ARMY "GRASSHOPPER"

A flying model Taloreraft 0-57 that provides thrills of the full scale plane.

by **SIDNEY STRURL**

THE Taylorcraft 0-57, and other light planes now used by the U. S. Army Air Corps, are known affectionately as "grasshoppers." They have been found to possess excellent characteristics needed for all-around general purpose military aircraft; as useful in the air as the "jeep" and "peep" are on the ground.

The term "grasshopper" probably grew out of the Taylorcraft's ability to take-off and alight in very small and difficult landing fields. Their work is very diversified, ranging from artillery spotting and observation work to delivering war material and serving as taxis.

Aside from a complete radio outfit and several more flight instruments, the Army's version of the Taylorcraft is identical to the commercial one. And to show the Army's faith in these small light planes. orders are constantly being increased for "grasshoppers."

For a flying scale gas model the Taylor-craft leaves little to be desired. The design proportions are excellent for producing stable and smooth flights. And the construction of this type of airplane is so simple that even if this is your very first gas model you should find no difficulty whatsoever.

The flight characteristics are just about perfect. With an Ohlsson 19 in the nose the flight is very similar to the full size job. Along steady climb and when the motor cuts, well, the glide is as good as you'll find on any contest field. But when you install a big motor in the nose, such as a Forster 29, then the CLIMB is as good as any you'll see on the field. The size is just right too. The ship will take any of the larger size Class " A" motors and all Class "B" motors. A class "C" version may be obtained by enlarging the model 1-1/2 times which would net you a six-foot job.

All-in-all I think we can safely say that this little job is a scale model that can hold its own against any other and will give a good showing of itself in an endurance contest and to top everything
else, is extremely easy to build.

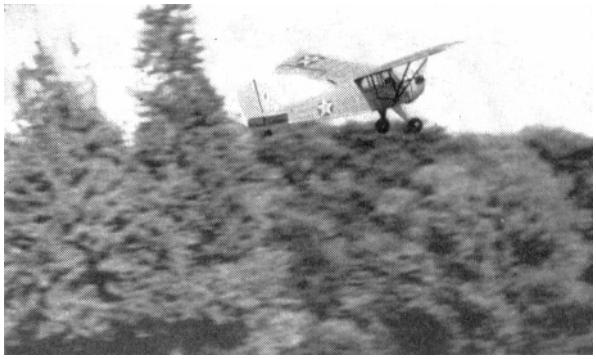
Now what do you say if we get busy, and build ourselfs a model of this here airplane just to see if I ain't right.

Fuselage

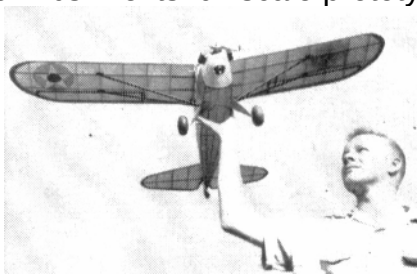
First of all it will be necessary to make full size drawings of the fuselage, wing and tail group. Most of the dimensions are given in the plans but sizes may be obtained by enlarging three times from Plates 1 and 2 as the given scale is 1/3" to the 1 ". All parts shown on Plates 3 and 4 are full size.

Lay the plans upon a smooth working surface such as a flat piece of pine board or other soft material so that pins may be pushed into it with ease.

The model "grasshopper" on the airport ready to take off



It climbs like its full scale prototype



The pilot ready to test his model

Construct the fuselage by first making two identical sides. Pin 3/16" square strips of balsa onto the plans wherever you see it grained. This constitutes the basic fuselage frame or basic foundation. Build one side and allow the cement to set. After the cement has set, do not remove from the plans. but build the other side directly upon the first side. Thusly you are assured of two identical sides. Remove the two sides from the plans and join together starting first from the rear and center portion and working toward each other. Make sure the two sides are curved the same amount and in line otherwise your model will have a tendency to keep turning in one direction in flight.

