

# SOPWITH TABLOID

By CHRIS MOES

The author/designer of our popular "Woody Pusher" (Aug. '74 MB) presents another interesting scale model, the plane on the cover. Three channel radio is perfect . . . there were no ailerons on early originals!

• The 1913 Sopwith Tabloid was an entirely new conception in aircraft design. When one considers its contemporaries, it is truly a classic example of compact simplicity. Designed and developed before the first great war, it proved to be "the shape of things to come" during the war years.

The prototype flew in public for the first time at Hendon, England, in November 1913. With Harry Hawker as pilot, and one passenger, it achieved a level speed of 92 m.p.h. and climbed to 1200 ft. in one minute. On April 20th, 1914, Howard Pixton flew a float equipped version to victory in the Schneider Race for seaplanes at an average speed of 86.78 m.p.h. (nearly double the speed of the 1913 winner).

It was at about this time that Tabloids entered military production, retaining the wheel and skid landing gear of the prototype, but otherwise similar to the Schneider machine. Major J. T. McCudden, V.C., recorded the arrival of the first pair of R.F.C. Tabloids at St. Quentin, France in August of 1914: "They did not avail us much as fighting machines, in that they were not fitted in any way with firearms, but they could and did perform excellently from a scouting point of view."

Military production of Tabloids stopped at around forty. Most of these were equipped with Le Rhone 80 hp. rotary engines, were covered in clear doped fabric, lacked ailerons (wing warping), and had the skid-wheel landing gear.

And so goes a brief history of this interesting, elegant, but not so well known aircraft. Now, let's look at the model.

So why did I choose to build a model of the Tabloid?

First of all, I love biplanes. For those of you who have flown biplanes . . . well, you know what I'm talking about. For those who haven't, you're really missing something.

In my search for a suitable scale subject. I soon came across three-views of the Tabloid. It really has a great deal going for it; lots of area, simple yet attractive lines, and reasonable moments (which meant I shouldn't have to add any lead).

It also had landing skids to be contended with. Well, they were beneficial on the real one, so no reason why they shouldn't be on the model. In fact, because of the skids, the landing gear can be far enough back to eliminate ground looping without having to worry about nose overs.

But most important, my models (usually scale) have got to be a little different. The Tabloid fits this specification nicely.

Aside from its landing gear, the model has a few other unique but advantageous characteristics. The fact that the fabric need only be clear doped helps keep the weight down, especially in the tail. Mine is under 3 lbs. wet.

The cable controlled surfaces are perhaps a bit more work to install, but are well worth the effort. They are surprisingly direct in their action and look great.

When I designed the model, I was equipped with only a three channel radio, so the prototype's lack of ailerons looked very inviting. With the dihedral increased slightly (from scale), the model is a marvelous performer with only R.E.M. controls.

I can already imagine people thinking, "I know, I'll beef it up, add ailerons (later Tabloids did have them), and use that new .35". Well, please resist the temptation. Build light, use only enough power to safely fly it, and I can assure, you will be amply rewarded.

Many pilots feel they should have a "reserve" of power in scale planes. An excellent idea, but all too often, these pilots are using their "reserve" all the time, and totally destroy realism by the excess speed. A habit develops, and they've lost the technique of flying slow. (You're so right! wcn)

To make my point clear, the actual Tabloids flew at about 80 m.p.h. Now, the scale of this model is 5/32 full size, therefore, the scale flying speed should be 5/32 x 80, or about 11.1 m.p.h. (actual). Let me see you do that with a .35 powered, 4 pound "bomb"! Mine comes awfully close.

The model is really quite standard in construction, and many details are given on the plan. There is, however, a lot to be done; this is no "weekender."

I should, however, clarify some of the more difficult and/or unusual building procedures.

## FUSELAGE:

The fuselage sides are framed up using 3/16 sheet in the front, with 3/16 square longerons and uprights in the rear. Note that the diagonals are set below face. They should sit flat on the plan when building the left side, but will have to be raised 1/16 off the plan when building the right side.

Plywood and 1/4 inch balsa doublers

are added once the sides are removed from plan.

