

• In the January '79 issue of *MB*, Peter Westburg referred to the Stearman 4E as one of the "sexiest biplanes of all time." I couldn't resist turning his excellent scale drawings into Peanut plans and building my own replica of this Depression era beauty. This included duplicating the red, blue, and silver Standard Oil of California paint job shown in the two-part series. The result was very gratifying and I think you will enjoy building the "Bull Stearman."

My approach is not for beginners, but if you've built a few Peanuts you should find some of these techniques interesting and simple enough to achieve. The primary challenge, if you're after realism (and with scale you should be), is to keep the structure light so you can afford the extra weight of the paint. My solution is to use 1/64 sheet balsa, condenser paper, and Floquil paints. The completed model weighed 16 grams less the motor. The weight prior to finishing was 14 grams, so surprisingly, the finish and decals added only two grams. The total weight of the craft, including the 1/8-inch rubber motor, was a shade under 5/8 of an ounce.

A good Peanut design will require little to no added weight to achieve balance. Of course, the choice of subject has a lot to do with this, but there are ways to maintain the balance problem of a short-nose airplane. Choice of structure helps, keeping heavier elements toward the front. Another is to move the center of lift aft by increasing the amount of lift in the tail section. The best way I have found to do this with Peanuts is to increase the surface area of the stab and elevator 15 to 20 percent. Balance is attained when the center of lift and the center of gravity coincide. This approximate location is shown on the drawing. On my model, no additional weight was required.

CONSTRUCTION

Before you start, assuming you don't already have one, get a cork-surfaced bulletin board for a building surface. These are an excellent aid to construction, as they take pins easily and remain



STEARMAN 4E

By TOM CADOGAN . . . The "Bull Stearman" is one of the most colorful and best looking of the 1930 era biplanes, also makes an interesting Peanut for builders with some prior building and flying experience.

true. You'll especially need one for the fuselage formers and other curved pieces, as I'll explain later.

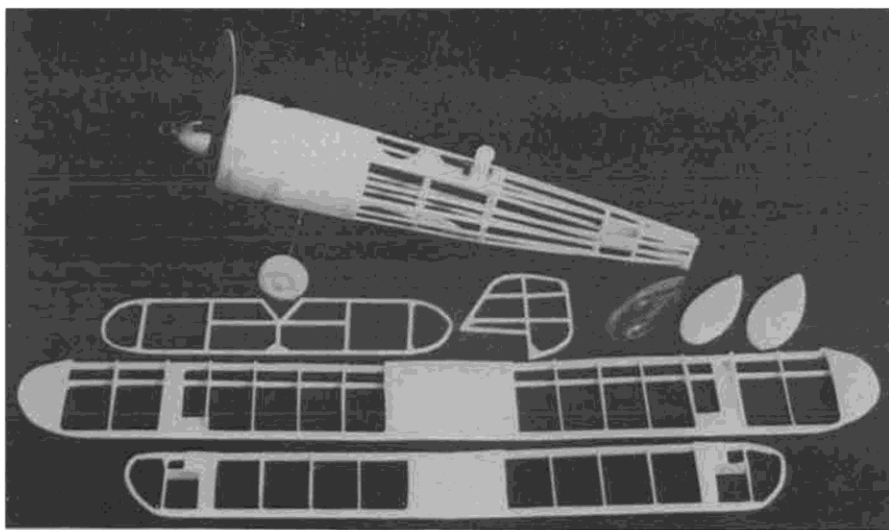
Begin with the wings by cutting the ribs from 1/64 sheet using a 1/32 plywood template. The use of 1/64 sheet is perhaps the only unusual thing about the wing construction, and a few precautions are necessary. Make sure you use a *non-shrinking* adhesive, such as Titebond, and don't try to force the ribs into position. I used sheet at the wing tips, around the strut connections, and at the center to provide an extra measure of strength at key places. I feel this is necessary when condenser paper covering is used because of the paper's low tensile strength. I would also suggest sheeting the leading edge of both wings,

though I didn't do this. Before you set the wings aside, make sure the angle of incidence is the same throughout each panel. Corrections can be made when you shrink the wing covering.

The tips of the wings and stabilizer and the outline of the fin are constructed from 1/20 square balsa. The balsa is soaked in laundry ammonia, rolled around a row of pins embedded in your building board, and pinned down to dry. For me this technique is simpler than cutting cardboard templates or making intricate laminations, but again, the cork bulletin board is essential for success.

