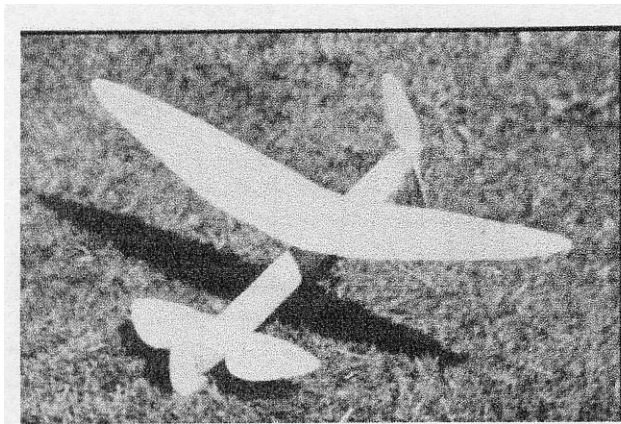


An All-Balsa Sportster

**A REMARKABLE FLIER OF UNIQUE DESIGN THAT WILL GIVE YOU
MANY ENJOYABLE BUILDING AND FLYING HOURS**

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Contributions by Felix Gutmann



This is how it looks when ready to fly. The motor tube fuselage is an unusual feature

This model was designed primarily with the purpose of catching the eye of the beginner since it provides a strong, easily constructed job. It is however, also well suited to the expert who likes to experiment with a new, novel design. The reward for constructing this model may be seen by glancing at the flight pictures.

The construction is comparatively simple, there being no built-up surfaces to worry about.

FUSELAGE

To construct the fuselage obtain a sheet of balsa 1/16" x 4" x 11 3/16". This is the blank from which the fuselage proper will be built. The blank is moistened by steaming over a kettle. It is then bent around a piece of broomstick about 12" long till the

edges meet. This will give it a teardrop cross-section. The edges are now cemented together and the whole form wrapped with a gauze strip to hold its shape till dry. It may, at this point, be baked in the oven for about 5 minutes and then left in the oven with no gas till it is dry. This would hasten the process.

When it has finally dried, remove the gauze and broomstick form and apply a cement skin along the edge to reinforce it. Now cut out two end bulkheads of 1/4" medium sheet balsa and of the cross-section of the body (see plan). Cut a rectangular hole in each one to accommodate the nose and tail plugs, and then cement one over each end of the fuselage shell. In the nose an added former of 1/16" sheet balsa, hard, with the grain running at right angles to the first may be glued on to increase the strength. The rectangular hole is also cut in this piece.

Now take a block of medium-hard balsa 7/8" x 1 1/8" x 1 3/8" for the nose block. Cut a plug 3/8" deep on one of the large sides. This plug is to fit snugly into the opening in the front bulkhead. Now fit the block in place, and using a sharp razor, simultaneously cut to shape the front bulkhead and nose block, rounding them off to the shape shown on the plan. They are finished down with sandpaper and will have the appearance of an integral unit.

The tail plug is cut from a block 1 1/8" x 1 3/8" x 1 1/2". A plug is cut in one of the small sides, in much the same manner as the front plug was carved, It is also finished down on the body.

The whole fuselage with plugs is now finished down with very fine sandpaper, and is given 3 coatings of banana oil with intermediate sandings.

Obtain 4 large dress snaps and press them into the body at the stations shown on the drawing. These will accommodate the removable landing gear. Cement skins overlapping the edges of the snaps are applied to hold them firmly in place.

TAIL UNIT

For the rudder, a sheet of 1/16" x 2 1/4" x 3 3/4" soft sheet balsa is used. The outline may be obtained by tracing from the plans. Note the direction of the grain. Taper the rudder to a fine edge towards the tail, and to a blunt edge around the leading edge. Before cementing the rudder to the tail plug, glue in place the .028 music wire tail hook. The hook is bent first, leaving the end straight. Push this end through its proper position in the

middle of the tailplug as far as it will go when it comes through at the tail end of the block, bend it into the U shape shown, with a pair of pliers, and then pull on the hook proper till the end lodges completely in the block. Now apply a cement skin to hold it tight.

