

Photos by the Author

A Cessna "Airmaster"

by John Blankenship

Peanut Scale brings back the delicate structures, a bit of flying fun around a lamppost. Plans herewith are full size.

The history of the attractive *Airmaster* series, which was built by Cessna from 1935 to 1941, is told by Paul Matt in the *Historical Aviation Album*, volume VI (available from Carsten's Publications). The model is scaled directly from Mr. Matt's excellent drawings which accompany the *Airmaster* story. Dihedral and horizontal stabilizer area have been increased for better stability.

The Fuselage

The fuselage structure is a conventional box frame. Select light wood for construction. Build the two side frames on the fuselage side view, using a plastic kitchen wrap to protect your plan. When completed, sand both sides lightly to remove bumps and excess glue. Assemble the side frames inverted, over the fuselage bottom view on the plan, after carefully cracking the longerons at the indicated points. Glue in the cross pieces, checking alignment carefully. While the assembly dries, cut the fuselage and cowl

formers. Bend the landing gear from .025 dia. music wire, and glue it between the $\frac{1}{8}$ " and $\frac{1}{16}$ " balsa landing gear mount pieces as shown. Add formers F-1 and F-2 and the landing gear assembly to the fuselage. Next, glue the $\frac{1}{16}$ " square stringers to the fuselage front, with the balsa shim as shown under the bottom center stringer to give the correct contour. Using a sanding block, round off the front edge of former F-1 as shown on the plan. The fuselage top between formers F-1 and F-2 is covered with a small piece of white bond paper. The completed fuselage should now be sanded lightly to remove bumps and rough edges and given two coats of clear dope in preparation for covering. Cut pieces of Japanese tissue slightly oversize, lay in place on the fuselage, and brush dope thinner through the paper around the edges of the area being covered. The thinner will soften the previously applied dope, causing the paper to adhere. Trim the paper carefully with a sharp razor blade. When covering is completed, spray the

fuselage with a light mist of water to shrink the tissue and set aside in a safe place to dry. When the tissue has dried, brush on two coats of thinned clear dope.

Cut the landing gear fairings from $\frac{1}{32}$ " sheet. Make a small groove on the inside surfaces with a pencil point for the landing gear wire, and glue the fairings together with the landing gear wire between. When dry, sand to a streamlined shape and paint or cover with tissue to match the fuselage. Cut the tailwheel from $\frac{1}{16}$ " balsa, paint, and glue to the fuselage. The wheels are laminated from $\frac{1}{8}$ " and $\frac{1}{16}$ " balsa discs as shown, with a $\frac{1}{16}$ " o.d. aluminum tubing bushing. The cutout in the outside $\frac{1}{16}$ " balsa disc allows the paper wheel retainer to be glued on and concealed with a paper cover disc.

The cowl should be built next. Pin the rear former, C-3, to the building board. Stack blocks to a total thickness of $\frac{1}{32}$ " ($\frac{1}{4}$ " and $\frac{3}{32}$ ") between C-3 and C-2 for correct spacing. Glue the $\frac{1}{16}$ " square pieces between C-2 and C-3 and check

alignment carefully. When the assembly is dry, glue a piece of flexible $\frac{1}{32}$ " sheet around the outside, then cement the front piece C-1 in place. The seven dummy engine cylinders are added next. Sand the cowl carefully, rounding C-1 as shown. The cowl "blisters" (engine rocker arm covers) can be formed with an epoxy or other type putty. Paint the cowl to match the fuselage and glue in place.

