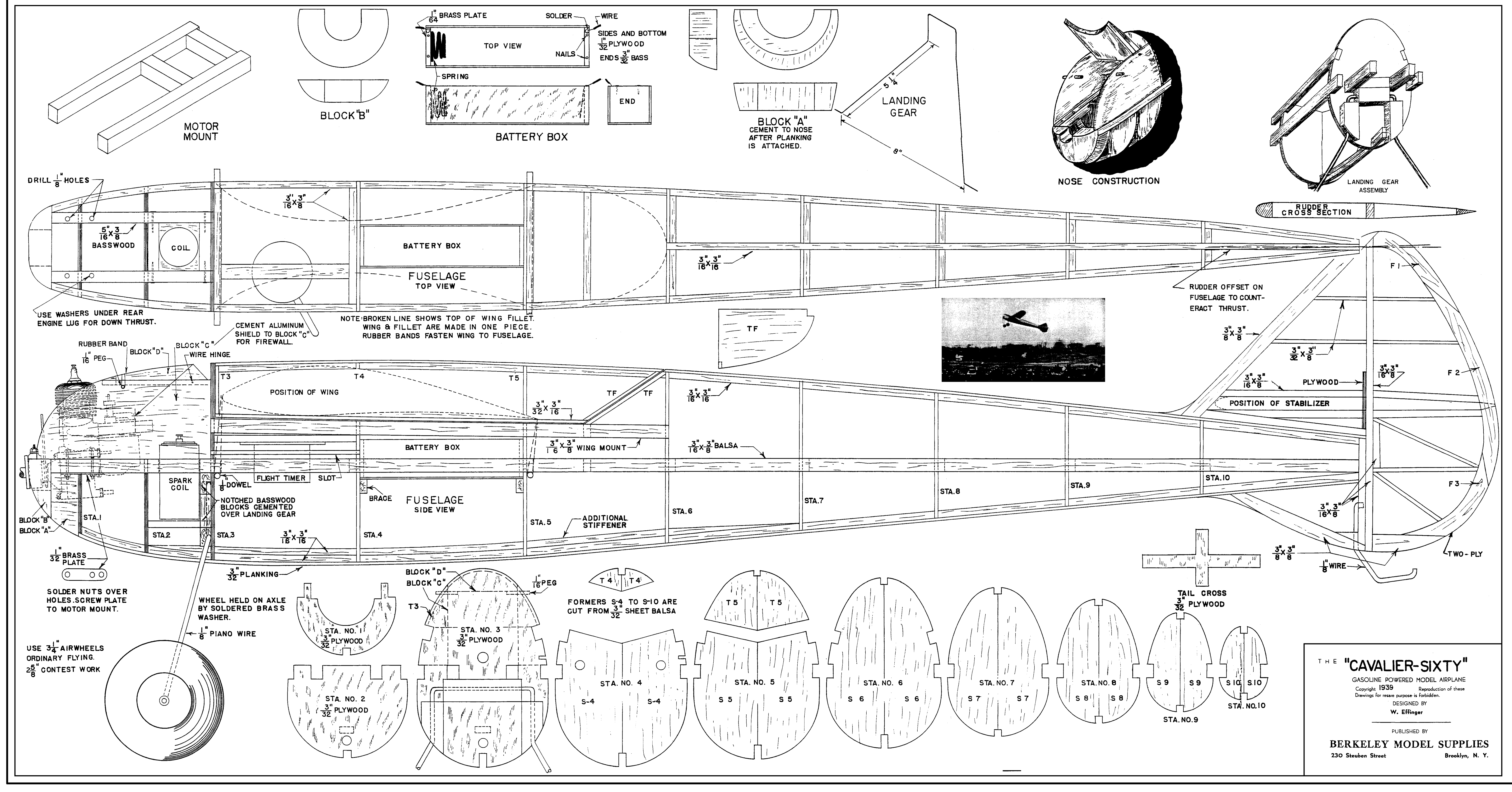
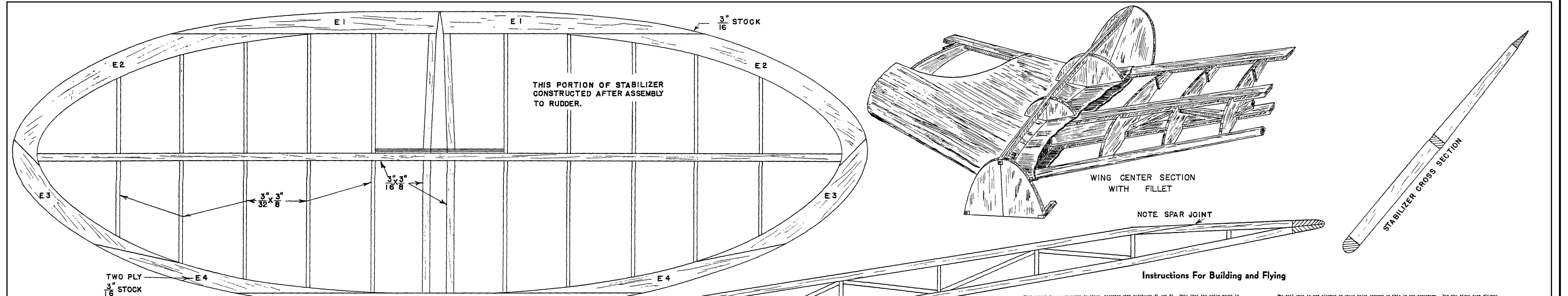
