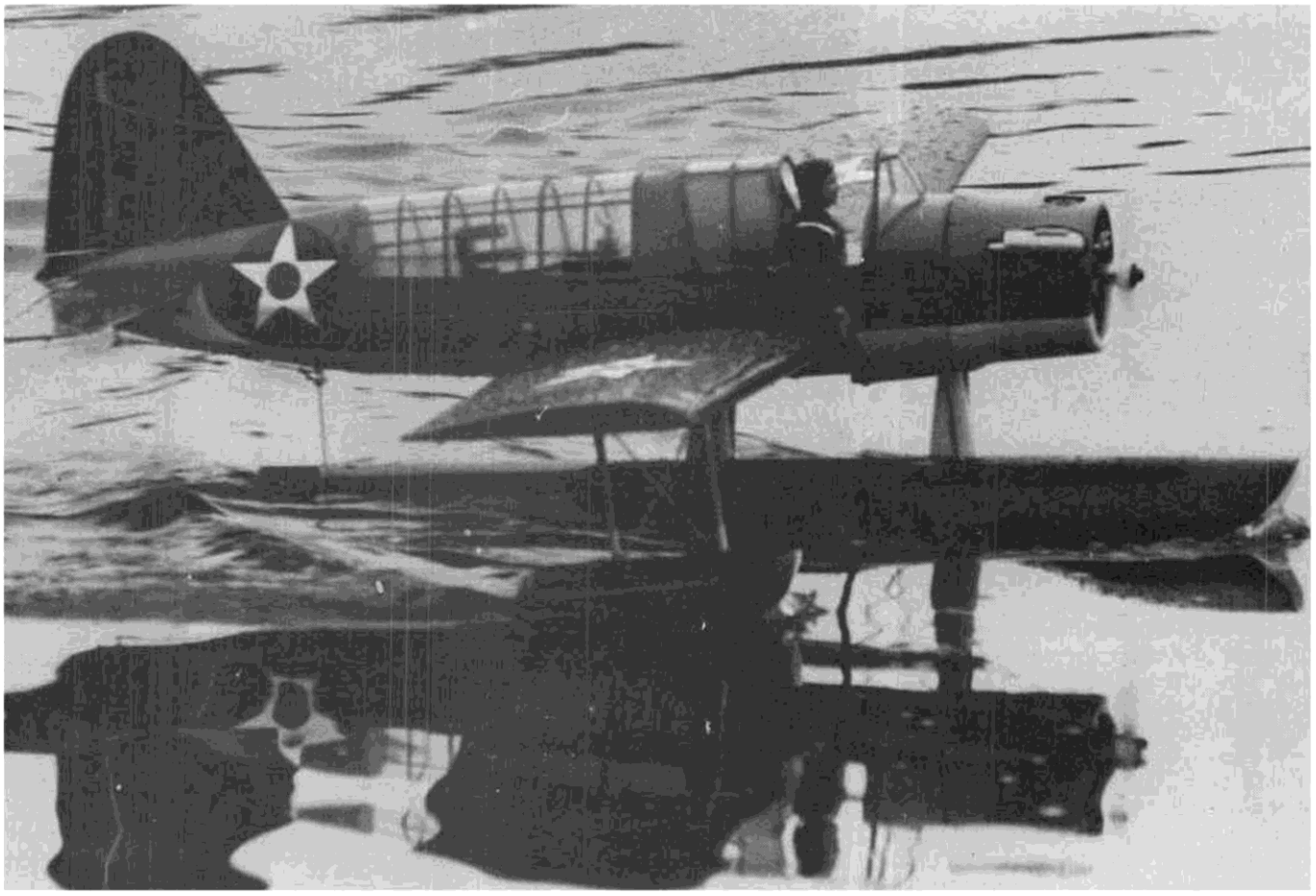


VOUGHT ✪ OS2U-1 ✪ "KINGFISHER"

By ELIOT KIMBLE . . . A fine combination; moderate size engine (OS Max .25), 48 inch wingspan, easy flier with flat-bottom airfoil, and best of all . . . semi-scale of a popular WW II Navy floatplane.

• The Vought OS2U-1, better known as the Kingfisher, came into being in 1938. It was powered with a 450 HP Pratt and Whitney R-985-4 Wasp Junior 9-cylinder radial air-cooled engine, and had a maximum speed of 177 M.P.H. This first model was delivered to the U.S.S. Colorado in 1940. Later, due to modifications in service equipment and the use of the R-985-50 engine, it became the OS2U-2. The OS2U-3 was produced in 1941 and was powered by either the R-985-AN-2 or -8 Wasp Junior. By the end of 1941, all naval observation squadrons were equipped with the OS2U.

