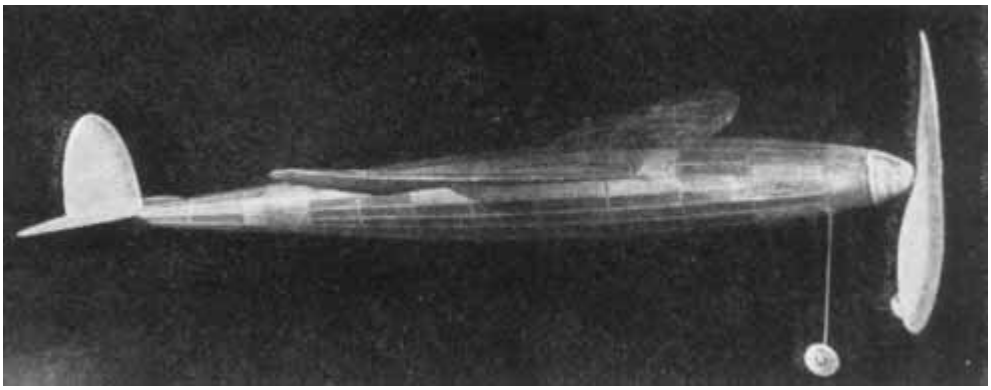
Build This World Record Speed Job

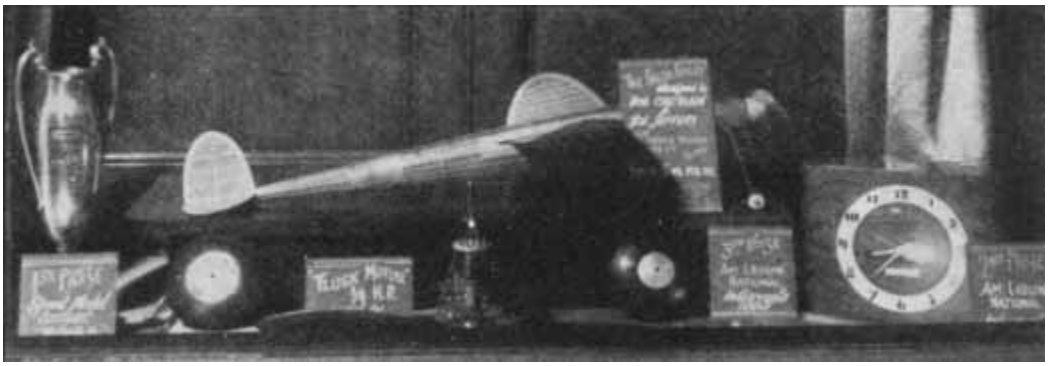
Here Is Complete Construction Data That Will Enable You to Build the Fastest Model in the World

By ROBERT JEFFERY and ROBERT CHATELAIN



The speed model ready for a 70 m.p.h. trip

IN ORDER to create this high speed plane first we should know just what we are building; how the original performed and something of its development to its present state of efficiency. It has been developed almost directly from ships used by Dick Korda and L. Becker in Cleveland in 1935. Although the present design does not even faintly resemble these ships, nevertheless it can be traced directly to them. The whole story is that we crossed Korda's design with those which we had previously developed, thus the result. Ours had been heavy, low-powered streamline "crates," while the Cleveland fellows depended almost wholly upon light weight and lots of power. We merely used the best points of both types; streamlining, lightness and power to gain the end which we have achieved.



