky from a creek or from pools of water in streets and fields after a rain. Even a shallow trough will do, for it need be only an inch deep and about fifteen feet long.

The ideal way, of course, is to procure a boat on some near-by lake or dam, then row well out from shore to launch the ship. In that way the Ducky-Wucky has ample opportunity to express its personality in a smooth, unhurried take-off, and in its long, graceful glide. But the Ducky-Wucky cannot do any of these things for you unless you build it. So let's get started.

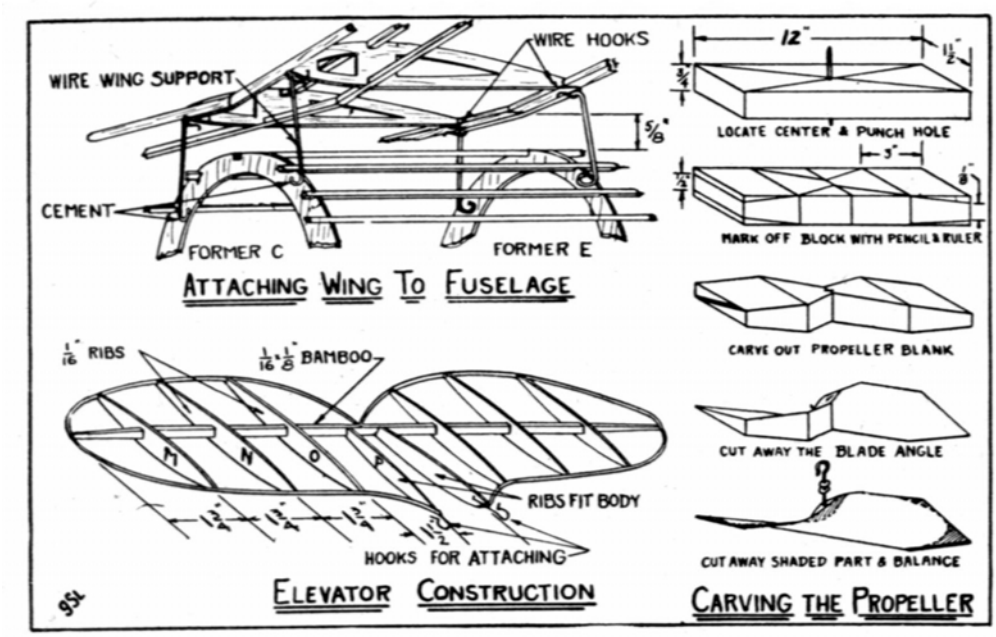
MATERIAL REQUIRED

1 propeller block x 1 x 12"
1 leading edge of wing 3/32 x 3/32 x 30"
1 trailing edge 3/32 x 1/4 x 30"
1 pair of 1 1/2" wheels
3 feet of 1/16" diameter reed
12 fuselage longerons 1/16 x 1/8 x 24"
1/16" sheet balsa for formers, bulkhead's, ribs, etc.
1 motor stick ¼ x 5/16 x 18"
6 wing spars 3/32 x 3/32 x 32"
1 punched clothing snap and 3 washers
Several feet of #14 music wire
2 sheets of tissue
1 ounce of cement and 1 ounce of banana oil
15 feet of 1/8 x 1/30" rubber.

SHEET BALSA PARTS

One full page of drawings is devoted to wing ribs, elevator and rudder ribs, fuselage formers, etc. Using carbon paper, outline them on a sheet of stiff cardboard. Be sure to include the notches and also remember to label each one to identify it.

Cut out the cardboard patterns; lay them on 1/16" sheet balsa and run a knife or razor blade around the edges. Notice that the oval fuselage formers labeled A, B, C, etc., are built up of two 1/16" pieces cemented together. To insure maximum strength, make sure the grains in these two pieces run in opposite directions. Cut away the wing ribs at the center to reduce weight. Be careful not to split the ribs in this operation.



FUSELAGE

Oval fuselages are a joy to behold, but are tiresome to build, so don't be too easily discouraged. Start by marking the positions for the formers on the 12 longerons. See the drawing on fuselage construction. Notice that the 1/16 x 1/8" stringers are inserted edgewise to prevent sagging after the tissue is applied.