The rudder may now be glued in place. A thin strip of bamboo is glued to the bottom of the rudder as shown. This serves as a tail skid.

Two pieces of $1/16'' \times 2 \frac{1}{4}'' \times 3 \frac{9}{16}''$ serve as the elevator-half blanks. The outline may also be traced right through the plans onto the balsa, or by the tracing paper- carbon paper method. The halves are of soft balsa and are streamlined in the same manner as the rudder halves. Make marks on the fuselage at the points where the elevator halves meet it and then glue them carefully on these points, holding in place with pins till dry. Two bamboo struts $3 \frac{9}{16}''$ long are used to brace the tops of the elevator to the fuselage. The removable parts of the tail unit are now the rudder and tail hook, both cemented to the tail block.



The Sportster going places, and gaining altitude.

WINGS

Two wing halves and a center section are cut from $1/16'' \times 3''$ sheet balsa: the shape is obtained from the plans the same way as the tail. Eight ribs of $1/16''$ sheet balsa are cut for the wings while two of $1/8''$ sheet are cut for the center section. The rib stations are marked off on the wings and the ribs glued in place. The sheet balsa is made to hold its shape till dry by holding with

pins to the ribs. When dry the halves are cemented well to the center section.

The dihedral angle is 2 1/4" for each wing tip from the center. The wing is finished down with fine sandpaper and given 2 coats of banana oil as is also the tail. The wing clips are bent of .028 music wire and are cemented, one each to each edge of the center section using the heavy 1/8" ribs.

LANDING GEAR

The wheels are 1 1/16" in diameter, and may be bought or cut from 3/16" sheet balsa and streamlined. One brass bushing cemented to each side of each wheel will serve as a bearing. There are 2 landing gear struts of .028 wire. The main strut is longer and is fastened behind, while the supporting strut (soldered to the main strut near the bearings) is in front. Note that the struts stay in place due to their springy action holding the sharp points at the top in the cups of the snaps. After the wheels are put on the axles, the ends are bent back to keep the wheel in place.