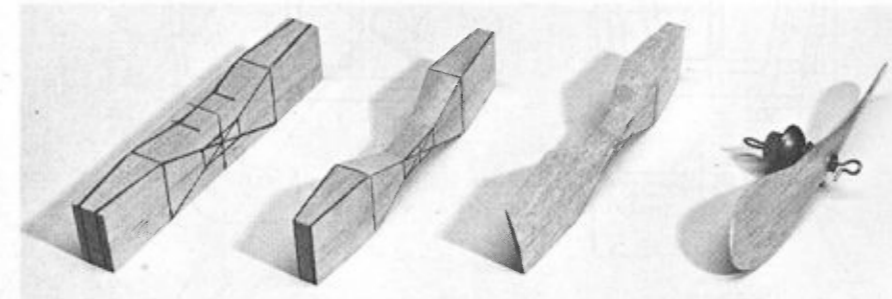
The Wings

The tips are laminated from $\frac{1}{32}$ "x $\frac{3}{32}$ " balsa strips. Cut the form block from $\frac{3}{32}$ " sheet to the inside tip contour. Soak the $\frac{1}{32}$ "x $\frac{3}{32}$ " strips in water to make them flexible. Pin the form block over a piece of plastic kitchen wrap on the building board. Wipe off excess water, then bend the first strip around the form and pin it temporarily in place. Apply a small amount of Titebond or Elmer's glue to the second strip and bend it carefully around the first strip. Use glue sparingly and be careful not to glue the laminated part to the form block. Use plenty of pins to hold the strips securely in place and allow a few hours for drying. Cut the wing ribs from light balsa sheet. W-1 is $\frac{1}{16}$ ", the remainder are $\frac{1}{32}$ ". Pin the $\frac{1}{16}$ "x $\frac{1}{8}$ " leading edge and trailing edge pieces in place and glue in ribs W-2 through W-6. With the $\frac{1}{16}$ " square spars temporarily in place, but not glued, mount the tips with the outer edge raised as shown on the plan to form a smooth upper surface. When the wing panels are dried, raise the tips with a scrap piece $\frac{3}{16}$ " thick under rib W-6 to form the dihedral. Complete the center-section with the W-1 ribs, the $\frac{1}{16}$ "x $\frac{1}{8}$ " trailing edge piece, and $\frac{1}{16}$ " square spars.

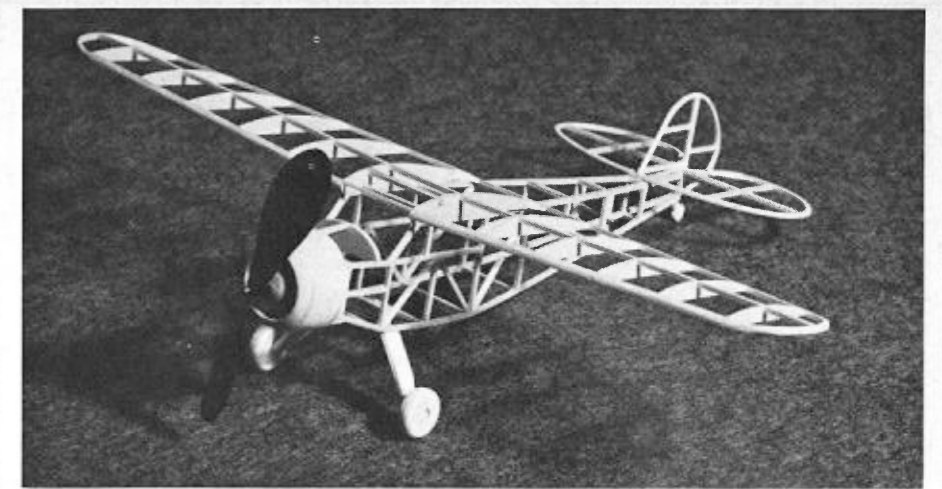
Shape the leading edge and trailing edge pieces and sand the wing assembly lightly all over. Brush on two coats of thinned clear dope to prepare the wing for covering. Cut pieces of Japanese tissue to cover the top and bottom of each wing panel and center-section separately. The covering is attached as previously described. Spray the wing with a light mist of water and set aside to dry, after which two coats of thinned clear dope should be applied.

Tail Surfaces

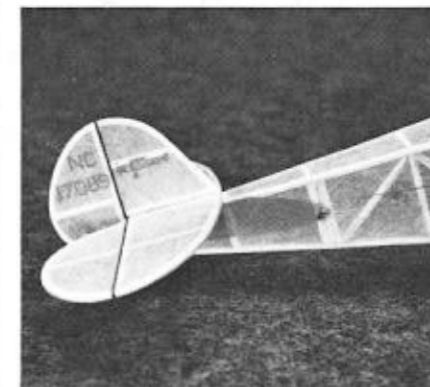
Outlines for the tail surfaces are laminated in the same way as the wing tips. Since the curvature is sharper, a little more difficulty may be experienced. Keeping a little tension on the strips and pinning securely as you go will help avoid breaking. Use the lightest wood available for the tail surfaces to avoid adding weight to the nose when the model is balanced