There's no preferred way for making an oval fuselage. As in a wrestling match, you must just grunt and groan, and try to bring forth a true-shape fuselage.

Former A is a piece of bamboo 1/32 x 1/16" bent around the flanged part of a hot chisel. An electric soldering iron will be excellent for this operation because you can heat it by simply plugging in the current.

At the rear of the fuselage, the longerons are cemented together and sanded to a circular shape. Then cut a notch in the rear tip. Make this notch large enough to accommodate the 1/16 x 1/8" elevator spar.

The top part of the fuselage between Formers F and G is covered with 1/16" sheet balsa. Cut a cockpit out of the sheet balsa. Cut a balsa headrest from balsa 3/8 x 3/8 x 1 3/4" and cement on the back of the cockpit. A windshield of 1/16 x 1/16" balsa is built up in front of the cockpit and covered with cellophane.

MOTOR STICK

Select a straight-grained piece of balsa 1/4 x 5/16 x 18" for a motor stick. Cut a balsa nosing the identical shape of Former A (the bamboo nose ring). This nose block is intended to complete the streamlined shape of the fuselage. Cement it to the front of the motor stick by cutting a notch in the bottom of the nose block. The motor stick is held in place in the fuselage by two #14 piano-wire clips. The front clip is cemented inside Former A; the second clip is cemented to Former F.

Punch a hole in a clothing snap. A phonograph needle and a hammer are the tools for this job. Simple tools, aren't they? This clothing snap is cemented to the front of the nose block 3/8" above the top of the motor stick. A rear hook from #14 wire is cemented to the motor stick.

WING

Cut 18 main ribs and 2 tip ribs from 1/16" sheet. balsa. Wing construction is illustrated in the drawing. Notice that the two center ribs are 1 1/2" apart. The other ribs are spaced 1" apart. A method of mounting the wing to the fuselage is shown in the drawing. Cement wire supports to Formers C and E. Wire hooks, cemented to the front and rear of the two center ribs; fit onto these wire supports. By bending the supports with pliers, the angle of incidence of the wing can be changed. However, the wing cannot be moved back and forth to balance the model. All such adjustments are made by changing the elevator angle, by shortening the motor stick, or by adding weight to the nose.

ELEVATOR AND RUDDER

Elevator construction is illustrated in the drawing. The same shape ribs are used in the elevator as in the rudder. The main spar is 1/16 x 1/8" bamboo. 1/16" diameter reed is used as an outline. Cement the rudder to the top-rear of the fuselage. The elevator is demountable. The bamboo spar fits into a notch in the rear of the fuselage. It is held in place by rubber bands attached to hooks cemented to the sides of the fuselage.

LANDING GEAR

A three-strut landing, gear is strong, yet flexible. Two of the struts are attached to Formers C and D. To make a strong joint, bend the ends of the struts so they fit snugly alongside the former. Cement and wrap with thread. The third strut is shaped like an inverted U.

The center of the U is attached to the bottom of Former C and each leg of the U constitutes the third brace of each half of the landing gear.

Cement wire axles to the ends of the landing gear. Notice that the landing gear is staggered forward. That is, the axles should be about 1" in front of Former C.

PROPELLER

The propeller block is 3/4 x 1 1/2 x 12". First locate the center and then punch a hole with a needle. The drawing will illustrate propeller carving technique. The width of the hub of the propeller should be 1/4". The thickness of the blades at the tips is about 1/16". Reënforce the center hole with metal washers. These washers can be cut from a tin can and cemented to the propeller.

