

help you. Don't take chances on a poor soldering job.

The fuselage is now ready for planking, 1/8" x 3/8", soft balsa strips are used. The strength and appearance depend entirely on a good planking job. The process of planking is not as difficult as it first appears. It is not necessary that all joints be a perfect fit as long as they are cemented together firmly. All the planking is horizontal. Start the planking from the four longerons and work in eight directions around the fuselage. Do not taper each strip but joint the last strips in place. When the planking job is completed, sand the surface smooth, taking off about 1/32" with the sand paper. Inspect the planking carefully for loose joints.

After the fuselage has been planked, shape the lower part of the rudder which is attached to the fuselage. Cut pieces R-9 and R-10 from printed wood. Gusset is made from scrap. Cement the 1/2" x 3/4" block in place. Cut hole in planking at Station No. 13 and cement 1/4" x 1/2" upright to bulkhead. This lower fin is not planked. It should be covered with 2-ply silkspan "GM" and faired into the fuselage.

The "keyway" for the tail unit is constructed as shown on the drawing and sketch.

### TAIL SURFACES

The rudders and stabilizer are one unit, being held together by plywood crosses. The rudders are constructed first. Lay out the rudder directly on the plan. After assembly, they must be sanded to cross-sectional shape as shown. Cement the plywood crosses in place and allow to dry firmly while constructing the stabilizer.

Build the stabilizer directly over the drawing having cut out the ribs from the printed sheet. It will be necessary to build the stabilizer in an inverted layout so that PT-1 and PT-2 may be inserted. The half of the stabilizer not shown can be built on the opposite side of the plan. The markings can be made more transparent by rubbing the plan with an oil rag.

The leading edge of the stabilizer should be sanded to cross-section and then steamed before cementing it to the ribs. Do not try to cement it in place without steaming as this will distort the stabilizer.

When the stabilizer is completed, shape blocks "M" and "O" as shown in the side view and cross section. Block "O" is hollowed for lightness. Note that 2 pieces of 1/4" veneer are cemented to the bottom of block "O" and should fit tightly over the keyway.

The balance of the tail unit is built up from the printed wood parts and cemented together. The rear lower rudder is firmly cemented to PT-2.

The entire tail unit is covered with "GM" silkspan. Dowels for attaching the tail unit to the fuselage are cemented as shown.

### WING

As the flying qualities of the model will depend greatly on the wing, care should be exercised while building it to avoid weakness and warps. The spars are made first.

Cut the front filler to exact size from 1/8" plywood. Cement the spars to the filler, cementing the joints of the spars together firmly. Place a 1/8" wedge under the plywood filler so that it will be centrally located between the spars. Construct the short rear spar in a similar manner.

