



# WACO SRE

By **GEORGE CLAPP**

PHOTOS BY **CONNIE MOYNAHAN**

**A classic cabin biplane scaled for free flight rubber or gas . . . also qualifies for Jumbo Scale . . . and it wouldn't be too difficult to convert for light-weight R/C. Correct size for Cover's Edo floats.**

● Having four grandsons living on Oneida Lake just north of Syracuse, N.Y., gave me a good excuse to build Chet Lanzo's Puss Moth (January '72 MB) on Hal Cover's Edo floats (October '73 MB).

After seeing Walt Mooney's Peanut Waco SRE, however, and being a Waco nut, I decided to draw it up (using Walt's outline times 3) and put it on floats. As work progressed, I sometimes wondered why I didn't stick with the Puss Moth, but having scratch-built most of my life, I guess it was natural.

The size of the Waco was dictated by the size of Cover's floats, as I didn't want to do them over.

The prototype shown here was also built to be flown R/C with rudder and throttle control. This is not shown on the plans, but easily done.

## FUSELAGE

The fuselage is of pretty normal construction, but built in 3 sections; (1) beneath the windshield, (2) cabin section, and (3) aft of the cabin. (No bent longerons). Then all 3 are glued together.

It should be noted here that 20 lb. monofilament fish leader flying and landing wires bear some loads, and therefore the fuselage cabin section at the top should be especially well built. These flying and landing wires not only add to the looks but also hold the whole wing assembly in place, and allow little damage in a crash, as everything simply comes apart.

The monofilament runs from the cabin to wing hooks and then back to the cabin, to make double flying and flying wires. Heat-shrink after fastening (with epoxy) at the cabin. Wires are then

stretchable enough to disassemble plane.

The aluminum tubes (4) that the wheel and float landing gears plug into are epoxied in place. The rubber band that holds the landing gear together is only on the front tubes as noted. The rear float struts are held up and braced with monofilament line.

The cowling on my ship was built up and mounted on a face plate that I made for my electric drill, then turned.

The windshield is made as follows: Iron satin-aluminum Monokote to a piece of medium weight bond paper. Using windshield pattern, cut openings and outline to shape with model knife (Uber, of course!). Fasten .007 clear acetate to back side with double-stick tape.

Side windows are made in the same manner.

## WINGS AND TAIL GROUP

The top wing is built in one piece, with two dowel plugs that go into block at top of fuselage. It is important that front plywood splice extends out to second rib from root because of cut out at front of wing. The tips are built up of four 1/32 by 1/8 inch laminations of balsa. Being my first attempt at laminations, these proved unsatisfactory. That's why they are noted as basswood on the plans. Take your choice. The 1/32 gussets shown on the wing, stabilizer, and rudder, are very helpful in preventing warps.

The most unusual part of the wings are the small hooks that the monofilament "wires" are attached to in assembly. A cross section on the plans clearly shows these. They are installed on the top of the bottom wing, and the bottom of the top wing, as close as possible to

the "N" strut. Done this way, they're barely noticeable. They and the aluminum tubes for struts are epoxied in place.

The leading edges of both wings are covered with 1/32 balsa, back to the front spar, on top only.

The horizontal stabilizer/elevator is built with 1/16 x 1/4 ribs which are sanded to a thin airfoil shape as shown, flat on the bottom.

The rudder is done in the same manner, but sanded on both sides for symmetrical airfoil.

## PROPELLER

Selection of prop block is very important. Medium weight is best . . . too hard can be brittle. Lay out all sides very carefully, then drill center hole in drill press, if possible. Next, cut out back center ("A" on plans). This leaves layout of sides ("B" on plans) on uncut side. Cut these out next. Now carve back sides of blades, using edges of blank as guides. These back sides should have about 1/32 inch concave in them. Then carve front, being sure blades are uniform in thickness . . . about 1/16 inch at tips and thicker nearer hub. Make blades airfoil shape but not too blunt at the leading edge. Cut blade outline from template, and finish sanding. Brush on several coats of talc and dope, sanding in between. Balance very carefully.

