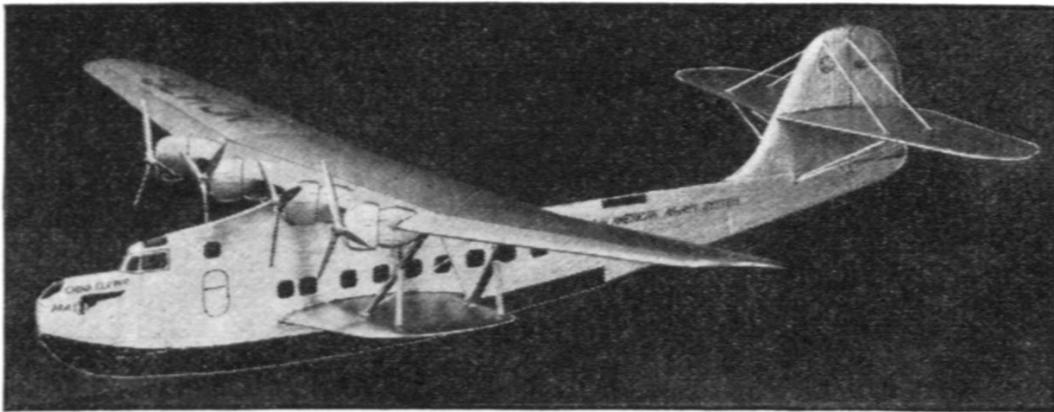


Build and Fly the China Clipper Glider

How to create a Fascinating Flying Silhouette Model of the Trans-oceanic
Clippers From Sheet Balsa Wood

By Jesse Davidson



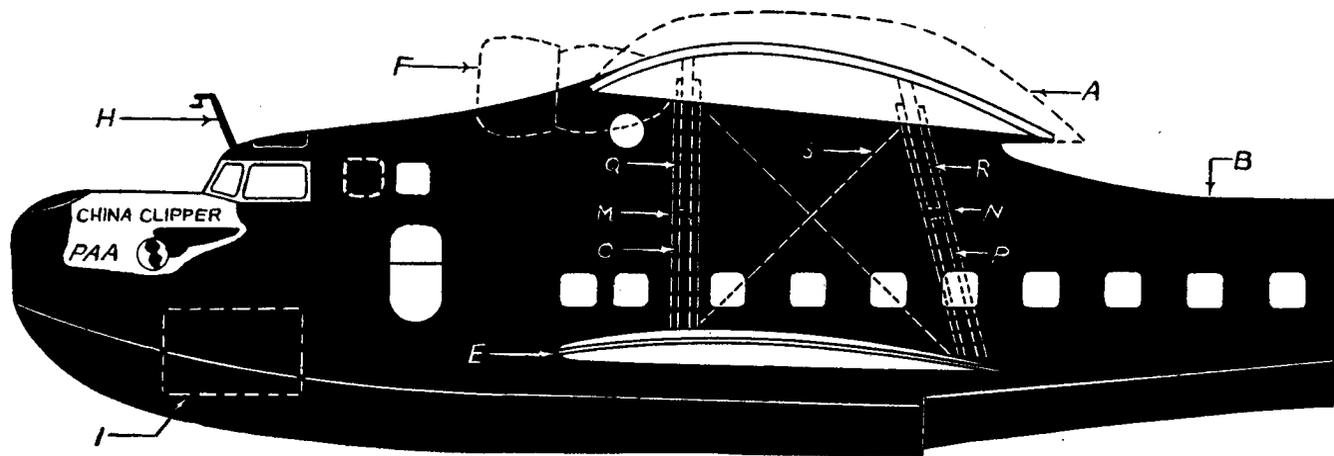
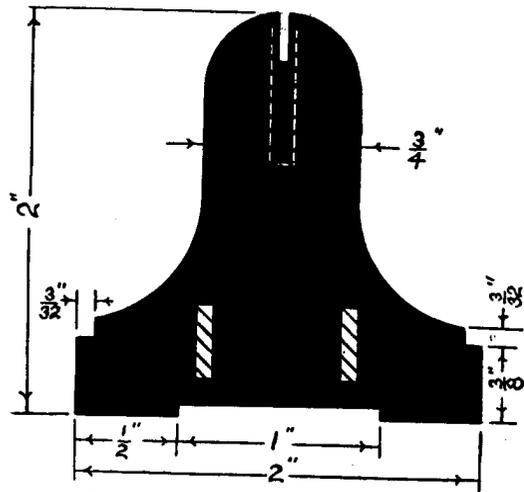
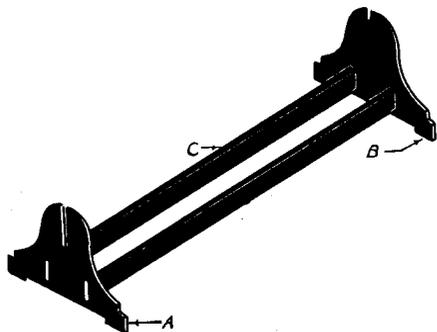
The completed model is a fine glider and a thing of beauty

