

No one remembers the Kingfisher except those guys who were plucked out of the sea after their more glamorous Hellcats and Corsairs let them down, or the lonely G.I.'s stationed all over the Pacific who got their valued letters from home in mail sacks tossed out of the observer's hatch. Yet, to most, it still remains a rather obscure aircraft. Surprisingly though, this aircraft played an important role in basic airframe design by being the first aircraft to feature a nonbuckling fuselage. The Kingfisher pioneered the, then new, spot welding technique, thus enabling the construction of a strong monocoque fuselage resulting in substantial weight savings.

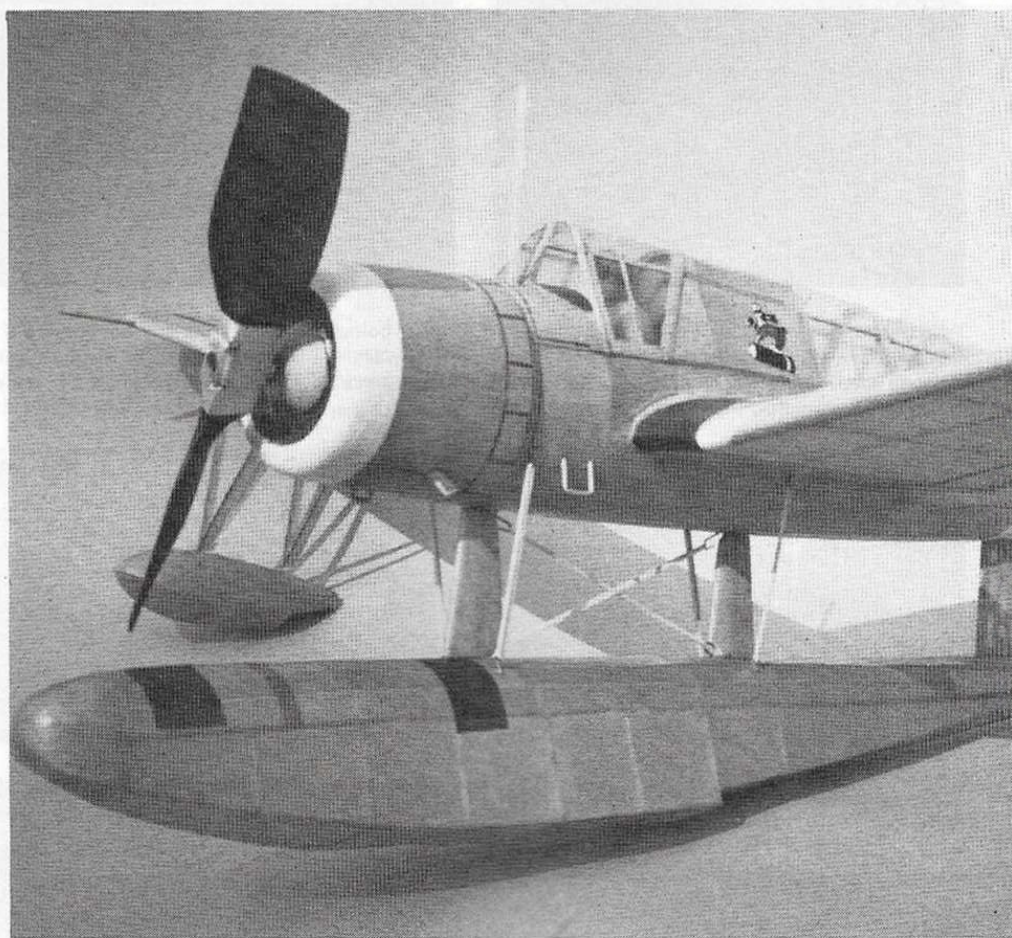
Originally designed as an observation aircraft for battleships and cruisers, the Kingfisher became a master at such diverse duties as rescue, reconnaissance and anti-submarine patrol along with their primary function of directing naval gunnery barrages which accompanied troop landings.

