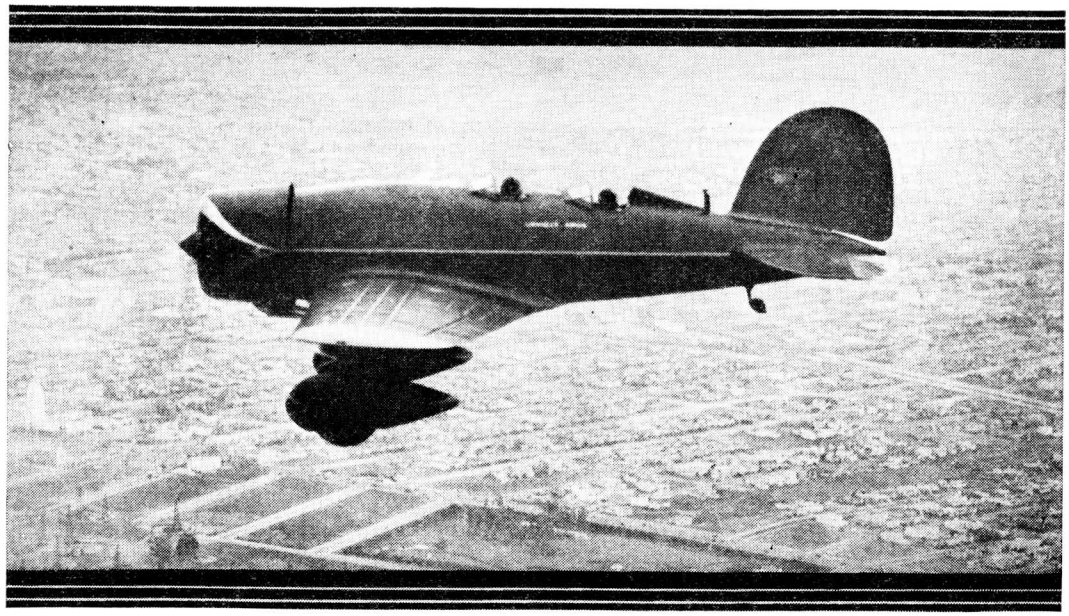

How to Build Lindbergh's "Dog Star"

Wonderful Flying Model of the "Lone Eagle's" New Mystery Low-Winged Lockheed

SOON after his famous flight over the Atlantic and the placing of his Ryan monoplane, the "Spirit of St. Louis," in the Smithsonian Institute at Washington, D. C., Colonel Lindbergh selected the famous Lockheed "Sirius" (Dog Star) as his next plane. This was built to his order and has a high speed of 190 miles per hour and the longest cruising radius of any single-motored airplane.

The Department of Commerce made a special dispensation in granting the new plane the license number of NR211, in view of the fact that the "Spirit of St. Louis" was numbered NX211.

The model designed is a flying replica of the plane and on completion, weighs exactly two ounces and flies more than one hundred feet after taking off from the ground. The colors designated in this article are exactly as those used on Colonel Lindbergh's plane, which combination was selected by this famous flyer himself.

The name, "Sirius," is taken from the Sirius star known as the Dog Star of the heavens. It is the custom of the Lockheed manufacturers to name their products after the various stars and planets; hence the designation of Col. Lindbergh's ship.

The model has an imitation N.A.C.A. engine cowling, so modified at the nose that the motor stick can be detached from the fuselage at will.

Fuselage

First, go over the drawings carefully and read all special notes regarding the structure of the fuselage so that you will be thoroughly acquainted with the designation numbers, letters and other symbols used to show the various parts and formers.

See Plans on Pages 22 to 29

Formers F-1 to F-9, inclusive, are cut from 1/16″ sheet balsa, shaped as shown in drawings 4, 5 and 6, and sandpapered smoothly. After this has been done, take one of the 1/2″ x 1/2″ x 1″ pieces of balsa and make tail piece F-10 as shown in drawing 6. Then fasten the round side of former F-9 to the flat side of former F-10 and ambroid together. These two parts are shown fastened together in the drawings of the fuselage structure. The motor stick clips should now be fastened to former F-8 as shown in drawing 6, ambroid being used to hold clip in correct position.

