F4U Corsair

By Pavel Bosak

Speedy and attractive, this four channel sport R/C version of the "Bent Wing Bird" really performs!

PHOTOGRAPHY: PAVEL BOSAK

Designed as a sport scale version of the illustrious F4U *Corsair,* the author's ship flies on a .40 schneurle engine, has the advantage of a space-saving wing span, and has proven itself highly maneuverable.

I wanted to build an attractive, space-saving, fast, and good-flying model in the sport scale category. I chose the F4U *Corsair.* Its thick fuselage and gull wing suited my first requirement pretty well. The choice of a hot .40 schnuerle engine would make it fast and its wing span, space saving. But only time would end up telling how well it would fly. Now, after building and flying it, I can report that it flies very nicely and its speed is so great that it could easily give some stiff competition at the Reno pylon races. At this point, I'm still using only the four primary channels for control without any extra functions, but in the future, I think I shall add a fifth servo for dropping a fuel tank or a bomb to get a few more points in scale competition.

A short *Corsair* history

The *Corsair* was, undoubtedly, one of the most successful Navy fighters to enter service before the era of the jet aircraft. Serving in both the Navy and the Marine Corps, this plane was superior to the Japanese aircraft it encountered in the Pacific theater of World War II. *Corsairs* shot down 2,140 planes against only 189 loses of their own. This extraordinarily high ratio made it better than any Japanese plane and many experts claim that it was better than the Army Air Corps vaunted P-51 *Mustang.* Production of the *Corsair* continued until December, 1952 and it was the last classic propeller fighter produced in America.

The prototype had its maiden flight in May, 1940 and it was quite apparent, even after only the first 30 minutes flying time, that its qualities would be extraordinary. But there was still a lot left to improve. The linkage controlling the aileron had some 96 modifications before the design was settled. The final armament was three 50 caliber machine guns in each wing with 400 rounds of ammunition each. Under each wing there were two bomb racks. The first operational unit got the F4U-1 model in September, 1942. After the 689th *Corsair* was built, a new version was introduced with the more familiar bubble canopy. From that point on, many variants were produced differing in engines or equipment, without any substantial change in its outward appearance.

Construction: wing

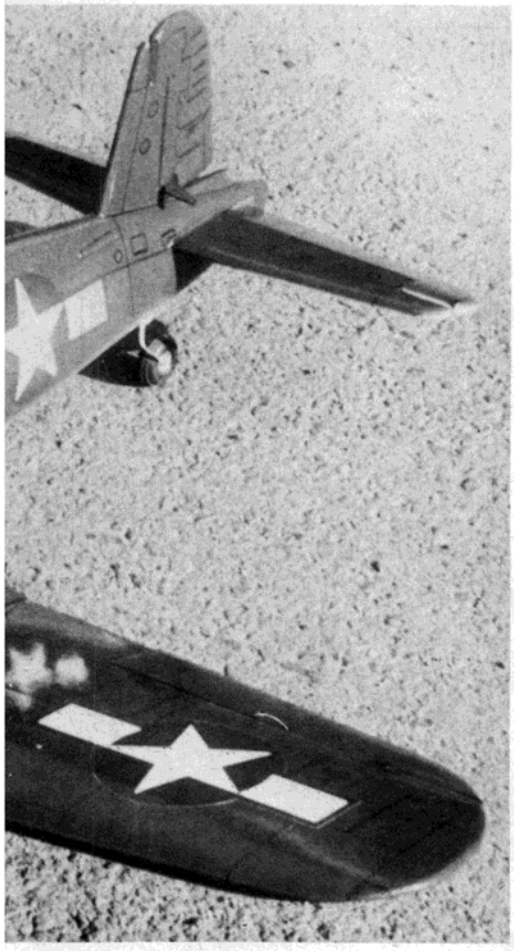
Don't let dreary visions of complex structure put you off. The plane is not *that* complex and can be built by any experienced modeler. Begin with the wings. First cut out all your wing parts. All the ribs are 1/8 balsa. The wing consists of a center section which is built as a unit and two outboard panels which are built onto it. Construction is much easier if you cut out all your wing parts first before assembly.

