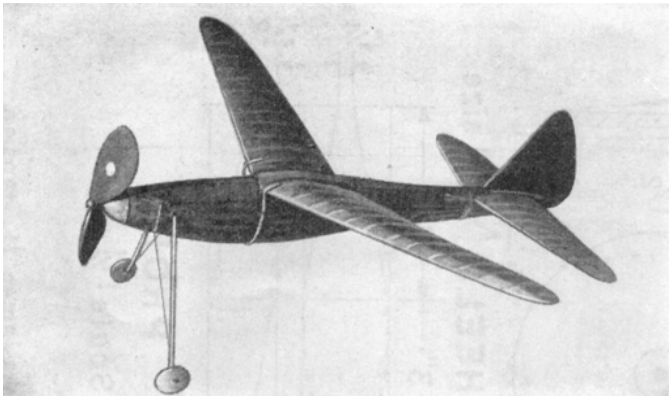
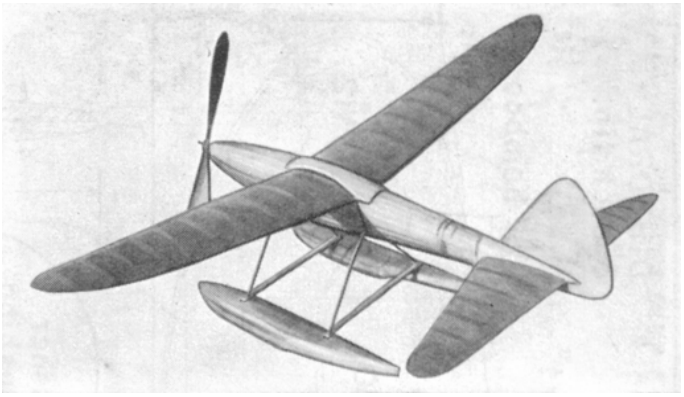


As a land plane it has won many contests

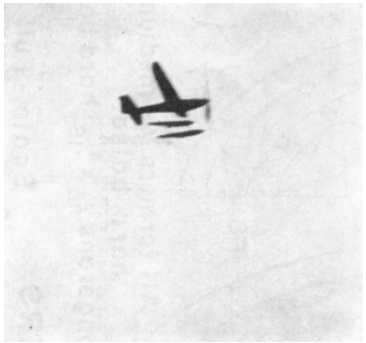


As a "hydro" it is a beautiful and consistent flier

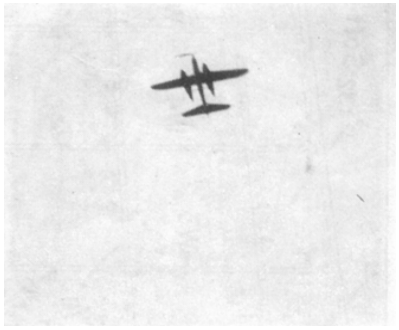
A WINNING CONTEST SEAPLANE

A Double Purpose Model Of High Efficiency

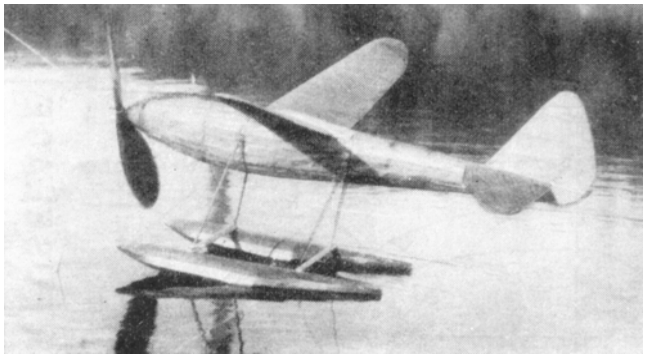
By JAMES JENSEN



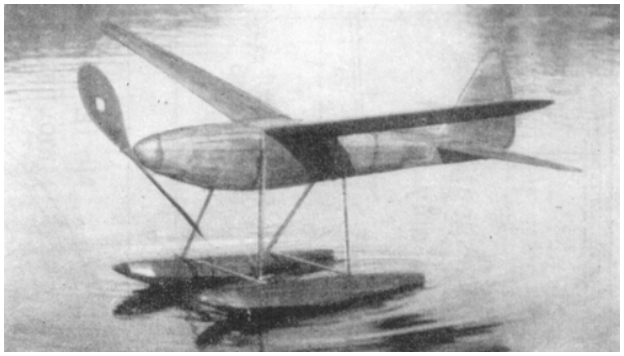
On its way after a water take off



Overhead climbing for altitude



On floats, the balance is right for easy take offs



Long tapered wings provide high flight efficiency

THE plans presented here are for the most successful of a series of experimental twin-float seaplane models built by the author in an attempt to conquer the difficulties encountered in this phase of model building. The same pair of floats were used throughout these tests, and it was found that most of

