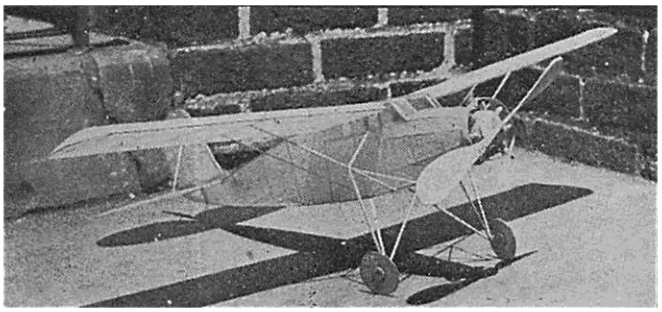
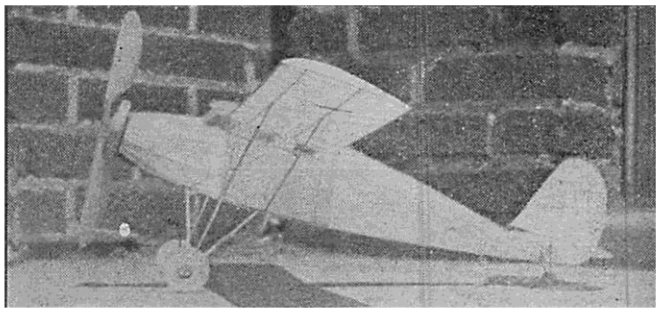


A trim-looking ship with a fine performance



Scale proportions are well carried out

Build This Prize-Winning Stinson

Complete Data From Which You Can Build This Flying Scale Contest Model With a Flight Endurance of More Than Two Minutes

By JOSEPH KOVEL

DECEMBER 27th, 1933, The Brooklyn Daily Eagle's "Junior Aviation Club" held its annual indoor meet at the 106th Infantry Armory, at Bedford and Atlantic Avenues, Brooklyn, N. Y.

The featured event of this meet was the "Replica" or "Flying Scale" event. It was a long time since an event of this type was held in this vicinity and it naturally incited a great deal of interest. There were over a hundred entries in this event and the air was filled with all sorts and sizes of miniature aircraft.

The models were first viewed by a board of inspectors, which was headed by Roger Q. Williams, the famous trans-Atlantic flier. After the entries were inspected and approved, the official flights started and were watched with a good deal of interest by both the contestants and the many spectators who came to watch this novel spectacle.

The "Stinson Junior" entered by the writer took the lead from the start with a flight of 47 seconds. After a slight adjustment, the model was wound up, launched and climbed to an altitude of about 55 feet. On this flight, the ship cruised around for 1 min., 32 2/5 sec. This flight caused quite a bit of comment and the preparations for the next flight were watched with more than ordinary interest by the timing officials, as well as by the contestants.

On its third flight, the ship unfortunately drifted to the side of the armory and was caught in the girders. However, Freddie Bergen, one of our up and coming model enthusiasts, was kind and agile enough to retrieve the model. Having the model well adjusted, your writer wound the motor of the ship to its limit and launched the model. It climbed away to a good start and soon reached an altitude of 70 feet. In fact, it was just barely missing the lights in the armory, and caused the proud builder of this ship many an anxious moment. It circled around gracefully, looking for all the world like its big brother, the original Stinson "Junior." Due to the fact that the winds in the motor were exhausted, the ship finally decided to come down. It was "dead-stick" about 15 feet up and glided down to a beautiful landing. The elapsed time of the flight was 2 min., 1 3/5 sec., which was announced as a world's record for "Indoor Flying Scale" models.

Though a scale model, it flies as well as one of the contest fuselage type

General Instructions

Study the plans and read instructions carefully before starting work on the model. Take plenty of time in building the model in order to insure good workmanship. When building the ship, be sure to use the grade of wood specified, as this has a great deal to do with the balance of the finished model.

Sandpaper each piece of wood that goes into the model. This removes the "whiskers" which have no structural strength, yet burden the ship with useless weight. Remember that this is an indoor model and that every bit of unnecessary weight will detract from its flying time.

