

Build This Model of the New Curtiss Fighter

Here You Have Complete Data Which Shows How to Build and Fly the Sensational New U.S. Navy Fighter

By WILLIAM WINTER and WALTER McBRIDE

THE new XF13C-1 Curtiss Experimental Fighter is the last word in pursuit ships. Contrary to the trend toward low-wing designs in late years, this ship is a high-wing cabin job with retractable landing; which when folded fits flush with the fuselage. Wing slots and flaps are incorporated in the design and insure a versatile performance. This latest demon of the air is capable of tremendous speed.

The proportions of the real plane make possible a graceful model of excellent flying characteristics, and you will be greatly pleased with the performance of this plane if you build it according to the following instructions.

Fuselage

The bulkheads are cut to shape from 1/16" sheet as detailed on the plan. Cut the main notches designated, mark the locations of the auxiliary stringers and fasten the four main stringers of 1/16" sq. in place on the widest bulkheads. Allow to dry and then locate the rear bulkhead. It may be necessary to press the stringers to obtain the correct curve at the rear and to eliminate strains that interfere with the alignment of the fuselage. After cement has set, glue the remaining bulkheads in place. Cut the remaining notches as required allowing for any irregularity in your work and cement the auxiliary stringers in place. Bend the rear hook to shape from .028 music wire and fasten to the rear bulkhead (cross grain).

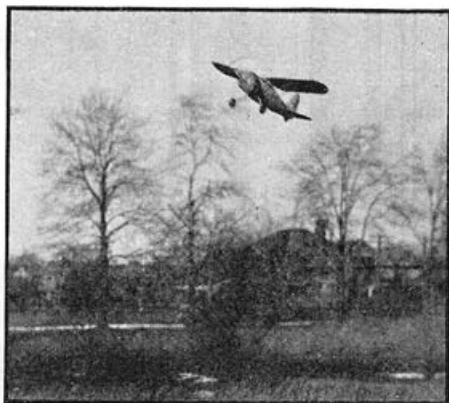
The rear plug is shaped from a block 1 1/8" x 15/16" x 11/16" as shown on the top and side views and cemented to bulkhead #10.

Former B is cut to the proper shape from 1/16" sheet and cemented in position. Block D is a small piece of balsa 2 7/8" x 9/16" x 5/16" cut as shown on the

fuselage plan and fitted against bulkhead #3 to form the peak of the windshield. The windshield structure is of 1/16" sq.

Two pieces of 1/16" outside diameter aluminum are cut to the length given and passed through the fuselage at the position shown on the top and side views.

To cover, long strips of Jap tissue must be used to avoid wrinkles. Clear dope is



Getting away for a flight of 300 feet. It is very stable

used to apply the covering. All excess paper should be trimmed off and the frayed edges doped down. Finished covering may be lightly doped.

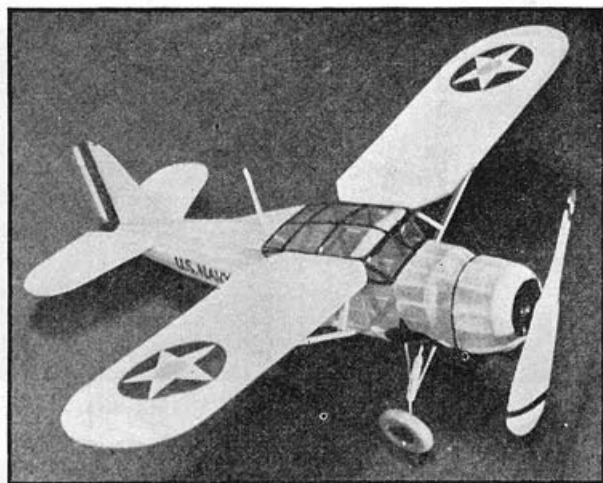
Tail wheel housing is formed from a block 7/8" x 5/8" x 2 1/8" as detailed and attached to the fuselage. The tail wheel is 1/8" thick and 3/8" in diameter and is held in position by small pieces of wire.

The windows and windshield are of cellophane. The edges may be trimmed with black dope or lacquer.

Being a Navy plane, the fuselage is silver.

Landing Gear

The oleo struts of 1/4" sq. are cut to their correct lengths and shape as detailed. Small pieces of bamboo are forced into either end as shown on the plan. The finished struts are attached to #2 bulkhead at the position designated. The axles of .034 wire serve as



Up to date, graceful and a fine flier

struts and should be fastened in place by thread as well as cement. The wheels are 1 1/2" in diameter and should be of a heavy type for correct balance.