Cut all the necessary fuselage bulkheads from 1/16" sheet balsa as shown in Plate 4 and cement in proper locations. Make the motor mounts from 1/4" x 3/8" strips of basswood. Anchor it firmly with cross members and fill in around the mounts with 3/16" sheet balsa and loads of glue. The nose and cowling is made from balsa blocks cut to the required shape and crossection. Five blocks are necessary, one for the top cowling, two for the sides, one for the bottom and one for the very front. These blocks will vary in size depending on the size and type of motor you use. If it is necessary to alter the size of the nose to fit your motor it will not affect the model much at all as long as you keep the general shape, crossection and thrust line.

Cut the blocks roughly to shape and then glue in place. Final shaping and sanding is done after the motor is mounted. Use blocks of very soft and light texture and you will not have to hollow out too much. Make a portion of the top cowling removable so that you can gain access to service and adjust your engine. For the sake of appearance you should mount your engine inverted.

Two F2 pieces are cut from 3/16" sheet balsa and cemented in place. F1 is carved from a small balsa block to fit under the leading edge of the center section and is cemented to the fuselage as shown in the plans. This forms somewhat of a cradle for the wing to rest upon.

The landing gear is now made and installed. All dimensions are given in the plans. Use a good quality 1/16" steel music wire. Install the landing gear in the proper location and bind with heavy thread and cement to the fuselage longerons and cross members. Bind the three struts together at the axle point with thin flexible wire and then apply enough solder to make a very solid joint.

Now add all the 3/16" sheet balsa gussets all around the landing gear-fuselage connection as shown in the plans for extra strength. Fill in the landing gear struts as shown with very hard 3/16" sheet balsa. Cut and trim this fill-in to a symmetrical crossection.

It is advisable to use 2-1/2" diameter air wheels. Use air wheels rather then sponge or wood wheels to obtain the best shock absorbing action. A lump of solder at the end of the axle will keep the wheel, in place. The tail wheel is a 1" diameter sponge rubber wheel. Bend the strut as shown from 1/16" diameter steel music wire.

Cut three bottom fairing stringers from 1/8" sheet balsa and cement in place. Add the 1/8"

round hardwood dowel to act as rubber hooks, to retain the wing and tail group in place.

Tail Group

The rudder and stabilizer are very simple to construct and you should find no difficulty with them. A full size drawing is needed to work upon.

Cut all the necessary curved parts from 3/16" sheet balsa as shown in Plate 3.

Pin the stabilizer's leading edge and center spar of 1/4" square balsa directly on the plans. Trim the 3/16" x 1/2" trailing edge to the correct shape and crossection and pin in place on the plan. Now cement the 1/8" x 1/4" ribs in place. Add the stabilizer tips in place. Note that the stabilizer is made in one piece, the 1/4" sq. center spar running the whole span of the stabilizer, 18-1/2".

The rudder is made in the exact same manner as the stabilizer. The tip, R1, and trailing edge are placed in the center of the spar and ribs to form a symmetrical section, however. Check stabilizer and rudder for warps.

The rudder and stabilizer are cemented together after they are covered and form a separate unit, detachable from the fuselage. It is held in place to the fuselage by strands of rubber wrapped around 1/8" dowels.

Built to correct proportions and including essential details it is most realistic

Wing

Although the wing is very easy to construct, care must he taken to avoid any warps. First make a full size drawing of both halves of the wing.

Cut the wing tips from 1/4" sheet balsa as shown in Plate 3. Cut the required wing ribs medium 1/16" sheet balsa.

. Trim the 1/4" x 3/4" trailing edge to shape and pin in place on the plans. Pin the 3/16" x 3/8" rear spar and the 3/16" x 5/8" front spar in place. Insert the ribs in their proper locations and cement. Now add the leading edge of 1/4" square balsa. Note that the leading edge is set on edge. Cement the wing tips in place. The 1/8" sheet balsa wing strut base may now be added in place.

Install 2-3/4" dihedral in each wing tip. Note that the center section is flat. Gussets and braces should be added at the dihedral joint for extra strength. Check the wing for any warps.

Cut the wing struts to size from 1/8" sheet hard balsa. Two are required.

Covering

It is advisable to use colored Silkspan for covering rather than color doping the model. Choose a regulation Army color. Use heavy clear dope as an adhesive. Sand the frameworks lightly to remove any flays and ridges that might mar a neat covering job.