Fuselage

In order to make the fuselage, select a soft board to work on (about 8″ x 30″) and tack a sheet of drawing paper over it. Draw the base line of the fuselage about an inch from the long edge of the board, then drop a perpendicular from that line about 6″ from the left side of the board. This perpendicular to the base line will determine the position of station 1. Drop the perpendiculars from the base line that will determine the positions of the other ten stations, (Plate 1, Side View).

From the base line, measure down on each perpendicular, the distance indicated on the plan, and make a dot there. When you have done this to all eleven perpendiculars, connect the dots, using the same curve as shown on the plan, and you have the top outline of the fuselage side. In order to obtain the bottom outline, measure down on each perpendicular from the top outline, the distance indicated on the plan. Make a dot there and when this has been done to all eleven stations, connect the dots with a line, using the same curve as shown on plan. When the top and bottom outlines of the fuselage sides have been obtained, draw the various struts into place and you are ready to start work on the model.

The longerons of the fuselage are made of 1/20″ sq. balsa, medium grade, and sanded to a slightly round cross-section. The struts are 1/32″ x 1/20″ medium balsa, with the exception of the struts located at station 1, which are 1/20″ x 1/8″. Make the two fuselage sides as shown in the side view of Plate 1. When the two sides have been made, put them together as shown in the top view of Plate 1.

Make the various formers, which are a scant 1/32″ thick, with the exception of those at station 1, which are 1/8″ thick (medium balsa), notch them and cement them into their proper positions. When this has been done, cut the stringers to size (1/32″ x 1/20″) and cement them into place. Cement a sheet of balsa, a scant 1/32″ thick by 7/16″ wide, around the nose of the plane, as shown in Plate 1. (This serves to provide a firm base for the cylinders). Cement the landing gear lugs into place. If you so desire, you may give former "C" a coat of dope, sand lightly, then draw an instrument board. This will add to the appearance of the finished model.

(Continued on page 38)

Motor Stick Detail (Plate 4)

First make the square which is to fit into the nose of the ship (1/20″ x 1/8″ medium balsa). Select a light piece of balsa for the nose block (3/16″ x 1 3/8″ x 1 3/8″), and cement it firmly to the square. When this is dry, fit the square into the nose of the fuselage, carve and sand the block to the correct shape. We are now ready to make the hollow motor stick.

Select a piece of medium balsa, 1/32″ x 1 1/4″ x 17″ and sand it lightly. Cut out the motor stick cap, then cut the rest of it to shape as indicated by the hollow motor stick pattern. Select a straight piece of either pine or spruce, 1/8″ x 1/2″ x 20″, and round one side of it so that the cross-section will form a "U" shape. Soak the balsa motor stick blank in water and bend it around the hardwood stick. Wrap gauze around it so that the balsa blank will take the shape of the hardwood stick, then bake it in an oven until dry (about 4 min.). When it is dry, unwrap the gauze from the stick and sandpaper the balsa "U" while it is still on the hardwood stick. When this has been done, insert the bulkheads (soft balsa) into the balsa "U," as shown on plan and cement the cap firmly into place.

The stiffeners, or motor stick reinforcers, are made of a medium grade of balsa 3/32″ sq., which have been planed to a triangular shape, as shown in enlarged view of cross-section. Give the whole motor stick a coat of dope and sand lightly. Cement the thrust bearing to the motor stick, cut a hole in the nose block, insert the motor stick into this opening so that the thrust bearing sets snugly on the nose block, and cement the motor stick firmly into place. Cement the rear hook and can to the motor stick and set aside to dry.

Wing Frames (Plate 2)

The ribs are made of a medium light grade of balsa, a scant 1/32″ thick and cut out for lightness, as shown on plan. The notches at the bottom of the rib are cut to receive a 1/20″ x 1/16″ spar. The notches at the top of the rib and leading edge are cut to receive a 1/16″ sq. spar. The trailing edge is 1/20″ x 3/32″. All the spars are made of a medium grade of balsa. Cut and sand the different spars to size and the wing frames are ready for assembly.

Those who have not had much model building experience may find it necessary to draw the wing plan on a sheet of paper and assemble the wing frame right on the drawing, as the wing plan is made to one half scale on the drawing. The front assembly view of the machine is also one half scale.

When assembling the wing frames, set the inner end ribs at an angle so that the wing will have a dihedral angle when cemented to the fuselage. The tips are made of 1/32″ x 1/20″ medium balsa and are slightly moistened before being bent into shape and cemented into place.