Tail Assembly

The spars of 3/32" sq. are pinned to the bench and all cross pieces with the exception of F are cemented in place. The edges of 1/16" sq. bamboo are bent to shape by candle flame and glued in position. Cross piece F due to its shape is attached after unit has been removed from the form.

To cover, use separate pieces of tissue for each side of both stabilizer and rudder. Finished covering is lightly sprayed and doped. Navy stripes are painted on the rudder. The fin and stabilizer are silver. The completed units are attached to the fuselage at the designated positions. Brace both stabilizer and rudder with 1/32" sq. bamboo.

Wings

The wings are built in two separate panels. Each panel is supported by a simple strut arrangement and is detachable. The pilot has an unobstructed vision through the glass cabin top.

Pin the spars of 1/16" x 1/8" to the bench. Using the rib pattern given, cut all the ribs from a soft sheet of 1/16" balsa. Pin the ribs together, sand until matched and cut notches. Cement the ribs in their proper positions. The leading edge of 3/8" sq. is sanded to shape and inserted in the notches at the front of the ribs. The trailing edge of 1/16" x 3/16" is shaped as shown on the rib pattern and glued in place. The tips are of 1/16" sq. bamboo bent by candle flame. The wing blocks are cut from two pieces of soft balsa 4 3/4" x 7/16" x 1 3/16". They are shaped as shown in detail, the wide edge being similar to the wing rib and glued to it.

Four pieces of heavy music wire are cut to the lengths given. Two are inserted in each block at the position detailed on the plan.

To cover, use separate pieces of tissue for each side of both panels. Apply paper with clear dope and trim the edges. Finished wings are sprayed and doped.

The upper surfaces are yellow and the lower silver. Three inch star insignia are used for decoration.

(Continued on page 40)



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(Continued from page 12)

The wing struts of $\frac{1}{8}$ " x $\frac{1}{4}$ " are cut to the given length. The small struts are of $\frac{1}{16}$ " x $\frac{3}{16}$ ". The fitting shown on the front view is a wire hook bent to shape and fastened to the strut so that it passes through a wire eyelet attached to the fuselage. The mounting of the wings is obvious as shown on the plan and as described.

Cowling

As the cowling is not regular in shape, it is built up to obtain the correct form. Its cross section as shown in detail is self explanatory. The face is three pieces of $\frac{1}{4}$ " sheet glued up, shaped and cut out as shown. The hole cut in the inner sheet is for the reception of the nose plug. The cylinders are given in detail and are cemented in place. The nose plug is 1" in diameter and $\frac{1}{16}$ " thick. It is shaped as shown and forms the crankcase. As it is to be removable, it should not be glued in place. The rear of the cowling is of $\frac{1}{16}$ " sheet. There are 14 cowl ribs. Three are attached at a time and checked for alignment as the work progresses. Their locations are to be found on the front view. The covering is of paper or wood veneer. The skirt is of $\frac{1}{32}$ " sheet balsa or veneer. The cowling is silver. The cylinders and crankcase are black.

Propeller and Motor

The propeller is cut from a block 8" x $1\frac{1}{2}$ " x $\frac{3}{4}$ ". The blank is first cut to the shape shown. The propeller is carved in the usual manner. Care should be given to the proper balancing to avoid vibration. Glue a $\frac{1}{8}$ " washer to the rear of the hub and another to the front of the nose plug to serve as bearing. The shaft of .028 wire is imbedded in the face of the propeller and passed through the hub and nose plug. A loose washer is placed on the shaft to reduce friction. The nose assembly is cemented to bulkhead K. Motive power is eight strands of $\frac{1}{8}$ " flat rubber.

Flying

The model should be tested over deep grass. If none is available test the ship R.O.G. with a few turns. A piece of lead is used to obtain the correct balance. The ship has a quick take off and is stable in flight.