the difficulties with his type of model were due to misfit pontoons.

The first experiments were conducted with a high-winged, light-weight model of square construction, with medium power, 180 inches of wing area and 17 inch prop. This model flew and glided very well, but could only be made to rise off the water on rare occasions. Due to the light construction it would not withstand many duckings without necessitating repairs, so was soon discarded.

The next model was built to the other extreme - sturdy construction, high powered, with 115 square inches of wing area and 12 inch prop. This model was extremely stable on the water, but in flight it appeared to have a built-in head wind. Flights were limited to short hops, and the glide was terrible.

The third model is the one shown here. This streamlined little beauty jumps off the water in about two feet, climbs steeply to 150 feet altitude and averages 60 to 65 seconds on 500 turns. It has had its share of "christenings" but when the proper method of launching was achieved it would take off successfully almost every time. As a landplane it passes contest rule requirements for Class "C" fuselages, and is no slouch in this event, having won first prizes for the author at two open contests.

Now let's start construction.

Fuselage

Fuselages with elliptical cross-sections are still quite rare, mostly because many modellers regard them as too difficult to construct. If the half-shell method, described below, is followed carefully, a very accurate fuselage will be the result and no difficulties should be experienced. The beauty and efficiency of the finished product is well worth the extra hour or two of time required by this type of construction.

The half-shell method consists of building the right and left halves of the fuselage as separate units in order that they may be built on a flat board, rather than in "mid-air" as is the custom when using the keel or jig methods.

Start construction by cutting out the fuselage formers. Trace the half-formers, shown full size on Plate 3, onto a sheet of stiff cardboard and cut out accurately with scissors. The formers are then cut from 1/16" sheet balsa of medium weight and flexible grain, by cutting around the cardboard patterns with a razor blade. If you have a small file of the correct width the stringer notches can be more quickly filed than cut. Note that the nose and tail plug formers, numbers 1 and 10, are 3 ply, and should be cemented cross-grain. Two each of all the other half-formers are required, with the grain vertical, and cut to 1/4" width, as shown on "F" 6, Plate 3. When these are finished lay them aside in order.

Draw a full size side-view of the fuselage, using the dimensions shown on Plate 1. This drawing is to be used as the pattern for the left half of the fuselage. Now trace this drawing on the reverse side of another sheet of paper to get the pattern for the right side of the fuselage. Lay the drawings on a flat, smooth board or bench and pin strips of 1/32" x 1/8" balsa along the top and bottom outlines. Cement the formers in their proper positions, being sure that they are not placed upside down. Test them occasionally with a small set square to make sure that they remain vertical to the board while the cement hardens. They should be left to dry for about 30 minutes. When this is dry, cement and pin the wing mount, of 1/8" x 1/8" balsa, in place in order to keep formers 5 and 6 rigid. Now add the 1/16" x 1/16" hard balsa stringers, holding them in place with pins and weights. These must be left to dry for several hours, preferably overnight, so that the structure will not spring out of shape when removed from the board. At this time laminate the nose block from 1/8" sheet balsa, and bend the rear hook from No. 18 music wire and the landing gear mounts from No. 12 wire.

The fuselage sides are removed from the board and cemented together all along the top and bottom stringers, being held tightly with rubber bands and pins until dry. Fill in the sections between formers 1 and 2 and between formers 9 and 10 with 1/16" soft sheet to prevent these sections being crushed by handling. Also, at this time, cement the landing gear mounts in position on formers 2, 3 and 4. Where these wires extend past the surface cement small pieces of 1/16" sheet around them to permit an easier covering job. When these are dry, sand the structure thoroughly but carefully with No. 2-0 sandpaper. Cut off the tail plug through the centre of former 10. Add the rear hook, cementing well. Fit nose and tail plugs snugly.