Now take the split bamboo and, with a sharp knife, strip the bamboo in 1/16″ x 1/16″ pieces, four of these to be used at once to hold fuselage formers together. These bamboo strips are ambroided to the sides, top and bottom of formers F-4 to F-10 inclusive, as shown in drawings 1 and 2 by heavy lines. It will be noted that the top stringer goes through former F-9.

Formers F-3 and F-4 are ambroided together, as shown in drawing 1 of the fuselage construction, making sure that the sides of former F-3 extend to the correct amount as shown. Now take the 1/32″ sheet balsa and cut out the cockpit formers X, Y and Z. Two of each are made of these formers.

Then from the same 1/32″ material, cut out five 1-3/4″ x 1-3/4″ pieces for the N.A.C.A. cowling covering, as shown in drawing 1. The cockpit formers are ambroided in place between formers F-6 and F-8, as shown in drawings 1 and 2. Former X goes halfway between the side bamboo stringers and the bottom bamboo stringers. Formers Y and Z are put on the top of the fuselage, as shown in drawings 1 and 2.

Now take formers F-1 and F-2 and ambroid together.

While these are drying, shape the clip M shown in drawing 5 and fasten to the (*Continued on page* 60)

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formers, as shown in drawings. The five 1/32" x 1-3/4" x 1-3/4" balsa strips are now cut to the correct tapered shape as shown in drawing. These are used to form the N.A.C.A. cowling. The top untapered piece is fastened first and held in place with ambroid and small bank pins.

Follow this layout around the cowling frame by setting in place piece after piece and holding in place with bank pins while the ambroid is drying.

Cradle

The cradle mounts are made from two pieces of balsa 3/8" x 3/4" x 5-1/4", and cut and carved to shape as shown in drawing 4. Care should be taken to see that the inner curved surface corresponds with the shape of the fuselage. Lay the cradles to one side while construction of the main wing panels is begun.

Wing

First cut out all the necessary ribs from the 1/16" balsa sheet. There are two ribs to be cut of each size shown in drawing 7. When this has been done, the builder should have ten finished wing ribs. (Note: the holes are drilled before cutting out the inside of ribs, so that they will not split while in work).

Now take the 1/8" dowels or round wood that is to be the main spars. Insert them through the holes for that purpose located in the ribs. The ribs should all be spaced and then ambroided in place, as shown in the wing constructional drawing.

When this has been done, there will be one left and one right wing panel ready for the leading and trailing edges to be installed. The leading edge, which is 3/16" x 1/8" x 12", is cut to the correct length of 9" and tapered from 3/16" to 1/16" as shown in drawing 6. The leading edges are then ambroided in place as shown in drawings 3 and 4. Note that the ribs have slots for this purpose (see rib R-1 in drawing).

The trailing edges are made from the 1/8" x 1/8" x 12" and are cut down to the correct lengths as shown in drawings 3 and 4. These pieces are then ambroided to the rear of the ribs as shown in drawing. The inner ends, where they meet, should be beveled as shown, and ambroided together. This, of course, is not done until the two main spars are slipped in the 1/8" aluminum sleeves. The wing is now all in one piece, and is what is termed "built up cantilever construction." Two pieces of the 1/16" split bamboo are now used to form the wing tips, as shown by the heavy lines in wing drawings 3 and 4.

Tail Surface and Rudder

In building up the tail surfaces, first cut the necessary formers F-12 and F-13 from 1/16" sheet balsa as shown in drawing 2. These are ambroided to former F-9 in an upright position as shown in drawing 2. A piece of 1/16" bamboo is now shaped to correspond with the drawing of the rudder and fastened in place with ambroid. (Bamboo may easily be bent to any shape if it is first heated over an electric iron, candle flame or bunsen burner.)

