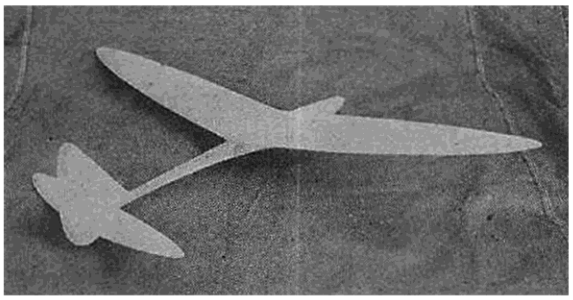


The smooth-flowing lines of the model are conducive to super-performance.

MONOCOQUE SAILPLANE

Plans of a sturdy soarer —a large-size model.

MONOCOQUE CONSTRUCTION can be used to good advantage in a model airplane where weight is not an important factor in the design. For the benefit of the beginner, monocoque construction is the type in which the material serves the twofold purpose of providing structural strength, in addition to being used as the outside covering.

In this model, $\frac{1}{16}$" sheet balsa is used. It is formed to the required shape, using ribs as formers. Monocoque construction is strong and rugged; it speeds up construction and is easy to handle; and the balsa surface can be smoothed and polished to give a glossy finish. However, it is slightly heavier than balsa-framework, tissue-covered construction. But even this disadvantage is minimized in a glider, which usually requires the addition of extra weight to bring it within the weight rules.

The glider built in this way gave a pleasing performance. It had a long, flat, fast glide with a slow sinking speed. The construction was rugged enough to withstand nose dives, collisions with trees, gusty air, and a variety of other accidents that would have necessitated repairs on any other type of construction. This model will give you a double treat. The construction is interesting and enjoyable. And, too, the finished model is well worth owning. It should thrive on the air currents for which summer weather is famous. The skin-type fuselage offers least resistance.

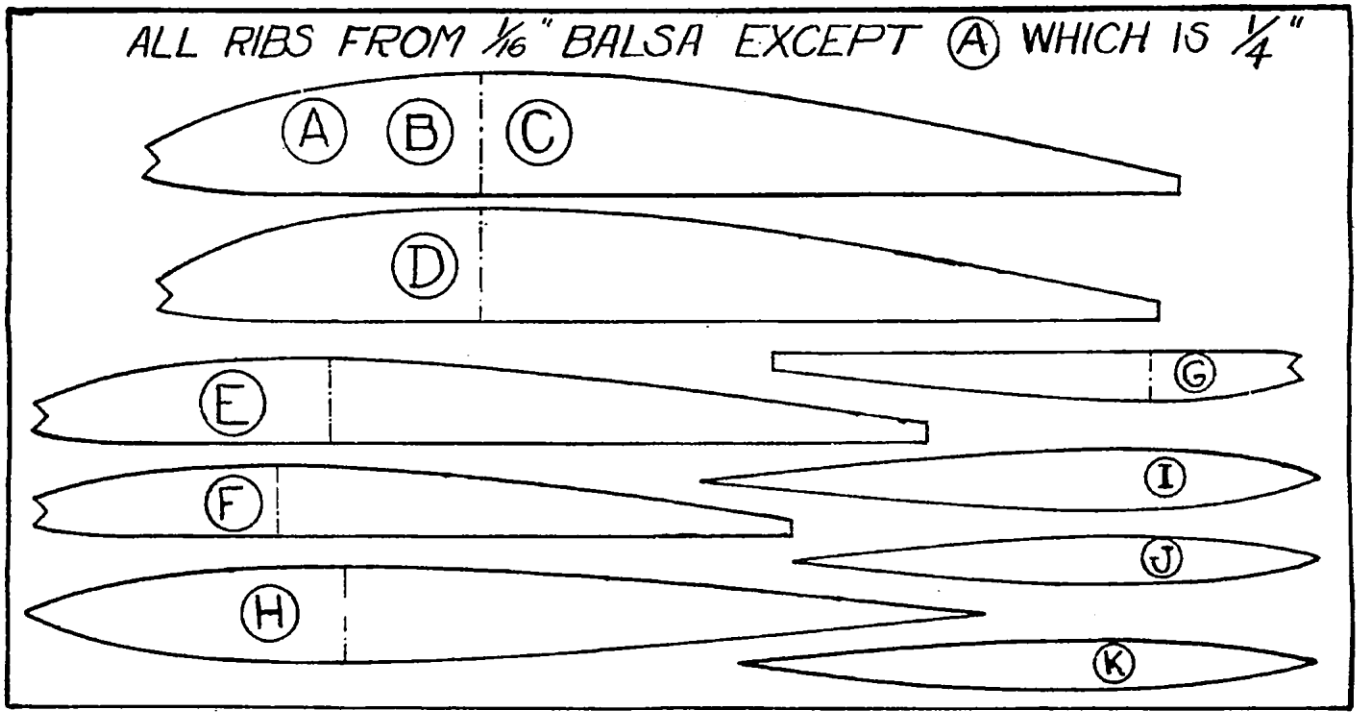
FUSELAGE

The fuselage is triangular in cross section. Start with the top panel. The front tip of the fuselage from Section B forward is added separately and is built after the remainder of the fuselage has been completed. The top of the fuselage is cut from $\frac{1}{16}$" balsa. Reënforce with $^3/_{32}$x$^3/_{32}$" balsa cemented along the edges, plus several cross braces, as shown in the drawing. Before assembling, smooth the outside surface of the balsa and finish with either dope or glider polish.