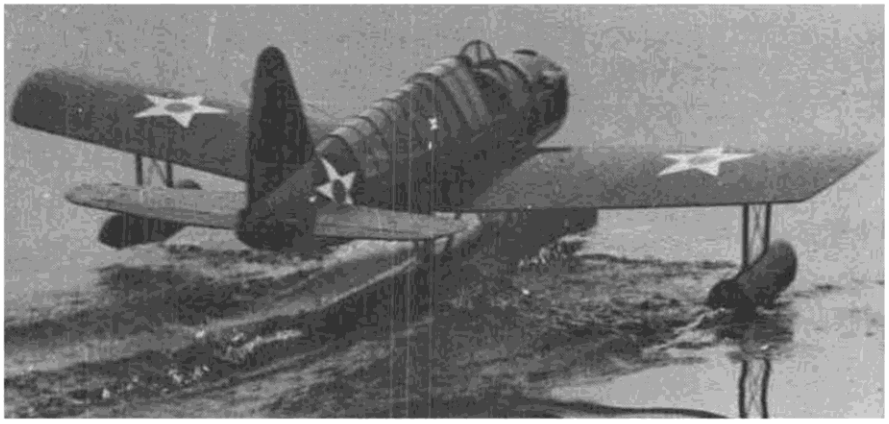
Although Vought produced the largest number of Kingfishers, 300 were manufactured by the Naval Aircraft Factory and were designated OS2N-1. All production of the Kingfisher ceased in 1942.

Spotting for naval gunfire, reconnaissance, anit-submarine patrol and liaison, were just some of the chores performed by the Kingfisher. It operated from catapults on battleships and cruisers, and from seaplane tenders and shore bases. Overall performance was improved when fitted with wheels, by increasing the cruising speed from 119 M.P.H., with floats, to 125 M.P.H. with wheels. The service ceiling also increased from 13,000 feet to 15,500.

In 1942, an OS2U-3 made national headlines by rescuing Captain Eddie Rickenbacker and his crew, who had been adrift in the South Pacific in a rubber raft for 3 weeks. With the seven men lashed to the wings and jammed into the cockpits, the pilot of the OS2U taxied 40 miles in rough seas before being picked up by the rescue ship.

I had several reasons for building the Kingfisher. I like water flying, I like realism, and I like to be different. In addition, the profile of this plane turns me on. There is no prettier sight than when it's up on the step, skimming across the water, getting ready for lift off.

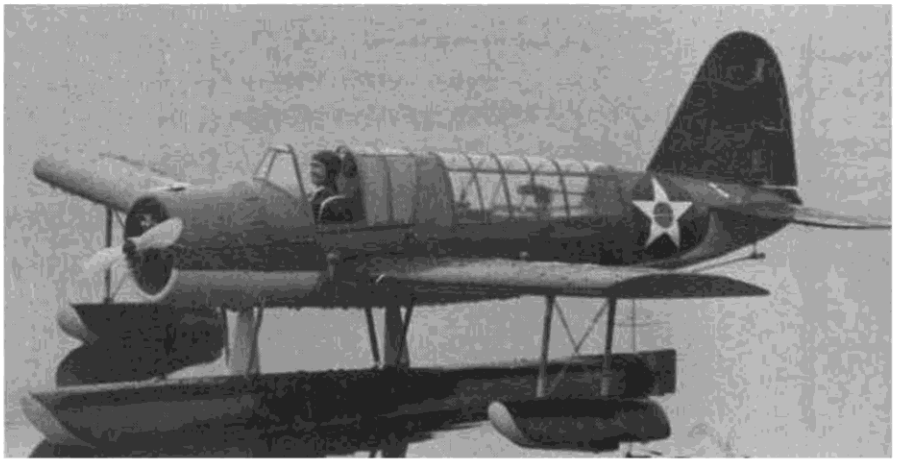
This model is far from scale but retains enough of the original outline to give the realism desired. Unlike the man-carrying machine, the model is



The "Kingfisher" plows through the water at low speed in the water, affording excellent handling and control of direction. At full speed, a tap of down elevator gets it "on the step".

quick to take off and is easy to fly. This is due mainly to its low wing loading . . . it is important to build it light. Remember, water is more forgiving than dry land, and does not require the building of a semi-solid model.

The following building instructions are for proper sequence only, many details are not mentioned, I am assuming that an experienced builder will apply his own techniques and know-how to its construction.



The author's model of the "Kingfisher" is extremely easy to fly and very stable in the air. Outboard floats will "knock off" if necessary. Note rubber bands holding main float in position.

Begin fuselage by cutting out all formers. Using the top view as a pattern, make two identical crutch halves out of 1/8 medium-hard balsa, two 3/32 plywood crutch doublers, and two 3/32 balsa doublers which extend from former 1 through 5. Cement balsa and ply doublers to top of crutch halves, making a right and a left crutch.