Cover the fuselage first using one piece for each side and bottom. Several pieces are required on the turtle-back. The cowling and similar wood parts such as landing gear struts are tissue covered, too. Use a separate piece of paper for the top and bottom of each section of the wing and tail surfaces. Once all parts are covered lightly spray them with water to tighten the paper. Then apply two or three coats of clear dope with a brush. Cover the cabin with heavy sheet celluloid.

All items such as cowling details, insignia, control surface outlines, etc., are made from colored paper. The wing struts are colored with black dope. The wing struts are held in place on the fuselage and wing by small bamboo pins pushed through the wood. These shear off in case of collision. The wing struts are installed in place only after the wing has been strapped in place to the fuselage with rubber strands.

Flying

After completion of the Taylorcraft check the model surfaces for warps. The Taylorcraft wings and tail are constructed solidly enough to resist warping, but if warps do occur take them out. Initial flights of the original model proved airworthiness, and by carefully making flight

adjustments championship performance will result. The wing is set at plus two degrees and the stabilizer at zero. There is no down or side thrust required for the motor.

Glide the ship several times putting more or less incidence into the stabilizer. Remember that careful slow adjustments save much time and effort later.

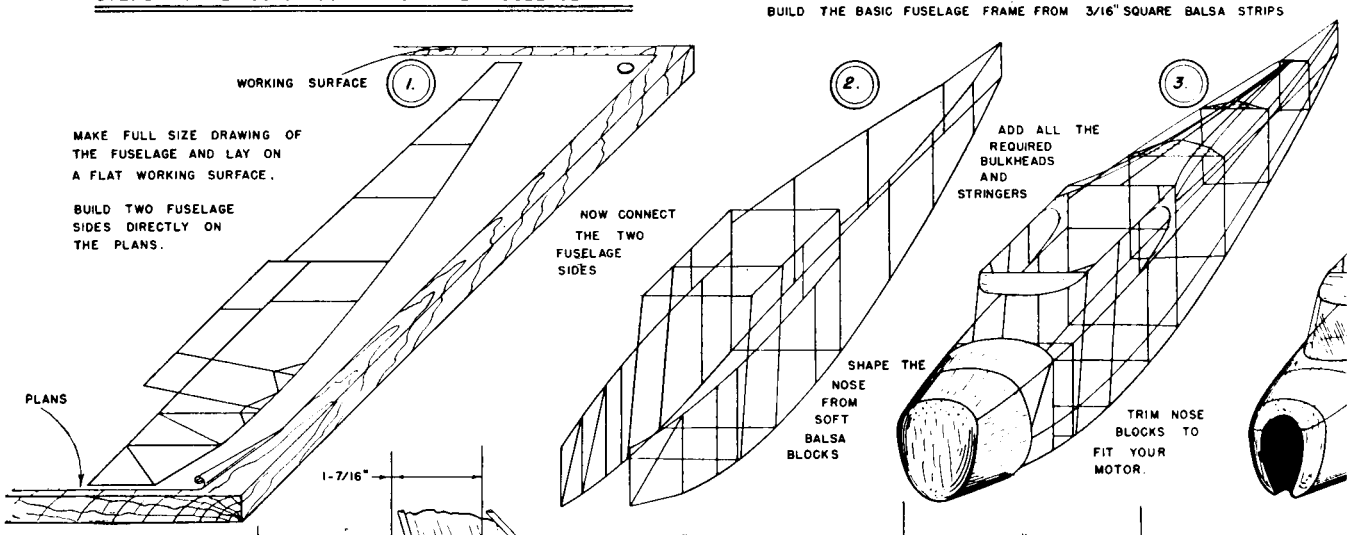
Set the timer between 10 and 20 seconds for the first flight and use very low power. Launch the 0-57 and watch the flight very carefully. Under power your Taylorcraft should climb in approximately 100 foot circles to the right. When the motor cuts, it should gradually turn to the right and glide in two hundred foot circles. Each model may have individual flight characteristics but all jobs such as this one should climb to the right under power, and glide to the left. If the ship reacts well on the first flight, fly it again with the same power and motor run. The ship should be flown about ten times, gradually increasing the power to the maximum.