The fuselage may now be covered, with the exception of the tail boom, which must wait until the stabilizer is cemented in place. Double covering is recommended. The second layer of tissue is likely to cause trouble unless the following proper procedure is followed!

If you examine a sheet of tissue, you will note that one side of the sheet has a more glossy surface than the other. This glossy side is partially waterproof and if it is water doped when another sheet of tissue is touching it the sheets will tend to stick together, causing numerous small wrinkles which cannot be pulled out. For this reason exercise care to see that the dull surfaces only are allowed to touch each other.

The first layer should be applied in small sections with grain lengthwise along the stringers and the dull side on the outside. This is water sprayed and when dry given one coat of heavy dope. The second layer is applied with the grain at right angles to the first and with the dull side on the inside. It is also water sprayed and given two coats of dope.

Tail Surfaces

Full size drawings are required for these, the dimensions being shown on Plate 1. The spars are tapered and notched before being pinned to the drawing. Pin down the leading and trailing edges and cement the bamboo tips in place. When dry they are raised on the pins by blocking up with 1/4" balsa scraps. Cement the ribs in place. After removing from the board, cover the stabilizer centre section, top and bottom, with 1/32" soft sheet. Like all other parts to be covered, the tail surfaces should be sanded with fine sandpaper, being careful to remove any cement which might touch the covering. The tissue is applied with the grain parallel to the ribs and should be given two coats of dope. The stabilizer is now cemented in place, being set at zero degrees. Fill in the corners and curves with 1/16" scrap balsa. Cover and dope the tail boom. Cement the rudder in place with 1/16" offset for right turn. Small wire hooks and rubber bands are used to hold the tail boom in position.

Landing Gear and Floats

The landing gear, of bamboo and wire, is shown on Plate 1. The ends of the struts are bent into small circles for clipping onto the wire mounts installed in the fuselage. The centre "V" strut is of one piece with the ends serving as axles. The rear strut for the float gear is also of one piece of No. 18 wire formed to fit the lower half of the fuselage. It is held in place with rubber bands so that it may be moved to vary the position and incidence of the floats.

The floats are built by the half-shell method described for the fuselage. The keel stringers should be cut to shape rather than bent. The mounting wires as shown on the side view, Plate 1, are in the shape of a "V" with one end bent into a small circle to accommodate the struts and the other end extending through the side of the float. They are later bound to the float joiners to strengthen the floats sideways. Cement these wires in place and also cover the bottom of the floats with 1/32" soft sheet before covering with tissue. The covering should have at least three coats of dope for waterproofing. The floats are joined at stations "B" and "F" with 1/8" x 1/2" x 8-1/4" pieces of hard balsa sandpapered to an airfoil shape and covered with tissue.

Wing

The wing construction is similar to that of the tail surfaces. Draw the full sized layout, spacing the ribs 1-1/16". The trailing edge is straight to give the centre of pressure line a sweepback angle. Lay down the complete outline, blocking up the front of the trailing edge 1/16" to allow for the under camber of the airfoil. Cement the bamboo tips in place. When dry, raise the leading edge and add the ribs and spars. After thirty minutes of drying pin the centre section clown to the bench and crack the spars for dihedral, blocking each tip up 3". Let these joints dry overnight if possible. Sandpaper the leading and trailing edges to shape. Cover the centre section and leading edge with 1/32" soft sheet, holding it in place with small pins until dry. Sandpaper the wing lightly all over. The tissue covering should be applied with the grain parallel to the ribs. Water spray and give two coats of dope. Cement small hooks to the centre section so that the wing may be held to the fuselage with rubber bands. Do not block up the leading edge as the correct incidence has already been built into the wing mount on the fuselage.

Propeller and Power

The propeller is carved from a medium hard block of balsa measuring 14" x 1-3/8" x 1-3/4". Taper to the dimensions given on Plate 2. Carve with about 3/32" under camber. Round off the corners, sandpaper smooth, balance and cover with tissue. The freewheeling device is detailed on Plate 1. If the model is to be flown only as a landplane a 15" prop will give slightly better results for contest work.