Mark position of plywood firewall in place. Place this assembly bottom-side up on work surface, with top of firewall hanging over the edge of work surface. Mark off position of bottom formers 1 through 6 and 13 through 16. Cement bottom formers 1 and 2 together and cement in place on crutch. Chamfer forward edge of former No. 5 and glue to No. 4 . . . cement these to crutch. Cement former 6 and 13 through 15 in place.

Prepare hardwood motor bearers and cement in place. Cement 1/8 ply dowel base in place across motor bearers. Prepare 5/8 dowel per plan, and cement to dowel base and former No. 5, add 1/8 ply side and rear dowel braces. Cement 1/8 ply wing dowel supports and former No. 6A in place. Cement hardwood screw eye blocks in place on former No. 5. These should be flush to the edge of the former.

Cement 1/8 balsa fill between formers 2 and 3, cement former 13A and rear wing dowel supports in place. Cut and fit 1/8 balsa keel pieces between formers 13, 14, 15 and 16. Be sure to add the hardwood insert in bottom keel piece between 14 and 15. Cement 3/8 balsa wing seat in place and sand flush with crutch and formers 6 and 13.

Remove this assembly from plan and construct top half of fuselage in the same manner.

Top cowl is removable, but will be built in place, then cut apart after fuselage has been sheeted.

Tack-glue 1/16 balsa cowl bottom strips in place on top of crutch. These extend from former 1 to front of firewall, and from rear of firewall through former 19. Do not glue these to firewall. Cement formers 1 and 2 in place on cowl strips. Cement formers 17 and 18 in place. Do not cement to firewall. Use pieces of playing card or something of similar thickness between formers and firewall to provide a loose fit for easy removal of cowl when finished. Chamfer forward edge of former No. 5 and cement to No. 4. Cement both to cowl strips. Add formers 19, 20 and 21.

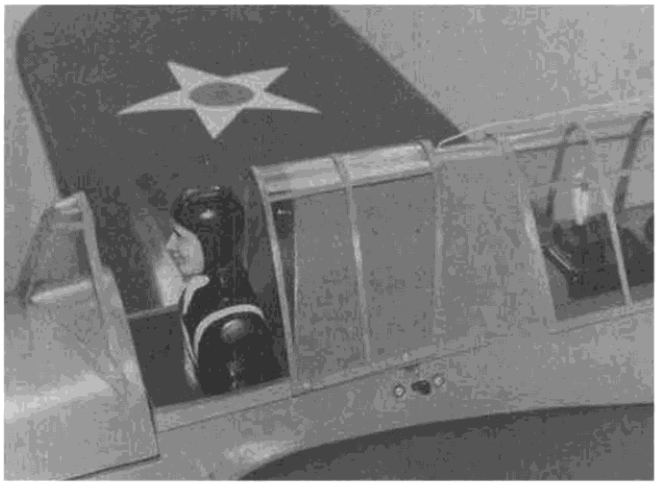
Since cowl separation is between formers 19 and 20, try not to glue these together. Cement 1/16 sheet cockpit cover to top of 20 and 21, and sand flush to edge of formers. Add formers 21A through 27. Cut and fit top keel pieces and 1/8 sq. stringers, cement in place. Add 1/16 sheet rear cockpit cover, and sand to contour of fuselage. Glue in 1/8 sheet between formers 25 and 26 for Nyrod exit support. Glue in 1/4 x 1/8 balsa stab supports and tail block. Install Nyrod for rudder and elevator control.

Check all formers for proper alignment and re-shape where necessary. In order to keep weight to a minimum, the original model was sheeted with 1/16, however I would recommend using 3/32 sheet, which will allow better sanding and a truer fuselage shape. Cut slot in tail for stab. Add simulated cowl flaps.

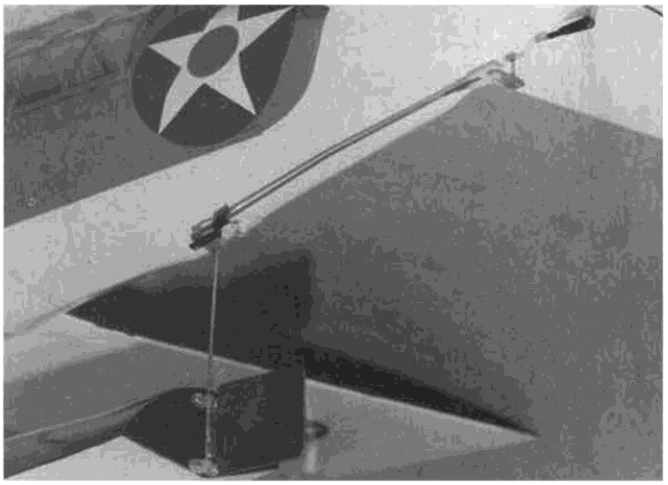
Fuselage is now ready for the finish of your choice. I used silk and dope on fuselage and fin, and Monokote on wing and stab. Top of fuselage is light blue, underside white. Top of wing and stab dark blue, underside white.