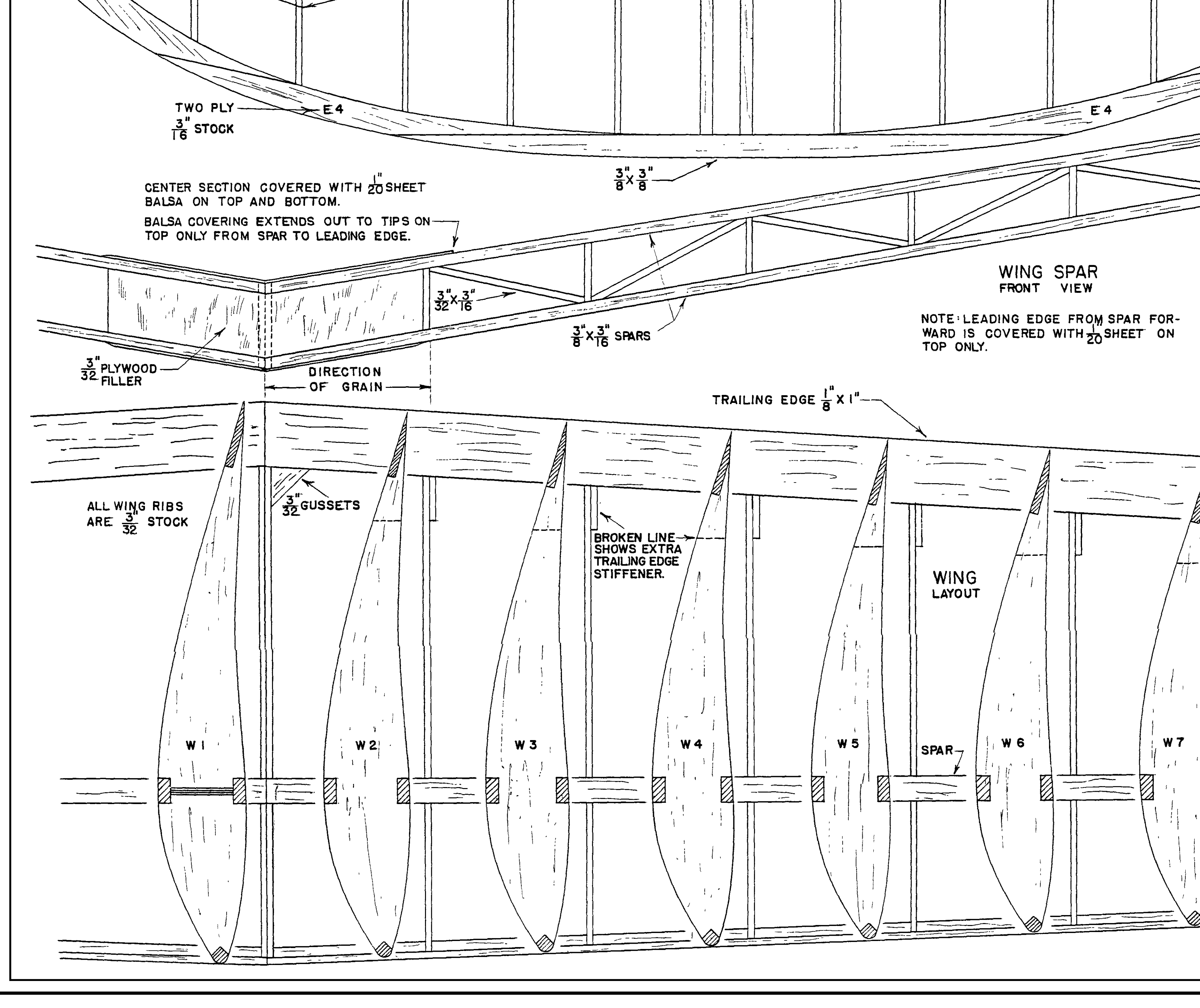