Power is supplied by 16 strands of 3/16" brown rubber with three or four inches of slack to bring the weight up to the required minimum of four ounces. The weight of the author's model as a landplane, less rubber, was 2-1/2 ounces. The floats added 8/10 ounce to this figure.

The model is now complete except for the small cover over the centre section. This is left to the last since the centre of gravity must be determined to get the wing in position. Assemble the landplane completely and move the wing until the centre of gravity is 2-1/2" back of the leading edge at the centre section. The floats will move the C. G. ahead about 1/4" but this can be counteracted by giving the stabilizer a negative angle of about one degree.

To build the cover, pin formers 4a and 7a in position. Add the stringers and fill in the corners with 1/16" scraps, cementing them to the wing centre section as well as to formers 4a and 7a. Now cover

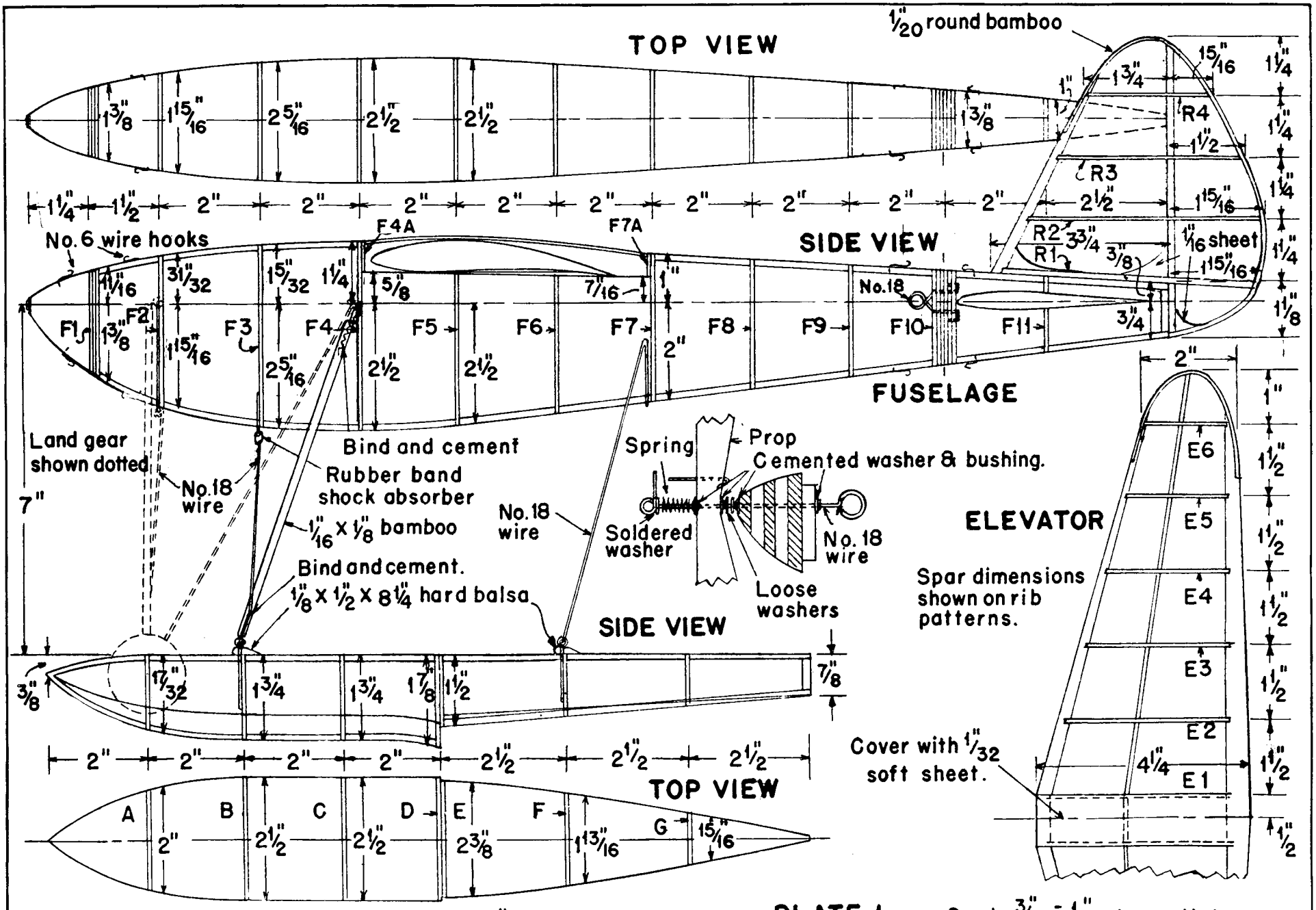
and dope in the usual manner and the model is ready to fly.