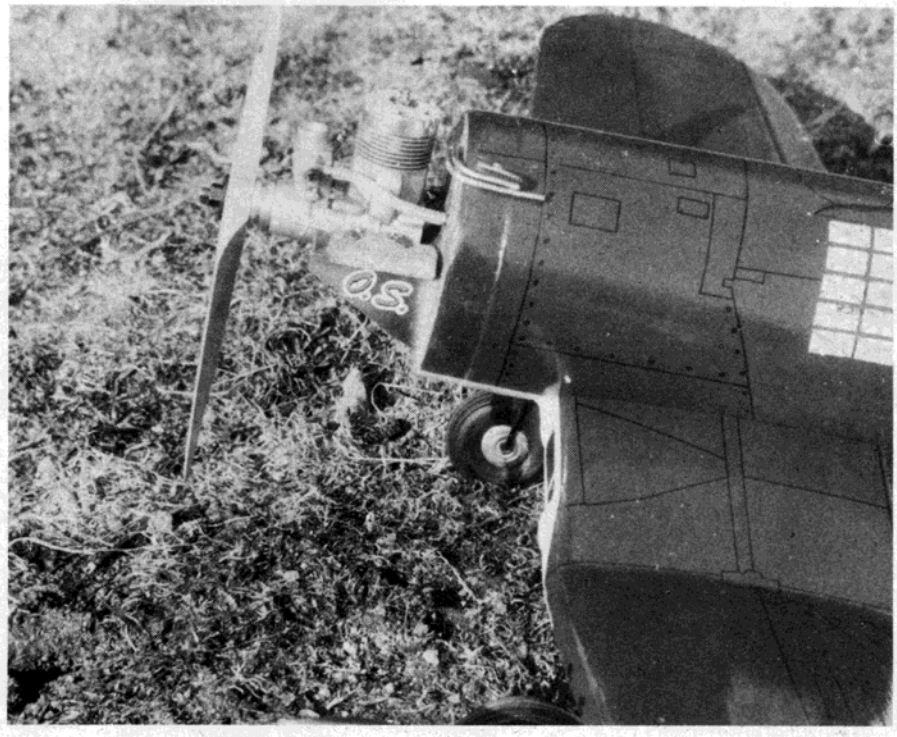
The ribs are all 1/8 balsa. The center section ribs, W-1,2, and 3, are all the same shape and their outline is on the plan. The ribs for the outer wing panels, W-4,5,6,7,8, and 9, are made by what I call "rasp interpolation". It's the sandwich method of shaping. You'll have to make a ply template of ribs W-4 and W-9 with a chord reference line as shown on the plans. Sandwich ten rectangular pieces of 1/8 balsa between the two templates and bevel the stack to the dimensions of the two end templates. That will give you two each of ribs W-5,6,7,8, and 9. Cut out two more ribs for W-4. After you cut out the notches for the top and bottom spar structure, make sure you also cut out or drill holes for routing the aileron pushrods. It will be quite difficult to do it after assembly.

Assembly of the cut-out parts begins by constructing the full length bottom wing spar and web. Figure A gives you the shape of the two piece web. The two pieces shown complete one half of the wing. You'll need four pieces in all which are joined by the ply dihedral braces W-15 for the center section, and the two W-16s, one for each of the outer wing panels. Consult section A-A, the wing plan front view for the actual dimensions. Assemble the wing ribs over the spar/web assembly with reference to the plans for correct alignment. Rib W-3 will have to be cut to allow for the W-14 dihedral brace to carry through from W-2 to W-4 without interruption. After assembly, add the 1/16 ply doublers to the noses of ribs W-1,2, and 3 for reinforcement of the landing gear block area.

Once that's done, you can add the top spar and you're then ready for the leading edge. It's done in two pieces, forward and rear. The rear piece, W-12, is glued to the noses of the wing ribs and is flush with the bottom and top of each rib "nose". This allows the bottom and top wing sheeting to be glued over the edge of the W-12 rear leading edge for a good firm glue joint and to butt to the rear of the front leading edge, W-13.

Sheeting, ailerons, and wing tip are next and will complete the wing structure. Start





The plans illustrate beam motor mounts with diagonal ply gussets for reinforcement as shown on the author's *Corsair* above. However, any of the commercially available glass filled mounts serve equally as well.

with the bottom sheeting and put in the maple landing gear block. A quick note. The bottom sheeting ends at rib W-9. The rest of the bottom wing is the bottom wing tip cut to the shape shown on the wing's top view. Before adding the top sheeting, install the aileron pushrods. Add the wing's top sheeting, cutting it flush with the front of the rear leading edge, W-12. The top sheeting goes all the way to the wing's tip. Now glue on the forward wing leading edge, W-13, butting it to W-12 and to the top and bottom sheeting. Cut out the aileron bay from the completed wing and add the 1/4 inch sheet balsa, part W-10 to the rear of the wing. Build up the ailerons as shown and hinge to the wing.

Fuselage and tail

By way of introducing you to the more complex fuselage construction, let me tell you that it's built in three basic stages. You'll start with the forward fuselage first, aligning and planking it with 1/4 inch thick strips of balsa cut 1/2 inch wide. Second stage in the sequence will be to build up the cockpit/canopy area. After that you can then finish things off with the rear fuselage and tail. Since this isn't one of those "box" type structures you'll have to use a fuselage jig; whether a commercial one or a home-brew type is up to you. I'll very briefly outline my method but use yours if you're more comfortable with it.

