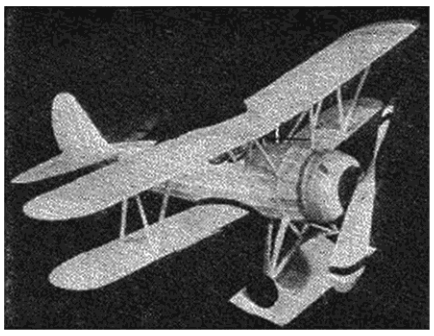
Building A Flying Curtiss "Osprey"

How You Can Create One of the Finest Flying Scale Models You Have Ever Built

By WILLIAM WINTER



Though of biplane type it has excellent flying qualities

THE OSPREY, an all around military plane, has proved itself one of the best of the export fighters. Shipped principally to South American countries it does yeoman's duty there as a combination pursuit, attack and bomber. The high speed of 174 m.p.h. and the climb of 1620 ft. per min. insures the purchasing government of capable accomplishment of a wide range of missions.

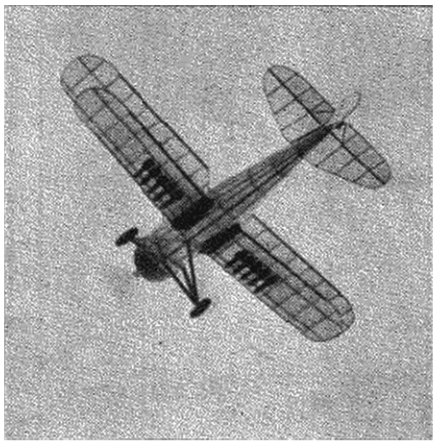
Coupled with its trustworthy performance is its ever present ruggedness. The export fighter must be equally adept at zooming out of rough or tiny fields, lugging a load of eggs over scraggy peaks or at tearin over jungle tree tops through a rain of missiles to strafe a tenacious foe.

The constructional method employed on our Osprey is as fool-proof as possible. By cutting the four main stringers from sheet balsa, to a patterned shape eliminates all that is undesirable in the building of a bulkheaded fuselage. Not only is the fuselage interesting to construct in this manner but it necessarily must be true. The weight increase is negligible, the finished plane weighing approximately the same as one of conventional build and less than others of a special technique. The strength of the finished Osprey will be evident when it starts to take punishment.

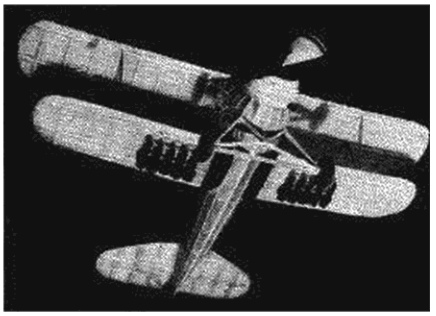
In flight this little ship is a revelation. The model is not a fragile floater but a well balanced, snappy imitation of its prototype. Like its big brother, it needs to ask no quarter when it comes to flyability.

Fuselage

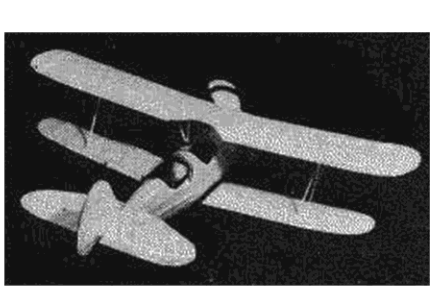
Using the patterns given, cut the former stringers from a medium piece of 1/8" sheet balsa. The bulkheads are cut from 1/16" sheet. Cement the side stringers in place on two of the widest bulkheads and allow to dry. Place the remaining bulkheads in position between the same two stringers. Locate the top stringers and the bottom stringers after checking the frame for alignment. The auxiliary stringers of 1/8" sq. stock are cemented in place. In making the original, the notches for these stringers were cut as the work progressed, their positions having been marked in pencil. The rudder post of 1/8" sq. is inserted and glued in place. The hook of .028 wire is bent and sunk in the rudder post. The cockpits are made by bending 1/32" sheet balsa. The sheet is at first glued in position. After the cement has set, mark the outline of the cockpits and cut out with a sliver of a razor blade.



