

MODEL F-8-F



by JOSEPH H. WHERRY

INSTRUCTIONS to the Grumman Bearcat are covered on page 21 of this issue. We will get right down to the construction of this fine flying model. The author has designed this job to scale of 1/8" to the foot, giving it a span of 10 feet. Designed with accent on scale and lightness, you need have no qualms about your model's flying qualities. Start with the fuselage which is of balsa wood. Bulkhead and keel construction. All bulkheads are cut from 1/16" balsa with the exception of No. 1 which is of 1/8" material. Lay the 1/16" top and bottom keel pieces directly on the plan and pin in place. Cement additional strips of like size in place at the ends of the fuselage as well as the strips upon which the elevators rest. This work at this early point will insure correct alignment of the elevators. The formers are made in two halves and glued in place on the keel pieces. Take care that they stand exactly at right angles to the keels. The side keel piece may be added, or may be left until the opposite bulkhead halves have been attached. Remove the section from the fuselage and add the bulkhead halves to the opposite side. The author prefers to add the side keel pieces after the bulkheads are in place. In this case, and by working from rear of fuselage forward on each side at the same time, much danger of warping is prevented. When this much has dried firmly, add the 1/32" by 1/8" stringers. These are yet deep stringers are stronger than the greater weight than the usual

1/16" square ones. Note that there is a short stringer running from top of bulkhead 4 through 5 to the rudder post. This stringer is omitted at this time. Now the 1/8" discs are added to front of former 1. Note that the two front discs are cut out; check the plans and note the dash lines for the amount. The third disc from front is provided with a 1/4" diameter hole only. After these are cemented in place they may be rounded off to form the cowl front. Small 1/8" discs are added at the center to form the base for the nose plug. Tail surfaces come next and these are built directly over the plans of 1/16" stock. Elevators should be built in one piece; this is easily done by allowing trailing edge and the spar to extend to full span; when the right side has been built, merely invert, move to left and finish. An efficient section is accomplished by adding 1/16" square strips to the tail surface ribs on each side. When rudder and elevators are finished, sand them to the proper streamline section as indicated by elevators on the side view. The wings are next. Cut two each of all ribs; Nos. 1 and 2 are of 3/32" balsa, all others of 1/16" sheet. The leading edge is 1/8" balsa and tapers from 3/8" to 1/8"; the spar is of like dimensions; the trailing edge is 3/32" flat stock 1/4" wide. Before constructing, however, we must trace the right wing plan accurately; then reverse same, retrace again, and we have the plan for the left wing. Pin spars in place over the plans and cement ribs in place very quickly. Before

ribs have time to dry in place, slip a 1/8" sheet of balsa beneath ribs from the rear; now, by sighting along the rear of ribs at board level, we can maneuver this balsa strip so that all ribs will line up perfectly. This is necessary in order that the ribs may be attached to the trailing edge because of the convex bottom surface. Now the leading and trailing edges may be cemented in place. The trailing edge is pinned down on the board while drying; the leading edge however must be firmly held in place with small props and pins because it will be above board level. Tips are formed of 1/8" flat material. Note the small extension caused by the elevators. When the wings are dry, remove from the board and cut away excess lengths of leading and trailing edges; however, leave the spar the length shown. The depth of the spar is best decreased to 3/16" so it will fit between the stringers at assembly later. With a small sanding block—or better yet is a small sandpaper cuticle file such as the ladies use—shape the leading and trailing edges and tips to the proper sections. Attention to this matter now will facilitate covering later. The author found it much easier to cover the tail surfaces first and spray them with water, and to dope them at this time. As always, it is expedient to use colored paper for a light flying model. The part being covered should have the tissue grain running the long way. Right now we are concerned with the tail surfaces, however, and one piece of tissue