The famous speed model and some of the prizes it has won

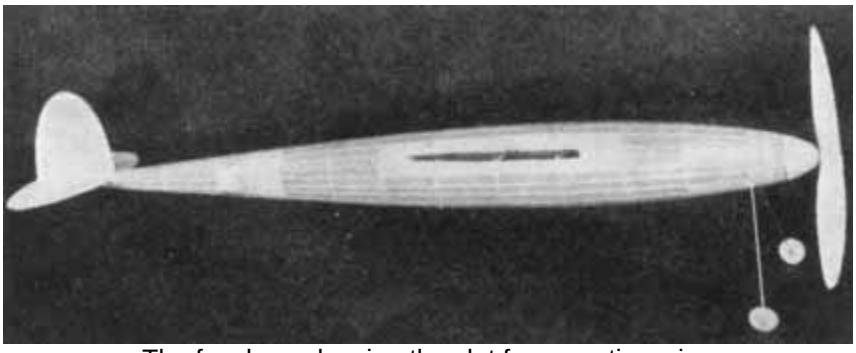
The record of the design has been brilliant from the start, having begun its career with a record smashing victory at Toledo where it easily beat the best of our, and their, square jobs. This happened in January of 1936, and since then the fuselage has been cleaned up considerably, weight decreased, and strength increased. The second ship of this type was equally successful over longer courses, namely 176 foot and 200 foot. It was this design which placed first and third in the National American Legion Contest-speed event-at Indianapolis in 1936. The speed was 50 m.p.h., a new course record, although speeds of nearly 70 m.p.h. have been obtained, both prior to and after this contest.

The plane presented here is neither of the two record-breakers mentioned above, but a third design, slightly improved, and boasting a fuselage design superior to either of the others. It is also designed so that no changes, except for power, need be made.

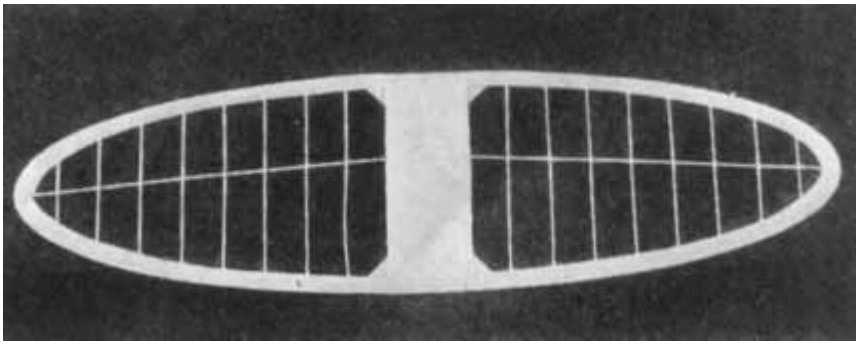
In the only contest in which this particular design has been entered so far, it won at a speed of 60 m.p.h. It was also flown by a 15-year-old girl over the 88 foot course at a speed of 54 m.p.h. On this flight the turns were limited and the powered flight was only about 80 feet, the balance being the glide. The control was very nearly perfect, flying perfectly straight and gaining only a few inches altitude over

the above mentioned course. On the fastest flight only enough turns were given it to carry it just past the finish line because of the wall at the end of the room in which the contest was flown.

When building a speed ship, several points must be kept in mind. The most important is that luck plays a relatively small part in a speed contest, that speed depends upon design and construction, coupled with expert flying. You have here the first, the other two depend upon the builder. However, we have, at the end of this article, listed a few hints concerning testing your speed plane. These hints are compiled from nearly two years of building and flying speed planes, the last year in competition.



The fuselage showing the slot for mounting wing



The complete wing frame before covering is applied

The construction of the ship starts with the wing, not because it is easiest, but because it is different in cross-section (airfoil) from the usual wing. The materials consist of 1/4" flat balsa, 10 pound stock, for leading edge; 1/16" flat balsa, 12 pound, for trailing edge: 1/32" flat, 10 pound, for ribs; and 1/16" x 3/16" tapered, 12 pound for spar. It is well to note that all sheet balsa used is "C" grain, or, more simply, quarter grain balsa, for stiffness. The ribs and leading and trailing edges must be cut out with utmost accuracy. Of special note is the method of notching the leading and trailing edges to take the ribs. In order to obtain the correct airfoil the leading and trailing edges must be blocked up from the drawing so that they line up with the bottom of the ribs. Since the wing plan is a true ellipse, both halves can be made over the same drawing by merely reversing the parts-ribs, spar, and leading and trailing edges. The next thing is to sand the leading and trailing edges to shape, making sure they fill out the airfoil. The center section comes next, it being two inches wide, which leaves enough outside to support the rubber bands which are used to hold it down. One inch dihedral is built into each half of the wing and the center section is covered on both sides with 1/32" sheet, grain running spanwise.