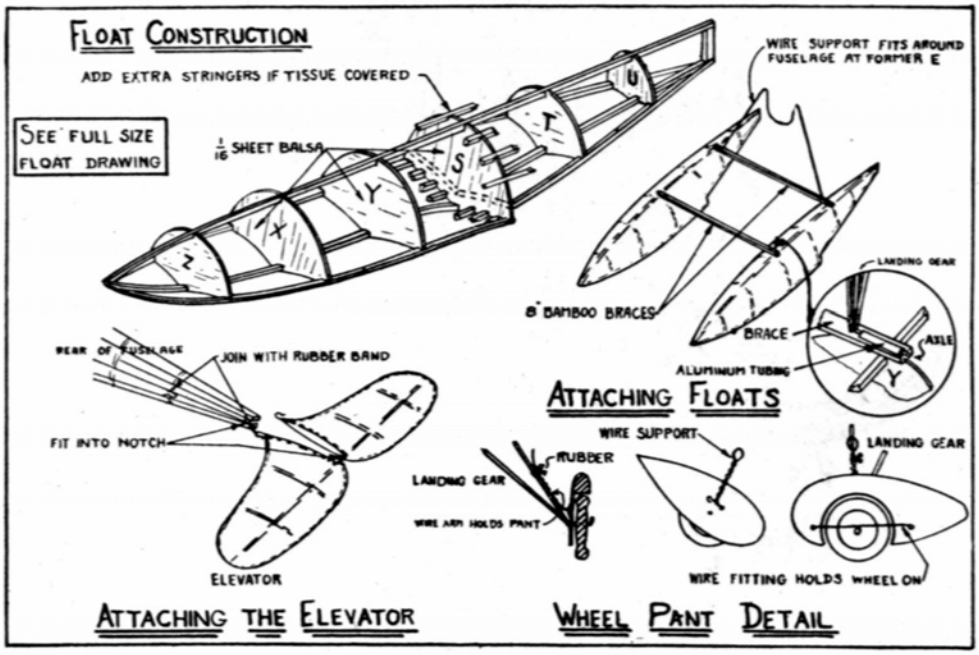
Make it a point to balance your propeller. Insert a needle through the center and rest the needle on your finger tips. By careful sanding you'll be able to make both blades the same weight and the propeller will remain in a horizontal position.

A #14 music-wire shaft is slipped through the nosing, several copper washers added to cut down friction, and the shaft is inserted in the propeller. When flying your model add a touch of grease to the washers every few flights.

FLOAT—CONSTRUCTION

Model airplane floats are made larger than is absolutely necessary for a take-off. But larger floats make a take-off easier and negligible; you have nothing to lose with larger floats.

A full-size float drawing together with a construction drawing are included. 1/16 x 1/8" balsa strips are used as longerons. The bulkheads or formers are cut from 1/16" sheet balsa. The bulkheads serve two purposes. They maintain the shape of the float and in addition divide it into separate compartments so only one compartment can become water-logged if your float springs a leak.



Note the curved portion of the bot-tom-center of the float. This curve helps to "shoot" the model off the water. To the rear of this curve is the step. When the model is taxiing along on the water, air coming in this step helps break the suction of the water permitting a take-off. These two features are important. Follow the drawing closely.

FLOATS—COVERING

Either sheet balsa or tissue covering can be used. The merits of each are obvious. Tissue is lightweight and easy to work with. Balsa is more durable and easier to waterproof,

but is heavier and requires more time to apply. So take your choice. However, if you use sheet balsa, only four longerons will be necessary to maintain the shape of the floats. With tissue you'll have to add longerons to the top and bottom of the float to prevent the tissue from sagging. See drawing.

Covering floats with tissue is the same as covering a fuselage or wing. Give the entire framework a coating of banana oil and let it dry before at-tempting to apply the tissue. Then apply the tissue in sections, trying to maintain the curve of the floats. Waterproof the tissue with one or more coats of valspar or clear brushing lacquer.

When covering with sheet balsa, use 1/32 or 1/64" thickness. Pins, rubber bands, and pinch clamps will be valuable in keeping the sheet balsa in place while the cement dries. To bend sheet balsa moisten the bend with saliva and gently form the wood with your finger tips and pin it in shape until it is dry, remembering that you can't cement wet wood. A coat or two of banana oil will water-proof the finished floats.

FLOATS—ATTACHING

Bamboo braces 1/16 x 1/8" connect the floats. As shown in detail, these braces are attached to float Formers X and T. The distance between the floats should be the same as the distance between the wheel axles—about 7 1/2". The axles fit into small pieces of aluminum tubing at the ends of the bamboo float braces. A wire support attached to the rear bamboo brace fits around the fuselage at Former E. This rear support is kept in place by small rubber bands. Wire hooks are cemented to the two side-center longerons at Former E. Rubber bands fit around these hooks and the wire float support.