Top cowl may now be cut away from crutch and 1/8 balsa fuel tank floor can be cemented between motor bearers. Plug any gaps to prevent water from entering the forward fuselage compartment. Treat inside of cowl and fuel tank area with a liberal coat of resin.

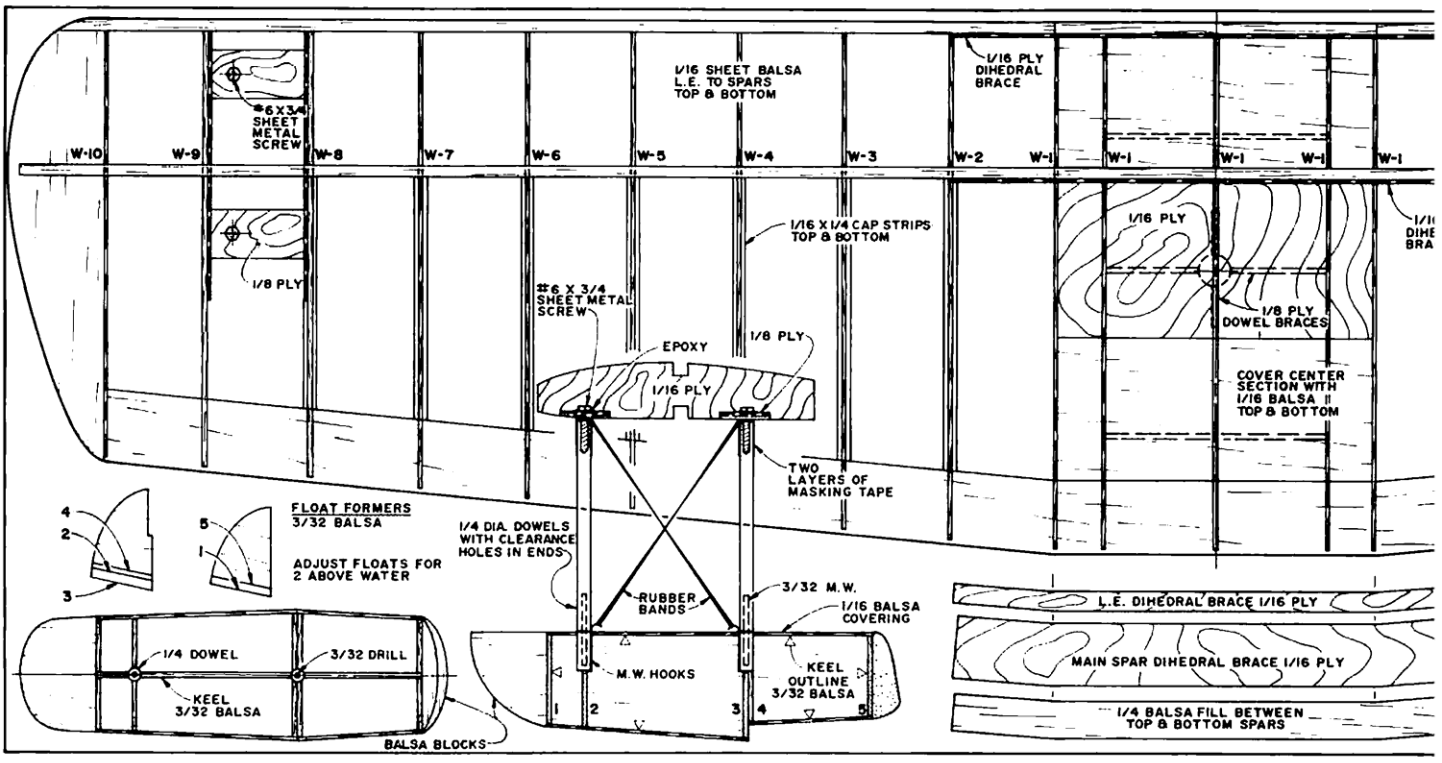
Prepare a set of aluminum motor plates and install the engine. I used an OS Max .25 with muffler, and have power to spare. An RST 6 tank fits nicely under the cowl, and is held in