The fuselage is as simple as can be hoped for when this type of construction is used. The materials required are 10 pound 1/16" sheet for bulkheads, 12 pound 1/16" square for stringers and a small scrap of hard 1/8" sheet for bulkhead No. 11. The method used in construction is a modification of the well-known half-shell type of construction. After all the bulkheads are cut out and notched the left half is laid out directly over the drawing, and left to dry over night. It is then taken up and the right half built on it. This method requires that you be prepared to finish the fuselage after taking up the one side. A piece of 1/8" flat is glued to the front of the tail boom and trimmed to fit into the rear of the fuselage proper. A safety hook is inserted in the boom and glued securely; note the washer between the hook and the bulkhead. Now we are ready to fill in the portions noted on the drawing. These spaces should now be filled:
between bulkheads Nos. 1, 2 and 3; around the wing slot; between bulkheads 10 and 11 ; and between 11a (front of boom) and 12. The bottom of the wing slot should fit the bottom of the wing and set it at 0° incidence. We glue small pieces of sponge rubber in the front of the wing slot for protection of the bulkhead and wing on hard landings. The 1/8" laminations for the nose block should now be glued lightly to the front bulkhead and the whole fuselage

sanded so that there are no bumps or rough places. The landing gear should be put in before the fuselage is covered. It is bent to shape and glued and wrapped with thread. The landing gear may not seem to extend into the fuselage far enough, but we have found that a stronger method of attaching, while better to think about, does more damage than good, for when the ship crashes, or, as one of ours did, flies full speed into high weeds, there is slight damage with it the way it is, but with a stronger method of attaching, the whole front of the fuselage will go. The wheels are made of two pieces of 3/64" flat basswood glued cross-grained and well streamlined. All the filled-in places should be given one coat of dope and the nose block several. Before covering, the noseblock is removed and a piece of 1/8" flat glued to it to fit into bulkhead No. 1.

The tails are the last of the parts to be made. Their simplicity is apt to make the model builder a wee bit careless, but this must not be, as the tails are really the most important factor in attaining straight flight and a slight bit of carelessness may be the cause of complete disaster, which is not impossible with such a small ship and so much power. The materials used consist of 12 pound 1/16" sheet and 1/16" square balsa. The outlines are made of 1/16" sheet cut to shape and the spars and ribs are 1/16" square. After they are laid out and let dry they should be turned over and glued on the bottom side. This process will prevent a great deal of warping, which is a natural tendency with such thin surfaces. They should then be carefully sanded to a streamline shape.