The cradles can now be set in place and ambroided as shown in drawing 3, while the rudder is drying. The 1/8" x 8" round wood is now cut to the correct size of the elevator spar, which is 7-5/8" long, the ends being beveled as shown in drawing. Now locate the center point and ambroid to former F-9 just above the two fuselage side bamboo stringers.

It is important that the elevator spar be straight across and level while drying. The elevator formers F-14 and F-15 are now cut from 1/16" sheet balsa as shown in drawing 5. Make two of each and then ambroid securely in position, as shown in drawing 5. The edges are made from 1/16" split bamboo bent to shape in the same manner as was done with the rudder edges.

Landing Gear

To start construction of the landing gear, first take the 1/8" x 1/4" x 12" and make the two O struts as shown in drawing 7. Then sandpaper and streamline. The V struts, of which there are two, are made from 3/16" x 3/8" x 12" balsa and are also sandpapered and streamlined as shown in the drawing. The T blocks are made from the 1/2" x 1" x 1" balsa, two such blocks being made. When finished these T blocks are ambroided to the O and T struts, as shown in drawings 7 and 8.

Now make the wheel streamline blocks from 1" x 2" x 3-1/2" balsa and carve as shown in drawings 7 and 8. After these streamlines have been carved to a rough resemblance to the drawing, it is advisable to use sandpaper to secure the final shape and finish. The two covers for these wheel streamlines are made from the 1/8" x 1-3/4" x 4-1/2" balsa on hand, making sure that the grain of the wood runs the same as in the streamline. (The lines shown in the drawing show the direction of the grain.) The wheels are put on by inserting a plain pin through the wheel bearings and then through the streamline. Clip off any excess length of pin and ambroid pin end so that it holds in place. The covers can then be ambroided tightly to the streamline and, if necessary, several small pins may be used to hold them in place while ambroid is drying. The T is ambroided in place as shown in the sketch.

Motor Power

The motor stick is a piece of spruce 1/8″ x 1/4″ x 12″, which is rounded at the front and tapers at the rear as shown in drawing 6. The bearing is put on with thread and some ambroid and the rear hook made from the number 14 wire, as described in the making of the metal fixtures. Number 14 music wire "can" may be used if desired. This always helps to hold rubber in place and also strengthens the motor stick.

The propeller is now carved from the balsa propeller block 9/16″ x 1-3/16″ x 8″, as shown in propeller drawing 7. The propeller hook, which is described in the metal fittings paragraph, is inserted through the propeller hub as shown in drawing and a drop of ambroid used to hold it in place, after the end has been bent over and redrawn in the hub.

Ten strands of 1/8″ flat rubber is used for the motive power to turn up the propeller and an S hook of number 14 music wire made at the rear end if the builder desires to use a hand winder.

Landing Gear

The completed landing gear can now be mounted, points A of the struts R being attached to points B and B1 on number 2 ribs with the wheels toward the wing tips. Struts S meet rib number 2 1-3/32″ back of struts R. The O struts are then secured to number 1 ribs as braces.

Metal Fittings

All metal fittings, such as the motor stick clips, the rear hook, the S hook and the propeller shaft, are made and bent to shape from number 14 music wire. These fittings are easily made with the aid of a pair of round-nosed cutting pliers and should be shaped, as nearly as possible, to correspond with drawings 5 and 6.

Covering

To cover the wing, tail surfaces, rudder and fuselage use the Japanese silk Hackone tissue paper. Fasten this to the wooden parts with banana oil or thin paste. The space near the cradles on the top of the wing is not covered, so that after the fuselage has been covered and doped with banana oil, the correct setting for the wing can be found.

Take a large rubber band and hold wing to the fuselage, gliding your plane until the correct setting is determined. The plane should make a perfect glide from the hand to about three or four feet in front of the person testing it, if the setting is right. After the correct position is found and has proven satisfactory, ambroid the cradles to the fuselage

in that position. Now cover the small openings with tissue and dope with banana oil.