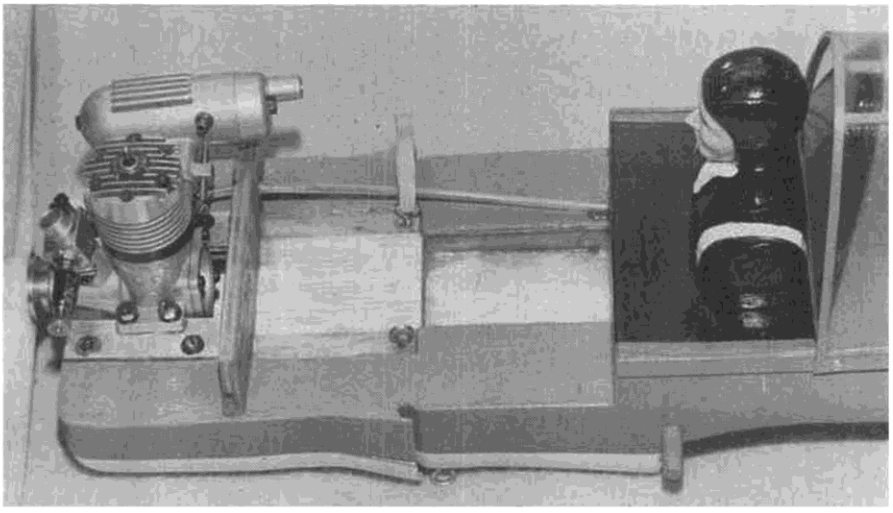


No "Chicken Scale" detailing here. This is a true Sport Scale model. Just enough stuff to show up 50 feet away, or in the air.

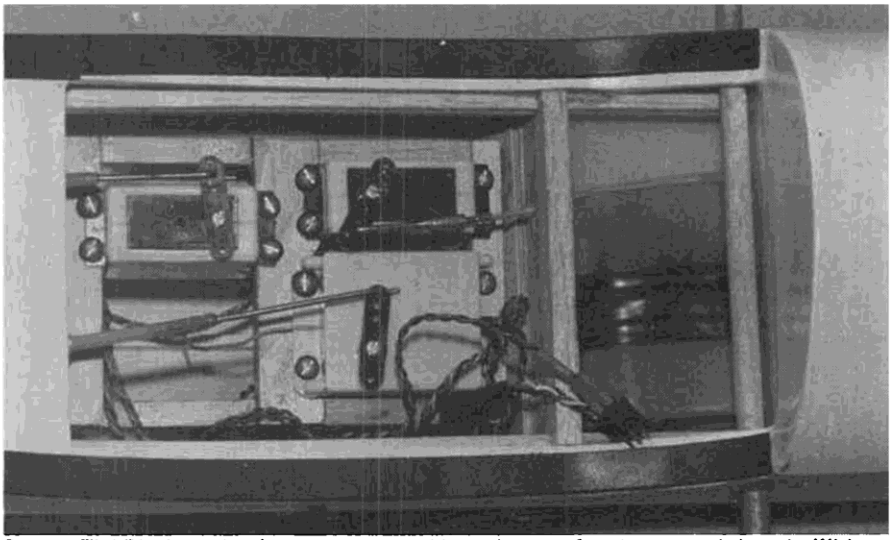


Water rudder linkage from air rudder. At any other angle than this, it is quite unobtrusive. Touch-and-go's are author's favorite trick.





How much access to the power compartment could you want? OS Max .25 with muffler has plenty of oomph for this 3-3/4 pound aircraft. No water entry problem here.



Cannon Tini-Block receiver/servo operates rudder, other two for elevator and throttle. With rubber wing seat/seal, only a total dunking would get radio gear wet.

place with a rubber band hooked to a screweye on each side of the tank.

