WACO UPF-7/PT-14

By DICK STEELY . . . The prettiest of a long line of pretty airplanes (and not just because they all happened to be biplanes), this one means a lot to the author because he's the lucky owner of a real one!

• There was something about the Weaver Aircraft Company right from the beginning. The design of those fantastic looking new biplanes caught many admiring glances at airports around the country right up into the late '30s. They still do!

The Troy, Ohio airplane building firm had turned out many nice machines by the mid-'30s, to provide the much admired vehicle for the budding needs of a growing aviation industry. I wonder if they knew at the time that those needs would be shortly channeled into the military pilot-training needs of a nation soon to be fighting for it's very survival. I doubt it.

Intended for civilian use, the UPF-7, produced in small numbers by comparison with many other trainers of the day, was soon to be the most singly produced WACO aircraft in the company's history. Between 1937 and 1942, 600 were built for use in the civilian pilot training schools around the country. The yellow wings, royal blue fuselage and oversize insignia were familiar sights around many airports. Oddly, only 13 were actually military aircraft, the remainder being used by the civilian pilot training schools, who were in effect, training the pilots who would take part in World War II.

Very few are left, only a little over a hundred, and one of them is mine . . . !

The radio controlled model size was determined by taking the Aeromaster wing chord, and the airplane in general, so the characteristics should be quite similar in handling and performance.

FUSELAGE

Construct 2 fuselage sides over the plans, using either 3/16 balsa sheet cut out over shaded area outline, or 3/16 balsa square, layed out over shaded area.

Cross-members of 3/16 square balsa are used to hold the two sides together. Formers are glued to the cross-members. Join the sides by placing them over top view and cementing cross-members as indicated, and as indicated by "X" on side view.

Assure that all pieces are assembled straight and square.

Cut main formers, plus side formers (at F1, F2 and F3), from 3/16 balsa. Glue them to framework.

Note that former F3 is a two-piece former . . . the front being balsa and the rear cut from 3/16 plywood. Fasten main landing gear wire to the plywood former, using your favorite method. Epoxy the F3 former/landing gear assembly onto framework.

Cut out and epoxy two 3/16 balsa bottom wing saddle supports in place. Cement 3/32 balsa sheet cover, the grain running spanwise, across the saddle support area. When cement has dried, cut access hole as desired.

Make cabane struts. Cut out cabane strut floor from 3/16 plywood and epoxy into fuselage framework. Fasten cabane struts onto cabane strut floor your favorite way.

Cover forward fuselage cockpit areas, nose area, area F3 forward, and the area from bottom wing leading edge forward with 3/32 balsa sheet.

Glue 1/8 balsa or pine stringers where indicated on fuselage framework. Note that formers are not notched. This allows stringers to be glued on in a smooth flowing line and so that the covering material will not touch the formers.

Make nose block from 1/4 or 1/2 inch plywood. Epoxy in place.

Scale tailwheel assembly can be made and installed at indicated scale position. Stand-off scale tailwheel may be epoxied to rudder.

If desired, a forward nose section access hatch can be made as indicated and attached, using your favorite method. Likewise the lower wing hold-down.

WINGS

Both wings are constructed in similar fashion. A full scale WACO UPF-7 has a Clark 'Y' airfoil. Such an airfoil may be easier to construct, and may be used if desired.

Spars are constructed from 1/8 by 1/4 hard balsa to form a 'U' shaped channel. Ribs, in halves, are then cemented onto each side of the spars, with leading and trailing edges supporting. This technique differs somewhat from traditional wing construction. You may find it quite interesting and perhaps very useful.

Commence wing construction by laying a strip of 1/8 by 1/4 hard balsa onto a straight line. Cement two 1/8 by 1/4 strips of hard balsa onto either side to form the 'U'-shaped spar. This method, as you can now easily see, provides a slot where spar joiners, made from 1/4 inch plywood in various lengths as desired, may be inserted. This presents a very strong, light, and straight spar. After spars are made, lay them over the wing plan and cement as many 1/4 by 1/4 cross-members into the 'U'-channels as desired.

Cut wing rib halves from 1/8 inch balsa sheet and cement them onto spars. Let dry. Turn wing over and cement bottom rib halves in place. Let dry. Construct wing center sections in the same manner and cover with 3/32 balsa sheet. Cement leading and trailing edges onto framework.

Make wingtips from 1/8 or 3/16 balsa, or from laminations of pine, and cement to framework.

Ailerons can be made from solid balsa aileron stock, or they can be built-up, using aft section of rib 'C' as a guide, cut down to allow for 1/16 covering.

Make wing interplane struts from 3/16 pine.

Fasten cabane struts to top wing center section. Use your own favorite way.

Ailerons can be operated by torque-tube or bellcrank methods.

TAILFEATHERS

Tail sections can be built up from 3/16 balsa square, or can be made from 3/16 balsa sheet or pine laminations (3 minimum) in the same manner as wingtips. Use plan outline of surfaces as guide.

FINISHING

I covered my UPF-7 with polyester and painted it with Aero Gloss dope. Color scheme selected was that used during the World War Two years for the standard Army Air Corps primary trainer, royal blue and yellow. I finished mine to fit that standard, without cowling or wheel pants, like the PT-14. You may wish to "doll up" your version like the civilian UPF-7.

This is my last radio control model project for a while, as I recently purchased a real WACO UPF-7 which I am currently restoring.

I hope that some of you will build more radio controlled UPF-7's and help bring back the memories of one of the most beautiful biplanes ever made. It's an attention getter! A good-looking two-winger of which you will enjoy every minute. Good luck! •

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