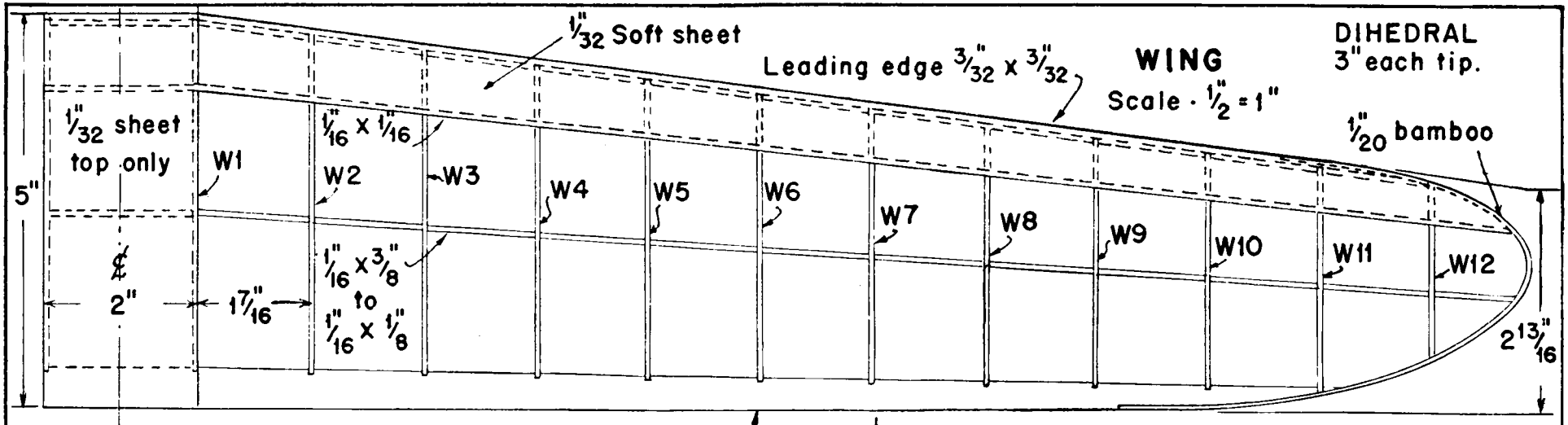
Flying

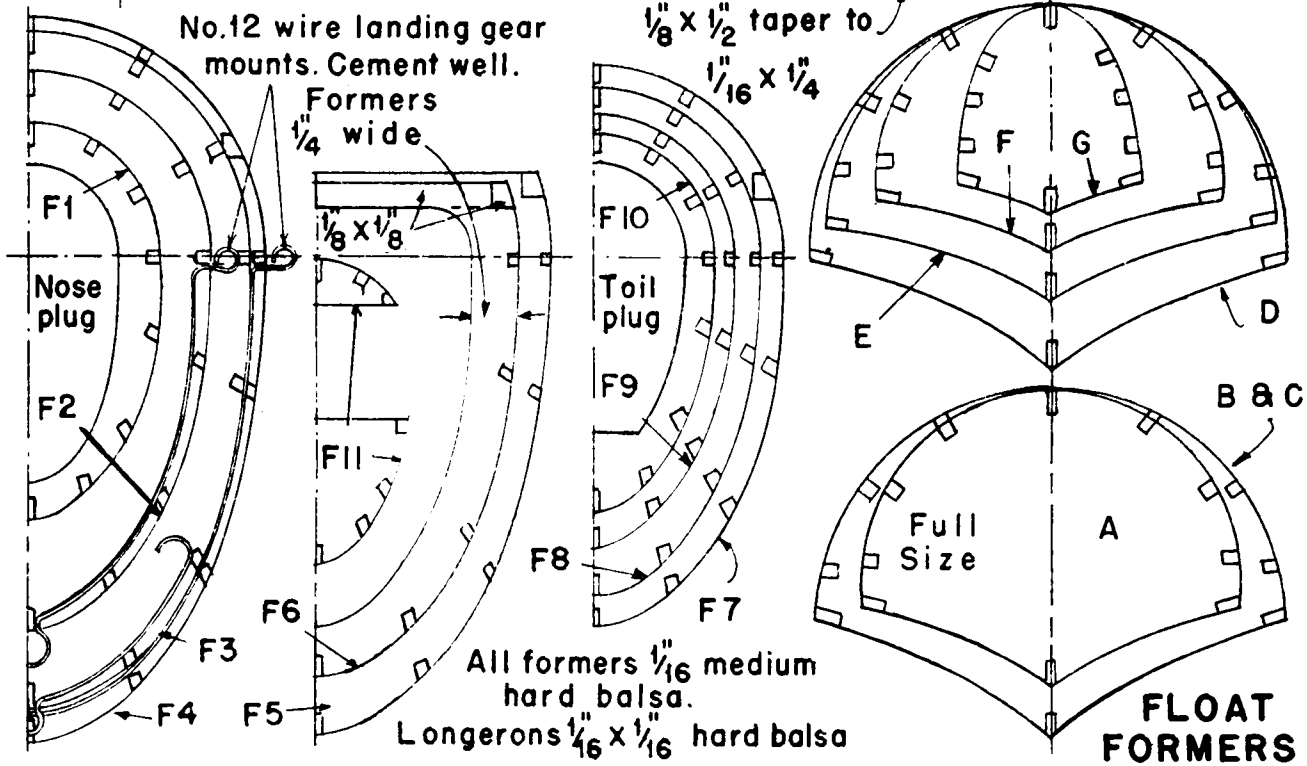
It is preferable to make the first test flights using the wheels. Adjust the rudder and thrust line until a slow right turn is obtained, both under power and in the glide. When the floats are installed try a few hand-launched flights over tall grass until satisfied that it is flying properly.

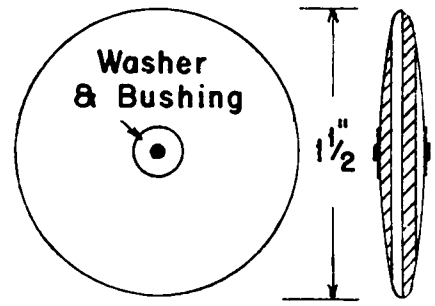
Now test it on the water. Start with about 50 to 100 turns and vary the float position and incidence until the model skims along the water in a right turn of the same diameter as that in which it flies. When launching, wind fully so that the model will jump off quickly. Let the prop pick up full speed before releasing the fuselage. Do not attempt to fly any sea-plane model from small bodies of water with trees, steep banks or other obstructions on the windward side as the slightest breeze will cause sufficient down drafts to make a take-off impossible.

Remember that seaplane models are more difficult to adjust than are the landplane types but if you have the patience to refuse to become discouraged at the first few duckings, you will be well repaid by the pleasant new thrills this unexplored branch of modelling will add to your hobby.


TOP VIEW
1/20 round bamboo
SIDE VIEW
No. 6 wire hooks
F4A
F7A
No.18
1/16 sheet
R1
R2
R3
R4
FUSELAGE
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
F11
Land gear shown dotted
7"
No.18 wire
Bind and cement
Rubber band shock absorber
1/16 x 1/8 bamboo
Bind and cement.
1/8 x 1/2 x 8 1/4 hard balsa
Spring
Prop
Cemented washer & bushing.
Soldered washer
No.18 wire
Loose washers
SIDE VIEW
ELEVATOR
Spar dimensions shown on rib patterns.
E1
E2
E3
E4
E5
E6
Cover with 1/32 soft sheet.
TOP VIEW
A
B
C
D
E
F
G
FLOATS Spaced 8" between center lines
PLATE 1
Scale 3/8 = 1"
James M. Jensen.