PROPELLER AND BEARING

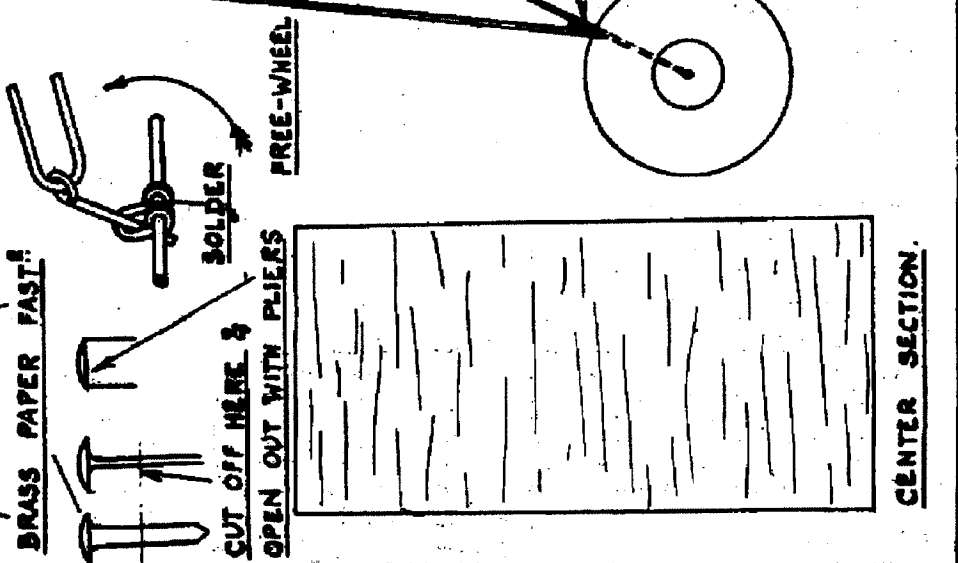
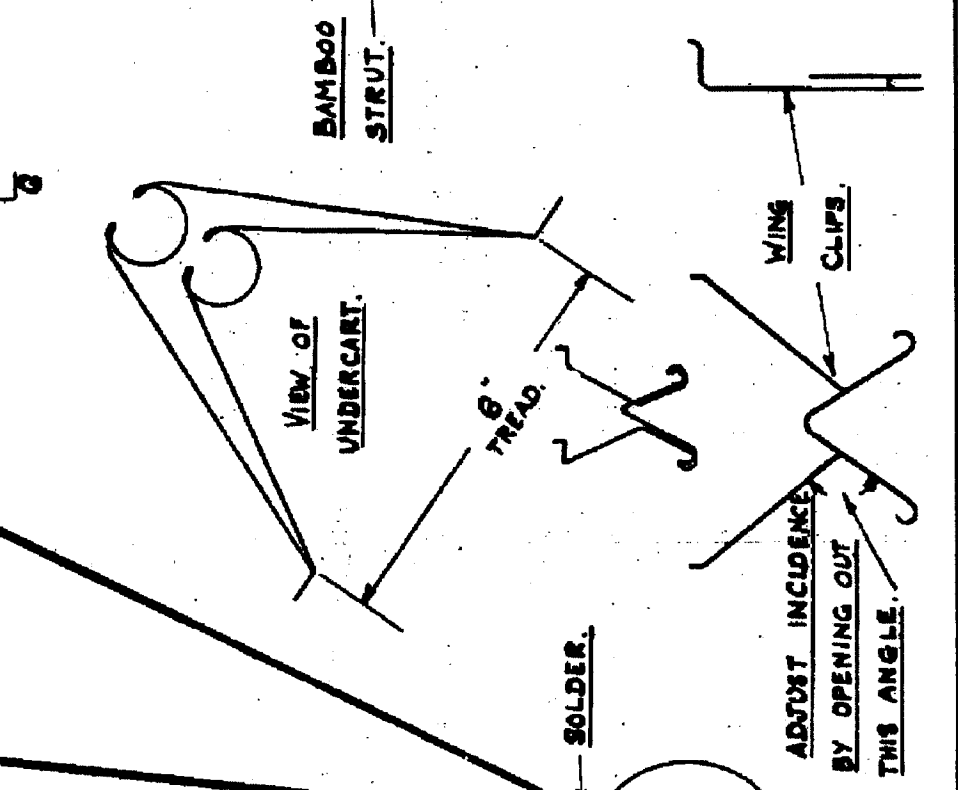
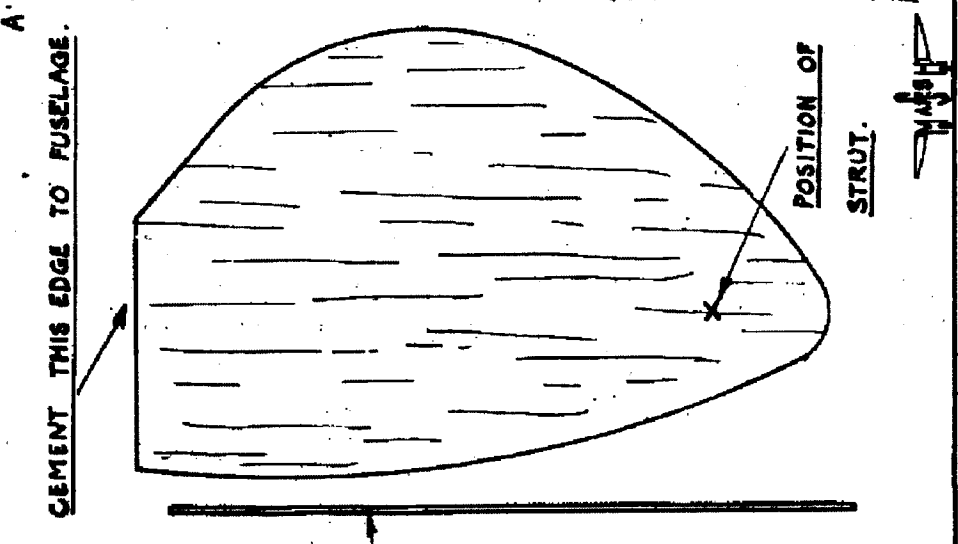
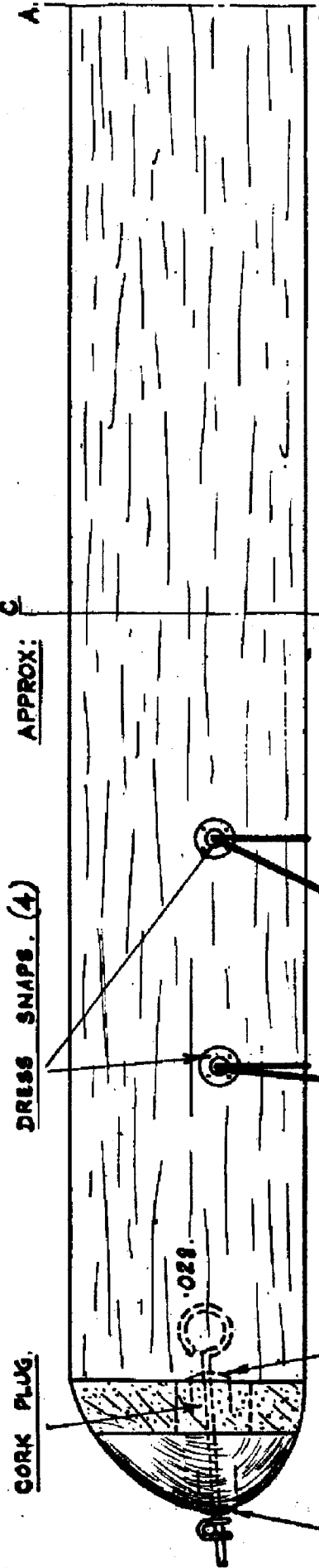
The propeller blank is of medium hardwood and is 11/16" deep x 1 1/4" wide x 8" long. On the top of the block lay out the symmetrical pattern shown in the broad view. Now cut away all the wood outside of this pattern running straight down to the bottom of the block perpendicular to the edges. This will result in a set of wedge-shaped pieces which are scrap. Now on this form lay out the side view of the block, disregarding the taper. Draw it on both sides and cut away these wedge-shaped pieces also. The blank is now ready for carving. The propeller is a right-handed one, that is, looking at it from the front it turns in a counter clock-wise direction. The photo shows in which direction the blades must face. Extreme care must be used in the carving process.