PROPELLER

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FLYING

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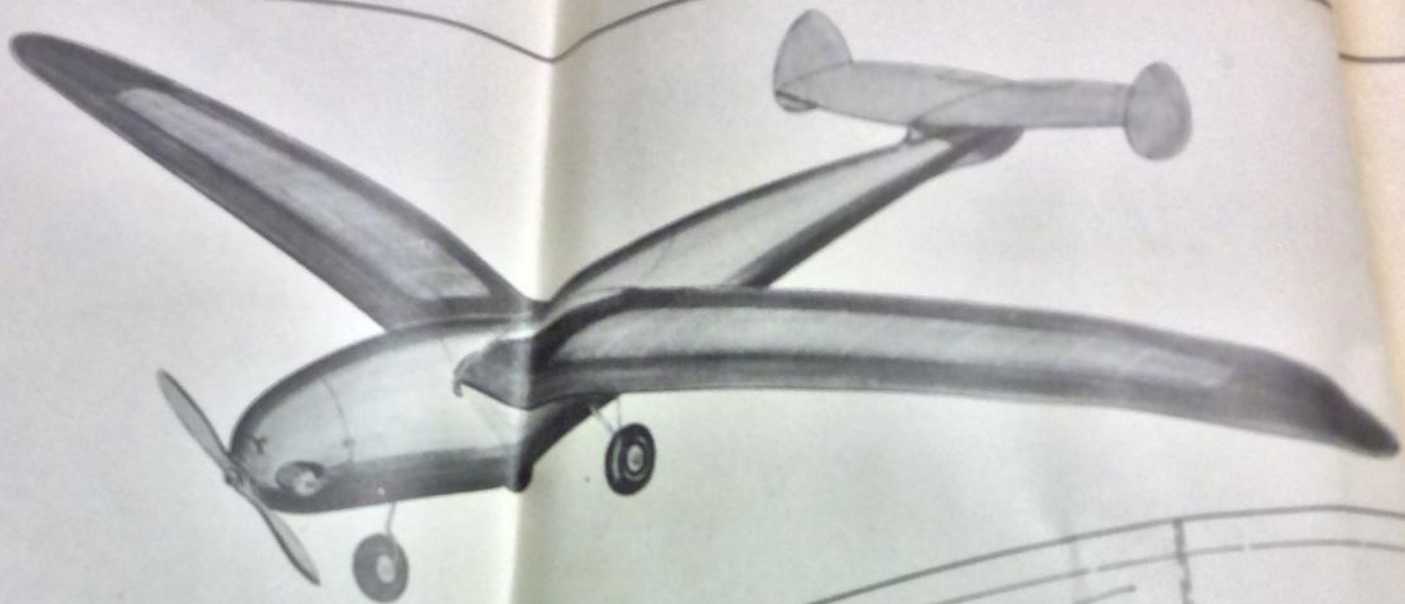
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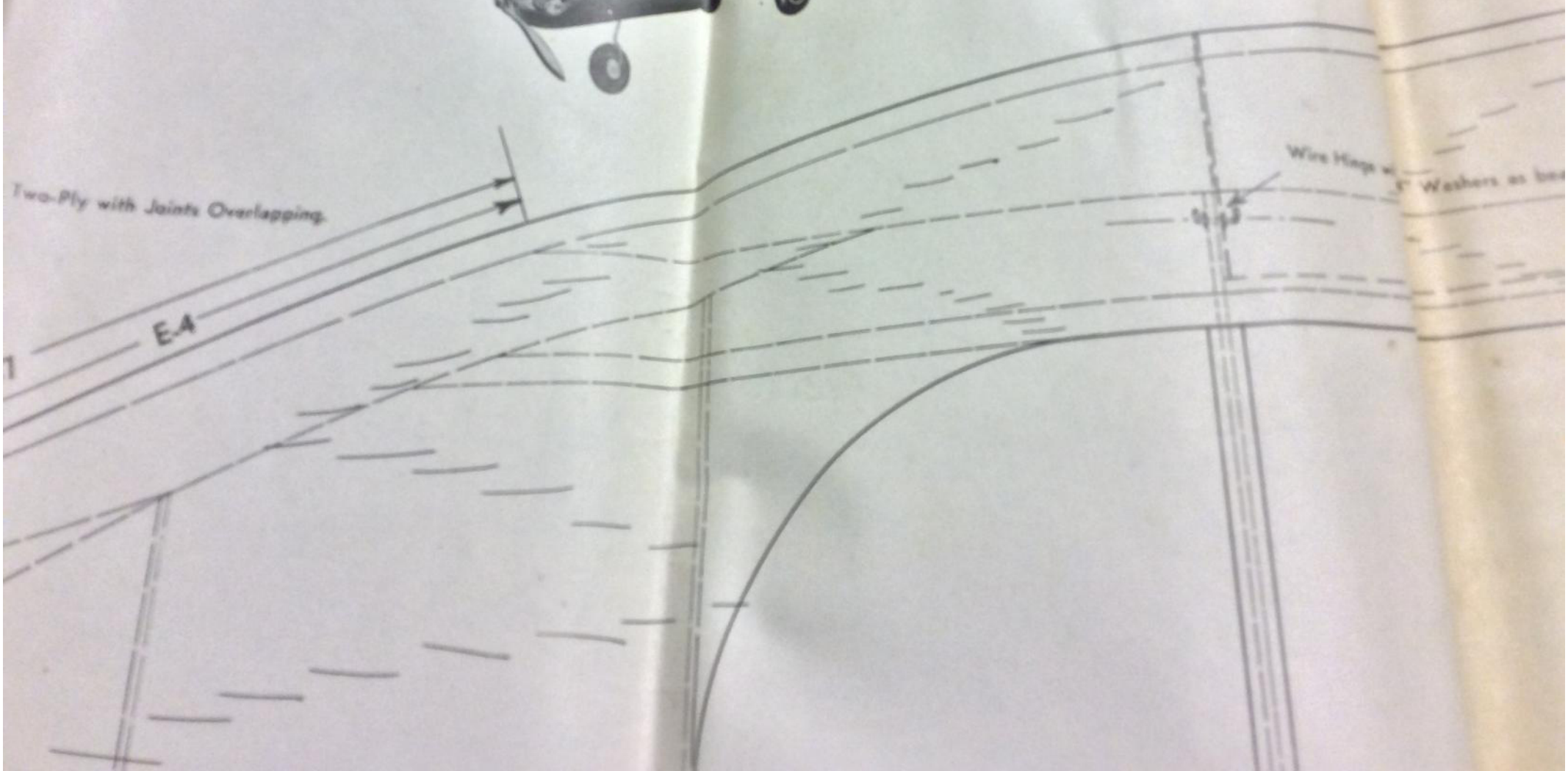
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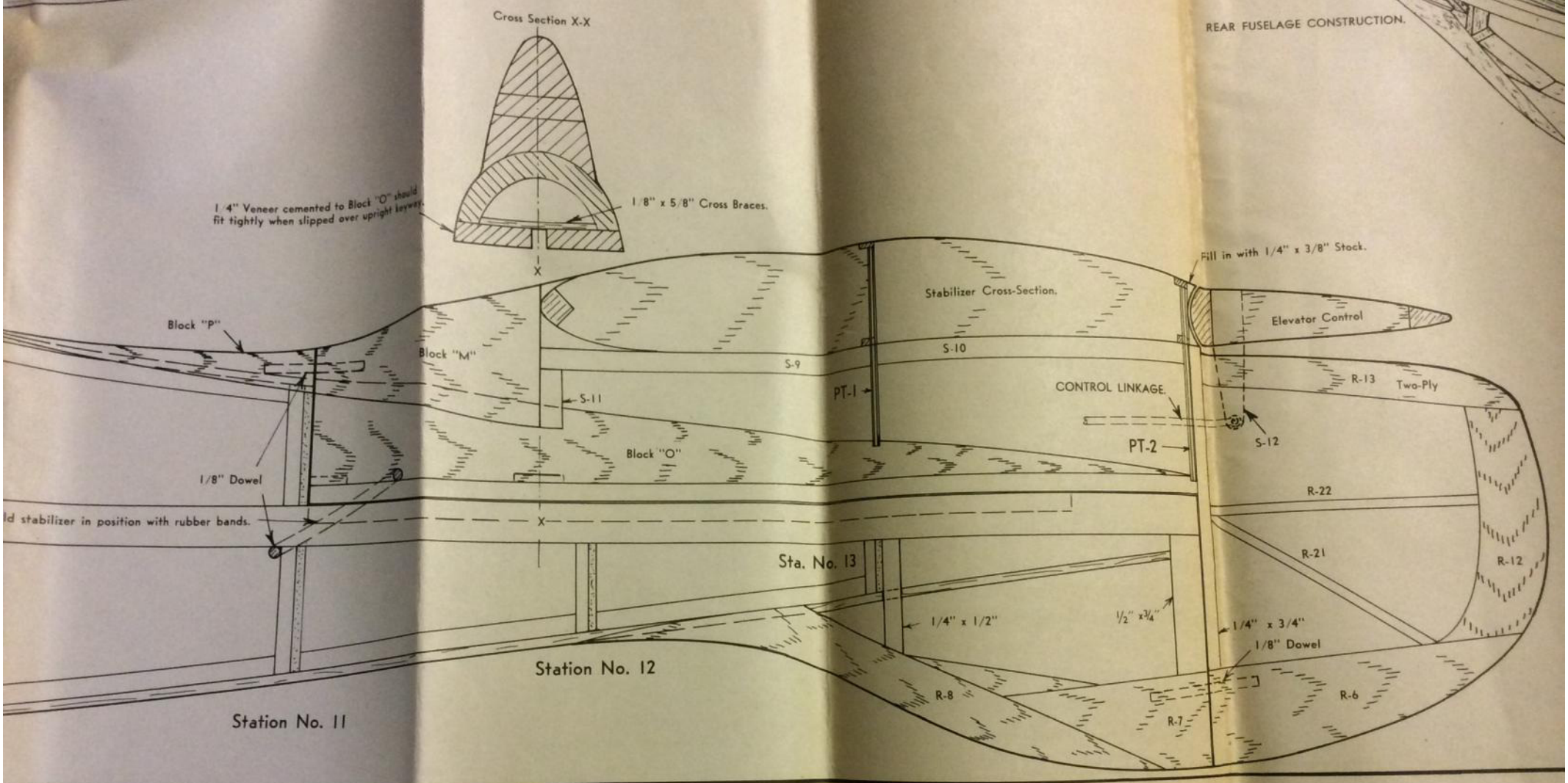


Two-Ply with Joints Overlapping.