The fuselage is begun by pinning down the 1/16 square outlines shown in diagonal shading on the plan, and cementing on formers 5-1/2 and 10, both cut from 1/32 sheet. The center 1/16 stringer is added next, leaving a 1/4-inch overhang at former 5-1/2. When this is dry, formers 6 through 9 can be slipped into place under the stringer and cemented in an upright position. These formers are also made by soaking in ammonia and bending along a row of pins. The remaining stringers are cemented in, extending each across former 5-1/2. Formers 4 and 5 are added, and the stringers broken, bent and cemented to the bottom of former 5 as shown on the plans. The fuselage half is removed when thoroughly dry, and the other side added in similar fashion. The landing gear wire is inserted, followed by the 1/64 sheet covering at the nose and around the cockpit. The landing gear shown is scale, but if you wish the Peck-Polymer prop to clear the ground,

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Basic structure is actually quite conventional, makes extensive use of 1/64 sheet. Standard Oil paint scheme is the most attractive, but is also a lot of work.

the gear should be extended at least half an inch. I personally prefer the low-slung, racy look of the prototype.

The wheel pants really add class and can be built from balsa or vacuum formed from plastic. I used balsa wheels purchased from Oldtimer Models. These balloon type wheels can be easily sliced at the center and sanded on a block so that the assembled wheel is slimmed down to scale. A neat trick for forming the wheel struts is to roll moistened 1/64 sheet to an airfoil shape and pin down until dry. Pry them open, coat the inside with Titebond, and set into position around the wires. The pilot's headrest is made the same way.

The pilot is carved from polyfoam plastic, one of those small curlicues you find in cartons as packaging material. Paint with acrylic tube colors, mixing a small bit of burnt sienna and white for a flesh tone. Finish with a bead of 5-minute epoxy for the goggles and a touch of Floquil silver. Make sure you don't get dope or Floquil paint on the polyfoam.

Sand and dope the framework and cover with condenser paper. Cover the sheeted portions by applying the glue or dope to the border areas only. Shrink the tissue with a fine mist of water and set each piece aside for finishing. It's much easier to do the finishing prior to assembly.

FINISHING

Now's the time to hunt up the December '78 and January '79 issues of **MB**. I know you have them, because no dedicated subscriber ever throws away a copy. You'll need the scale drawings and photos for the details and little touches of authenticity. Multiply the Westburg drawing measurements by 1.37 to scale up to Peanut size. A small calculator is handy for this.

The sight of sunlight glinting through a tissue-covered frame may be a free flighter's dream, but it's *not* scale realism. Scale model aircraft finishes should be as close to opaque as possible. For the most part, Floquil paint fills the bill. It covers beautifully in one coat and is fairly dense, yet light. Floquil dries with a flat finish, however, so an additional step is necessary to obtain a semi-gloss or gloss surface. My solution is to use acrylic spray coating. This material is used to preserve artwork, such as charcoal drawings, and is ideal for our purpose. The windshields must be masked or the spray will make them cloudy. Spray a small puddle on wood scrap and brush the coating into the smaller spaces or touched-up areas. The results are quite impressive.

A No. 2 red sable brush is very expensive, but certainly a worthwhile investment in your hobby if you want the satisfaction of great detail work. As you gain skill in working with this brush you can expand on the details you wish to include on your models. If you print neatly with a pen, you can learn to do it with a No. 2 brush and Floquil. The Standard Oil of California fuselage stripes and eagles were duplicated with

Floquil on Sig decal paper. When soaked in water, the paint skin remains fully pliable and slides off for perfect application on the model.

As a final detail, small blobs of 5-minute epoxy were used to simulate wing and taillights. Plastic model paints provided the tiny spot of color needed.

ASSEMBLY AND FLYING

By this time, let's hope you tried the fit of the lower wing in the fuselage. Cuts and adjustments are more difficult after the finishing stage. Aside from this, the most difficult part of assembly is the attachment of the upper wing. Begin by cutting a balsa or plywood template with four holes to match the basswood inserts on the cabane struts. Cement the struts to the fuselage and carefully center the template. When the cement is set, remove the template and attach the upper wing, cementing it at the proper incidence angle. The interplane struts are installed in pieces. First bend the basswood strips into place, then add the 1/32 balsa sections. Sand, dope and paint silver (for the Standard Oil of California version).

Flying should present no unusual difficulties. The model has good proportions and looks great in the air. Experiment with different motor lengths. I'm going to try some Pirelli when I get it, as my luck with the wind-up has been disappointing lately. It should be noted that the Stearman has withstood two motor breaks with no skin or fuselage damage by the flailing rubber. Since I don't want to risk the third time just yet, the 4E now sits in my son's room, holding its own in the company of some fine (ugh) plastic models. ●