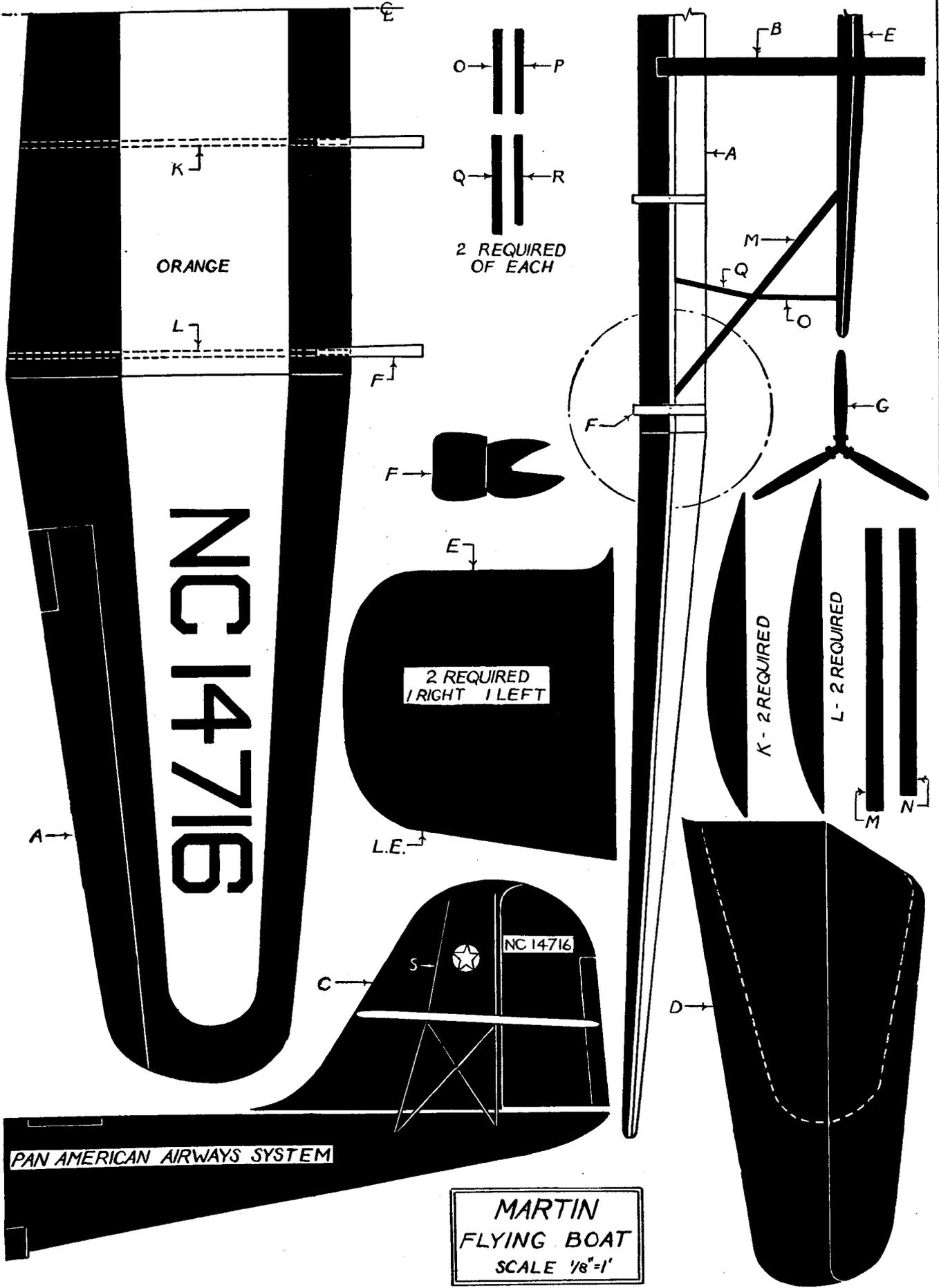
THE clipper ships of the middle 19th century were the fastest sailing vessels ever built and were used extensively in the California and Australia gold rushes and in the tea, opium and slave trades. They were the last effort to compete evenly with the steam vessels on long voyages and with heavy cargoes, and for many years they were moderately successful in delaying the final victory of steam.