E-4

Wire Hinge with Washers as shown





1/4" Veneer cemented to Block "O" should fit tightly when slipped over upright keelway.

Cross Section X-X

1/8" x 5/8" Cross Braces.

X

Block "P"

Block "M"

S-11

Block "O"

1/8" Dowel

Hold stabilizer in position with rubber bands.

X

Sta. No. 13

Station No. 12

Station No. 11

Stabilizer Cross-Section.

S-9

S-10

PT-1

CONTROL LINKAGE.

PT-2

S-12

Fill in with 1/4" x 3/8" Stock.

Elevator Control

R-13 Two-Ply

R-22

R-21

R-12

R-8

R-7

R-6

1/4" x 1/2"

1/2" x 3/4"

1/4" x 3/4"

1/8" Dowel

S-10  
1/4" Veneer

Top View of Stabilizer Mount.

Top View of Fuselage with Stabilizer Removed.

REAR FUSELAGE CONSTRUCTION.

Fill in with 1/4" x 3/8" Stock.

Elevator Control

The Custom-Cavalier "108" is the latest design in the proven result of eight years of experimental work in "108" was designed primarily for experimental work in surfaces and recommended control mechanisms are shown should not be used when model is used in free flight.

The model can be easily built by anyone who has and who is able to follow the plans and instruction intended for the beginner or the model builder who together quickly. It is a model that requires a t tion and when finished will bear evidence of real

Before beginning the actual construction of to obtain a general idea of the construction. the model as far as possible. Most of the cons progresses. In all cases take your time, mak and aligned.

Select a flat table or work bench will serve work. A flat table or work bench will serve have all your tools close at hand. You will drill, file, soldering iron, knife, razor

THE FUSELAGE

The fuselage "crutch" is construct Balsa with the exception of the last to top view of the fuselage is used to la temporary cross brace at Station No. 1

The next step in the fuselage o Carefully cut 1/4" sq. balsa strips to station. It is easiest to cement y cutting the plywood fillers will be for start the construction will be for same manner. No 1/4" square longer the "diamond" frame work has been from the printed sheets and cement

The wire forms of the land on the drawing. These parts o the fuselage with grooved balsa the bulkhead with several coa between each cost. Note that strut if heavy pay loads are washers to the axle on each

The coil is mounted permanent, do a good wire for the wiring hookup. soldered with acid core somebody to help you.

The fuselage is strength and appearance is not as difficult fit as long as they the planking from t not taper each str plated, sand the planking careful

After the attached to the scrap. Cement cement 1/4" x 1/4" with 2-ply a

The " TAIL SURF

Iron Hinge  
washers as bearings

S-16

S-15

S-14

S-12

S-13

3/4" steel and tapered.

S-9  
1/4" Veneer

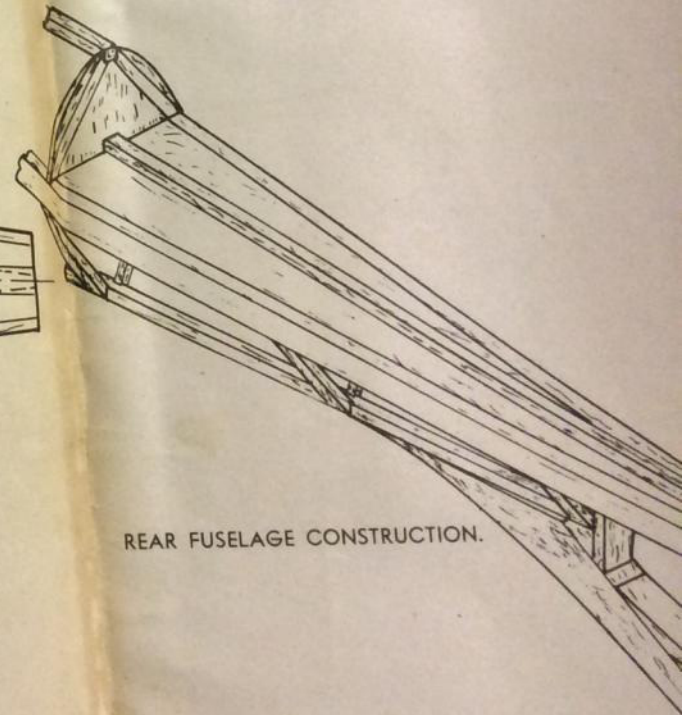
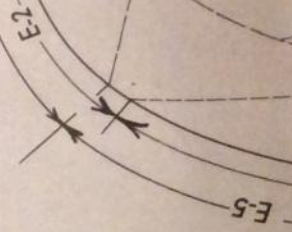
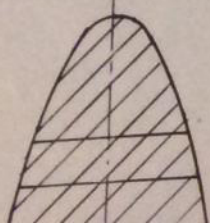
S-10  
1/4" Veneer

Top View of Stabilizer Mount.