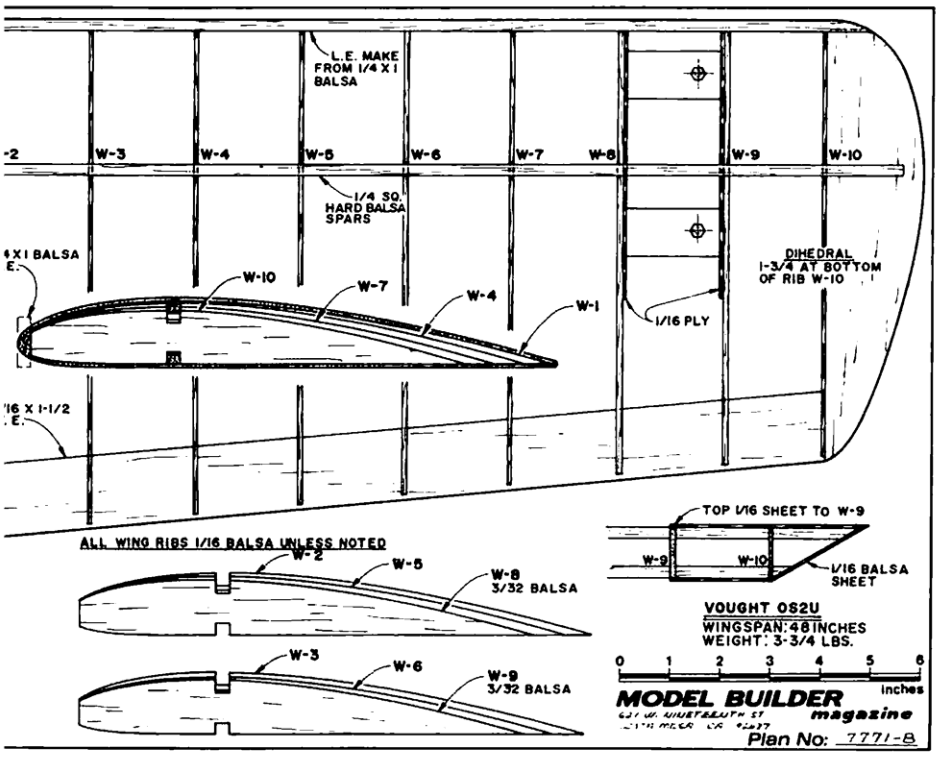
WING

Cut ribs No. 8 and 9 from 3/32 medium hard balsa, all other ribs are cut from 1/16 medium balsa. Build two wing panels directly on plan. Each panel starts at outer rib No. 1. Pin down 1/16 T.E. Cut a 1/16 shim approximately 1 inch wide and slightly longer than wing panel. Pin down in main spar location, cover with waxed paper, and pin bottom 1/4 sq. spar in place. Cement ribs 2 through 10 in place on spar and T.E. Cement top 1/4 sq. spar in place. Cement 1/4 x 1 inch leading edge in place (excess L.E. stock is trimmed off after L.E. sheeting has been added).

Do the following steps over the plan. When cement has completely set, raise tips of each panel 1-3/4 inches from bottom of rib 10 to work surface. Join panels with 1/4 inch balsa dihedral gusset which fills space between top and bottom spars. Add center section L.E., bottom T.E. and top and bottom spars. Add L.E. and main spar ply dihedral gussets. Cut all No. 1 ribs to fit, and cement into place fore and aft of main spar. Add top 1/16 T.E., then top 1/16 L.E. sheet and top center section sheet.

Cement 1/16 ply doublers to ribs 8 and 9. Epoxy a No. 6 x 3/4 inch sheet metal screw in place in 1/8 ply tip float strut support and cement into wing between ribs No. 8 and 9. See plan for detail. Bottom L.E. sheeting may now be added.

Top of wing tips are sheeted to rib No. 9. Cut L.E. and tip sheeting per plan view to form tip shape, then add bottom 1/16 sheet from bottom of rib No. 10



FULL SIZE PLANS AND PATTERNS AVAILABLE – SEE PAGE 104

up to meet top sheeting. When glue is dry, trim excess bottom sheeting.

Cement 1/16 ply dowel support in place and add bottom center section sheeting. Prepare 5/8 dowel per plan and cement in place. Add 1/8 ply dowel braces front and rear. With wing in place on fuselage, add formers 7 through 12. Add hardwood screweye blocks to former No. 9. Sand formers to final shape and add sheeting. Fill center section T.E. to a depth of a 1/2 inch with epoxy.

EMPENNAGE

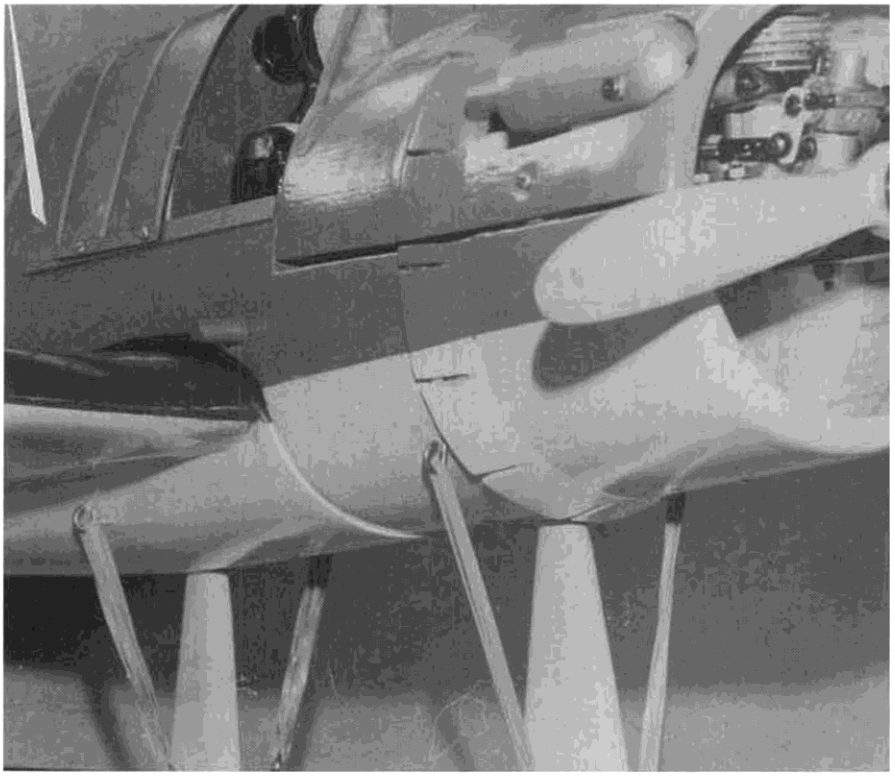
Fin, rudder, stabilizer, and elevator are all made from 3/16 medium sheet with all leading edges rounded and trailing edges tapered. Insert 1/16 music wire for water rudder linkage into rudder, see plan for detail. Cover, finish and hinge. Elevators are joined with 3/32 music wire yoke. Cover, finish and hinge.