So, get things ready by cutting out all the formers and drawing the vertical and horizontal reference lines on them for alignment

purposes. When that's complete, make sure you plot and drill the holes necessary for the throttle cable, engine mount, and fuel lines in the firewall, F-1. Don't forget the tail wheel bracket, as well, for the rear former, F-6.

Now for the assembly, Cut a bunch of those 1/4 by 1/2 inch balsa planks to a length that's longer than the fuselage. Take three of them to use as longerons to hold the first four formers, F-1,2,3, and 4, in place. Use one strip as a bottom keel and place the respective formers on that and then add a strip to the right and the left side of the formers to hold them firmly in place. Start from the bottom and add more 1/4 by 1/2 inch planks until you get to the cockpit floor area. Be sure you constantly check alignment and correct any bends or twists.

Once you've gotten to the cockpit area, construct a floor from the top view shown on the plan. Add former F-4A and then create some type of plug for the shape of the canopy which I made by vacuum forming it with some acetate sheet over a balsa plug. If you prefer, you can just carve a balsa canopy, but for structural purposes, you'll still have to construct a cockpit.

The third sequence involves the tail. To start, take one of the planking strips and center it on the top of former F-4A and then glue it in place. Take formers F-5 and F-6 and position them between the top and bottom keels and glue in place. Continue the planking process. When the entire fuselage is finished, you'll have to fill in the cracks with your favorite filler and then sand it to its final shape.

Use the outlines shown on the plan to cut the 3/8 sheet balsa fin, rudder, horizontal stab, and elevators. As indicated, use 1/8 inch music wire as a joiner for the two elevator halves. You'll have to cut out the slots for these parts in the fuselage and do so carefully to insure the proper incidence angles. The only thing left to do is the engine cowl. Take some 1/32 ply and form it into a tube the circumference of the firewall, F-1. Then cut a one inch thick, circular block of balsa, the same diameter as the ply tube and glue it to the tube. Cut out the hole for engine cooling and prop shaft and then sand the lips of the cowl round.

Finish

It's your choice. I used the venerable old method of dope and silkspan, but with the advent of the mylars such as MonoKote™, or the heat shrinkable woven fabrics such as Coverite™, the options are many. Resin and light glass are also feasible. Nothing, however, is going to hide a poorly prepared surface. So make sure all the dents and dings are filled and the entire surface sanded smooth and the dust wiped off the model. The color schemes for the *Corsair* are numerous and there's no lack of articles or books which document this popular aircraft.

The author poses with his *Corsair;* one of the more renowned World War II planes. For those considering construction, there are plenty of sources for scale reference to add a little more authenticity to the plane.

Into the wild blue

There are still a few things to consider before you commit your model to the air. In my case, an OS .40 FSR provided the power for the plane and was able to deliver the fast performance I had originally hoped for. If you prefer more docile performance, a smaller displacement engine such as a .25 or even a hot .20 (as long as the weight is kept way down) will fly it well enough.

Check the throws of the rudder and the elevator. In the case of the rudder, make sure that when it is at full deflection it does not interfere with the movement of the elevator in the "up" position. As for the elevator, deflections of 7° "up" and 10° "down" will give you plenty of maneuverability. If there's more deflection than that, you'll experience snap rolls.

With everything in the model except fuel, check that the balance point is at 25% of the wing chord. Don't deviate from that. The plane is still capable of the whole F3A pattern while remaining very stable. During take-off, keep the rudder in neutral position and only correct direction as needed. After a 50 foot run, it's ready to test its wings. Mine was a joy to fly. I hope your's will be too.

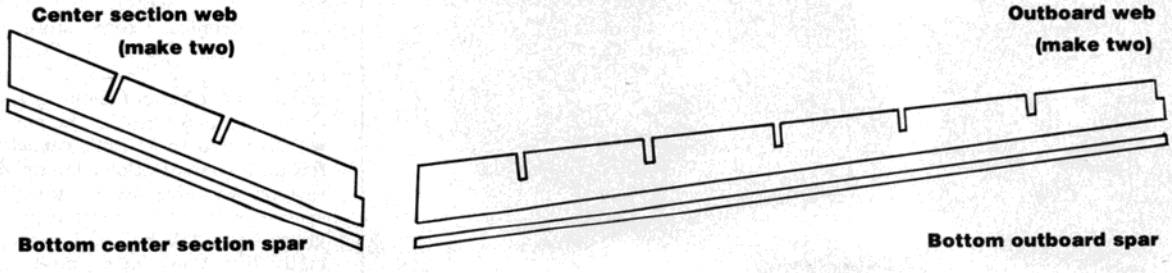


Fig. A Drawing not to scale