Aligning the fuselage sides is an easy task, since they are perfectly parallel from bulkheads F7 and F8 on forward. This is done with the sides upside down on a flat surface. A carpenter's square is really all that is needed (which is why a top view does not appear on the plans). With the tail pulled together, cross braces are added, their lengths taken from the plan.

Cabane struts are added before completing the fuselage top. They consist of two inverted "U's", with dimensions taken from the side view. Coathanger wire is sufficient for the job, and simplifies making the "Z" bends at the fuselage exit points. Do not add cross braces and fairings until after covering is complete.

The landing gear is bent up from piano wire, bound and soldered. Note that the axle is held in place by rubber bands. The butt ends of the upright struts restrict fore and aft movement, while the rubber provides shock absorption. Wheels are best held in place by soldered washers (most realistic) though wheel collars could certainly be used.

Certain details will be added after covering and clear dopping of the fuselage-tail assembly is complete. These will be discussed after the section on covering.

## TAIL SURFACES:

Both horizontal and vertical stabilizers are virtually flat in section, with rounded edges. The elevators are sanded to triangular cross section after construction. The curved outlines are laminated from 6 strips of 1/32 x 3/16 balsa, soaked in warm water and using Wilhold as an adhesive. They are then curved around a waxed balsa form, or simply around regularly spaced straight pins. Experiment though, since most people have a method which works best for them. Some people may prefer using plywood or basswood strips. This is okay if you don't mind a little extra work when sanding.

Control horns should be added after most of the sanding is complete, but before covering.

## WINGS:

The wings are really quite simple to construct. Don't be frightened by the vast number of ribs and riblets. When building wings, I like to build both outside panels completely, then prop up to correct dihedral around the center section plan, and "fill in" the center sec-

tion, This produces a very true wing (though only as true as the building board!). A little washout on the tips would do no harm.

Once the bottom wing is removed from the plan, it should be fixed to the fuselage with rubber bands, masking tape, etc., and the lower portion of its center section constructed. It is then ready for mounting, using the common pin/wing bolt method.

Don't put the strut mounting pins in place until *after* covering and don't forget the 1/4 x 1/16 strips at the lower wing roots (these are necessary for covering).

#### COVERING:

After final sanding, the plane should be given 3 coats of clear dope, sanding between coats. The sheet areas must be filled with sanding sealer. A thorough job will really pay off, since the nose of the original was actually covered in aluminum. Thus, any wood grain showing would totally destroy the effect. Do not get any sealer on any of the open framework areas, since this is clearly visible beneath the covering.

Now, a suitable fabric must be prepared. I started with Silron, though any of the popular silk-synthetic, woven covering materials would do.

This must then be dyed to approximate the color of the unbleached materials used on aircraft of this period. The dye I used was a mixture of tea, onion skin and some commercial blue dye. The tea provides red, and the onion skins provide the yellow. Mixed in the correct proportions, these two (toned down by the blue) should produce the desired shade. Experiment first with small samples of the material to be used. Then, when it is right, dye at least 2 square yards of material. This is how much is actually required. But, making some extra is recommended for patching any damages later on.

Before covering the wings, brush melted paraffin wax on the top surfaces (but not the edges) of the tips and trailing edges. This will eliminate the problem of unwanted "stick-down" of the material in these areas.

When covering in general, try to do a neat job of any overlapping, eliminating it if possible, since this would be quite noticeable on the finished plane.

Give the whole model a thorough clear dope job; at least 7 thinned coats. Clear fills much slower than color, and any holes in the fabric soon will collect oil and moisture.

However, don't completely fill the grain of the silk, since this is one case where silk grain looks much better than high gloss. The nose of course, can be filled with sanding sealer to achieve the smooth, no-grain finish necessary in this area.

#### CONTROL SYSTEM:

Rudder and elevator horns should be painted medium brown. Now, cut the fuselage exit guides from thin cardboard, and, using cellulose type cement, glue in the appropriate locations. Once dry, the exit holes can be cut through the silk, and the cardboard painted silver. (*Cyanoacrylates would be great here. wcn*)

Bellcranks are cut from 1/16 plywood and mounted on 3/16 dowels.