Tail Frames

Draw the stabilizer plan on a sheet of paper, lay a sheet of waxed paper over the plan and stick a number of pins into the stabilizer outline. Select a light grade of balsa for the stabilizer outline, plane it down to 1/32″ sq., then sand it round. Moisten this strip and bend it around the pin jig that you have just made. The spar is a medium grade of balsa, 1/16″ x 3/32″ at the center, tapering down to 1/20″ round at the tips. After the spar has been cemented into place, you may cement the ribs into position. (The ribs are 1/32″ sq., sanded to a slightly round shape).

The rudder is made in the same manner. The parts are now ready to be covered.

Covering

Cover the window frames of the fuselage with a light grade of cellophane, then cover the rest of the fuselage with superfine tissue or any other light grade of tissue.

The wing and tail frames are also covered with this tissue. The wings and fuselage may be sprayed with water in order to tighten the covering. While the wings are drying, give the right wing some washout and the left wing some washin. It is not advisable to spray the tail surfaces with water, as they are comparatively weak and might warp out of shape.

Assembly

Cement the stabilizer to the fuselage and do likewise to the rudder. Cement the wings to the fuselage, giving them 1 1/2″ dihedral for each tip. Set the wings at a 3 degree angle of incidence in relation to the line of thrust, (which passes through the center of the rubber motor when it is tightly wound).

Cut the wing struts to the correct size (front struts are 1/16″ x 1/8″ x length, and rear struts are 1/20″ x 1/8″ x length), and cement them firmly into place, taking care that the wing has 1 1/2″ dihedral for each tip.

Landing Gear

Cut and sand the landing gear struts to size and cement them firmly into place. Bend the shock absorbing axle into shape (use .020 wire), and cement them to struts "C." The wheels are made of 3 discs which are cemented together cross-grained. They are secured to the axle by putting a drop of cement on the end of the axle after the wheel has been slipped on.

Bend the tail wheel fitting (.020 wire) into shape, slip on the tail wheel and cement the fitting to the fuselage.

Cylinder Detail

The cylinders are made of a light grade of balsa, 1/4″ sq., which has been planed and sanded to a round cross-section. Coat this balsa dowel with cement, then wind black thread around it, as shown on Plate 4. Cut seven pieces of this strip and cement them to the balsa motor base at the nose of the fuselage. The anti-drag ring may be made of either a light grade of cardboard, of 1/32″ sheet balsa, (balsa preferred). After it has been cut to size (pattern on Plate 4), moisten the balsa slightly on the outside, if balsa is used, and bend it around the cylinders, cementing it firmly to each cylinder.

Propeller

The prop is carved out of a soft balsa block 1″ x 1 5/8″ x 10″. First mark out the diagonals, cut out the prop blank, then carve the prop. The blades taper from 1/8″ at the hub to 1/32″ at the tips. When the prop is carved, cut and sand the blades to the shape shown on Plate 3. Bend the prop shaft to shape (.026 wire), pass it through the rear of the nose block, slip a couple of washers on, slip the prop on, bend the shaft as shown in dotted lines on Plate 3 and sink it into the prop hub. Cement it firmly into place and the model is now ready to be powered.

The ship may be powered with either 4 strands of black rubber (1/8″ x 1/32″) with 2″ of slack, or 2 strands of brown rubber (7/32″ x 1/30″) with 2″ of slack.

Flying the Model

Remember that this is primarily an indoor ship and should be tested as such.

Balance the ship by holding the wing with your index fingers about 1/3 back of the leading edge. The model should balance on an even keel. If it is tail heavy, add a bit of weight to the nose. If it is nose heavy, add weight to the tail.

When this has been done, wind the prop about 150 turns by hand, raise the nose slightly and launch the ship. If the model has been built properly, it will climb to about 20 feet, circle a few times and come in for a graceful landing. If the ship stalls, raise the leading edge of the stabilizer slightly. If the ship dives, raise the trailing edge of the stabilizer slightly.

When the ship has been adjusted properly, remove the motor stick, lubricate the motor, attach the "S" hook to a mechanical winder, stretch the motor to about 4 times its normal length and give it the maximum number of winds. Put the motor stick into the fuselage, pin it into place, then glance at a calendar before launching the ship.