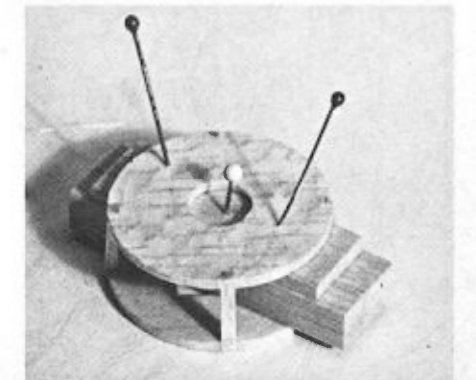
A propeller in four stages, all of which are easy, obvious as you proceed. A blank of balsa is outlined by pen, excess trimmed away, roughly carved for blade pitch, and sanded down. At right: The Cessna cowl is circular, formed of rings. Temporary spacer holds all in alignment.

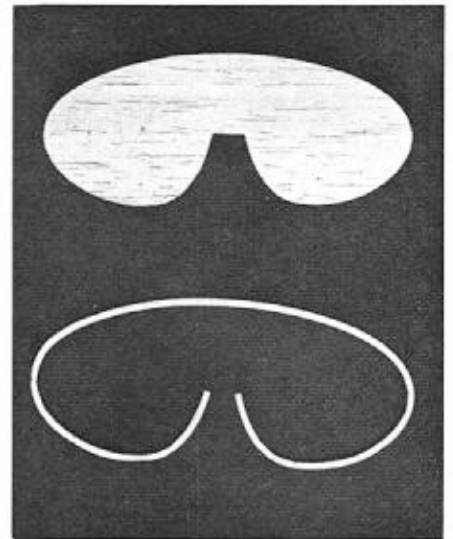
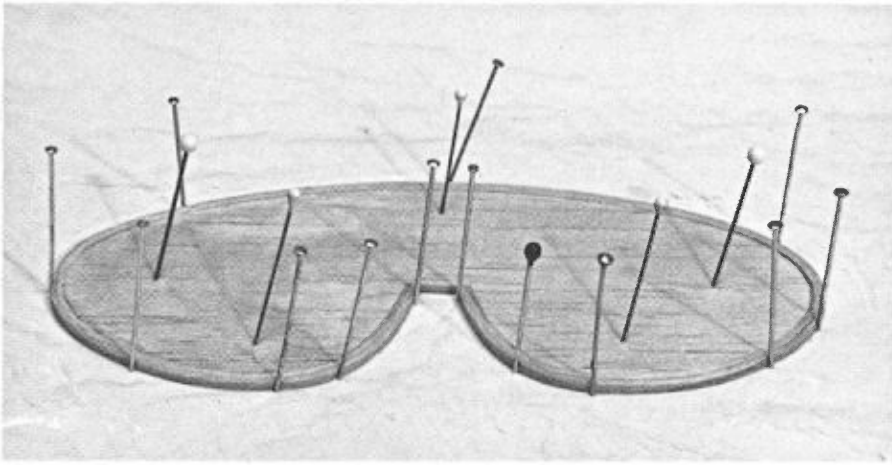


Once upon a time aircraft were simple, basic things. We built them of twigs and sticks and coaxed them to fly. Peanut Scale returns us to our memories and our new skills bring forth performance.



Hold your weight down aft. A laminated outline, strip stock for ribs. It tends to resist warps. At right: A hand carved balsa prop will improve performance. Cut it from a block per the blank. Below: It will just sit there until you pack it full of winds. Prop will screw it into the sky.





Laminated edges? A sheetwood inner form is cut to outline, pinned to plan. Thin strips of balsa are cut from sheet, soaked, bent around under slight tension which prevents strip from buckling. The second or third strip is added and the glue allowed to dry. At right: The form is removed.

later on for flying. Cover the tail surfaces carefully to avoid wrinkles. To help keep warps away, do not spray with water to shrink the tissue. Apply two coats of thinned clear dope.