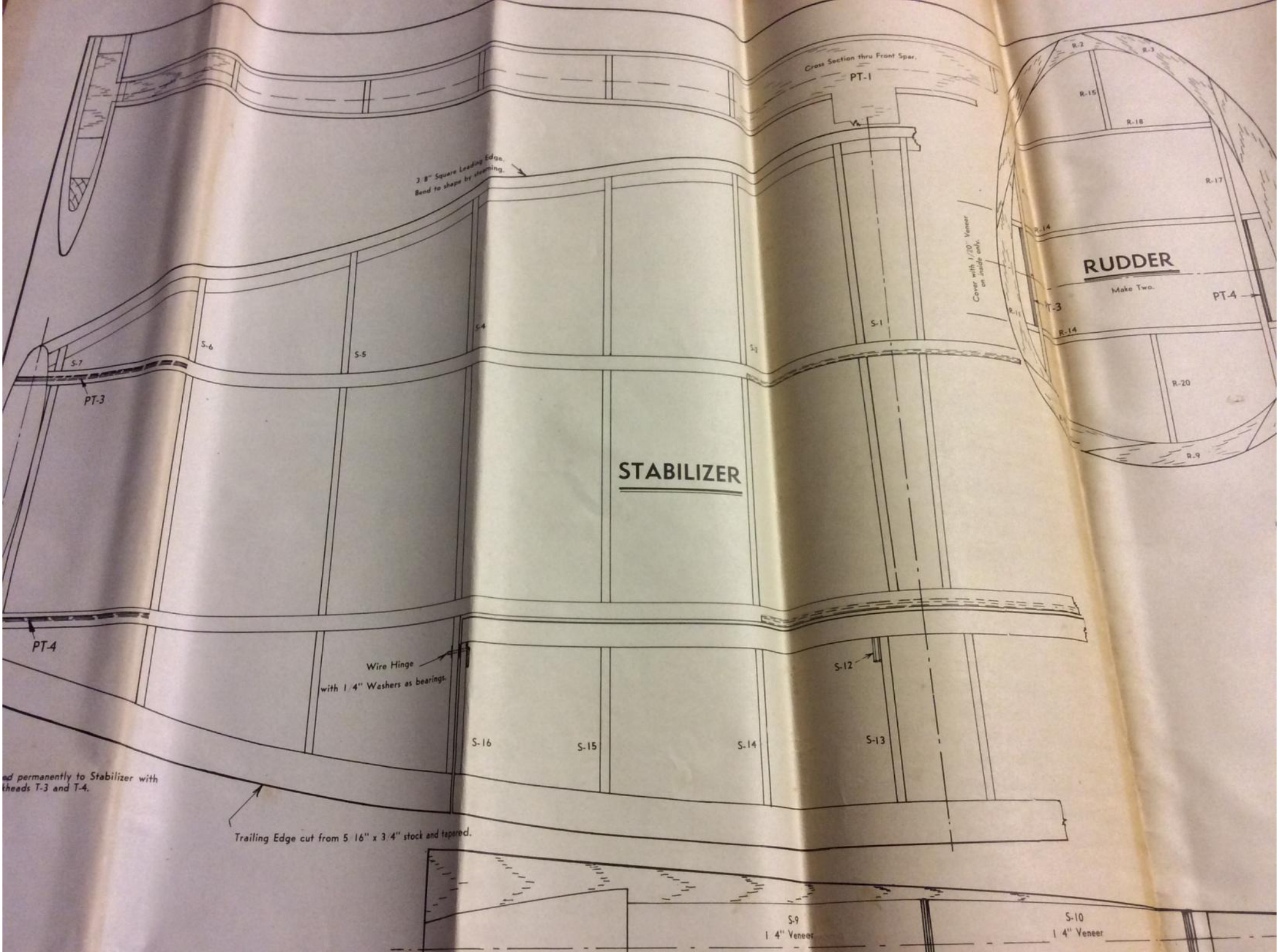
1/4" Veneer Filler

Top View of Fuselage with Stabilizer Removed.

Cross Section X-X



REAR FUSELAGE CONSTRUCTION.



Cross Section thru Front Spar.

PT-1

3 8" Square Leading Edge.  
Bend to shape by steaming.

Cover with 1/20" Veneer  
on inside only.

# RUDDER

Make Two.

# STABILIZER

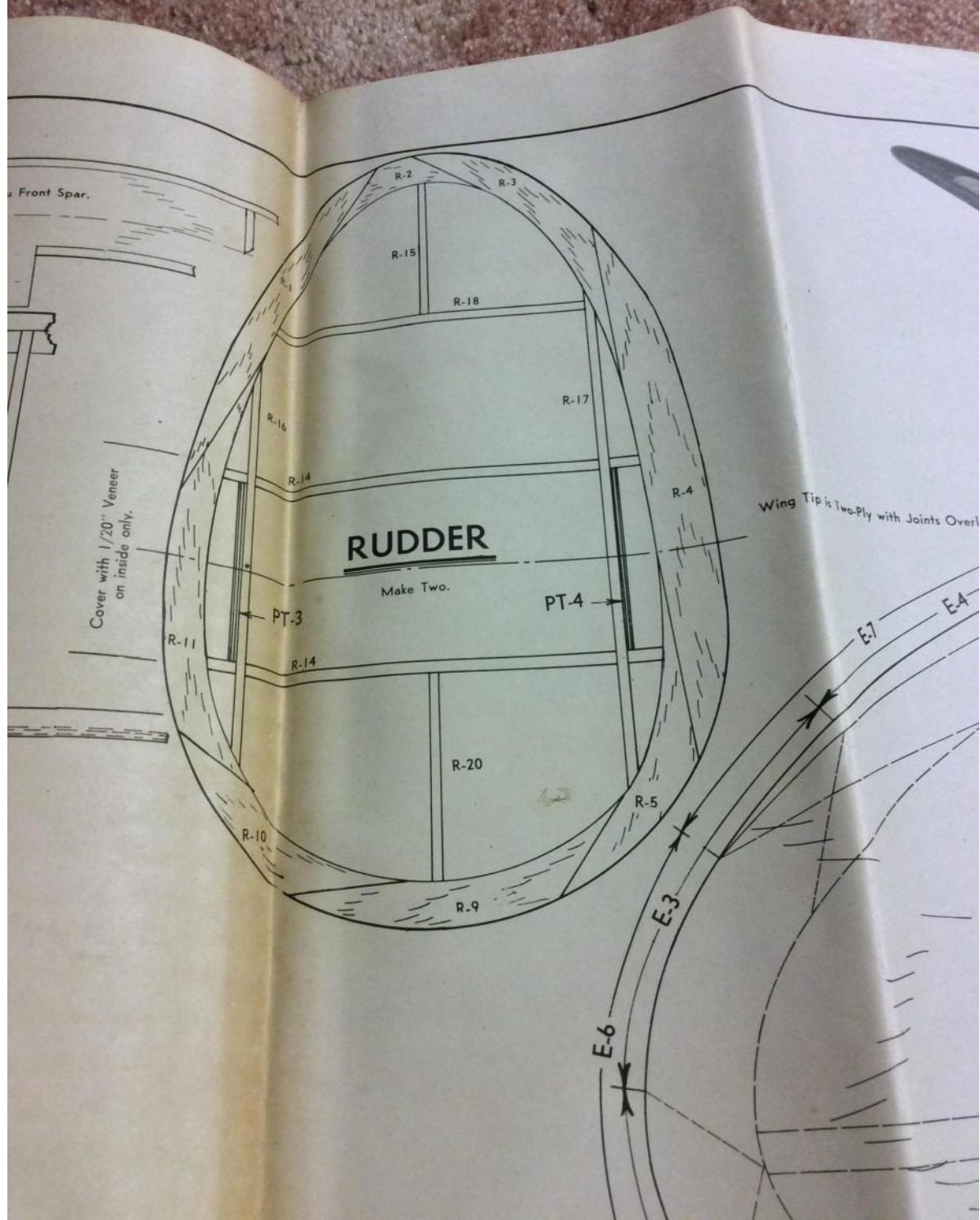
ed permanently to Stabilizer with  
threads T-3 and T-4.