The completed model in full flight with bombs showing



Miniature bomb racks give a very realistic appearance



Large tail surfaces make it an unusually steady flier

Cut two pieces of sheet balsa the patterns for which are marked V and insert between the fillet extensions of No. 3 and No. 4 bulkheads. The points mentioned are marked Z and ZZ on the bulkhead sheet.

To cover, use narrow strips of tissue to avoid wrinkles. Be sure that the grain is not varied in covering. Trim the surplus paper frequently and dope down the frayed edges. If the paper is to be sprayed, do it lightly and evenly. A coat of clear dope is given the finished covering.

The fillet blocks X and Y are shown in detail. Fillet block X is shaped as shown and cemented to the fuselage side, its rear face coinciding with the extension of No. 3 bulkhead and is cemented to it. In like manner, attach fillet blocks Y.

Trim the cockpit edges with black enamel dope or lacquer. The telescopic sight is a rounded 3/32" balsa strip. The windshields are cut to shape from celluloid and cemented in position.

Landing Gear and Tail Wheel Assembly

All the struts are marked by letter. Their positions on the model are marked with the corresponding letter. The two main struts are cut from 1/8" x 3/8" stock and streamlined. The remaining struts are 1/8" x 1/4". Scrape a tiny piece of paper away so that the wood is exposed at all the intended joints. The main struts H are cemented to the fuselage at the position designated on the side and front views. Use pins to hold the work in position until the cement has set. In mounting the other struts I, J and K, be sure that the joints are neat and well cemented. The assembly is noticeable on the pictures.

The axles of .028 wire are bent to shape with the wheels in place and bound as well as glued to the struts marked J. The wheels should be of medium weight.

The 5/8" tail wheel is mounted on the .014 wire axle. The axle is attached to the rudder post and braced as shown with 1/32" sq. bamboo. The assembly is shown in detail.

Tail Assembly

The main spars of 1/16" x 1/8" are pinned flat to the bench. The cross pieces of 1/8" sq. are cut to the required lengths and are cemented in place. The bamboo edges are bent to shape, preferably by candle flame. So that the contour of the fuselage at the points of attachment will be matched by the innermost cross pieces of both stabilizer and rudder, these pieces are cut to the required shapes from 1/16" sheet.

Cover each side of both surfaces with a separate piece of tissue. A light coat

(Continued on page 34)

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(Continued from page 13)

of dope is sufficient to tighten the paper. Do not spray with water as warping is likely.

In attaching the completed units to the fuselage, be sure that the 1/16" positive incidence called for is incorporated in the stabilizer setting. The thread bracing shown is attached after the cement has dried. Notice that the stabilizer is mounted forward of the rudder.

Propeller, Cowling and Motor

The cowling is built up of soft balsa discs cut from 1/4" sheet. The foremost disc is of 1/8" sheet. The diameters of the various sizes can be found keyed as N, O, P, on both the front and the side views. The amounts cut out are to be found on the cross section of the cowling. The sheet that supports the detachable motor plug has a square hole cut in it to support the plug. The cowling is completely glued up before any shaping is attempted. The shaping is done with a razor and fine sandpaper. Attach the finished cowling with cement to bulkhead No. 1.

The crankcase is cut to the required shape and diameter from a soft block 5/8" thick. The square at the rear of the plug is cut from 1/4" sheet. The cone shaped extension at the front is shaped from a scrap. The bearing the pattern for which is given, is bent and sunk in this extension. The cylinders are rounded from a piece of 3/8" sq. They are nine in number and are attached permanently to the crankcase. The rocker arm housings are formed from 1/16" sq. scraps. The exhaust pipes shown can be cut from 1/8" sq.

The propeller blank is cut from a block 8" x 1 5/8" x 3/4". The carving is done in the usual manner. The proper balance is important to good performance and deserves an extra share of caution. The propeller blades should be sanded to the smoothest surface obtainable.

The shaft of .028 wire is bent to shape at the prop end and imbedded in the hub. Force a bearing similar to the one used on the plug into the rear face of the hub. Place a loose washer and the plug on the shaft before bending the rubber hook.

The motive power is eight strands of 1/8" flat rubber and should be lubricated if the maximum performance is hoped for.