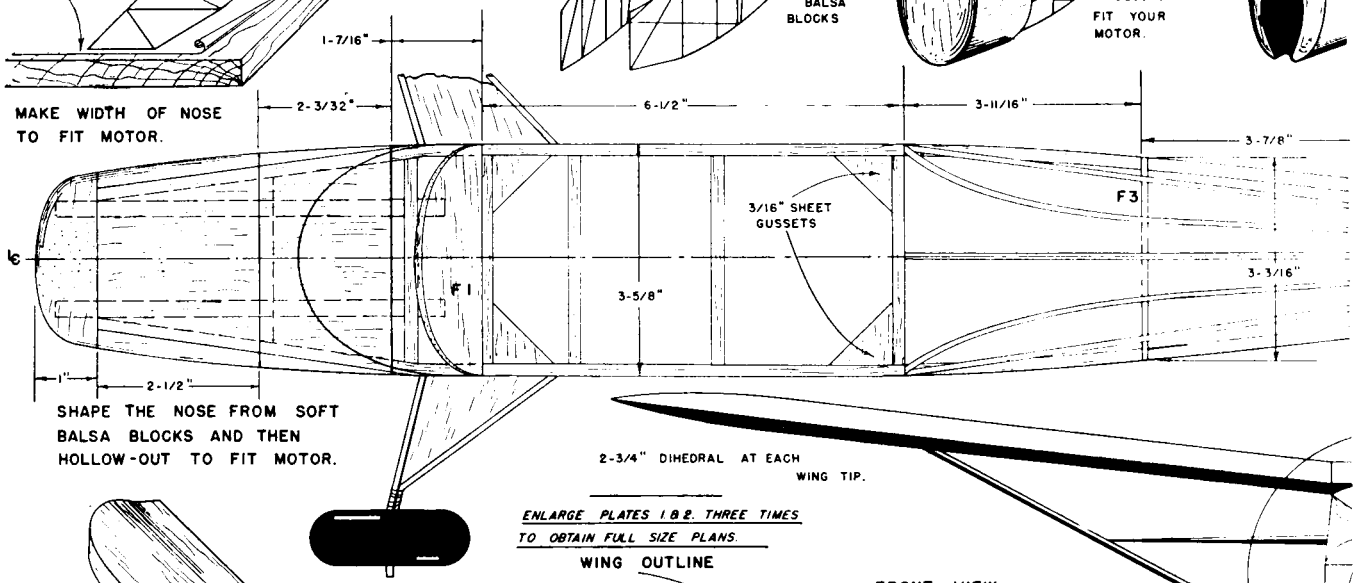
If you have followed instructions, and are not afraid to open your engine wide, you now have a perfectly flying scale gas model that will afford you many hours of satisfaction, and what's more, an excellent chance to win in the next local contest, whether it is an endurance or scale event.

VICTORY

STEPS IN THE CONSTRUCTION OF THE FUSELAGE:

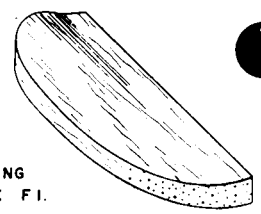
BUILD THE BASIC FUSELAGE FRAME FROM 3/16" SQUARE BALSA STRIPS





ENLARGE PLATES 1 & 2. THREE TIMES TO OBTAIN FULL SIZE PLANS.

