



# BOSTONIAN BEAVER

By WALT MOONEY . . . Although this little Bostonian is not a true scale model, it can be built as such with stretched wings if you prefer, but it will no longer be a Bostonian, so you can take your pick or build both . . . they're cheap!

• Here is a relatively simple little model that will fly well and has some of the flavor of the deHavilland Beaver. As a Bostonian, its wingspan is limited to 16 inches. It was originally built with that class in mind, and had neither wing struts nor landing gear fairing sheets. When it was completed, it looked like a racing version of the Beaver, so a second wing was built. The second wing was built with a span which would be scale for a fuselage of this length. Now the model looked more like a Beaver, so struts and wire fairing sheets were added to fill out the impression.

Take your choice, and build either one.

If you choose the long wing version, you'll have to draw up a 24-inch wing. This may be a little challenging if you have never done it before, but it's not hard. Simply get a long enough piece of paper, and make three parallel lines 12 inches apart. Copy the tips from the plan at each outer line. The two root ribs will remain in the same position relative to the centerline. Draw the spars, and the leading and trailing edges from tip to tip. Draw in rib locations equally spaced between the root and tips. You'll need 16 ribs instead of 10.

The wings, vertical tail, horizontal tail, and fuselage side frames are made directly on top of the plans. You'll need two fuselage side frames. I suggest building them on a flat building surface directly on top of each other so they will turn out as nearly identical as you can make them. When the side frames are

completely assembled and the cement is dry, they can be removed from the plans. Both sides will most likely be cemented together by excess cement at the joints. Use a thin, double-edged razor blade (half a blade is enough), and carefully slit the two frames apart. A single-edged blade has a thick rear edge that will pry the sides far enough apart to break them during the separation operation: a single-edged blade is thinner, and won't cause this kind of problem.

Once the fuselage side frames are separated, you can begin the fuselage "box" assembly by cementing the side frames together at the very rear end. It is imperative that the two frames be exactly matched at the rear end for perfect alignment. Next, add the cross braces as you work forward from station to station. Note that there is a sharp angle in the longerons at the wing trailing edge in the top view. Carefully crack the longerons at this point before adding this cross brace pair. There is a similar break at the landing gear/instrument panel station that must be dealt with in the same fashion.

Try to get the fuselage as true and square as possible. The cross-braces at each station should form perfect rectangles, not skewed parallelograms. Viewed from the side, both side frames should be lined up with one another. Viewed from the top, the longerons break and frame cross-braces should be in the same imaginary planes, centered on and perpendicular to the centerline of the fuselage. It is difficult to true up a

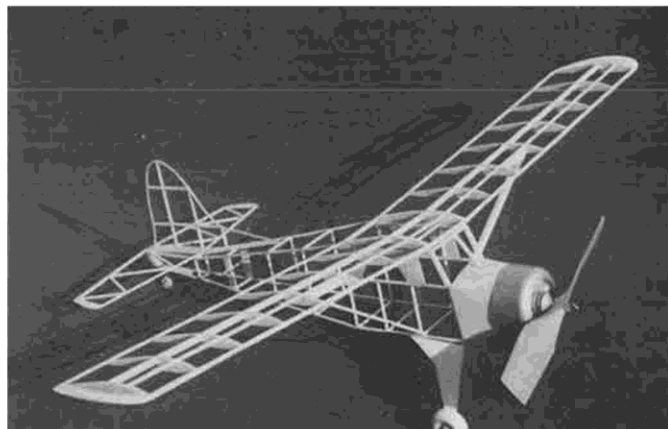
fuselage box frame *after* it is completely assembled, so you must check your progress at the addition of each set of cross-braces to make sure the structure you are assembling matches the plans.

When you are satisfied with the fuselage frame assembly, add the formers at the forward station, and add the former at the instrument panel location. Cover the front of the fuselage with 1/32nd sheet balsa.

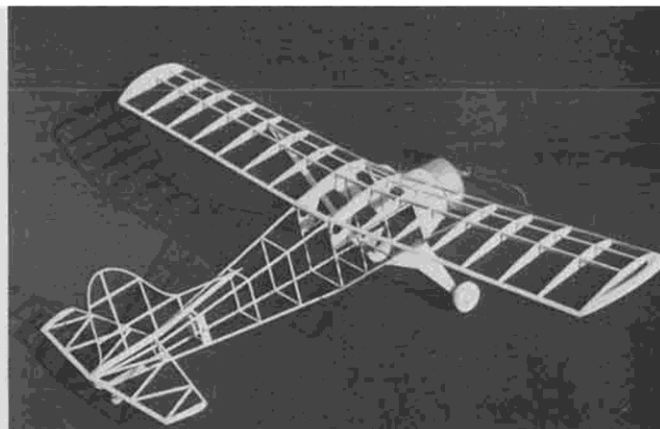
The nose cowl and the removable thrust button should be constructed next. The cowl formers are all *circular*. Sizes are shown in the side and top views. The thrust button is made of several layers of hard balsa, and a plastic thrust bearing is installed at its center. Note that the cowling former in which the thrust button fits has a square hole in it to accommodate the button. The thrust button should be a snug fit in the nose cowl former. The cowl formers are wrapped with 1/32nd sheet balsa to complete the cowl.