When Donald McKay's Flying Cloud arrived in San Francisco 89 days out of New York it established a record never surpassed and only twice equaled—once by the Flying Cloud herself three years afterward, and in 1860 by the

Andrew Jackson. It was indeed a triumph of which every American at the time had reason to be proud for it reduced by one-quarter the record of 120 days made by the clipper ship Memon two years before.

It was of this event that the New York Commercial on October 8th, 1851, said: "Such a passage as this is more than a local triumph and inures to the reputation not alone of the builders of the ship and her enterprising owners, but of the United States. It is truly a national triumph and points clearly and unmistakably to the preeminence upon the ocean which





ORANGE

NC 14716

PAN AMERICAN AIRWAYS SYSTEM

2 REQUIRED OF EACH

2 REQUIRED
1 RIGHT 1 LEFT

K-2 REQUIRED

L-2 REQUIRED

MARTIN
FLYING BOAT
SCALE 1/8"=1"

awaits the United States of America."

At this period of its history, the United States was at the peak of her maritime glory. The American flag rippled from the masts of clippers side by side with the Union Jack of Britain in every important seaport in the world. The rivalry between these two countries was intense but the American merchant marine had the edge. One of our keenest foreign critics of the early nineteenth century, Alexis de Tocqueville, in his famous book "Democracy in America" mentions the fact that our mariners were bold and hardy and possessed of confidence that denied the need for caution and safety that too much were with our British cousins. The American ships were faster than the English so that eventually they had to call for Donald McKay, the foremost American ship builder of his day, to design clippers for the English merchant marine.

Donald McKay and the clipper ship era are synonymous. For his was the genius that influenced the improved type of sailing vessel that put America in the forefront of the maritime powers.

The writer regrets that he cannot further elaborate the notes on this phase of American development of transportation for it was indeed a romantic era. America was having its growing pains and expanding westward rapidly. The gold rush was at its height, settlers were pouring into newly acquired territory that was Texas, Oregon and the states comprising the Mexican Cession.

Expansion, development and progress was moving at a fast clip.

And so we leave these precursors of the modern clipper ship era that unlike the previous one is not a last expiring effort to hold its own with the steam vessel—the gigantic greyhounds of today— but that will probably reduce oceangoing commerce to the transportation of freight only and leave the passengers and express to the flying clouds of today.

The reader will be interested in the etymology of the word "clipper," I am sure. It is not very clear but probably obtains its derivation from the verb "clip" which in early times meant, among other things, "to fly" or "run swiftly." The expressions "going at a good clip" or "a fast clip" are familiar to most of us. In fact I have used the latter expression somewhere above. We can reasonably suppose therefore that when craft of this new model were first built which were intended in the argot of the day, to clip over the waves rather than plough through them, they became known as clippers because of their speed.

During the War of 1812, the swift privateers built at Baltimore were known as Baltimore Clippers but whether these were the first ships described as such in a nautical application is not certain but undoubtedly the word clipper is of American origin. It is interesting to note that the aerial clipper ships are built in Baltimore where the Martin Aircraft Company is located.

The first Sikorsky and Commodore flying boats to be used

by the Pan American Airways in its South American service in 1928 can be compared with the fast little packets that immediately preceded the era of the clipper ship. Today Pan American Airways has the swifter clippers such as the Brazilian Clipper, Pan American Clipper, etc.

With the South American routes established and operating smoothly, Pan American looked out over the Pacific seas and beyond and saw the Philippines, 21 days away by surface vessel, and a little farther on sprawling China. . . .

The newspapers were full of the China Clipper's first regular flight to the Philippines and return. You've read of the ovations; descriptions of the ship. No need to rehash it. Then followed the Philippine Clipper. And today they clip it down the wind to the islands discovered in 1521 by Magellan and where he met his death.

Tomorrow, flying clouds will scuttle over the North Atlantic towards Europe.

And so, reverting to the editorial of the New York Commercial quoted above, its sentiments can be modernized by substituting the words "in the air" for "upon the ocean." But the United States does not await preeminence in the air. It is preeminent.

And now to work.