WING OUTLINE

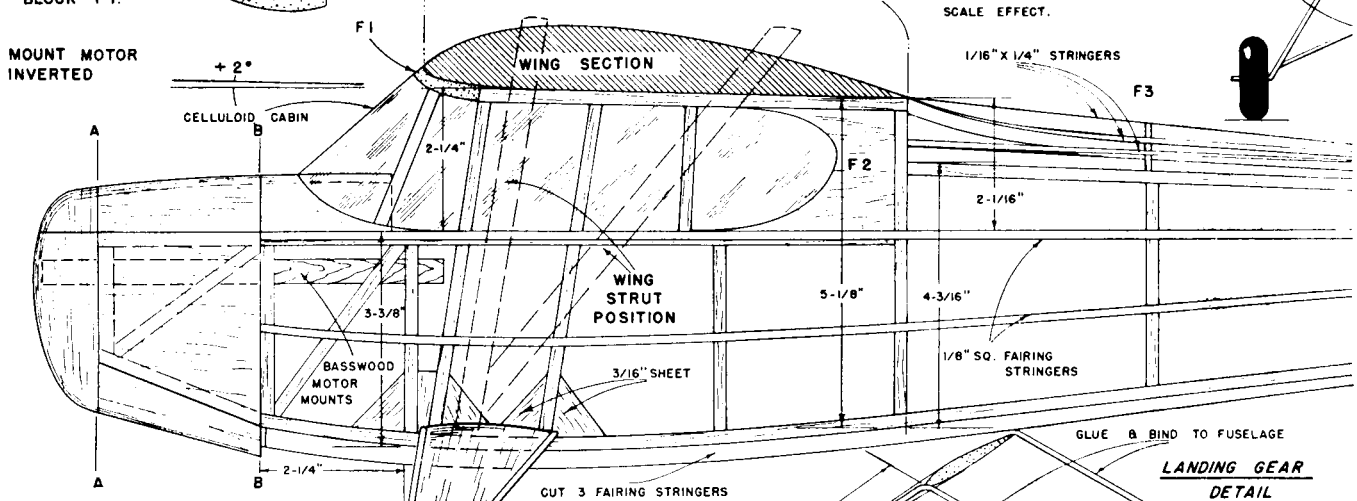


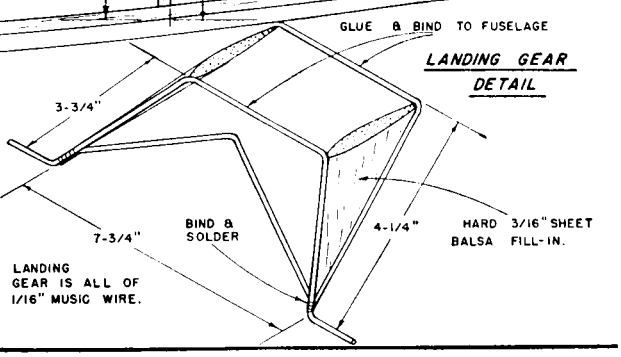
VIEW SHOWING BLOCK F1.

FRONT VIEW
SCALE 1/6" = 1"

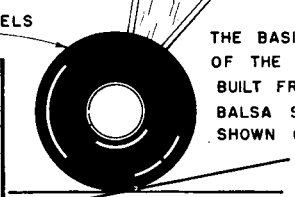
HOLD WING STRUTS IN PLACE WITH DRESS SNAPS

DUMMY CYLINDERS TO THE NOSE FOR SCALE EFFECT.



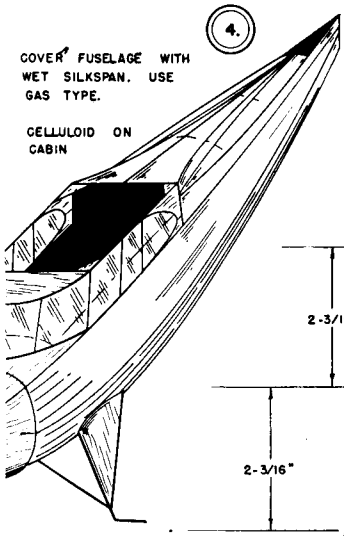


2-1/2" DIA. AIR WHEELS



THE BASIC FRAMEWORK OF THE FUSELAGE IS BUILT FROM 3/16" SQUARE BALSA STRIPS AND IS SHOWN ON THE PLANS IN GRAIN.

ANY CLASS "B" OR LARGE CLASS "A" ENGINE MAY BE USED IN THIS MODEL. FLYING WEIGHT DEPENDS ON THE SIZE MOTOR EMPLOYED.



4.

COVER FUSELAGE WITH WET SILKSPAN. USE GAS TYPE.

CELLULOID ON CABIN

3-1/16"

1-1/2" 1-3/8"

S1 S2

2-5/16"

2-3/16"

2-3/16"

BLACK PAPER

1/8" X 1/4" RIBS

3/16" X 1/2

F4

4-1/8"

1/4" SQUARE

1-3/8"

2-3/8" 1-3/4" 4-1/16"

5" 3-1/8"

1-1/2" 1-7/16"

R1

2-1/16"

1/4" SQ.