MAIN FLOAT

Cut all formers and crutch from 1/8 medium balsa. Mount wing to fuselage and mark dowel location on crutch. It is important that the 5/32 holes in the dowels line up. Proceed to cut out crutch and formers. Prepare 5/8 dowel as shown on plan. Place in position by sliding dowel into cut-out and seating crutch in dowel slot. Top end of dowel should extend approximately 3/32 above crutch. Cement in place. Add formers and hardwood blocks for screweyes. Use a straight edge to check formers for alignment, make adjustments where necessary.

Float bottoms are added next. Use 1/8 rock hard balsa or 3/32 medium with 1/32 ply laminate. Cut bottom pieces oversize and trim off excess after cementing in place. Top sheeting is added in four sections; front of float to step, left and right . . . and from step to rear of float, left and right. Mark position of dowel on sheeting, cut and fit half-circle to dowel. Cement section in place, start on top centerline of crutch and bend sheet down over formers and edge of float bottom. When cement has set, trim flush with float bottom. Repeat this operation for the other three sections. Cement nose block in place as well as 1/16 ply end cap. Sand all to shape.

Tip floats are constructed in the same manner. Note, however, that the 3/32 music wire strut pins are epoxied into dowels and small hooks are cemented to the dowels.



Faired 5/32 music wire main float struts plug into drilled hardwood dowels in fuselage. Rubber bands hold everything in place. With a little research, you could build the landlubber version.

Dowel float struts thread into wing screws and plug into floats, rubber bands hold it together.

MAIN FLOAT STRUTS

Main float struts are made from 5/32 music wire sandwiched between two pieces of 1/4 inch balsa sanded to a streamline shape. These struts are not cemented to either the float or the fuselage, but are entirely removable. Make wire strut length such that they do not hit bottom on either dowel, this will enable you to make final adjustment of float angle by trimming length of balsa fairing.

MISCELLANEOUS

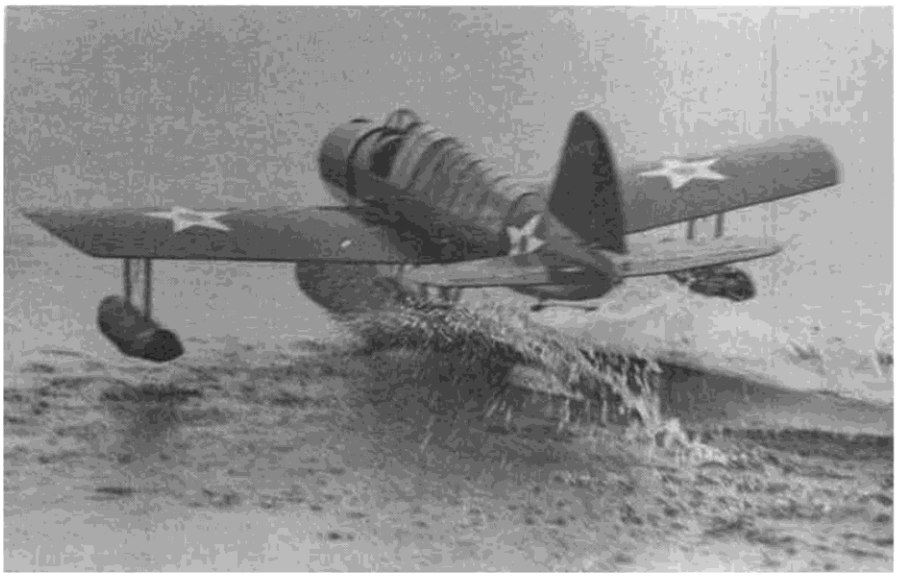
Windshield and both front and rear canopies were molded from .040 acetate.

I carved my molds from soft pine and used the kitchen oven for heat. The windshield plastic was held captive in a wood frame while being pulled down over the mold. The plastic for the canopies was laid on top of the mold in the oven and allowed to lay down naturally as the heat softened it. Flexible wood trim, a very thin veneer used for covering the raw edges of plywood, was used to simulate the canopy framing.

Machine gun and radio gear are made from scrap. For more scale detail, I would suggest that you purchase one of the small scale plastic models. These are highly detailed and excellent for reference.