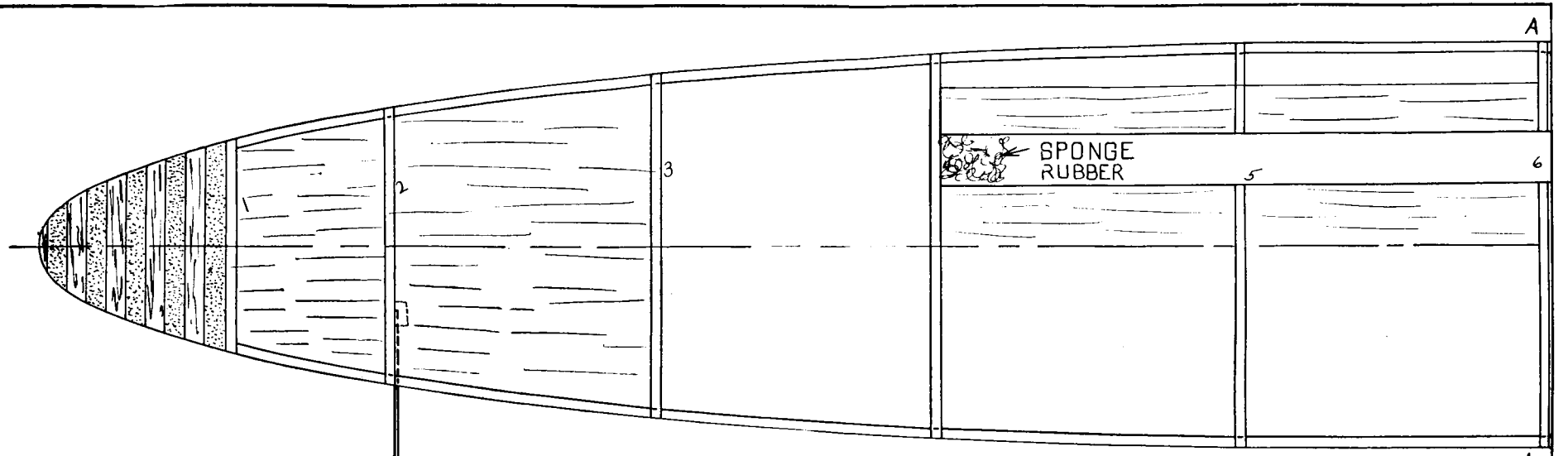
The wing and tails should be covered first and the scraps of paper left can be used on the fuselage. We use colored tissue on all our models, for it gives decoration and light weight as well. The paper should be cemented to each rib, then the surface sprayed with water and doped with thinned clear dope. This applies to the wing and tails, but the fuselage must be covered with small pieces which fit the spaces between stringers and bulkheads and should be given two or three coats of thinned clear dope. By thin clear dope we mean regular nitrate dope mixed with all equal part of lacquer thinner. The wing and tails must be watched very carefully as the thin surfaces warp with little or no reason.

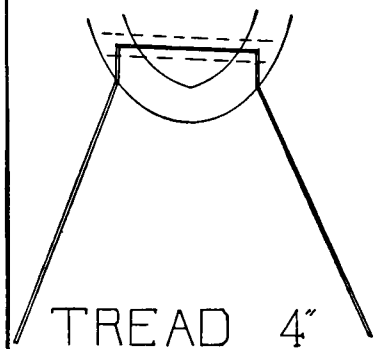
After the model is completely covered the parts should be assembled. The stabilizer is cemented to the middle stringer and should have 0° incidence. The fin is cemented directly to the stabilizer with no offset. The wing slot, as mentioned before, is sanded to fit the wing and to give it 0° incidence. The wing is held on by 1/8" flat rubber and a wire hook which is bent to fit the bottom of the fuselage. These rubber bands should be as tight as possible to prevent any movement of the wing while the ship is in flight.

Last, but far from least, comes the propeller. This is carved from a basswood block 5/8" x 1" x 7-1/2". It is carved in the usual sweep-back manner, leaving the hub about 3/8" deep by 1/4" wide, the thickness of the blades tapering from 3/16" near the hub to 1/32" at the tips, which are rounded off to give a pleasant shape to the blades. The final finishing consists of three coats of clear dope with intermediate sanding with No. 240 Wet or Dry paper. The use of basswood comes from our experience with both basswood and pine propellers. The power, by the way, ranges from 16 strands of 1/8" for distance, for long courses, to 30 or more strands for short courses.

We now come to the third, last, and touchiest of the important points, the flying end. We take the completed ship out to a field in which the grass or weeds are over a foot deep. The "crate" is hand-wound and hand-launched at a considerable angle of climb. This procedure is repeated until a straight climb is obtained, which means not a loop or a leveling out before the power quits, but merely following the line on which it is launched. After this part is conquered, we go to where there is as little grass as possible and, with the aid of a platform about a foot high. R.O.B. the model into the wind, gradually increasing the number of turns until control is good when the motor is fully wound. It might be well to state that we believe the tails are the best control surfaces, giving better control with less drag than if the wing were warped for adjustment.