One can imagine the jolting experience it must have been to be launched off a battleship catapult with the same charge as that used to fire a naval five inch shell. Upon returning to its battleship, the Kingfisher would land in the slick created by the mother ship's sudden turn to port or starboard. After securing to a trailing line the little scout would be hoisted aboard by one of the deck cranes.

Of notable exception to the mundane day-in, day-out scouting and patrolling was the aerial victory over a Japanese Zero which occurred while directing bombardment gunfire just before the invasion of Iwo Jima. She might have been slow, but she was maneuverable and sometimes deadly.

The model of the Kingfisher is done in $3/4" = 12"$ which results in a span of 27 inches. I chose to build the pre-war version, OS2U-1, primarily because the Navy had such an attractive color scheme at that time. These colors are available in domestic or Japanese tissue which eliminates the need for spray painting. My model represents an OS2U-1 Kingfisher from the battleship Mississippi.

The colors used on this model are: fuselage and wing bottoms - light grey; stabilizer, rudder and rear tail cone - blue; and, top surface of the wings - yellow; in addition, using white strips on the fuselage, cowl, and wings. My model has interchangeable floats and landing gear. The prints show either method of con-



PHOTOGRAPHY: MOPSY MIDKIFF

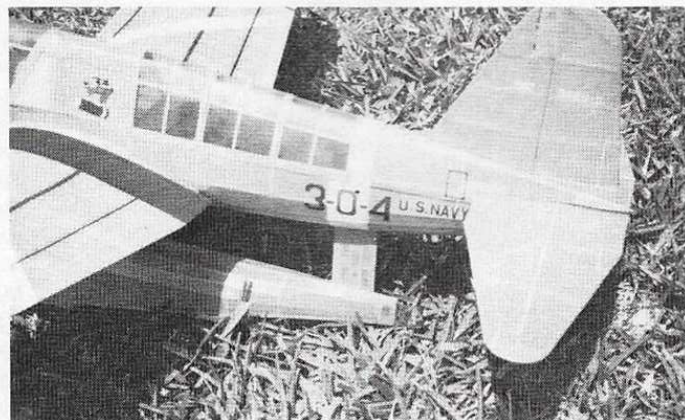
a Rubber Scale: **Kingfisher**

By Mike Midkiff

Take your choice: floats or wheels. This gorgeous freeflight rendition offers both.



The center float pylons plug into the fuselage and are retained by rubber bands. The wing floats should be as light as possible.



Three pieces of celluloid make up the observer's canopy. It helps simulate the appearance of sliding hatches which telescope into one another.



struction, but the float version requires an 8 inch diameter prop whereas the land version should be at least 10 inch diameter.

Construction

Start construction with the fuselage by building two identical framework sides, later joining with the appropriate cross pieces. Note that the engine cowl is built separately and is joined after covering. Glue all of the top, side, and bottom formers in place, as well as those which form the front and rear canopy frames. Add all the bottom, side and top stringers which are medium hard $\frac{1}{16} \times \frac{3}{32}$ balsa. Add the $\frac{1}{16}$ wrap around sheeting between formers #4 and #5, the $\frac{1}{8}$ wing base plates, the landing gear and/or float tube sheeting along with the two $\frac{1}{16}$ ID tubes for the float pylons.

Fill in the two top turtle back areas with soft $\frac{1}{32}$ sheet. Build up the cowl by joining the #2 and #3 formers with four pieces of $\frac{1}{8} \times \frac{1}{4}$ stub stringers. Wrap this with $\frac{1}{16}$ sheet and add the two front cowl rings. Carefully locate the two aluminum wing mount tubes; the front tube is $\frac{3}{16}$ ID and the rear tube is $\frac{3}{32}$ ID. Also locate and glue in place the $\frac{1}{16}$ ID main LG tube. Finally, shape and hollow out the rear fuselage cone and glue in place.