Hollow out the bottom of the blades slightly. And do not make the blades thicker than 1/8" where they are widest. Put a pin through the center and balance the propeller before sanding. When sanding, round all the corners. Apply 4 coats of banana oil with intermediate sandings. For bearings use 2 cotter pins or brass paper fasteners. The drawing shows how to work these into bearings. A hole is drilled through each, and one is inserted

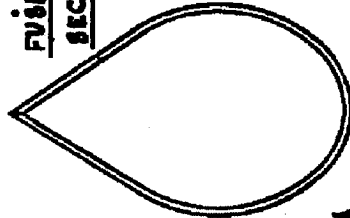
in the front of the nose block, the other in the rear. A free-wheeling device may be made as illustrated but any other proven type may do. Note the slight down thrust applied to the propeller. This keeps the model from stalling when under full power and yet permits a flat glide when the power is exhausted. The free-wheeling, by cutting down the propeller resistance at this time by allowing it to rotate freely, increases the gliding angle.

FLYING

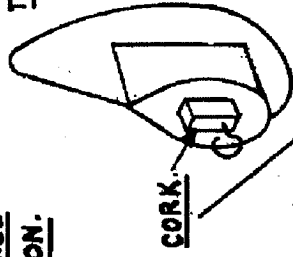
First glide the model in a field. If it stalls move the wing back, if it dives move it up. Incidence may be adjusted by bending the wing clip as shown on the plan. There should be a slight positive incidence in the wing. For average flying use 6 strands of 1/8" flat rubber. For stunt flying use 8. Allow a few inches of slack so as to get a good number of winds.