WHEEL PANTS FOR LAND FLYING

For land flying a pair of “half” pants is used. A half pant is one which doesn’t have a covering over the outside of the wheel. the wheels are 1 1/2”in diameter and 1/4” in thick. From a piece of 1/4” balsa cut a piece to the shape of the pant. (see drawing of exact-size parts) Cut away enough wood from the center of this piece to allow the wheel to

revolve freely. Cement 1/16” sheet balsa to one side of the piece. Carve to a streamline shape.

Slip the pant and the wheel on the axle. You’ll notice that there in nothing to hold the wheel on the axle. So cement a wire brace on the outside of each pant. Make a loop in the wire brace to fit around the wheel axle. But this only partly solves your trouble since the pant is still free to turn on the axles. Remedy this by cementing a wire arm to the pant. This arm fits alongside the landing gear strut and a loop of rubber will hold it in place.

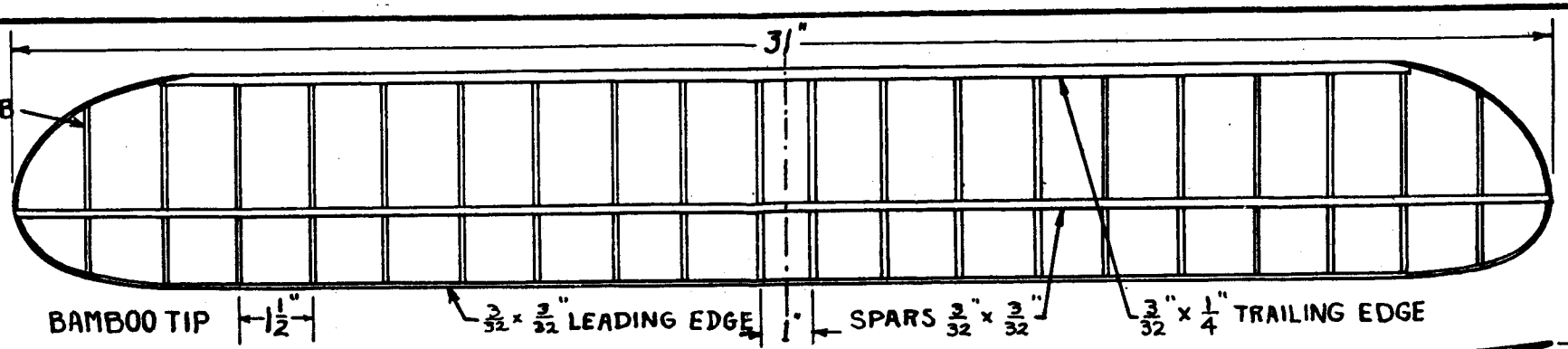
FLYING AND ADJUSTMENTS

The model should balance at the center of the wing. The wing and elevator should be set at zero degrees incidence. That is, they should be in line with the rubber motor. If your model doesn’t balance, you can cut and inch or so off the rear of the motor stick. Also, raising the front edge of the elevator will counteract tail heaviness. Adjust the model to fly in right circles, since this is the best for a water take-off. Floats and wheels can be interchanged without disturbing the balance of the model. The flight with the floats will be much steadier than with the wheels. Notice that the step of the float should be in front of the center of gravity. Since the center of gravity is at the center of the wing, the step of the float should be in front of former D. Let the model take off into the breeze. If you’ve followed the plans and directions closely the ship will leave the water in a short distance. However, if your ship doesn’t take off, add a few more strands of rubber. If it tips forward on its float, the rear tips rising out of the water, it may be necessary to move the floats farther forward.