Bill of Materials

- 2 $\frac{1}{8}$ " x 3" x 24" balsa—Bulkhead, wing ribs and in cowling
- 1 $\frac{3}{32}$ " sq. x 36" balsa—tail surfaces
- 7 $\frac{1}{8}$ " sq. x 36" balsa—stringers and windshield
- 1 $\frac{1}{2}$ " sq. x 10" balsa oleo struts and block F
- 2 $\frac{1}{8}$ " x $\frac{1}{8}$ " x 24" balsa—wing spars
- 1 $\frac{1}{2}$ " sq. x 24" balsa—leading edge
- 1 $\frac{1}{8}$ " x $\frac{1}{8}$ " x 24" balsa—trailing edge
- 1 $\frac{3}{8}$ " x $\frac{3}{4}$ " x 36" balsa—wing struts
- 3 $\frac{3}{4}$ " sq. x $\frac{3}{4}$ " balsa cowl face
- 2 $\frac{4}{32}$ " x $\frac{1}{8}$ " x $\frac{1}{8}$ " balsa wing blocks
- 1 $\frac{1}{8}$ " x $\frac{1}{8}$ " x 2 $\frac{1}{2}$ " balsa—windshield block
- 1 $\frac{1}{8}$ " x $\frac{1}{8}$ " x $\frac{1}{8}$ " balsa—tail plug
- 1 $\frac{3}{8}$ " x $\frac{3}{8}$ " x 2 $\frac{1}{2}$ " balsa—tail wheel housing
- 1 8" x $1\frac{1}{2}$ " x $\frac{3}{4}$ " balsa—propeller
- 4 $\frac{1}{8}$ " sq. x 15" bamboo—wing tips, tail edges and landing gear braces
- 1 6" .028 music wire
- 1 8" .034 music wire
- 3 $\frac{1}{8}$ " washers
- 1 oz. cement
- 1 2 oz. clear dope
- 1 $\frac{1}{2}$ oz. yellow dope
- 2 sheets Jap tissue
- 1 pr. 1 $\frac{1}{2}$ " wheels
- 8 ft. $\frac{1}{8}$ " flat rubber
- 1 sheet cellophane
- 4 3" stars
- 1 6" $\frac{1}{8}$ " aluminum tubing

The Glider Grows Up—Part No. 2

(Continued from page 5)

extremely difficult to adjust the controls so this can be accomplished, not to mention the weight it entails when you get through. Finally, most tailless ships tend to be unstable longitudinally.

Lippisch got rid of all the difficulties at one fell swoop. He solved the rudder trouble by making the rudders independent of each other. When he wants to turn right, only the right rudder moves; for left, only the left rudder. The arrangement did away with the synchronizing difficulty and Lippisch found, to his delight, that by using them both together he had an air-brake that helped out his stability in a pinch. The aileron difficulty remained; it was solved by hinging almost the entire trailing edge of the wing and splitting it into three sections, the central portion being used as an elevator and the tips for ailerons.

With these changes the Storch flew beautifully. What was best of all, the controls proved effective in stalling positions; that is, the stall was practically eliminated as a source of danger. She operated so well, in fact, that Lippisch mounted a small 7-9 hp. engine in her for a trial as a powered plane, whereupon, she demonstrated her aerodynamic qualities by making 65 m.p.h. with this insignificant power plant. Immediately she was widely copied; many of the new Russian gliders are modified Storches and at least two important airplanes have sprung from the design—the French Guercchais flying wing and the new Westland-Hill Pterodactyl in England, which has made such remarkable records. (The latter, incidentally, incorporates another glider feature in the one-wheel landing gear.)

But although the results were interesting, resistance to stall and efficiency as a powered plane were not the objects the glider experts were trying to attain. What they were trying to do, we will tell in a minute; meanwhile, let us look at the next radical change in design, Klemperer's Ente, or Duck. It goes right back to an idea the Wrights had tried—and dropped—in 1908, the idea of having control surfaces out in front of the main wings. Instead of providing another set of controls behind, as in the original Wright model, Klemperer boldly turned the whole machine around to fly tail-first. His theory was that the control surfaces would act as "feelers." Good glider pilots become very sensitive to changes in speed or direction of air currents; with these feelers projecting ahead, Klemperer reasoned they could detect changes in currents through the feel of the controls an instant or so before the changed breeze struck the wings and could swing the stick to take the best advantage of them.

The Ente has the disadvantage of requiring that its control surfaces carry a load, for the sake of longitudinal stability. This requires the pilot to hold onto his controls every minute, never allowing the slightest variation from the proper angle, and in practice, it makes the Ente a very wearying and nerve-racking craft to fly. Klemperer's Ente was, nevertheless, a considerable success, so much of a success that he was summoned to Hamburg to design a