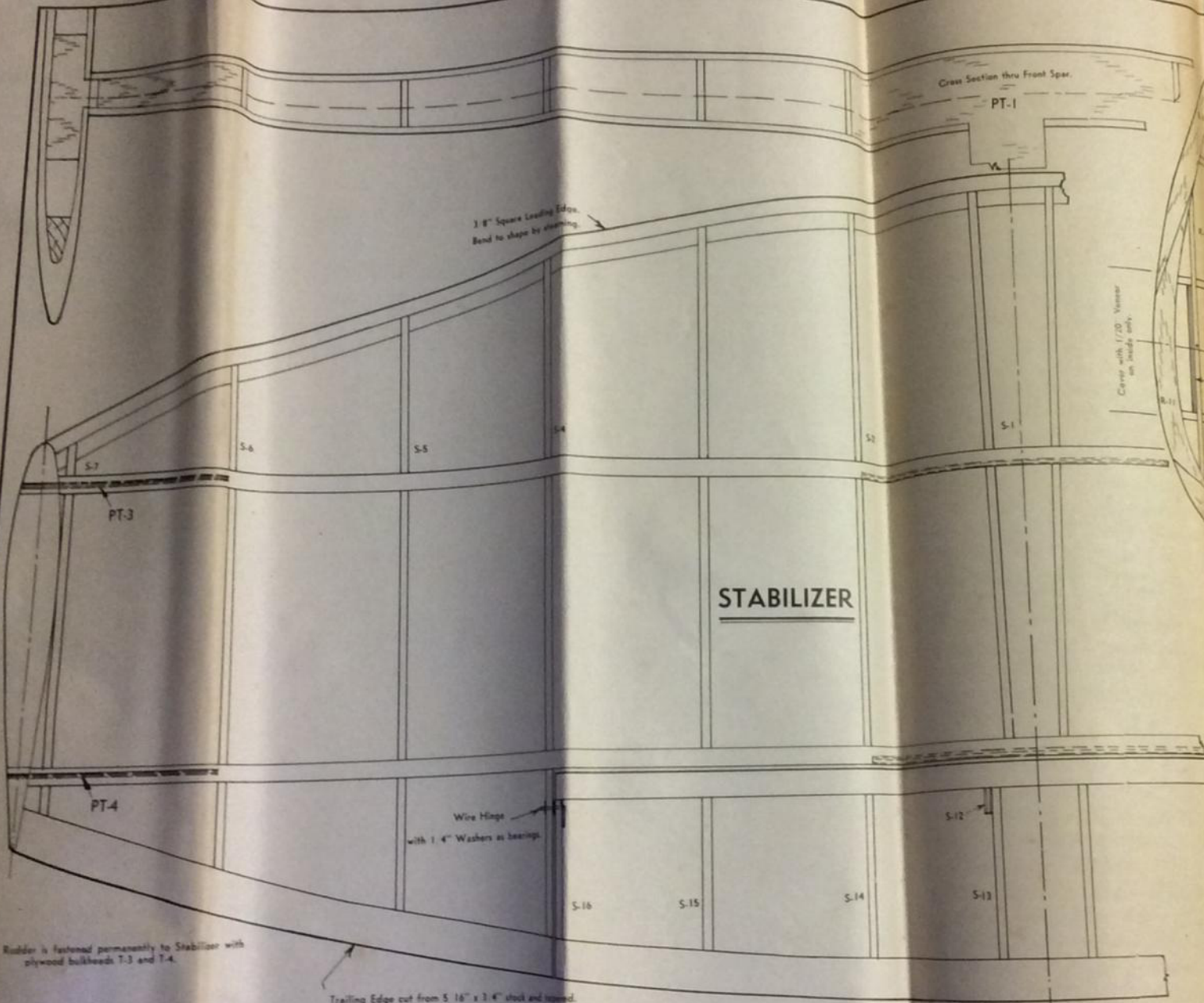
Trailing Edge cut from 5 16" x 3 4" stock and tapered.

Wire Hinge  
with 1 4" Washers as bearings.

S-9  
1 4" Veneer

S-10  
1 4" Veneer





Cross Section thru Front Spar.

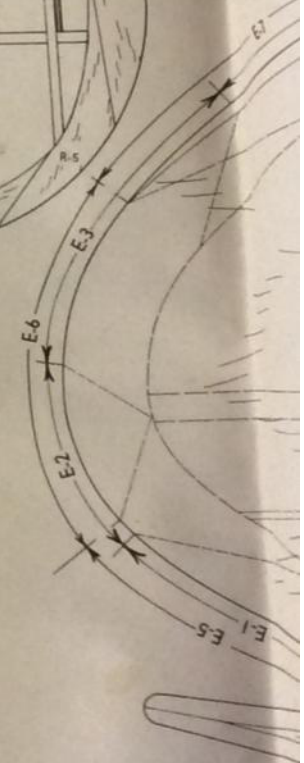
PT-1

Cover with 1/20" Veneer  
on inside only.

**RUDDER**

Make Two.

Wing Tapered to tip with



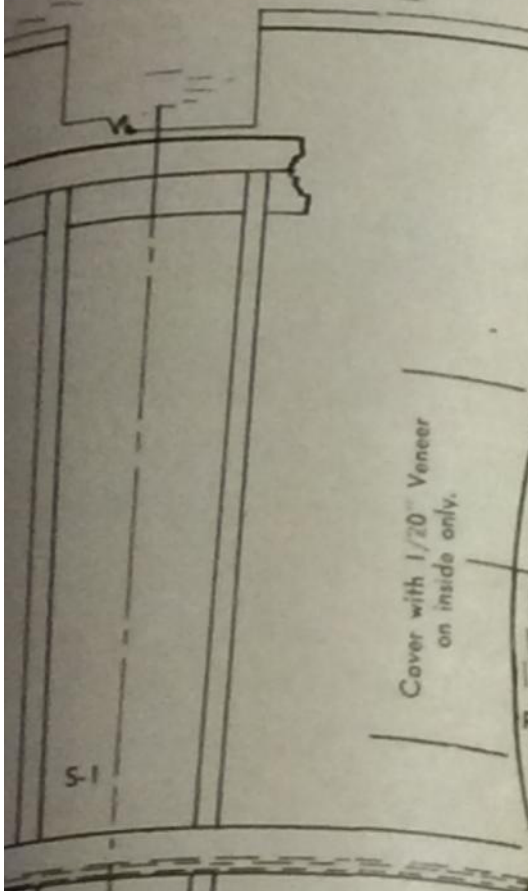
Rudder is fastened permanently to Stabilizer with plywood bulkheads T-3 and T-4.