2-1/16"

1/8" X 1/4"

3/16" X 1/2"

F4

1"

BLACK PAPER

F5

2-3/8

1-15/16"

STAB. POSITION

4-1/16"

1" DIA. RUBBER WHEEL

1/16" MUSIC WIRE

NO.1

3-11/16"

NO.1.

NO.1

3/16" X 3/8" REAR SPAR

2-7/8"

NO.1.

1/4" X 3/4" TRAILING EDGE.

2-7/8"

NO.1.

BLACK PAPER

2-7/8"

NO.1

1/8" SHEET WING STRUT BASE

2-7/8"

NO.1.

WING STRUT

2-7/8"

NO.1.

1/4" SQ. LEADING EDGE.

2-7/8"

NO.2.

3/16" X 5/8" FRONT SPAR

2-7/8"

NO.3.

W3

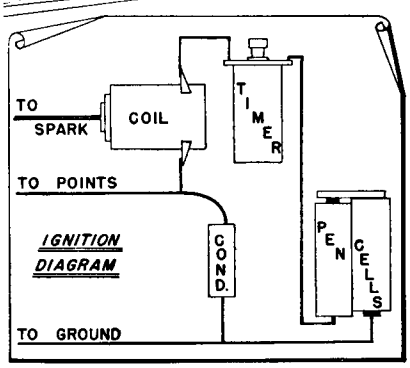
W2

W1

2-3/8"

2-7/8" 2-3/4"

7-1/2"