Build the two wing panels in the conventional manner, adding the dihedral break where shown on the plan. Align the wings to the fuselage and assemble the wing tubes in place. Take care with their alignment so that each wing panel has the same dihedral, incidence, and distance from the front. It might be a good idea to glue the tubes into the wings sparingly until final alignment is made, if required, by shimming the tubes and then gluing solid. Assemble and glue all the wing gussets and tip float supports and tubes if used.

FLYING MODELS

The stabilizer and rudder are built as flat structures using $\frac{1}{8}$ square for the leading and trailing edges; $\frac{1}{8} \times \frac{1}{16}$ ribs; and $\frac{1}{8}$ sheet tips and gussets. Note that the rudder and fin are built separately so that the rudder may be offset and tack glued in place during flight trimming.

If you choose to build the interchangeable float version, the main center float and the two wing tip floats must be built as light as possible. The main float is constructed on a center keel with light $\frac{1}{16}$ sheet bulkheads notched and glued in place. Add the $\frac{1}{16}$ square side stringers and the $\frac{3}{32} \times \frac{1}{16}$ top stringers. Note that on the $\frac{1}{16}$ square verticals between the bulkheads, each set must have an upper and lower cross piece $\frac{1}{16}$ square. These prevent buckling of the stringers between the bulkheads. Glue in place the mounting tubes and the six $\frac{1}{32}$ wire hooks. Sheet the area between the top stringers where the pylons attach. Carve and assemble balsa blocks to the front and rear of the float, and sand these blocks to final shape.

Make the wing tip floats from very light balsa or expanded polystyrene foam and hollow out to make as light as possible. Glue the $\frac{1}{32}$ wire float struts and braces into the float. Be sure that the two main struts pass through the float and are secure on the bottom. Use card stock or thin balsa for the strut fairings.

Tissue Covering

Sand lightly all the structures which get covered and apply two coats of full strength dope. Sand lightly after each coat dries to remove the balsa fuzz which stands up after the dope dries. Dope a third coat on all the outlines of each structure where the tissue will cover it. Cover the stab and rudder assembly with one piece per side. Cover each wing panel bottom with one piece; however, the top of each panel will require two pieces due to the dihedral break. The fuselage can be covered in four pieces if you happen to be using good wet strength, Jap tissue, and the tissue if moistened before each piece is applied.

After all of the structures are covered, water shrink all tissue areas. Dope the fuselage

and wings with four coats of 60/40 thinned clear dope and the stab and rudder with three coats of 50/50 thinned clear dope.

Canopies

Cover the observer's canopy with three separate pieces of celluloid, working from the rear forward, one section at a time. This gives the appearance of the sliding hatches on the full size aircraft, which telescope into each other when open. Cover the pilot's canopy with three pieces of celluloid; the front windshield is one piece, the area between the windshield and frame #5A is the second and the sliding canopy section is the third separate piece.