S-9  
1/4" Veneer

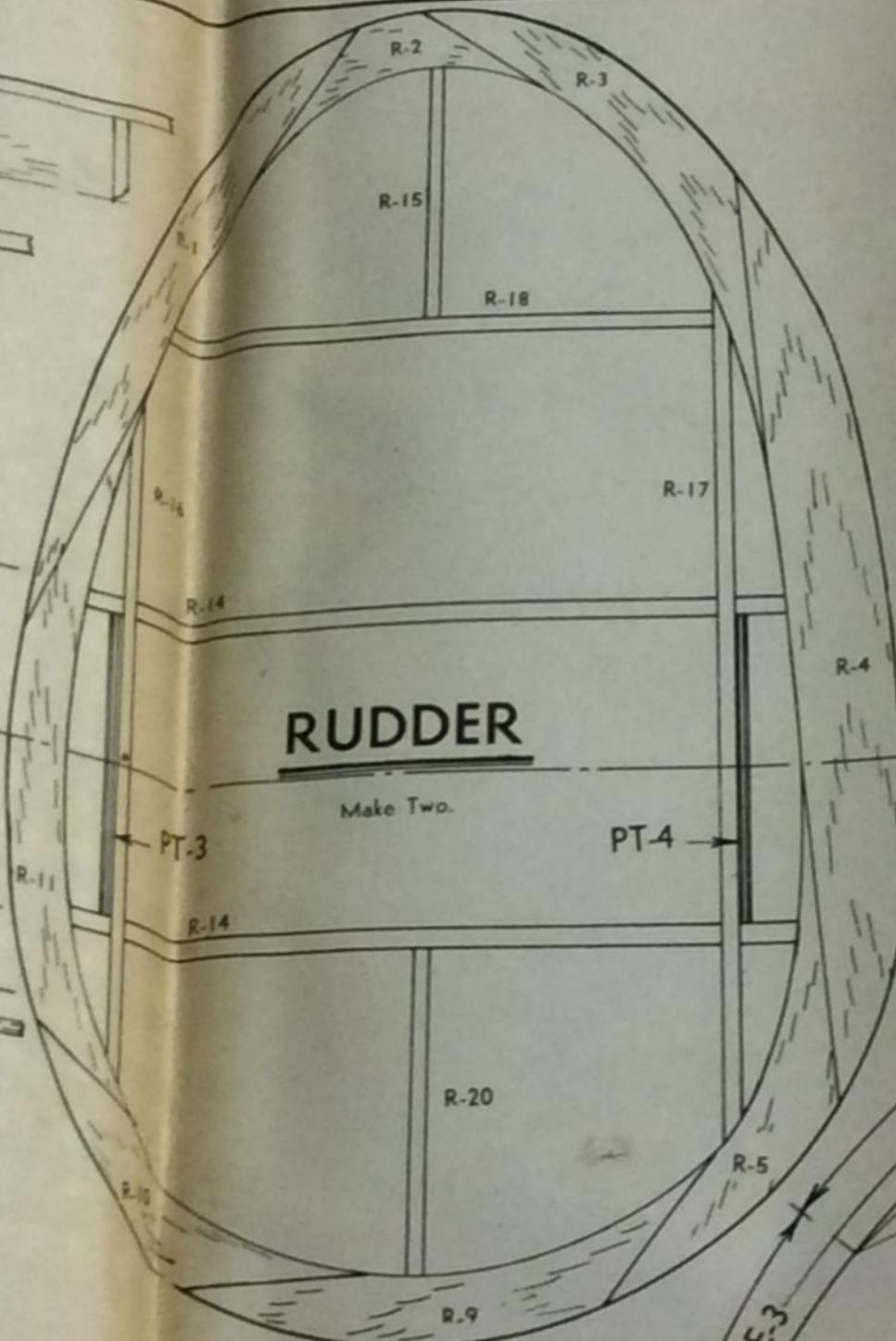
S-10  
1/4" Veneer

Cross Section thru Front Spar.

PT-1



Cover with 1/20" Veneer on inside only.



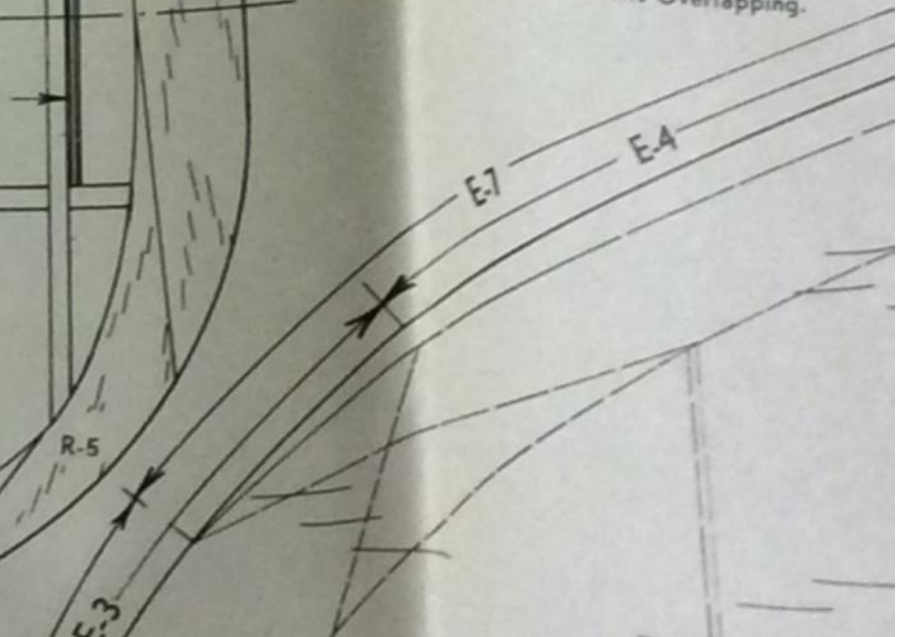
# RUDDER

Make Two.