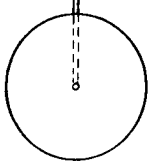
As a last word we want to say that if care is used in the construction, and common sense in the flying, we are very confident of the results you will get with this speed plane.





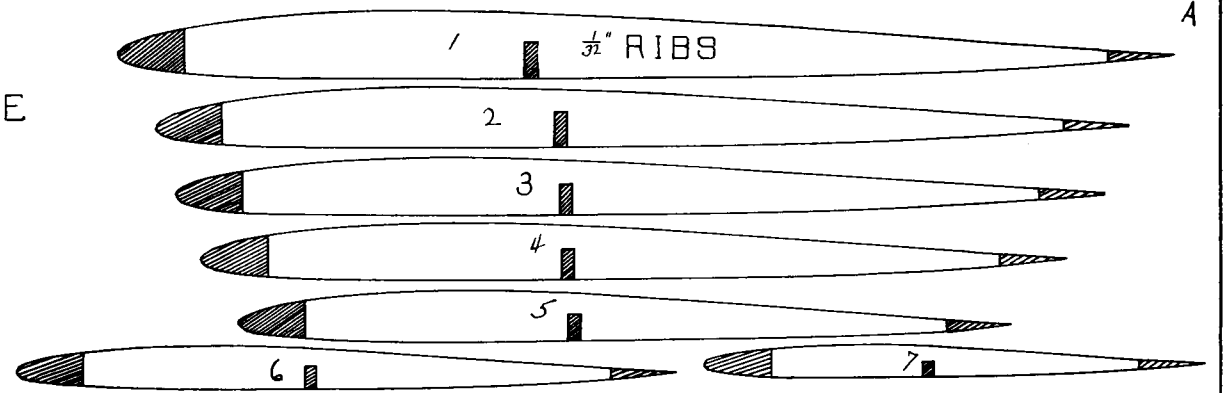
TREAD 4"