Instructions For Building and Flying

The "Cavalier-Sixty" is a 60" Wingspan version of the famous "Cavalier" series of gas models. The model can be easily built by anyone who has had model building experience and who will follow the plans and instructions step-by-step. The plane may be powered with any engine up to .30 cubic inch displacement and fly under class "B" rules of the National Aeronautic Association. The weight of the completed model with engine and complete ignition accessories will be in the neighborhood of 1 pound 14 ounces. Do not try to improve the performance by lightening the structure as the ship is designed for maximum performance at the mentioned weight.

Before beginning the actual construction of the ship, look over the plans and pictures to obtain a general idea of the construction. If any difficulties appear, try to construct the model as far as possible. Most of the construction will become clear as work progresses. In every case take your time, making sure that all parts are accurately cut and aligned.

Before beginning the actual construction of the ship, select a flat board about three feet long and eight inches wide for layout work. A flat table or work bench will serve the same purpose. It is best to have all your tools close at hand. You will need a small hand jig saw, tack hammer, hand drill, file, soldering iron, knife, razor blade, and sandpaper.

THE FUSELAGE

The fuselage "crutch" is constructed first. It is made entirely of 3/16" x 3/8" balsa. The top view of the fuselage is used to layout the "Crutch". Cross members are cemented in place at each station except at the nose. Next cut all bulkheads from the printed wood. It will be necessary to cut the plywood bulkheads with a jig saw. After all the bulkheads are cut out, cement them in place between the crutch, and also cement them firmly to the cross members. The motor mount must be made next.

The motor mounts are 5/16" x 3/8" Basswood with cross pieces of the same size. The motor mount should be constructed completely before cementing it to the crutch. Note that small nails are used to hold the motor mount together. It is best to drill the holes for the motor bolts at this time. If you already have your motor, use the crankcase holes to mark the position for drilling the holes in the mount. Cut out and drill brass plate. Solder nuts to plate, making sure that the engine bolts will work in place easily. Next screw this plate to the bottom of the motor mount.

Next cement the motor mount in place, together with bulkheads #1 and #2. Note that the motor mount is notched into station #3 for additional strength. Give the motor mount several coats of cement after it is installed for additional strength and resistance to oil.

The wire form of the landing gear is now bent to shape and attached to bulkhead #3 by means of the grooved blocks as indicated in the sketches. Make sure that the landing gear is a tight fit in these blocks as any tendency to move will weaken the landing gear after a few flights.

Next add the 3/16" sq. longerons on top and bottom. Note that there is no longeron between Stations #3 and #6 but there is an additional longeron on the bottom between these stations. Add the wing mounts as shown on the side view.

Before planking the fuselage it is necessary to make all the wiring connections and install the battery box. Since the motor installation is permanent, good wiring is essential. Make good clean soldering joints and you will never have ignition trouble. Consult your engine instruction booklet for wiring hook-up. Note that the engine is given down thrust by placing small washers under rear crankcase lugs.

The process of planking is not as difficult as it first appears. 3/32" x 3/8" soft balsa strips are used. The strength and appearance of the model depends entirely on a good planking job. All the planking is horizontal. Start the planking from the top and bottom longerons and work towards the crutch. Note that there is no planking on the top of the fuselage at the wing position. Do not taper each strip but joint the strips in position. Make sure that the planking is firmly cemented to each bulkhead and to each adjourning strip.