The materials listed below are balsa unless otherwise specified:

- A. Wing, $1/16'' \times 2 \frac{1}{2}'' \times 16 \frac{1}{4}''$
- B. Fuselage, $1/8'' \times 1 \frac{15}{16}'' \times 11 \frac{3}{8}''$
- C. Rudder, $1/16'' \times 1 \frac{15}{16}'' \times 2 \frac{11}{16}''$
- D. Elevator (make two), $1/16'' \times 1 \frac{3}{4}'' \times 3 \frac{1}{2}''$
- E. Sponson (make two), $3/16'' \times 2 \frac{3}{8}'' \times 2''$
- F. Motor nacelle (make four), $3/32'' \times 17/32'' \times 1''$
- G. Propeller (make four) $1 \frac{1}{2}''$ dia.
- H. Pitot tube, $1/32''$ round bamboo
- I. Position of the nose weight which is lead foil
- K. Wing rib (make two), $1/16'' \times 9/32'' \times 2 \frac{7}{16}''$
- L. Wing rib (make two), $1/16'' \times 1/4'' \times 2 \frac{9}{16}''$
- M. Front wing strut (make two), $1/16'' \times 1/8'' \times 2 \frac{1}{8}''$ bamboo
- N. Rear wing strut (make two), $1/16'' \times 1/8'' \times 2''$ bamboo
- O. Front lower compression strut (make two), $1/16'' \times 1/32'' \times 5/8''$ bamboo
- P. Rear lower compression strut (make two), $1/16'' \times 1/32'' \times 5/8''$ bamboo
- Q. Front upper compression strut (make two), $1/16'' \times 1/32'' \times 3/4''$ bamboo
- R. Rear upper compression strut (make two), $1/16'' \times 1/32'' \times 11/16''$ bamboo
- S. Brace wires which are of white thread.

The principal parts of this glider are the wing, elevator and sponson (shown in half), fuselage, rudder, motor nacelle, wing ribs and struts. Trace all the parts except the struts and propeller on transparent paper or, if you wish to avoid damaging the page, measure each part from the drawing and redraw it on the wood to be used for that part.

The first step is to cut out all the balsa parts exactly on the lines. Now we'll concentrate first on the fuselage. With the aid of a sharp pencil and a ruler, mark out the cabin windows of the hull and also the windows of the pilots' control room. The water line, which is represented on the fuselage drawing by the thin white line at the lower part of the hull, is also marked off on your balsa piece. Be sure both sides of the body are alike.

Before attempting to camber the wing it is best to mark out the ailerons and aileron tabs as well as the area allotted to that portion of the wing to be painted orange. The outlines of the ailerons should also be made on the under surface of the wing. The license numbers are marked off on the upper surface of the right wing and on the under surface of the left wing. The wing is then cambered to shape over a steaming kettle. While so arched, apply cement along the tops of all four wing ribs, letters K and L, and set them in their respective places. The use of small model making pins pushed through the top of the wing part way into each of the ribs will do lots to help

retain the cambered shape until the moisture has entirely evaporated. In the meantime you can mark out the hinge lines on both the rudder and elevator parts.

Next to be placed in position are the motor nacelles. Apply a little cement on the cut-away portions of each nacelle and slip onto the wing. Note that the lower part of the cut-away portion of each nacelle fits snugly to each wing rib. See side view plan of fuselage. Hold the wing away from you and check on the alignment of all four nacelles.

At this time all the main parts of the model are ready for painting. The colors of the Clipper glider are given as follows: The entire fuselage is painted aluminum with the exception of the portion below the water line which is done in black. All the windows shown in white on the plan are done in black on the model with the exception of the large door which should be outlined only, with black india ink. CHINA CLIPPER and the letters P A A as well as the winged globe are done in black. PAN AMERICAN AIRWAYS SYSTEM is also black. Be sure to match both sides alike.

Next, add on the pilot tube. This part is made of rounded bamboo 1/32" diameter and cemented in the position shown on the plan. Paint aluminum. The elevator parts are colored aluminum with the hinge line marked with india ink. The rudder is also aluminum colored and its hinge line and tab marked with india ink. The license numbers are done in black on both its sides.

Now on both sides of the vertical fin nearest to the hinge line paint the Martin trademark. It is a five pointed white star on a circular background of blue. A very fine blue line runs parallel with the angles of the star as close to the edge as possible but leaving sufficient space for a white margin, extremely narrow. Around the blue field is a thin white circle. Above the white circle is a red one five times the thickness of the white one. Around the red circle is a thin white one and over that is still another thin red circle. Inside the star, horizontally, appears the name MARTIN, above, and below U. S. A. in blue.