WEIGHT

Floats (balsa covered) .65 ounces
Fuselage, Landing gear and wheels .63 ounces
Elevator and Rudder .21 ounces
Wing .35 ounces
Propeller, 10 strands and motor stick .77 ounces

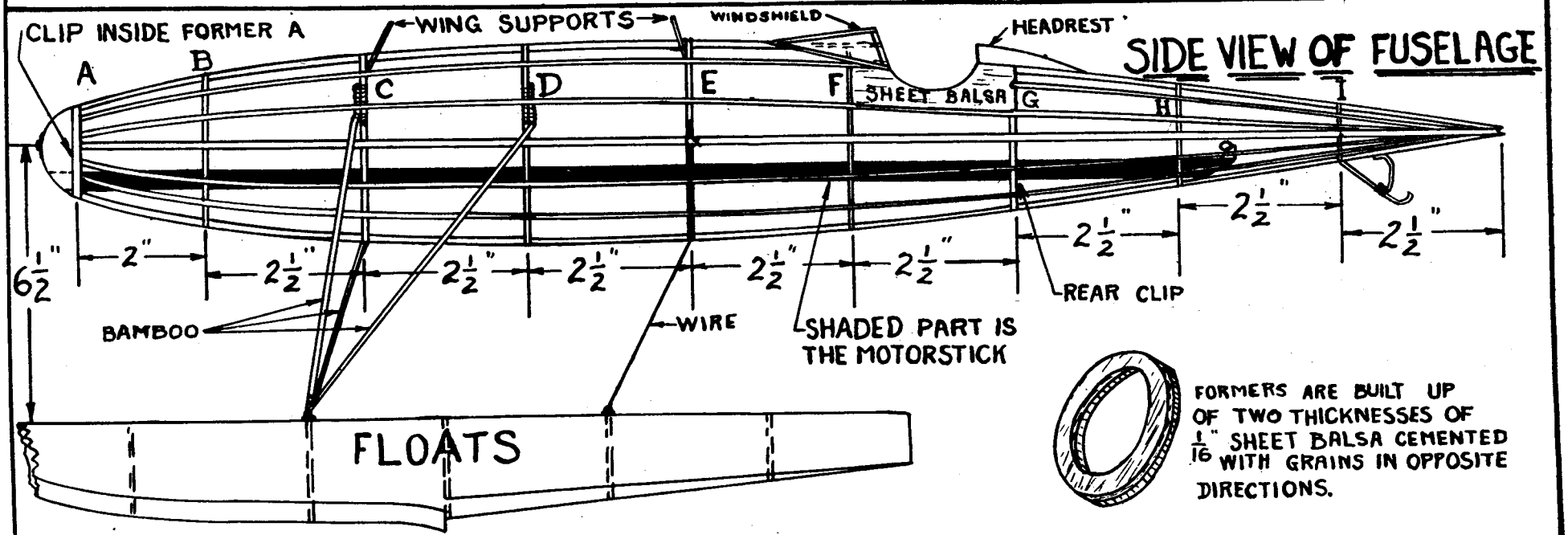
Total as land plane 1.96 ounces
Total as hydro plane 2.61 ounces