.040 WIRE



BC

$\frac{3}{32}$"x$\frac{3}{4}$" BASSWOOD WHEELS



CENTER SECTION

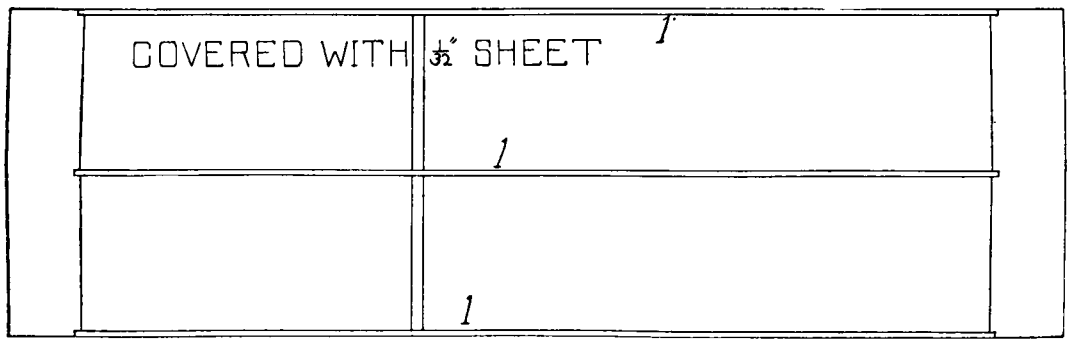
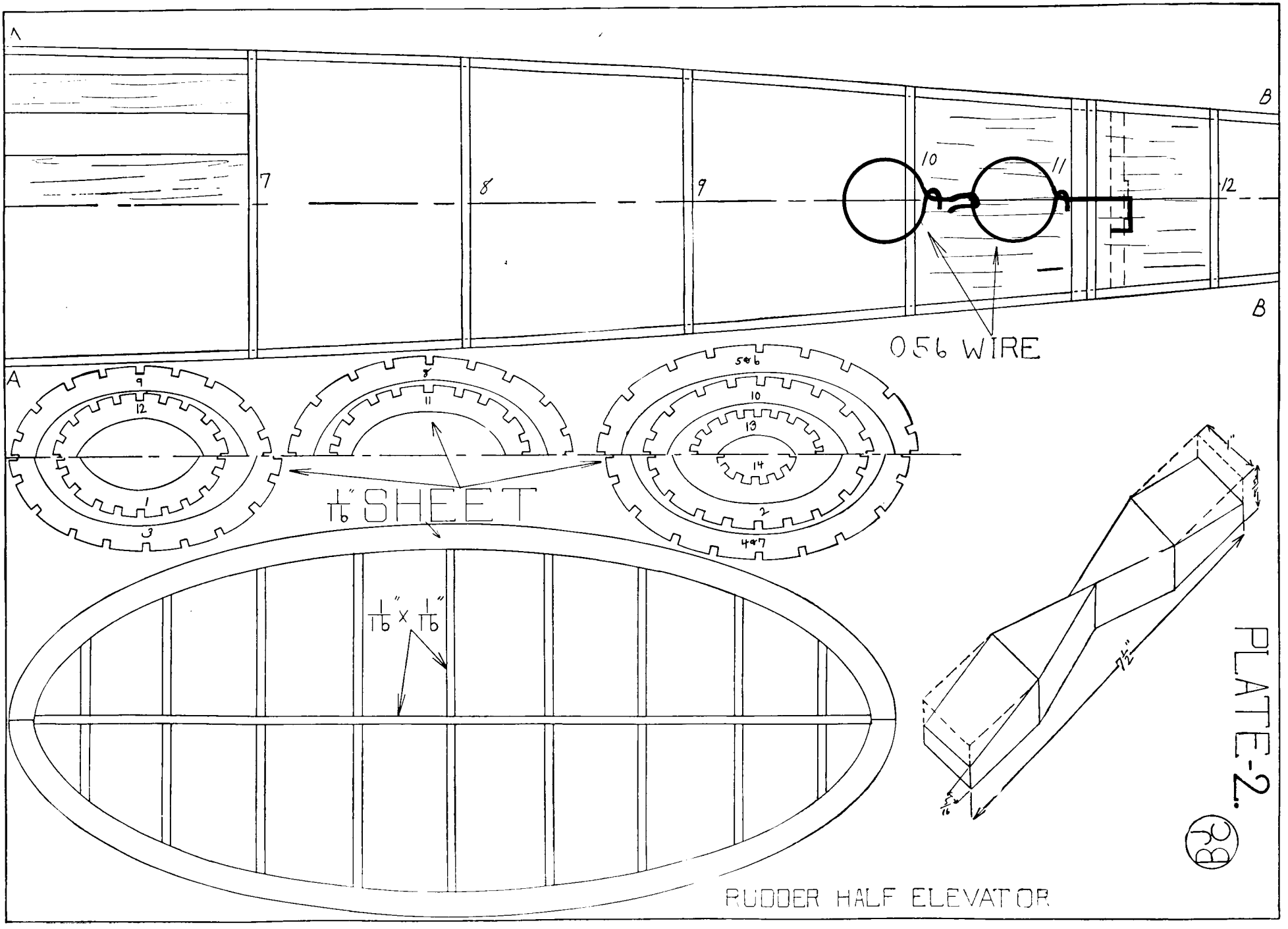
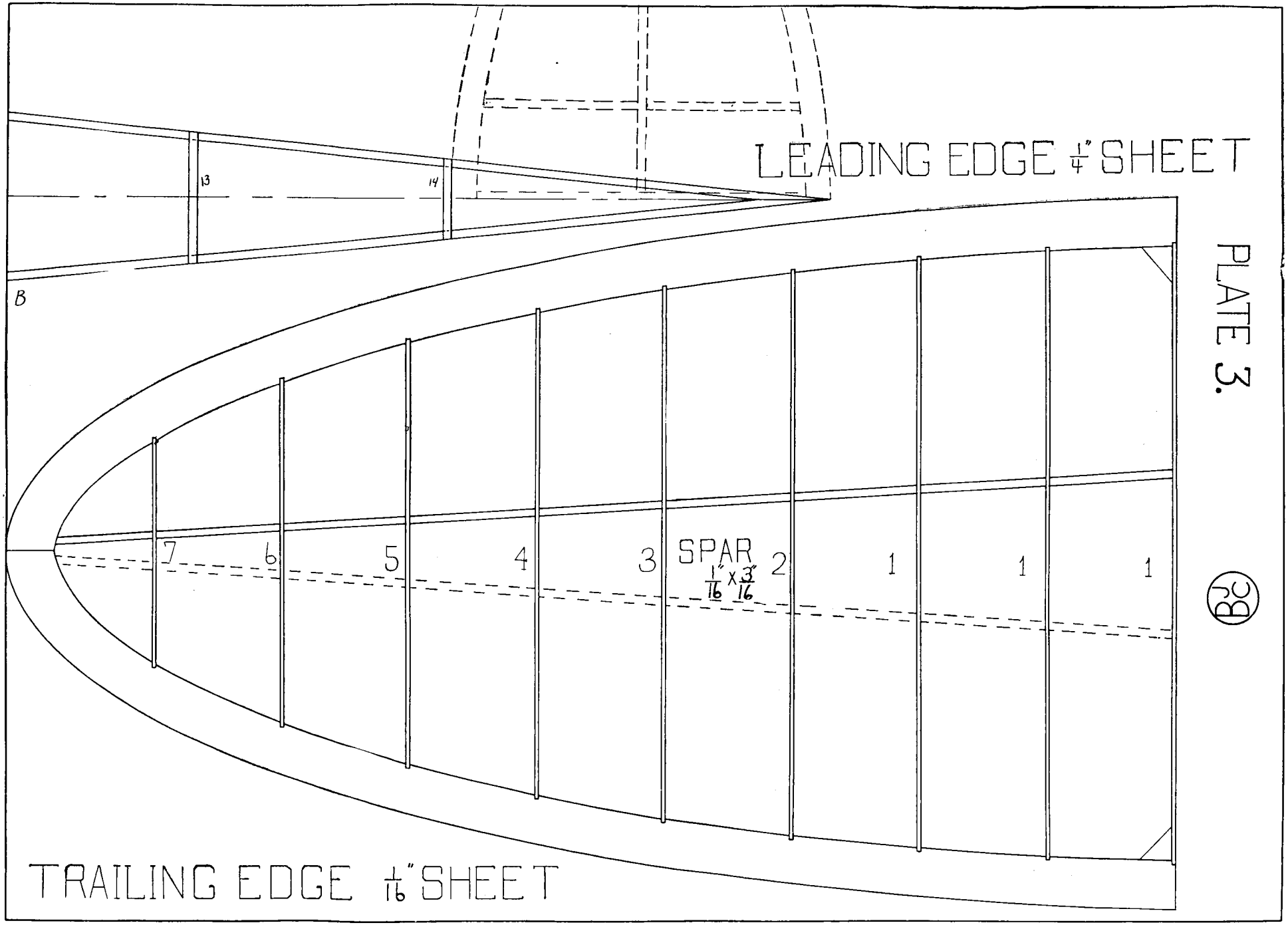


PLATE 1


A
B
7
8
9
10
11
12
B
056 WIRE
A
9
12
1
3
8
11
5&6
10
13
14
2
4&7
1/16" SHEET
1/16" X 1/16"
PLATE-2.
RUDDER HALF ELEVATOR


LEADING EDGE 1/4" SHEET
PLATE 3.
B
13
14
7
6
5
4
3
SPAR
1" x 3/16
2
1
1
1
TRAILING EDGE 1/16" SHEET