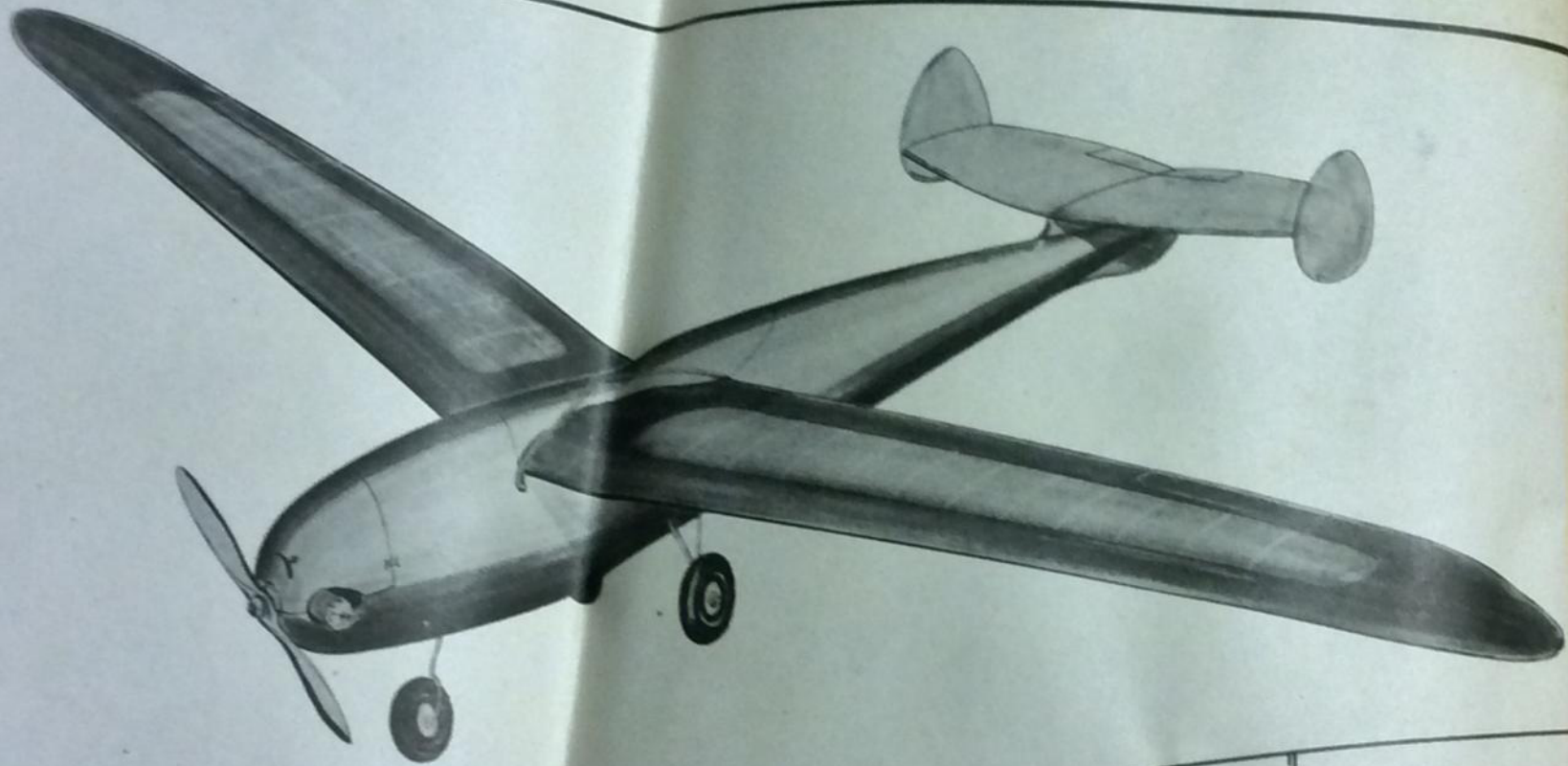
Wing Tip is Two-Ply with Joints Overlapping.

PT-4

PT-3



W-14



lapping.

Wire Hinge with 4" Washers as bearings.

do not give propeller drawings with the model. For the Brown Jr. Motor, we recommend a 16" diameter x 12" pitch propeller.

### FLYING

The Custom-Cavalier "108" is primarily designed for controlled flight although all previous Custom-Cavalier models were excellent free flight ships. Wartime civil defense makes the free flying of a model of this size difficult. Air raid spotters and raider detectors may mistake it for a full-size airplane. Unless you are located away from the shoreline or borders of the U.S.A., it is not recommended that you used the model in free flight for the duration.

The use of Radio Control in this ship will offer no installation difficulties for the Radio Amateur. Note that rudder Control is neither desirable or recommended. For left and right turn, use aileron control only. When the model is flown for the first time with radio control, chose a calm day and a field with plenty of room. Check the model for balance along the main wing spar. With the engine at part throttle allow the ship to taxi along the runway. The model should roll in a straight line with the tail high. Gradually increase the power until the model takes off by itself without using any control. On the first flights it is best that the ship be slightly nose heavy rather than tail heavy. Once the model is at least 200 feet in the air, the controls may be used. Never use the controls below this altitude except when the model is making a landing approach.

To use the model on a control line for flying in a circular course, attach the ".010" music wire guide line to the wing tip and another piece to the rudder. Bind the rudder piece to the wing tip wire about 20 ft. from the tip, forming a "Y". The line to the rudder should be adjusted to be taut at all times.

To control the elevator from the center of the circle by means of two wires may also be desirable. Several patented methods may be used, but all methods are at present in a development stage. For the latest developments in control line flying, consult model magazines such as "Air Trails".

The size and type of propeller can be determined only by individual experimentation and will depend on the type of flying the model will be used for. The propeller included with the kit is only an all-purpose propeller. For maximum performance try several pitches and diameters.