## COVERING

My ship is covered with satin aircraft aluminum Monokote, and looks like the real thing. In my opinion Monokote is the lightest way to go, saving all those coats of dope. On larger R/C models, where wind penetration is im-

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portant I prefer the added weight of silk and dope. If silk and dope are used on the Waco, do not stretch too tight on tail surfaces, as they will warp.

I used 14 strands of Sig 1/4 inch rubber. Lubricate well with castor oil or rubber lube, and tie ends with nylon thread at the "S" hooks. Be sure to balance ship as shown with rubber motor installed.

My Waco climbs out with torque, to the left. The right top wing has slight wash out to keep the torque effect to a minimum. As torque runs low it gradually goes into a right glide.

#### MISCELLANEOUS

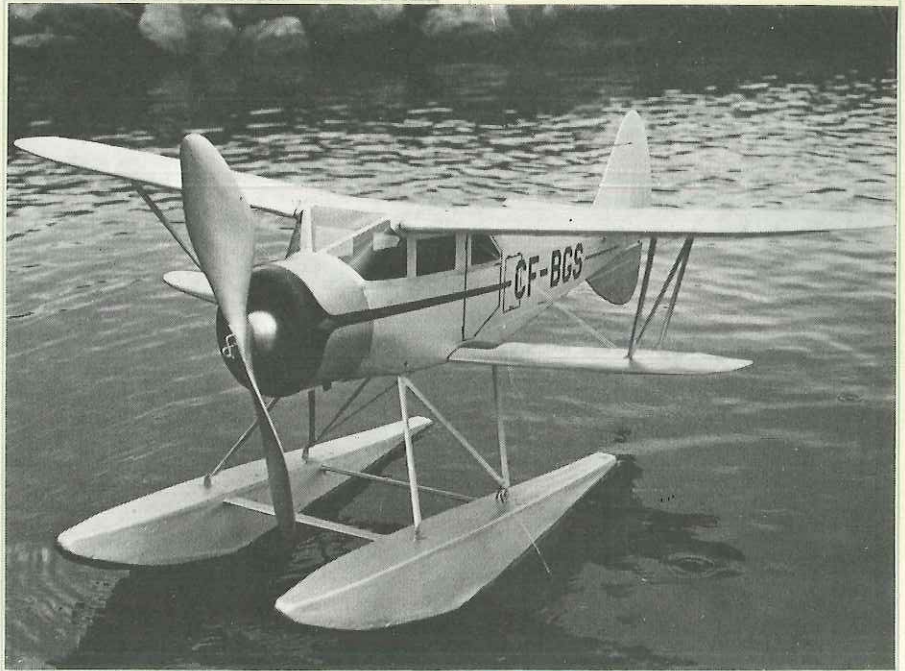
The sub-fin used on the float version may not be exactly to scale in outline. The only picture I could find of an SRE on floats was in "Classic Biplanes," by Robert T. Smith. This one appeared in the background of a shot of a Beech Staggerwing on floats. These sub-fins differed from plane to plane anyway, so I guess it's not all that important. But the sub-fin is needed to balance out the frontal area of the floats. The fin and rudder area was also slightly increased from scale because of this. The Canadian registry on mine is authentic, as far as the CF-B goes, for that era. The rest of it (GS) is the initials of my daughter and her Canadian husband! All research I did on the Waco on floats turned out to be

of Canadian registry. Many still fly the bush country up there.

While researching the SRE in "The Waco Story," by Ray Brandly E.A.A. 38963 (he is also the president of the National Waco Club) I ran across some very interesting facts. The first SRE model came out in 1940, powered by the Pratt and Whitney 450 h.p. Wasp Jr.

engine. This ship had a cruising speed of 195 m.p.h., a rate of climb of 1,550 f.p.m., and a landing speed of only 55 m.p.h.! No five place, single engine aircraft has ever equaled that performance to this day. This includes some with retractible gear.

May many happy hours be yours while flying the SRE. ●



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