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is used on each side of both rudder and elevators. The elevator can be cemented in place as soon as finished. Take care that it is perfectly aligned and setting at the negative incidence. The rudder is attached at this time. Several small installations are made before final and complete assembly: place the small 1/8" flat blocks in place for the rear motor hook and drill a small hole in each for the hardwood dowel. Add the two 1/16" by 1/8" strips to form the dorsal fin just ahead of the rudder. The author used no cockpit outline on the model shown in the accompanying photographs; however, if the individual prefers he may use a balsa paper outline to simplify final covering. The landing gear struts of .040" piano wire are formed with reference to the dash lines on the drawing side and front views. Cement these struts directly to the inside of the No. 2 ribs. A bit of needle and thread work in addition to plenty of cement will assure their staying firmly in place. Fairing may be added by means of rubber tubing, soft balsa, etc., or it may be left off entirely for lightness. Now we are ready to cover the wings. One piece can be used on each side of each half. Spray when covered, and when dry give one coat of clear dope. The fuselage is covered next, with the exception of the portion below the side keel forward of bulkhead 4. Because of the fact that we later use bond paper for the cowl, we'll not cover with any tissue forward of bulkhead 2 either.

Cement the small 1/8" by 3/8" balsa pieces to the rear of the wing spars. A glance at the side view will show how these small pieces aid in mounting the wing. This mounting is very light; a first it may seem impracticable. However, if directions are followed you'll have one of the lightest wing mountings you've had yet on a scale model. Wings are added one at a time. Use fairly thick fast drying cement because you must hold the wing in place as it dries. On bulkhead 3 will be seen certain dash lines. These indicate the angle and placing of the 1/8" flat pieces that were cemented to the spars. Use plenty of cement and take care that the incidence is correct. The wing outline is shown with scale incidence; note, however, the broken line showing incidence for flying model. The wing incidence will be correct if the trailing edge is 5/16" and the leading edge 3/16" below the side keel pieces. Note that leading and trailing edges do not touch the fuselage sides; be concerned only with securing the spar extension to bulkhead 3. When both wings are securely in place the spaces between wings and fuselage are filled in with scraps of soft balsa sheet. Cover the uncovered portions of the fuselage; also cover the balsa fairings with bits of colored tissue. Note that the Bearcat employs no fillets at the wing root. Now we are almost on the home stretch. Cover the nose between bulkheads 1 and 2 with bond paper for a realistic cowling effect. Add the antenna mast which can be either a sliver of bamboo or hardwood.

Cover around the elevators and rudder if you have not already done so. Here is where the short stringer mentioned earlier comes in handy in forming the fillet between elevators and rudder with scraps of tissue. Cover the dorsal fin and add the antenna of black thread. The fairings or wheel "fenders" may now be cut from either heavy bond paper or from 1/32" sheet balsa and cemented in place. A dummy auxiliary fuel tank may be made for that model that will grace a mantel. The tail wheel mount is made of 1/8" thick balsa, is streamlined and cemented firmly in place. A small piece of aluminum can be cut to shape to hold the small hardwood wheel. With the addition of air intakes and machine guns (positions of which are shown by arrows on wing plans) with black dope or India Ink our Bearcat nears completion. The most difficult part of all is the cockpit canopy. First carve a dummy canopy of balsa with close attention to the front view. Note that the canopy tapers or slants inward at the bottom. Finish this dummy with fine sandpaper. Use one of the prepared chemicals now on the market to form this canopy; or you may heat celluloid sheet and stretch it over the form. Carefully fit it in place and with small tissue scraps fill in between it and the rest of fuselage. Black tissue or dope is used to mark off the cockpit lines.

Carve two propellers to dimensions shown. Notch one on the front and the other on the back and cement together. This prop is stubby but it is efficient. Use the regular steel wire shaft upon which a nose plug and bearings have been mounted. Install at least three loops of 1/8" flat rubber which has been well lubricated and the model is finished. The built-in downthrust (just like the real ship) together with the incidence provided in the wings and tail surfaces will give you a fast climbing model if you have done accurate work. First, however, test glide your Bearcat in tall grass. If it stalls, add small weights to the nose; if it dives, add weight to the tail. When a good glide has been achieved, try about 50 turns of the prop and hard launch. If results are good, pack in the power and let 'er go. A little experimentation with various thrusts and weight combinations will bring out the best flights. ROG flights can be gotten out of this lightweight model with ease. The model shown here is colored navy blue with a red nose. Colored dope was used only on the cowl front, tail wheel, and the few small details. Acknowledgment is extended to the author's friends, Bruce Dietrich, who did the photography and John W. Sonner who assisted the author in construction.