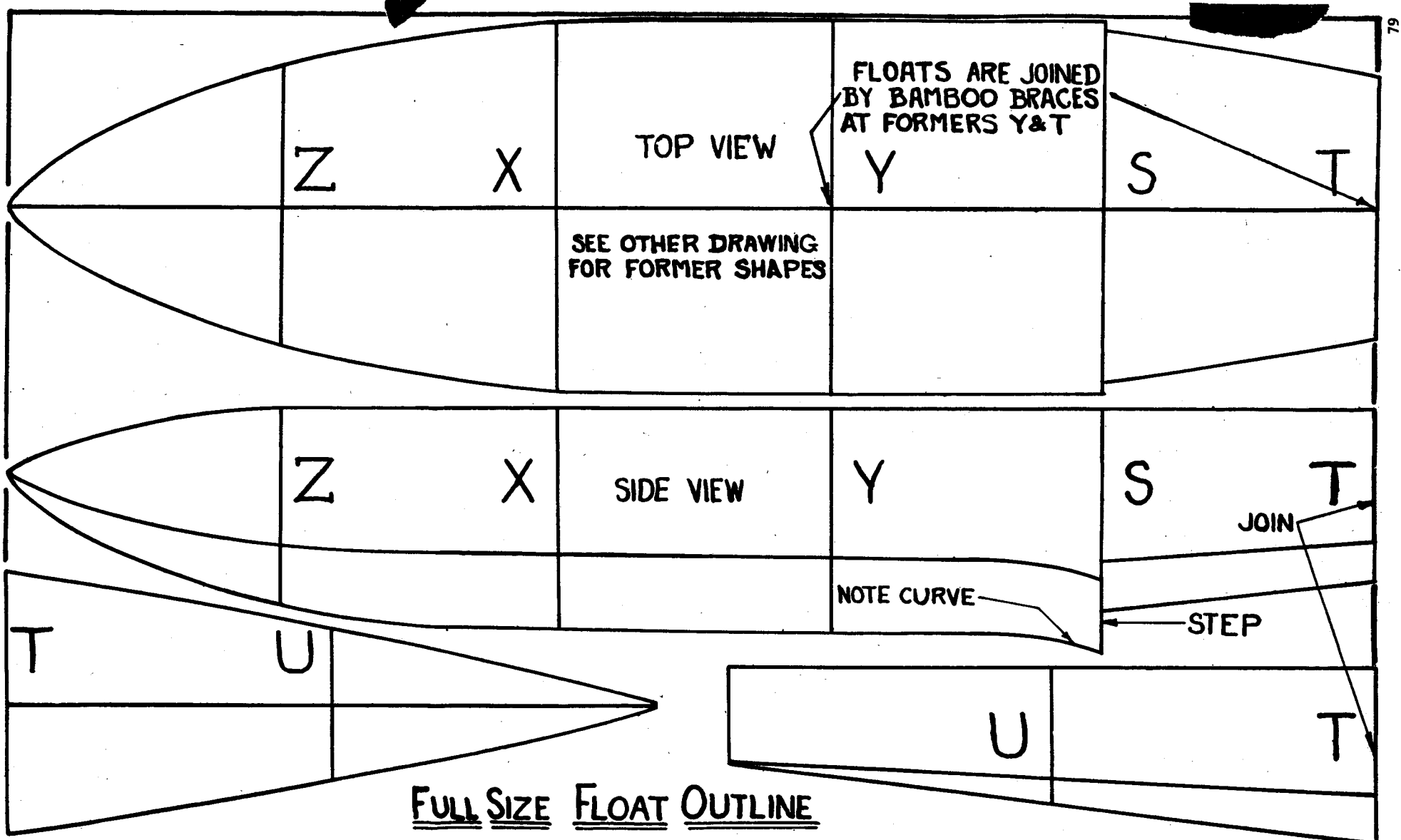
EXACT SIZE RIB SHAPE GIVEN IN OTHER DRAWING