Model Assembly

Markings and control surface outlines are most easily applied before assembly. The wing numerals and fuselage stripe were cut from red tissue with a sharp razor blade and applied by holding in place and brushing thinner through to soften the dope underneath. Control surface outlines were marked off with India ink in a drafting pen. Glue the wing and tail surfaces in place, checking alignment care-

fully. Cut the side windows and front windshield from thin clear plastic. Check the fit of the front windshield and trim if needed for a good fit. Use glue carefully and sparingly to avoid a mess.

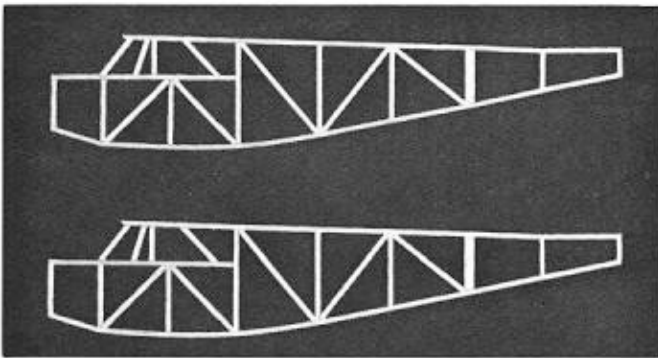
Propeller and Motor

A balsa propeller can be carved as shown, or a commercial plastic or balsa propeller can be cut down to size. Balance the propeller carefully for smooth running. A split-ring type lock washer epoxied to the front of the propeller will serve as a free-wheeler latch. Bend the $\frac{1}{32}$ " dia. music wire shaft, mounting the propeller to a hardwood thrust button as shown. Include a couple of small brass washers be-

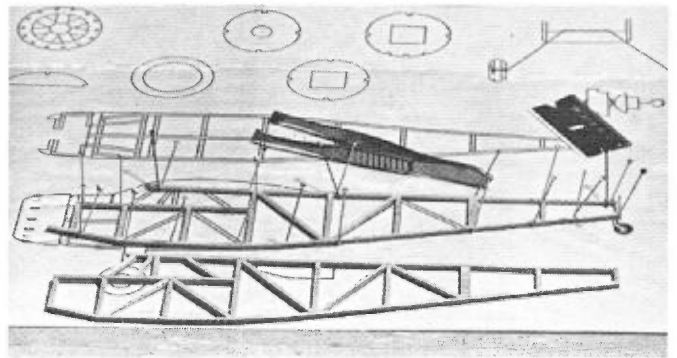
tween the propeller and thrust button for bearings. The motor is a single loop of $\frac{1}{8}$ " flat rubber about 8 or 9 inches long.

Flying

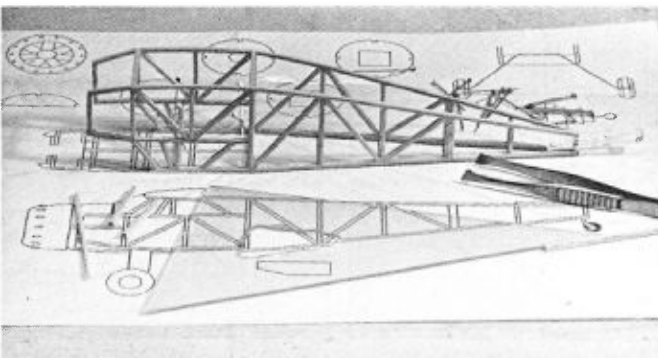
With the motor installed, the model should balance about $\frac{1}{8}$ " forward of the main wing spar. Use clay as needed to achieve this balance point. Hand glide the model over grass and bend the elevators up or down as needed to achieve good glide trim. Some downthrust will be required to control the powered flight. A $\frac{3}{32}$ " shim under the top edge of the thrust button placed slightly to the left of center was required on my model. Crank in some winds and try your wings.



Two of a kind. The fuselage sides are easily assembled. It doesn't take much strength to saw up $\frac{1}{16}$ " sq. lumber, but accuracy is all-important.



The second fuselage side takes form. Strive for good glue joints, neat accurate workmanship. Use the same pin holes to erect the other side.



Crosspieces cut to exact lengths, as per the top view join the sides. Do use care to angle the ends as taper suggests. At right: Time for flight.