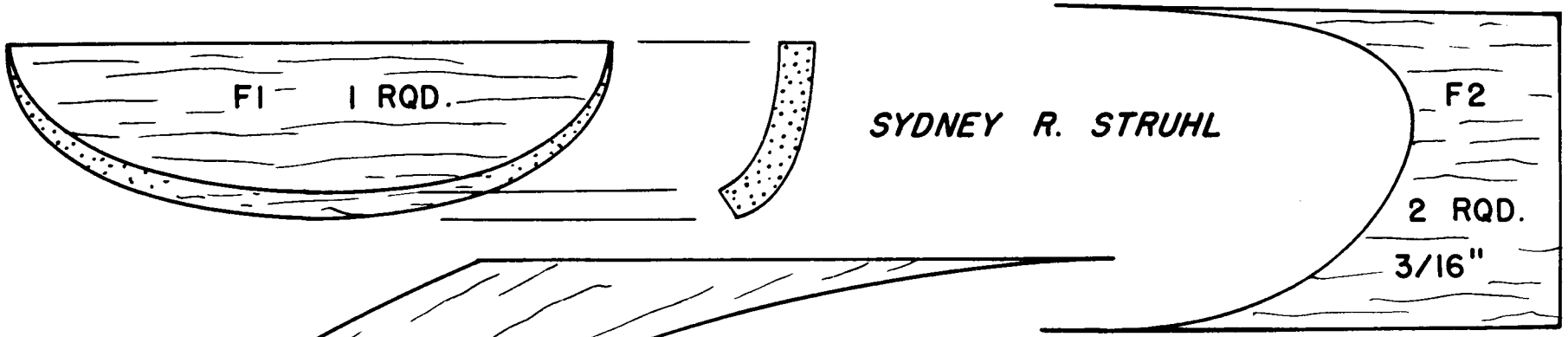


TAYLORCRAFT 0-57

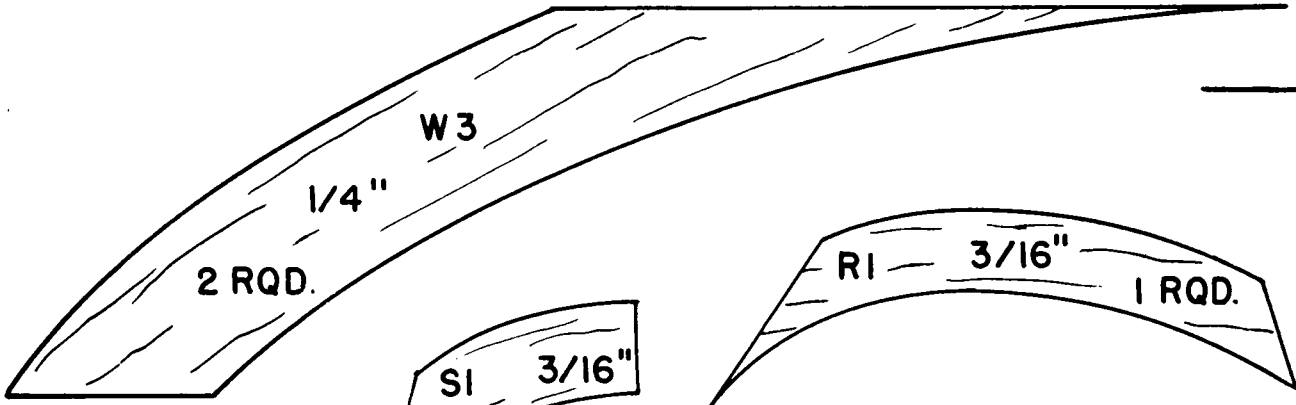
BY SYDNEY R. STRUHL

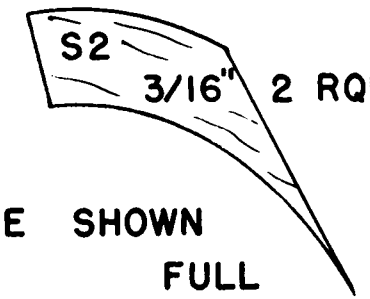
WING SPAN	48-1/2"
OVERALL LENGTH	33-1/2"
ENGINE POWER	CLASS A OR B
SCALE: PLATES 1. AN 2.	1/3" = 1"
PLATES 3. AND 4.	1" = 1"

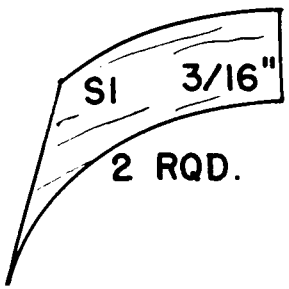
PLATES 1. AND 2.