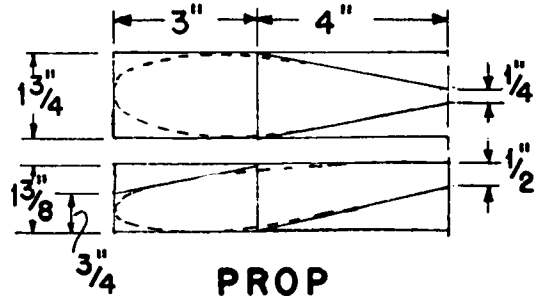
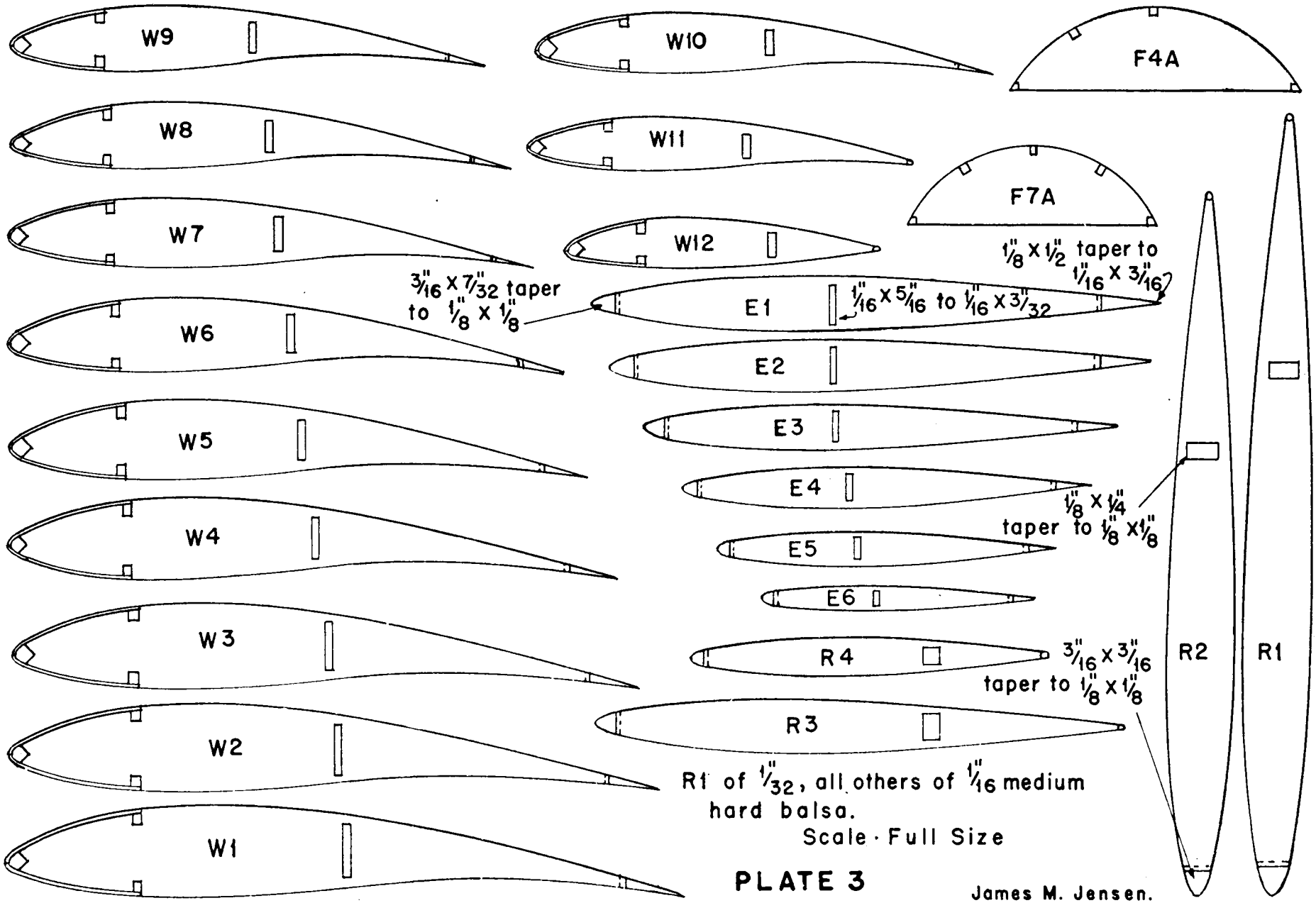


PLATE 2

James M. Jensen



R1 of 1/32, all others of 1/16 medium hard balsa.

Scale - Full Size

PLATE 3

James M. Jensen.