CUT RIBS FROM 1/16" BALSA

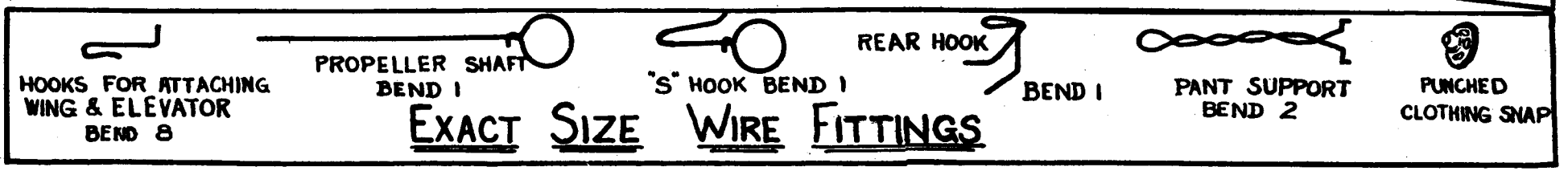
WING CONSTRUCTION



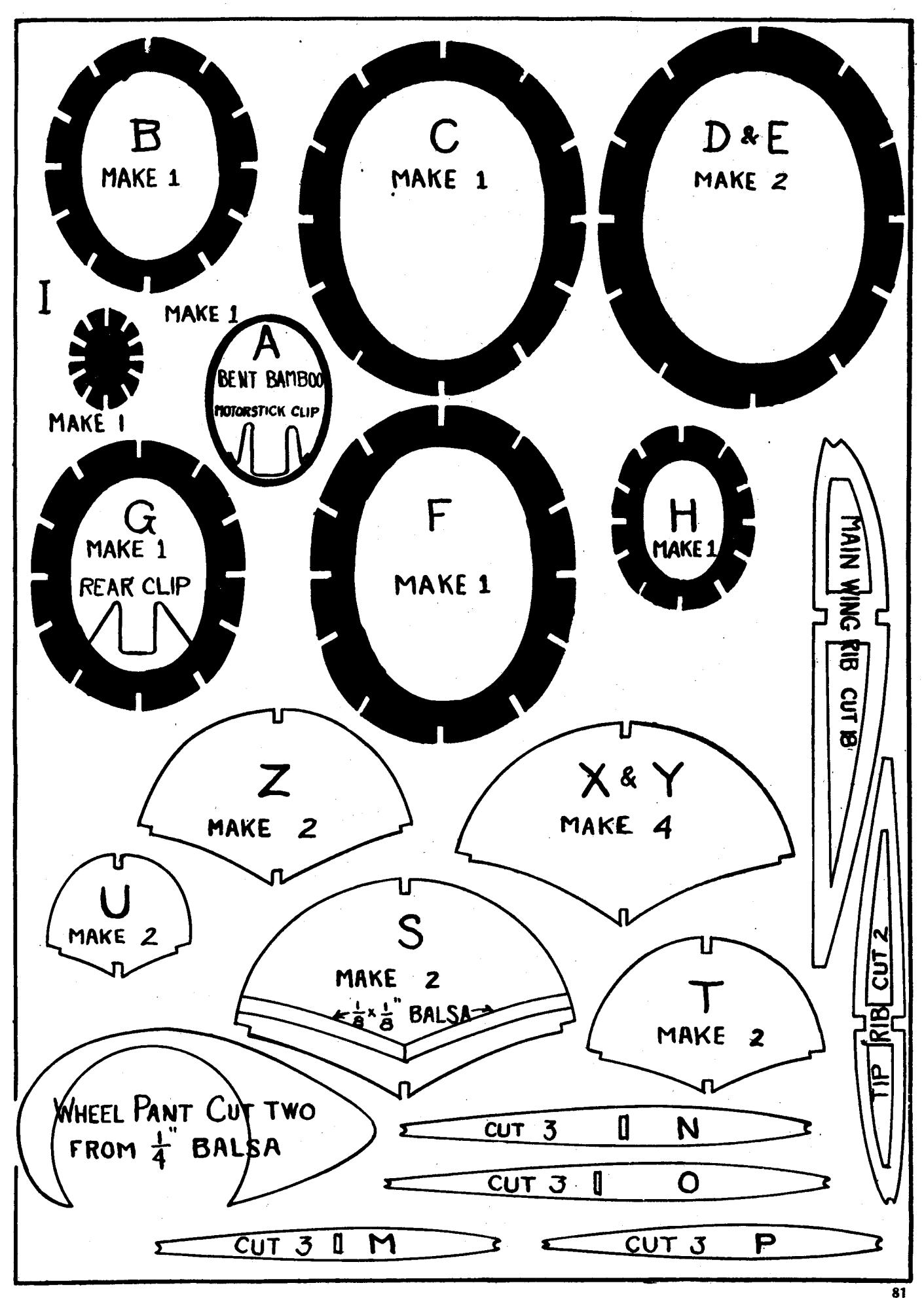
FORMERS ARE BUILT UP OF TWO THICKNESSES OF 1/16" SHEET BALSA CEMENTED WITH GRAINS IN OPPOSITE DIRECTIONS.



FULL SIZE FLOAT OUTLINE



EXACT SIZE WIRE FITTINGS


B
MAKE 1
C
MAKE 1
D & E
MAKE 2
I
MAKE 1
MAKE 1
A
BENT BAMBOO
MOTORSTICK CLIP
G
MAKE 1
REAR CLIP
F
MAKE 1
H
MAKE 1
MAIN WING RIB CUT 18
Z
MAKE 2
X & Y
MAKE 4
U
MAKE 2
S
MAKE 2
← 1/8 x 1/8" BALSA →
T
MAKE 2
TIP RIB CUT 2
WHEEL PANT CUT TWO
FROM 1/4" BALSA
CUT 3 N
CUT 3 O
CUT 3 M
CUT 3 P