Next, cut the 2 side panels. Start assembling by cementing the 2 side panels to the top section—that is, join them to the edge of the $^3/_{32}$x$^3/_{32}$" balsa strip. After this joint has dried, join the 2 side panels along the bottom edge. It will be necessary to reënforce by several cross braces at the front of the fuselage, where the sides are curved. These can be fitted to shape and then cemented in place before joining the bottom edges of the 2 side panels. Use $^3/_{32}$x$^3/_{32}$" balsa for the cross braces.

The front tip of the fuselage at Section B is added last. It is made by wrapping sheet balsa around a former, which is cut to fit the oval shape of the fuselage at Section B. It is cemented in place after the necessary weight has been inserted into the front of the fuselage. The amount of weight cannot be determined until the remainder of the model has been completed.

This weight, which is added to the front of the fuselage, can be either lead (such as fish



sinkers or solder wire) or nails. Sufficient weight should be added to bring the leading edge of the wing up to Section A, indicated on the drawing. More delicate adjustment can be made after the model is assembled by moving the wing backward or forward along the top of the fuselage.

The wire hook for attaching the thread towline is cemented to the bottom of the fuselage. It is bent from medium wire.

WING

The shape of the wing is known as a distorted ellipse. That is, the shape of the ellipse has been modified to give a straight center of pressure line. The construction can be reduced to a minimum of work if you follow the directions as outlined. First cut a cardboard pattern to the shape of half the wing. This pattern is used for cutting the 2 pieces of sheet balsa which are used for the top of the wing. It is necessary to make the sheet balsa of sufficient width to allow for the curvature of the ribs. The actual width of the balsa pattern is given in the drawing.

Using the cardboard pattern, cut 2 duplicates from $\frac{1}{16}$" balsa. (Join the edges of 2"-wide sheet balsa to form a 6"-wide sheet.) Sand the surface of the balsa and add either dope or glider polish to fill the pores. Finish with additional sanding. Surfacing the balsa while it is still flat is considerably easier than after it has been bent to the shape of the wing.

Now cement the $\frac{1}{8}$x$\frac{1}{8}$" balsa leading edge and the triangular-shaped trailing edge ($\frac{3}{32}$x$\frac{1}{4}$") to the bottom edges of the sheet balsa. Curve these pieces to fit the edges of the balsa pattern. The edges of the leading and trailing edges should fit flush with the edges of the balsa pattern. After the cement has dried, bend the sheet-balsa wing panel over the ribs, cementing the balsa to the ribs. Note that all ribs are $\frac{1}{16}$" balsa except ribs (A) which are $\frac{1}{4}$" stock. The leading edge should be fitted into the notches which have been cut in the front of the ribs. The trailing edge should be butt-jointed to the rear edges of the wing. With sandpaper, round off the leading edge of the wing. Also sand the extreme rear of the trailing edge to knife-edge thickness.

JOINING THE TWO WING HALVES

The 2 halves are joined by cementing together the center ribs (A) of the 2 wing halves. They should fit together at such an angle that the tips are raised 5 inches. Special care should be given to making a snug joint at the top of the wing. A band of tape or silk should be cemented across the top of the wing to strengthen the joint.

A balsa saddle should be cemented to the bottom of the wing for mounting to the fuselage. This saddle is dimensioned in the drawing. It should fit flat across the top of the fuselage. The wing is attached by rubber bands which fit around the fuselage.

The bottom of the wing is covered with tissue, which is given a coat of dope. The front of the wing, which extends over the fuselage, is faired with a small piece of balsa cemented to the leading edge.

ELEVATOR

The method of construction follows that used in the wing. However, no leading or trailing edge is used. The elevator is made in one piece. And, just as was done with the wing, the balsa is polished before assembly. The top and bottom of the elevator are both made of $\frac{1}{16}$" sheet balsa. Draw a full-size pattern on cardboard and use it in cutting out the 2 balsa pieces. Cement these pieces to the ribs and, with your fingers, shape the wood to fit the curve of the ribs.

RUDDER

The rudder is built directly to the fuselage. 2 ribs are used to help shape the $\frac{1}{16}$" sheet balsa. The part of the rudder which extends below the fuselage is made flat. In attaching the elevator, cut a notch in the rudder. The trailing edge should be raised about $\frac{1}{16}$" above the leading edge. All joints between the fuselage and the rudder should be faired with a mixture of talcum powder and dope and later sanded to shape.

FLYING

First glide by hand to determine the correct wing setting. Add enough weight to bring the wing well forward on the fuselage. Turn can be put into the model by warping the wing tips.

A strong, lightweight grade of thread makes the best towline.

WEIGHTS

Wing	1.70	ounces
Elevator	.45	"
Rudder	.25	"
Fuselage plus weight	2.50	"
Total RTF	4.90	