When the planking job is completed, sand the surface smooth, taking off about 1/32" of the outter surface with fine sandpaper. Inspect the planking carefully for loose joints.

After the fuselage has been planked, add the nose blocks "A", "B", and "C". Carve them to a smooth contour with the rest of the fuselage.

TAIL SURFACES.

The rudder and stabilizer are one unit and are permanently attached to the fuselage. The rudder is constructed first. Layout the rudder directly on the plan using pins to hold the ribs and outline in position. Note that the front lower part of the rubber is built directly on the fuselage and not on the plan. After assembly the rudder must be sanded to a streamline shape as shown in the cross-section view. Next cement the plywood cross in position on the rudder.

Because of the plywood crosses, only 3/4 of the stabilizer can be constructed directly on the drawing. When 3/4 of the stabilizer has been constructed, slide it in position on the rudder and cement it to the plywood cross. The balance of the stabilizer must be built by allowing the rudder to extend over the edge of the table or workbench. No adjusting tab is shown on the drawings. A small aluminum tab about 1/2" x 2" may be used on the rudder if necessary.

The tail unit is not planked or sheet balsa covered as this is not necessary. For the first test flights it is only necessary to "spot glue" the tail assembly to the fuselage so that it may be removed for slight adjustments.

WING

As the flying qualities of the model will depend greatly on the wing, care should be exercised when building it to avoid weakness and warps. The spars are made first, directly on the front view of the wing. Use a 1/8" wedge under the plywood filler to centrally locate it between the spars. After one side has dried add the spars for the other side.

Remove the spar from the plan and add all the wing ribs, sliding them in position on the spar. Next add the leading and trailing edges. Taper the trailing edge before attaching it to the ribs. The small rib stiffeners and the inter-spar braces are added next. The wing tips are added next. The wing tips are made from 3/16" stock and are sanded to a smooth contour with the rest of the wing.

The wing is now ready for sheet balsa covering. The center section between ribs W-1 and W-2 is covered on both top and bottom. The leading edge is covered from the spar forward on the top only. 1/20" sheet is used throughout.

The finished wing is then covered at the center with a fillet as shown in the sketch. The fillet is covered with the same planking material as the fuselage and should be shaped to conform with the lines of the fuselage.

COVERING AND DECORATING

The model is now complete, ready for covering. The entire model is covered with "Pervel", including the balsa planking and the sheet balsa covering on the wing. The fuselage is covered in small sections, working from the rear towards the front. Each side of the rudder, stabilizer and wing is covered separately.

The wing should be covered first since it requires the largest pieces. The bottom should be covered first, making sure that the covering is cemented to each rib. Next cover the top of the wing allowing the covering to overlap the leading edge about 1/2 inch. The tips should be covered separately. The tail surfaces should be covered next and the fuselage completed with the remaining pieces.