Cut the wing ribs out of 1/16th sheet balsa. It is probably best to cut one rib pattern out of harder material, and then use this pattern to guide your blade while cutting out all these ribs as identically as possible. Pin the leading edge to the plan, and using the ribs as a guide, pin the trailing edge down over the plan at exactly the right distance behind the leading edge. Now, cement all the ribs in place. Cement the spars in place in the rib notches.

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All framed up and ready for covering, the D.H. Beaver is a modification of the Bostonian Beaver. See text for mods.



Three-quarter rear view of skeleton framework. In this state it is almost too pretty to cover!

When this assembly is dry, cut a narrow notch *almost* all the way through the leading and trailing edges at the dihedral break locations. The dihedral break is located just at the outside of the two centermost ribs. Next, cut the spars *clear through* at the outside of the centermost ribs. Lift the spars above those ribs (they should bend enough to do this without breaking), and lift each wing tip to the correct height for the wing dihedral while leaving the center panel of the wing pinned to the plan. This will cause the spars to overlap a slight amount at the center section. Carefully cut off just the overlapping spar material, and then cement the resulting spar joints back together. Rub some cement into the notches in the leading and trailing edges of the wing which should be closed up pretty well by now because of the dihedral breaks.

Now rough-cut the wing tips from soft balsa blocks. Lightly cement them to the tip ribs, and carve them to the exact shape required. Then, separate them from the ribs, and hollow them out for lightness. Make them as thin as you desire, and then cement them back in place permanently.

Make the outline of the vertical tail by laminating thin, basswood strips to the shape shown. The outline on the model in the photos was made around a curved line of pins at approximately 1/4-inch intervals along the inside of the tail outline on the plan. When the outline is dry, remove most of the pins, and assemble the rest of the vertical tail directly over the plan.

Assemble the horizontal tail directly over the plan. This structure is very simple and easy to construct, so no special instructions are needed here.

When all the balsa assemblies are dry, use fine sandpaper to shape the leading and trailing edges to the correct cross-section. Then, sand the *entire* structure to remove any rough spots, and to generally smooth up the structure prior to covering.

Bend the main landing gear wire to the pattern shown on the plan. Cement it in place in the fuselage.

Cover the model with lightweight tissue. The color scheme can be anything that you desire. Because the Beaver has been used as a bush plane in the Arctic, an Arctic scheme was used on the longwinged bird in the photos. The tail surfaces and the wing outer panels were covered with red tissue, and the rest of the model was covered with silver tissue. All tissue panels should have the grain of the covering material aligned with the longest dimension of the part.

The tissue can be adhered to the balsa sticks with thinned, white glue. Thin the glue with at least equal parts of water (50/50). Use this glue only on the outline of the structure. When covering the model, make sure the tissue overlaps the edges enough to cover all of the balsa so that the edges of the surfaces are not left unfinished as far as coloration is concerned.

After the covering adhesive is thoroughly dry, the tissue should be water shrunk. This is best done by very lightly fogging a spray of water above the surface. The tissue should get damp, but not really wet. The tissue will shrink as it dries, yielding a smooth, wrinkle free surface. Next, give the tissue two coats of thinned, clear dope.

Before assembling the surfaces to the fuselage, it's a good idea to add any decorations that you may want on the model. It's easier to add the lines indicating control surfaces while the flying surfaces are unattached. Similarly, decal numbers are easier to apply to the fuselage sides at this point also.

Cut the landing gear fairings from 1/32nd sheet balsa, and cement them in place on the wire. Make the tail wheel out of sheet balsa, and bend the wire from a straight pin and install it on the fuselage. Put balsa wheels on the main gear, and retain them with a drop of cement on the axle. Be careful not to get any cement on the wheel.

Cement the tail surfaces to the fuselage. Lightly cement the wing in place on the fuselage. Make the wing struts and fit them in place. Their location on the wing is indicated by a small "X" on the third rib from the center.

A seven-inch diameter plastic propeller is cut down to six inches for the Bostonian. Bend up the nose hook and insert it through the thrust button. Add a couple of small washers between it and the propeller, and then bend in a winding hook. Install the windshield and the windows. A 1-3/16-inch piece of 1/16th diameter aluminum tubing is used for the rear motor peg.

A loop of 3/16ths flat rubber about 12 inches long is about right for first test flights. Make sure the airplane balances at the center of gravity (CG) indication. Ballast the model if necessary using modeling clay. Try a few hand glides to make sure the model flies reasonably. If it stalls, separate the trailing edge of the wing from the fuselage, and add shims as required to get a proper glide. Use the same procedure on the leading edge if the model dives in the glide. Now, give the model about 50 hand winds, and try a short, powered flight. Use thrust adjustments to control the powered part of the flight, and gradually work up to more and more turns in the rubber motor.

The plastic propeller and thrust bearing for this model can be obtained from Peck-Polymers, Box 2498-MB, La Mesa, CA 92041.

The balsa wheels are available from "Old Timers," Mike Mulligan, 6031 Cortez Dr., Huntington Beach, CA 92647.

Have fun with whichever Beaver you choose to build. ●