Assembly

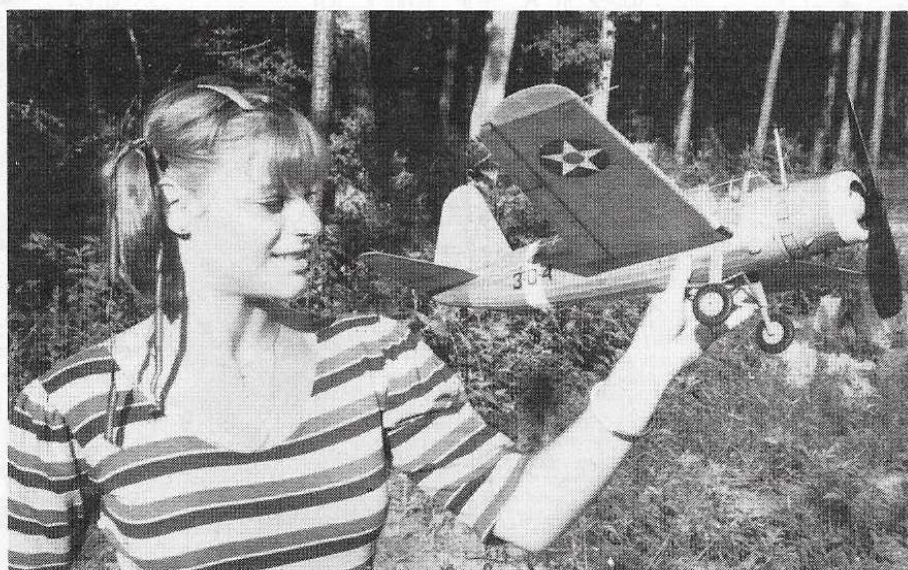
If you are flying the float version, the model will require an 8 inch diameter propeller, otherwise use a 10 inch diameter propeller. The landing gear springs open to assemble into the tube below the wing, and the rear struts plug into the rear tube. On the float version, the float plugs into the bottom of the fuselage and is held on with six rubber bands which simulate the support cabling on the full size Kingfisher. The wing tip floats simply plug into the four tubes built into each wing panel.

Detail

The pre-war insignias are spray painted using an air brush. The heavy black lines are done with black tissue strips and the thin lines (aileron and flap separation, etc.) are done with a fine point "sharpie" marker. Exhaust stacks and steps are built from aluminum tubing. Window framing is done with two layers of appropriate colored tissue using spray adhesive to attach. The antenna is made from $\frac{1}{32}$ plywood.

Flying


The land plane version uses four loops of $\frac{1}{8}$ rubber approximately $1\frac{1}{2}$ times as long as the distance from the prop to the rear peg. Trim the model with a slight amount of wash out on the left wing and a little more on the right wing. Check to see that there is approximately two degrees decalage between the



Lovely Cindy Midkiff holds the conventional gear version of the Kingfisher. Mike built his model to have interchangeable floats and landing gear. Main gear struts spring open to plug into the fuselage.

wing and stab. If not, adjust the stab until there is. Ballast the nose or tail to achieve the center of gravity as shown on the print. Not until all the above are done should you attempt trimming flights. Pick a day with less than five MPH wind, and a field with at least 12 inches of protective grass. Do not attempt trim flights if there is more than a five MPH wind. Windy or gusty conditions make for erratic trim flights which cannot be interpreted correctly to make the appropriate thrust line or control surface changes.

Start trim flights with approximately 200 winds and 2 degrees of right and down thrust. Trim to achieve a good climb first. With only thrust line shimming, achieve a shallow, wide, left-hand climbing circle. With maximum winds, this should get the model to 100 feet of altitude without a stalling or galloping climbout pattern. Once you are satisfied with the power burst and climbout, trim the glide. Use the rudder only for this. A wide turn to either right or left is okay after climbout. If the rudder must be used to achieve a circling glide, corresponding thrust line changes must be made. For example, if left rudder is needed for a good circling glide, a little more right thrust must be added to keep the climbout unchanged.

The float version takes the same size motor, but a somewhat shorter one so that there is more punch to break the water's suction on the float. The water rudder must be be used to counteract the tendency to turn left since torque causes the left wing float to "dig in". With the power burst, the model will skim forward on the main and left float. If the appropriate right water rudder is set correctly, the model will travel relatively straight until the wings level out and she majestically lifts off the water. The seaplane version may fly only 25-30 seconds after breaking water, but seeing the Kingfisher in its water element, circling and dropping lower for a soft water landing will definitely bring back a new and thrilling dimension to rubber scale flying. 



Cory Capps shows off the float version with its eight inch diameter prop (above left); land version uses a ten inch prop. The assembled wing panels show (above right) the plug-in dowels used to attach to the fuselage. The center float attached to the fuselage (below); the float is a built-up structure. Keep it light.