All control wires are .012-.015 multi strand steel cable. These are attached at the ends by forming loops and fixing with crimped 1/16 O.D. aluminum tube (about 1/4 inch long).

For the rudder, attach one 20 inch length of wire to each end of the bellcrank. For the elevators, attach one 40 inch length, by the middle, to each end of the crank (this will have the net effect of two 20 inch lengths at each end).

These wires are threaded through the appropriate exits, and the bellcrank dowel assemblies are held in place by 1/8 inch plywood bearing "blocks." Once the glue has dried, the wires can be attached to the control surface horns.

By using this system, the servos can be connected to the bellcrank with adjustable links, thereby allowing trim adjustments to be made in the usual manner. With the control wires snug (but not too tight) an absolute minimum of play can be achieved.

#### OTHER DETAILS:

Ordinary straight pins were used as rivets on the fuselage. Holes must first be drilled in the appropriate locations, then 1/4 inch cut-off pins can be glued in place. Location of rivets can be had from the photographs. However, the exact rivet spacing seems to vary from plane to plane. This job takes a bit of time, but is well worth the effort.

Seam lines were simulated using 1/16 inch Letraset tape. The dummy access hatch (right side only) was made from cardboard. Once these details are complete, the front fuselage can be sprayed silver.

Once the inside of the cockpit has been painted black, the cockpit combing should be added. After thorough soaking in water, a 3/4 inch strip of soft leather can literally be "moulded" in place. Use masking tape for this job, and allow about an inch overall for shrinkage. After the leather is dry, it can be removed, cut to exact length with the seam at the rear of the cockpit, and cemented in place.

Rigging the model is an absolute must, since it not only looks good, but holds the interplane struts in place. These are fabricated from multi-strand wire. Loops are formed at the fuselage ends, using crimped aluminum tubing, and are attached to small hooks on fuselage and upper cabane with small rubber bands.

They are attached at the interplane struts by threading through predrilled holes and knotting.

The motor is mounted using 4-40 bolts and blind nuts. Use the side and down thrust as indicated; though it may seem excessive, it is necessary. The tank is mounted sideways directly behind the engine. I used epoxy to hold a 4 oz. slant style tank in place. A sheet metal heat shield is definitely required behind the exhaust outlet. . . I still have the grisly remains of the tank I used on my first flight, "sans shield"!

You may want to add a scale cowling around the engine. However, I ran into some cooling problems with mine, so I don't really recommend this. I now fly without it.

Once the strut fairings have been added, *all* struts can be painted medium brown. Don't omit the stab struts, since they add considerable strength in this area.

With the radio mounted as far forward as possible, the plane should balance at about a third chord back from the upper wing leading edge. I didn't have to add any nose weight, but this will be necessary if the C.G. is any further back.

Markings consist only of a registration number and the company name on the rudder. Later Tabloids did have the full R.F.C. decor, with rudder stripes, roundels, etc..

Now, the big choice: "to weather or not to weather." I did, and I think it looks good. I used clear dope, "dirtied up" with some brown and black, sprayed on in the appropriate areas. If you are inexperienced in this area, practice on a "scrap" model first, since there is a tendency to overdo it, and any mistakes are virtually irreversible at this stage.

#### FLYING:

With a warp-free structure, the Tabloid is a very docile flyer. It is not exactly aerobic, though it will do inside loops, stall turns (as only a biplane can), chandelles, etc..

Takeoffs are very much like a tricycle geared plane, with absolutely no ground looping tendency. Landings should be made well above stalling speed. Put the tail down immediately after making ground contact, or the skids may catch in the grass. If this problem persists; don't overlook the simplest solution; curve the skid tips up a bit more (or cut the grass!). Flying over pavement is okay, but because of the narrow landing gear, wingtip skids might be a wise investment.

Well, good luck with your Tabloid. If any questions should arise with respect to the model, information sources, etc., don't hesitate to drop me a line. If you are really stuck for small rubber bands to hold the rigging in place, send me a dime, and I'll mail you a set.

Write to M.C. Moes, R.R. #2, Peterborough, Ont., Canada, or in care of the Model Builder.