SYDNEY R. STRUHL







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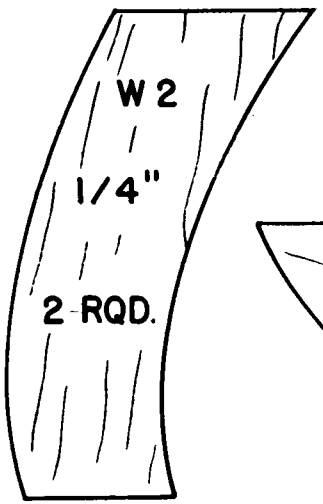
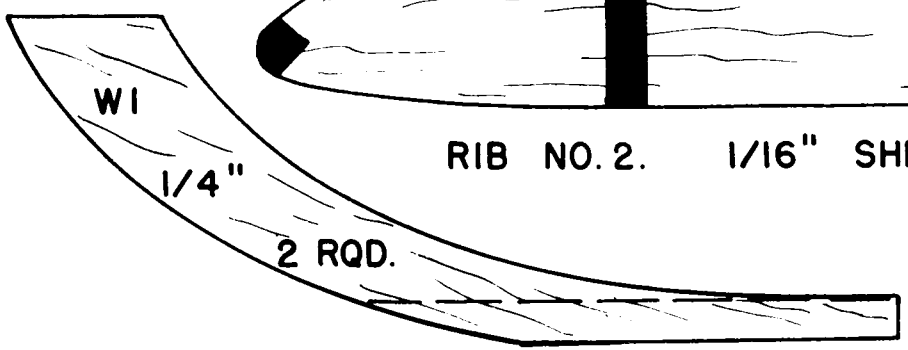
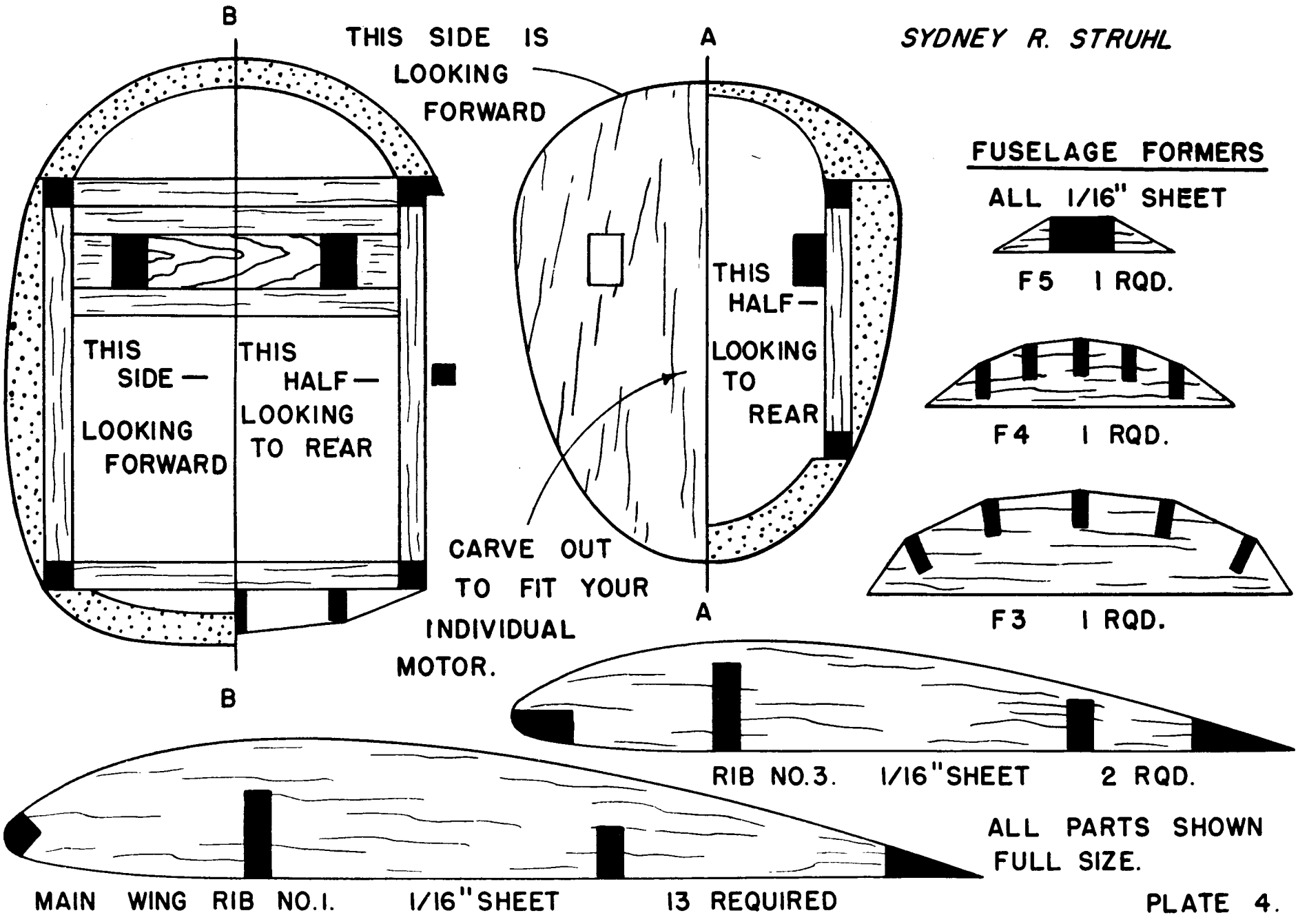




RIB NO. 2. 1/16" SHEET 2 REQUIRED

PLATE 3.


B
THIS SIDE IS LOOKING FORWARD
A
SYDNEY R. STRUHL
FUSELAGE FORMERS
ALL 1/16" SHEET
F5 1 RQD.
F4 1 RQD.
F3 1 RQD.
THIS SIDE — LOOKING FORWARD
THIS HALF — LOOKING TO REAR
THIS HALF — LOOKING TO REAR
CARVE OUT TO FIT YOUR INDIVIDUAL MOTOR.
A
B
RIB NO.3. 1/16" SHEET 2 RQD.
ALL PARTS SHOWN FULL SIZE.
MAIN WING RIB NO.1. 1/16" SHEET 13 REQUIRED
PLATE 4.