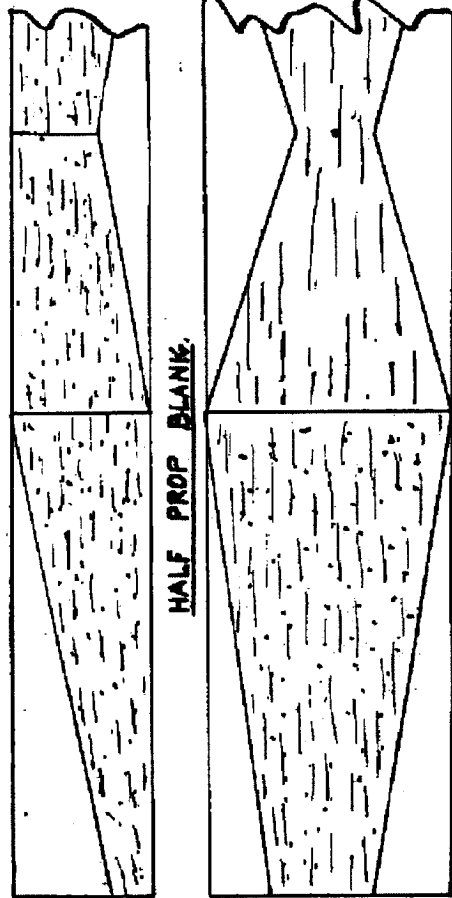
FUSELAGE SECTION.



VIEW OF TAIL UNIT.

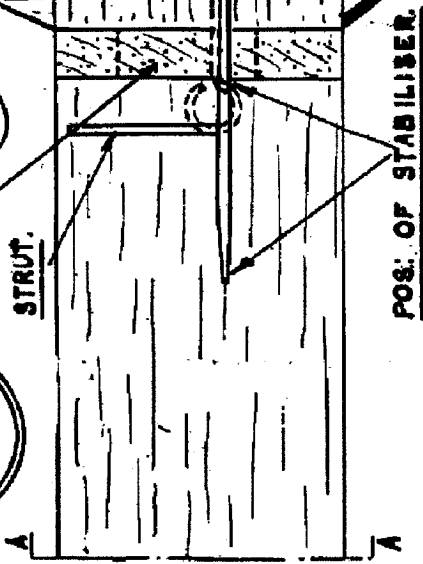


HALF PROP BLANK.



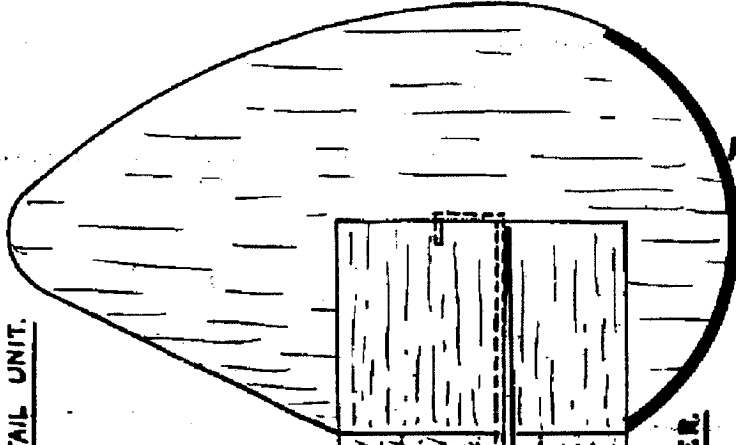
BEND BAMBOO RIBS ($\frac{1}{16}$ IN.) TO TOP OF BALSA RIB.

RIBS FOR WING CLIPS MAKE 2 $\frac{1}{8}$ SHEET.



POS. OF STABILIZER.

BAMBOO SKID.



FRONT OF WING.