You are not expected to do all this on the small vertical fin and with the scale-size trade mark shown, but if you're going in for a larger glider of the Clipper and want detail down to the letter, here you are.

The entire wing with the exception of the area designated for orange is painted aluminum. The whole underside of the wing is aluminum. The license numbers both above and below are painted in black. Separate the orange and the silver colors with a thin line of black all around the orange portion. The nacelles are also painted aluminum with a thin black line separating the end of each cowling from the rear portion of the nacelle. See letter F. The sponson halves are painted aluminum.

When the paint on the wing has dried thoroughly, crack the wing slightly at the points shown on the plan by the black and white line

just outside, the rib position, letter L. The dihedral angle measures $1/2$ ". If necessary, place little objects at the tip ends of the wing to hold the angle until the cement hardens. Now the model is ready for assembly.

The wing is attached to the fuselage in the position and angle shown on the side view plan. Apply cement along the under-side of the wing and press firmly to the body making sure it is perfectly centered. A couple of small model making pins pushed right through the top of the wing into the body will help hold it securely.

The sponsons may be made individually as listed in the bill of materials, or a piece of wood measuring $3/16$ " x $2\ 3/8$ " x 4" may be cambered to the shape as shown on the side view plan, letter E. Note how it tapers from the inward side which measures $3/16$ " to the outward tip to measure $3/32$ ". See front view, letter E. Complete the sponson piece with a fine sanding and then with the aid of a thin-bladed knife divide it in half. Check each half by laying it directly on top of the sponson pattern. Attach the halves to their respective sides of the fuselage with a little cement and small model making pins inserted at inward angles to hold them securely until the cement hardens. Afterward remove the pins. Note also that the sponsons protrude slightly ahead of the wing. See side view plan.

In attaching the wing struts, letter M, place them in position first. These are the forward struts. The

rear struts, letter N, are next to be cemented in position. The smaller upper and lower compression struts of which two of each are required are then attached as shown on the front view plan.

All struts are cut from bamboo and must be streamlined. When the cement has hardened all around, paint the struts in aluminum color.

Before cementing the rudder to the fuselage, attach each elevator half to the sides of the rudder. They are set at a slight angle of incidence as shown by the white line on the rudder drawing. After the cement hardens, attach the whole affair to the fuselage in the position shown on the side view plan. Later add the brace wires of white thread indicated by the letter S between the wing struts (side view) and the tail structure.

Carve out four three-bladed props carefully and twist the blades slightly so that they'll whirl when the model is launched. Use small pins for the shafts and center them into each nacelle. The props, of course, are painted aluminum.

Letter I designates the position for the nose weight. Use lead foil for the weight. Get enough of this foil and fold it into the shape as shown on the plan. Now cut out the portion of the fuselage where the weight is to be placed and cement the foil in with a drop of cement.

Glide the model indoors and out in order to observe its behavior. Should the model stall, add more foil by cementing pieces cut to the

same pattern. Add as much as needed until the model glides with a long gradual descent. Touch up the weight of with aluminum paint.

Choose a breezy day for outdoor gliding and always launch into the wind.

For those desiring to build a model of the Philippine Clipper, the dimensions above given are exactly the same for the [~ sister ship. The license number of the | Philippine Clipper is (NC-14715) and the name is placed along the bow as shown in the plans.

Build a Cradle for Your Model

I am sure that you will want to keep this model for decorative purposes and for the best effect, a cradle is the thing. Painted in a yellow and green combination it makes an attractive color scheme in contrast to the aluminum, orange and black trimmings of the glider. It is a very simple affair and can be constructed and assembled in a few minutes.

Two pieces of balsa each measuring $3/32$ "x2"x2" are used for the ends. An "end" with full size dimensions is shown in the plans from which you can make a full size pattern on stiff paper, cut out, and traced onto the balsa pieces. The front end is distinguished by having the larger slot shown by the dotted lines, while the rear end slot is shown by the white space between the dotted lines. The dimensions of the large slot are $1/8$ " wide and $3/4$ " deep. The small slot is $1/16$ " wide and $1/4$ " deep. In each end cut out the right and left

slots in which the side members are placed. See letter C in sketch of completed cradle. The slots measure $\frac{3}{32}$ " x $\frac{3}{8}$ ". The slots are placed $\frac{13}{16}$ " apart measured from the outsides. The length of each side member measures $\frac{3}{32}$ " x $\frac{3}{8}$ " x 7". Apply a little cement to all parts to be joined and assemble as shown in the isometric view. The ends are painted yellow and the side members medium green.

Model Airplane News, June 1936