Wings

Using the rib patterns provided, cut the ribs from 1/32" sheet. Pin each set of the main ribs together and sand until uniform. Cut the notches required to receive the spars. The spars of 1/16" x 1/8" are pinned to the bench. To them are cemented the ribs at the proper spacing. The leading edge of the top wing is 1/8" sq. That of the lower wing is 3/32" sq. The trailing edges of both wings are shaped from 1/16" x 3/16" stock. The wing tips and the center section cut out are of 1/16" sq. bamboo bent by candle flame to the required shape.

The dihedral of the top wing is 1/2" and is incorporated by cracking the spars at the points designated. The tips are supported by blocks until the recemented spars have dried. The 3/4" dihedral in the lower wing is attained by slanting the first rib. The first two ribs on the bottom wing are supported by inserted pieces of 1/16" sq. as seen on the wing plan. The top wing is also braced by 1/16" sq. at the designated locations.

To cover, use separate pieces of tissue for both sides of the lower wing panels. The lower surface of the top wing is covered with one piece. Three pieces of tissue are needed to cover the upper surface of the top wing, one for each flat section. The finished covering is lightly doped.

Center Section and Interplane Struts

The center section struts are sanded down to 3/32" x 3/16" and streamlined. The interplane struts are 1/16" x 3/16".

Attach the center section struts to the fuselage at the proper locations. Check them for alignment before the cement has set. Scrape away a small piece of paper at each of the points on the wing surface to which the struts will be glued. The wing is glued to the center section struts and temporarily fastened by pins. The lower wing panels are attached to the fillet structures. The incidence of the top and lower wings is 1/16" and 1/32" respectively.

Place some convenient object under each of the lower wing tips to support them at the proper dihedral until the interplane struts have been attached. These struts are attached at the positions shown on the side view and on the plan view of the wing framework. The load and lift wires are black thread. They are fastened to the strut ends with a drop of cement.

Bomb, Rack and Machine-Gun

The bombs and machine-gun are made of scraps of soft balsa. The fins on the bombs are cut from stiff paper. The bombs are slotted to allow placement of the fins.

The rack consists of a frame of 1/16" sq. Two parallel strips are suspended lengthwise below the wing. Small perpendicular strips hold the main frame to the wing ribs. They are attached to the second and third ribs of the lower wing. Small pieces of wire are forced into the rack and into the bombs below so that the assembly appears as designated on the side view. The bombs are intended on the model to be of ornamental use only.

Paint the bombs and gun black.

Flying the Model

If possible, test the ship over deep grass. If none is available, fly the model on a few turns R.C.G. As the correct balance is ascertained the turns may be increased. If it is necessary to warp the elevators more than 1/16", a small weight should be used for balancing purposes. The original flew without adjustments of any sort. If the Osprey is correctly built, you can expect it to speed at least four hundred feet when a winder is used. If you value your model, fly it in the open. The distances that it is able to cover in a few seconds are exceptional for this type of model.

Bill of Materials

Strip Balsa

4—1/16"x1/8"x36". Wing and tail spars.
5—1/16" sq. x 36". Stringers and tail.
1—1/8"x3/8"x6". Landing Gear.
1—1/8"x1/4"x14". Landing gear.
3—1/16"x3/16"x24". Interplane struts and trailing edges.
1—1/8"x3/16"x24". Center section struts.
1—1/8" sq. x 24". Leading edge.
1—3/32" sq. x 24". Leading edge.

Sheet Balsa

1—1/32"x2"x24". Ribs and cockpits.
1—1/8"x2"x28". Former stringers and cowling.
1—1/16"x3"x24". Bulkheads.
1—1/4"x3"x18". Cowling.

Block Balsa

2—5/8" sq. x 1/2". Fillets.
2—5/8"x1 1/8"x3/8". Fillets.
1—8"x1 5/8"x3/4". Prop.
1—5/8"x1" sq. Nose plug.
1—3/8" sq. x 4". Cylinders.

Miscellaneous

1—1 oz. cement.
1—2 oz. clear dope.
1—pr. 1 3/4" wheels.
1—5/8" tail wheel.
1—scrap celluloid.
8 ft. 1/8" flat rubber.
2—white tissue.
1—3/8" washer.
1—scrap bearing tin.
1—8" .028 music wire.
1—2" .014 music wire.
2—1/16"x1/4"x12" bamboo.
1—black paint for trim.
Black thread for wires.