FINAL ASSEMBLY

After all finishing has been completed, insert stab and elevator assembly into slot previously cut in aft fuselage, and cement in place. Plug remaining slot. Drill hole and insert nylon tube through aft fuselage for water rudder linkage. Cut a 'V'-groove in top of fuselage to receive fin, pre-glue fin and groove for a strong bond. Insert 1/16 wire extension into tube, and glue in fin and rudder assembly. Mount wing with rubber bands, insert main float struts into float and fuselage, and secure with rubber bands attached to screweyes on each side of float and on wing and fuselage.



Main float is just about to come out of its plowing attitude as ship gains speed. Note that although right rudder has been applied, the left float is still out of the water. Lotsa action!

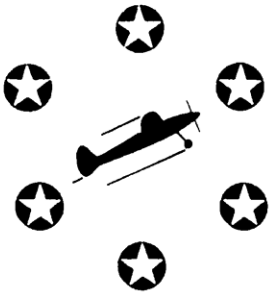
Cut 1/4 inch dowels for tip float struts. With model at rest in water, tip floats should have approximately a 2 inch clearance. Drill a hole in one end to allow the dowel to be screwed onto the wing tip. This is a break-away point to prevent damage to the wing in case of rough handling. Several wraps of masking tape on this end of the dowel will add strength to the dowel if it breaks away too easily. Screw dowel to tip and insert float pins into struts, secure with rubber bands attached to wire hooks on float and looped around wing tip screw.

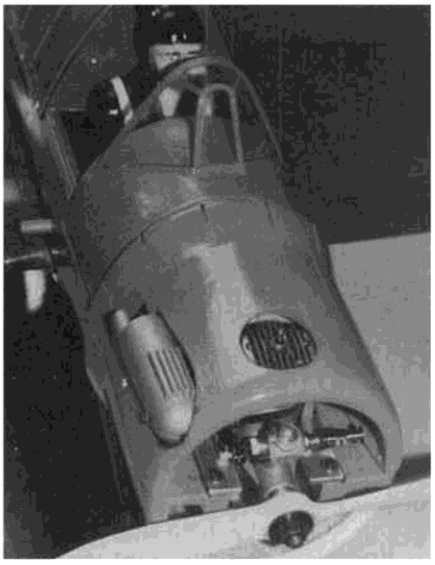
Link up water rudder per plan. Be sure it turns in same direction as air rudder.

FLYING

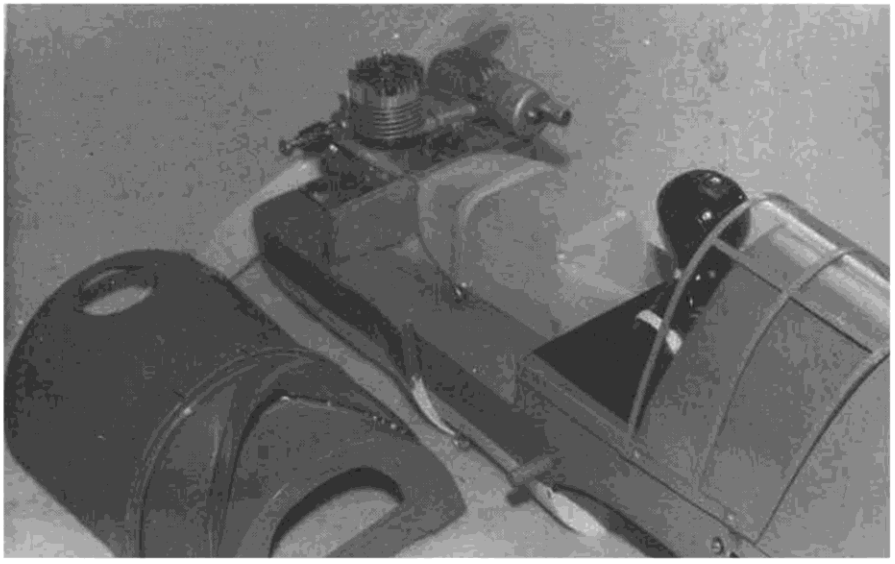
Pilot should do a bit of taxi work to become familiar with the handling on water. High-speed taxi should be straight; trim out any unwanted turning with the water rudder. When power is first applied, model will set back and plow, than as it gains speed, a touch of down elevator will put it up on the step. Model is ready to be airborne when it starts to skip along the top of the water. Sometimes a slight back pressure on the stick is needed for lift-off. Original model weighs 3-3/4 lbs. and flies like a trainer.

Happiness is shooting takeoffs and landings with the Kingfisher. Build one and have at a lot of happiness . . . ! ●





Though cowled, there is still plenty of room for cooling air to circulate around engine.



Pilot has excellent view of fuel tank with cowl/hatch removed! Excellent accessibility for work on engine, throttle, tank, etc.