Coloring

The Lockheed Sirius is beautifully colored as follows: The fuselage and landing gear are colored with black dope, while the wings and tail surfaces are orange. The strips on the side of the fuselage and wheel streamline are bright gold with a silver propeller. License numbers and other identifications are painted in black on the wings and in orange lettering on the rudder.

Necessary Materials

5 pieces	1/16" x 2-1/2" x 12"	balsa	formers, ribs
3 pieces	1/32" x 2-1/2" x 12"	balsa	formers, side panels, etc.
2 pieces	3/8" x 3/4" x 5-1/4"	balsa	cradles
2 pieces	1" x 2" x 3-1/2"	balsa	wheel streamlines
1 piece	1/8" x 1-3/4" x 4-1/2"	balsa	streamline covers
3 pieces	1/2" x 1/2" x 1"	balsa	T blocks and tail piece
1 piece	3/8" x 3/8" x 1-3/8"	balsa	head rest
2 pieces	1/8" x 3/16" x 12"	balsa	leading edges
2 pieces	1/8" x 1/8" x 12"	balsa	trailing edges
1 piece	1/8" x 1/4" x 12"	balsa	landing gear braces, struts
1 piece	3/16" x 3/8" x 12"	balsa	landing gear V struts
1 piece	9/16" x 1-3/16" x 8"	balsa	propeller
4 pieces	1/8" x 12"	round wood	main spars
1 piece	1/8" x 8"	round wood	elevator spar
1 piece	1/8" x 1/4" x 12"	spruce	motor stick
3 pieces		split bamboo	stringers, etc.
1 piece	3" x 3"	sheet celluloid	windshields
1 pair	2"	celluloid wheels	landing gear
2 feet	No. 14	music wire	fittings and clips
1 large		thrust bearing	propeller bearing
2	1/4"	copper washers	propeller washer bearings
1 sheet	20" x 30"	Japanese Hack-one tissue	coverings
2 pieces	1/8" - 2" long	aluminum tubing	spar sleeves
10 feet	1/8"	flat rubber	motor
1-1/2 oz.	bottle	ambroid	gluing, etc.
1-1/2 oz.	bottle	banana oil	doping, tissue fastening
1-1/2 oz.	bottle	black dope	fuselage
1-1/2 oz.	bottle	orange dope	wings, tail surfaces
1-1/2 oz.	bottle	gold dope	fuselage strips

Wings on a Battleship

(*Continued from page* 13)

exhibition of stunt flying. He was glad for the time in the air for now, for the first time, he was getting the feel of his plane, and really testing her.

It was a beauty, and responded to his slightest touch. What power, what ease, what stability she had! Never before had he piloted such a superb machine. Like a veritable eagle of the sky he dived, zoomed and spun, reveling in the chances that he took. But in reality, Bob did not consider them chances, such was the confidence he had in his own skill and in the plane.

THERE was the landing on the deck of the *Saratoga* to be accomplished. It would be more difficult now that the ship was at sea than it had been when she was lying at anchor in the placid waters of San Diego harbor, but his spirits had soared too high with his craft in the clouds, to worry about landings.

Out of the sky he swooped in graceful spirals and before even the deck crew were aware of his intention, he brought his throbbing plane to a perfect landing. No trouble this time and with a happy smile of triumph, Bob climbed from the cockpit.

All his fellow officers met him with pleased smiles and words of congratulation. Not "Old Tradition," however. He again held his few remarks until all the ship's officers were assembled for dinner. The meal passed uneventfully and then, just as he rose to leave, Captain Russell spoke.

"So you're proud of yourself, eh? All those monkey-shines up in the air don't mean anything. Trick stuff. Show-off stuff. What's the good of it?"

Bob's face flamed scarlet in anger. It was with the greatest difficulty he restrained himself from a hot, hasty reply. "Old Tradition" turned on his heel and left the mess without another word.

The next day, targets were towed out and anchored, and Bob took to the air well loaded with sandbags. He went through the various maneuvers with perfect technique and out of a possible score of twenty