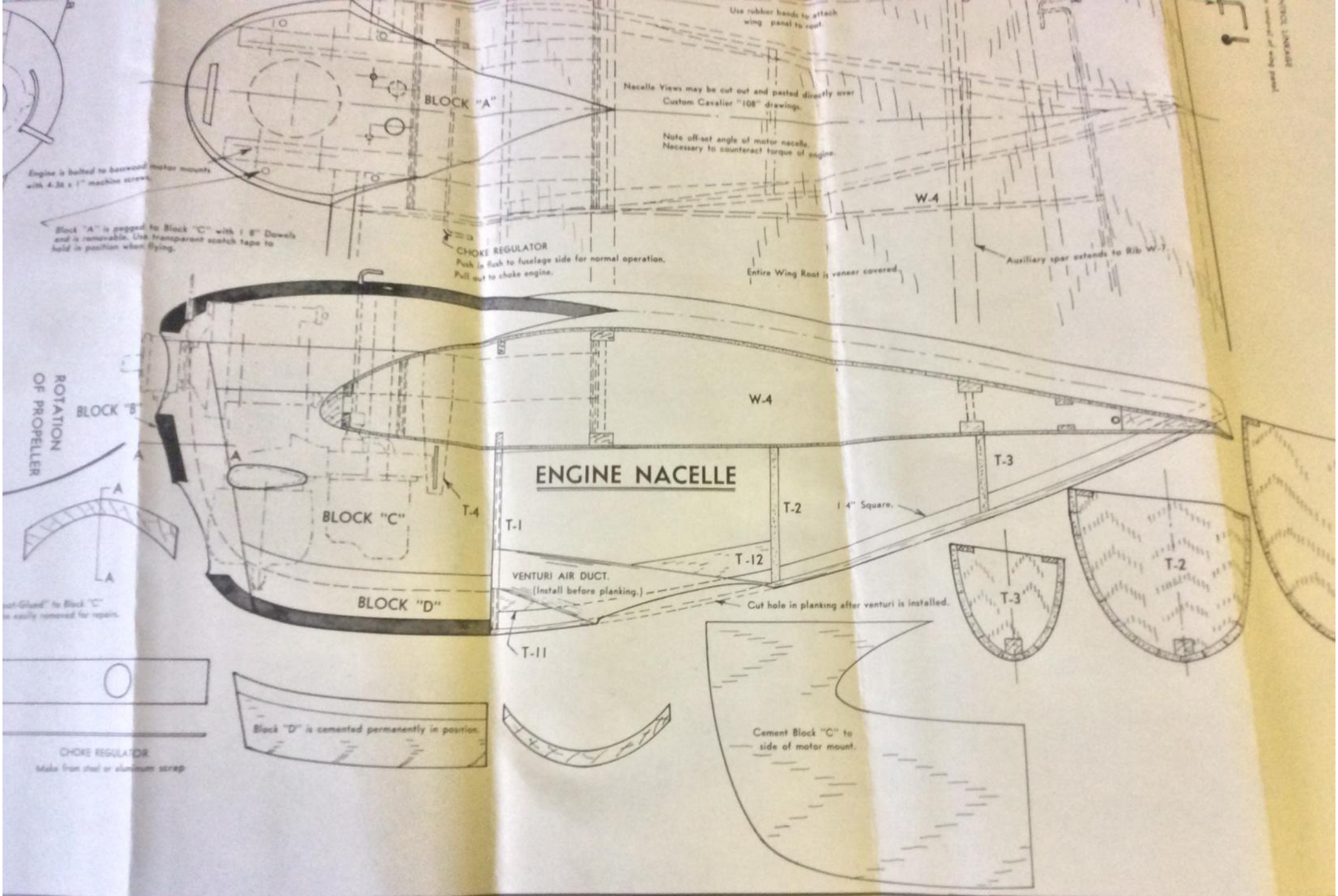
#### NOTE:

Berkeley Models, Inc. would appreciate pictures of your finished model and also comments as to how we can improve this model.

# CUSTOM CAVALIER—"108"

Mfg. by **BERKELEY MODELS, INC.**





Engine is bolted to birchwood motor mounts with 4.38 x 1" machine screws.

Block "A" is pegged to Block "C" with 1/8" Dowels and is removable. Use transparent scotch tape to hold in position when flying.

**CHOKE REGULATOR**  
Push in flush to fuselage side for normal operation. Pull out to choke engine.

Nacelle Views may be cut out and pasted directly over Custom Cavalier "108" drawings.

Note off-set angle of motor nacelle. Necessary to counteract torque of engine.

Use rubber bands to attach wing panel to roof.

W.4

Entire Wing Root is veneer covered.

Auxiliary spar extends to Rib W-7.

ROTATION OF PROPELLER

### ENGINE NACELLE

Use "Hot Glue" to Block "C" so easily removed for repairs.

Block "D" is cemented permanently in position.

**CHOKE REGULATOR**  
Make from steel or aluminum strap

**VENTURI AIR DUCT.**  
(Install before planking.)

Cut hole in planking after venturi is installed.

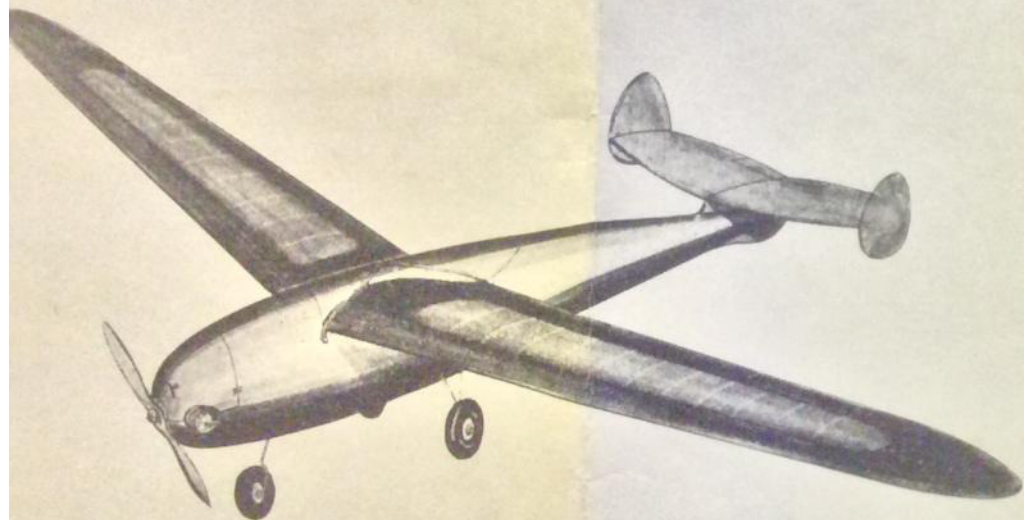
Cement Block "C" to side of motor mount.



Station No. 9

Station No. 8

Station No. 7



## CUSTOM CAVALIER—"108"

Gasoline Powered Model Airplane for Controlled Flight

Designed and Engineered by BILL EFFINGER

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Mfg. by

**BERKELEY MODELS, INC.**

Brooklyn, New York U.S.A.

Three Sheets