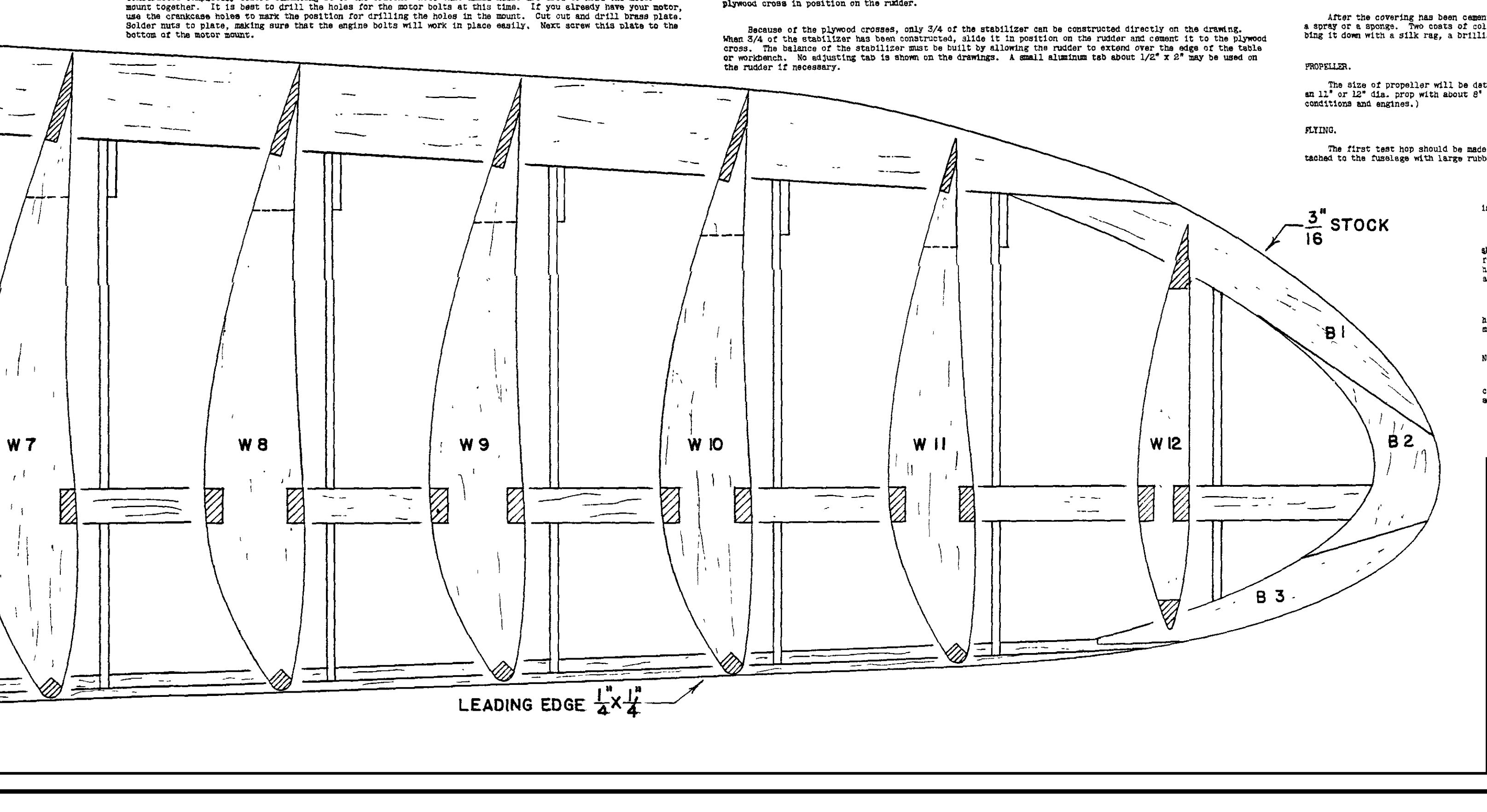
After the covering has been cemented to the framework and has dried sufficiently, moisten the covering with a spray or a sponge. Two coats of colored dope will give the model a solid finish. By waxing the model and rubbing it down with a silk rag, a brilliant lustre can be obtained.

PROPELLER.

The size of propeller will be determined by the engine used in the ship. For the Ohlsson "23" we recommend an 11" or 12" dia. prop with about 8" pitch. (Pitch and diameter will vary with different altitudes, weather conditions and engines.)

FLYING.

The first test hop should be made on a calm day with an engine run of about ten seconds. The wing is attached to the fuselage with large rubberbands as shown in the side view of the fuselage.



The model should balance exactly as shown on the plans. Test gliding is recommended only if tall grass is available to soften the landing.

The first flight should be made with the engine idling. If the model should stall, correct by wedging up the front end of the stabilizer on the fuselage. If the model will not take off, it is probably due to being nose heavy, correct this by lifting the rear edge of the stabilizer. Small adjustments can be made best with B-B shot.

There should be no signs of sharp banking with this model. If this happens, your wing or rudder is probably badly warped. Straighten it immediately before making any more flights.

NOTICE.

This ship meets all the requirements of the N.A.A. for Class "B" competition. If you win contests or break records with this model please advise us by postcard.

"CAVALIER-SIXTY"

GASOLINE POWERED MODEL AIRPLANE

Designed by: W. Effinger

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SHEET TWO