

BUTTERCUP

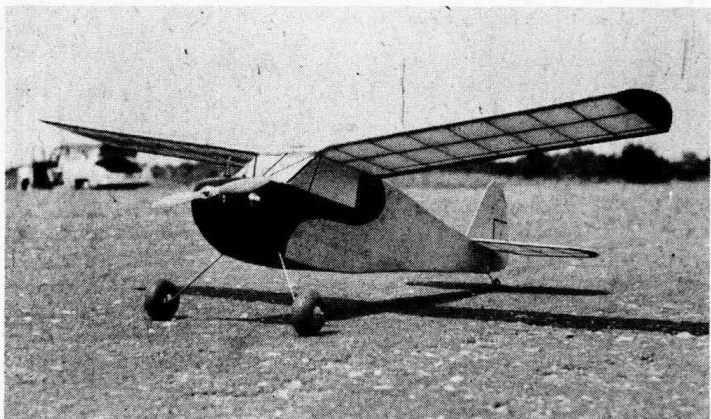
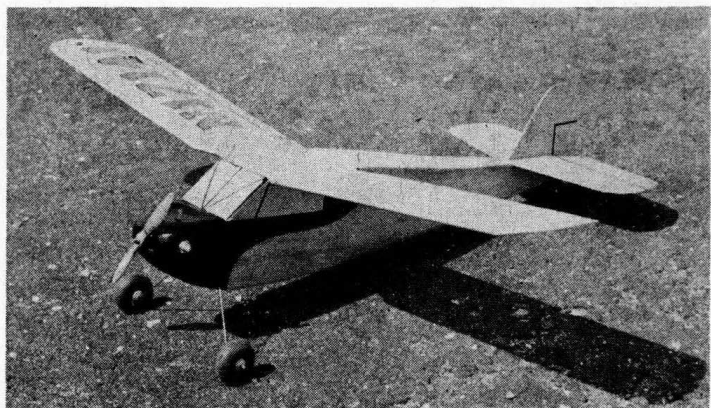
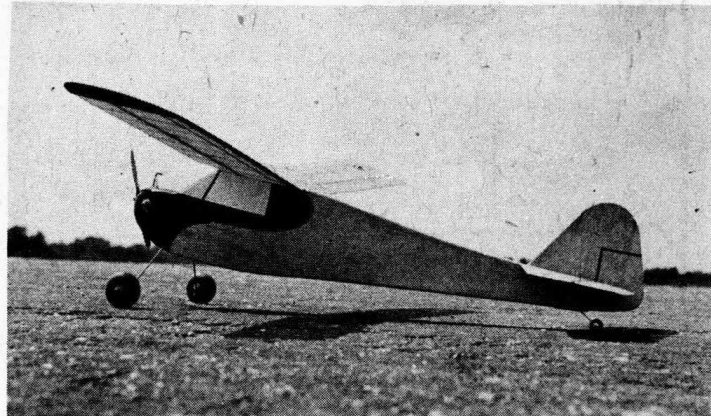
This semi-scale 1/2A version of Steve Wittman's famous utility light plane features simplified flying surfaces

by Dick Struhl

● Presented here is a free-flight semi-scale version of Steve Wittman's "Buttercup" utility lightplane. The original acts as the flying workshop and delivery wagon for the racing team of Wittman and Brennand. Our model counterpart acts merely as a means of having some good consistent flying over weekends.

We chose to power this model with a 1/2A engine and build it to the approximate scale of one inch to the foot, giving a span of 28 1/2". The original model was powered with an .020 Infant, and put in several hundred fine flights before a larger Baby Spitfire was installed. Flights with the Infant were slow enough and yet realistic enough to give plenty of fun.

The model was adjusted for a steep glide (no downthrust) so that we could fly on a full tank of gas and still be reasonably certain that the model would return to us. With the larger engines, you will find it necessary to install downthrust in the engine and also use some type of de-thermalizer, such as a pop-up tail, etc. There is no question that, if you get the model up high enough, you are going to lose it out of sight.



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We call our model semi-scale because we have left off superfluous details such as the wing struts, fairings and other minor details that would tend to detract from the flying ability. We have altered the landing gear, dihedral airfoil and stabilizer size, all in the interest of making our model fly just a little better. But, basically, the "Buttercup" has the general layout of a fine gas free-flight model.

ENLARGING THE PLANS: Some parts are shown full-size, but the main plan is drawn $\frac{1}{3}$ scale. This means that you will have to enlarge the main plan three times to obtain full-size drawings. The simplest way to do this would be to have a 21" by 30" photostat enlargement made of the main plan.

Another manner of enlarging the plans, and incidently much less expensive, is to obtain a cheap pair of draftsman dividers from your local art goods store or 5 & 10. Using the dividers, all you need do to enlarge the plans is to draw the center lines or base lines, set the dividers on the part to be enlarged on the magazine plans, and merely mark off each part or space three times. Thus you achieve a three-time enlargement.

Study the plans as you are enlarging them and you will see that the

model is very simply constructed, strong and, above all, light. Use soft, light balsa throughout in the construction except for the wing and stabilizer spars. It should not take more than two or three evenings' work to complete the model.

FUSELAGE: The fuselage is made by first cutting out the sides from 1/16" sheet stock. You may butt-join two sheets to obtain the necessary width. Then cut out the fuselage bulkheads and install in place, as shown in the plans. Note that bulkhead A is 1/16" plywood and also acts as the engine mount and landing gear base.

The landing gear is now bent to shape from 1/16" steel music wire, and bound and cemented very well to bulkhead A. Locate your engine mounting holes on the bulkhead and cement appropriate nuts on the back to take the engine mounting bolts.

Install the fuselage top and bottom next. Note that the section acting as the windshield and top cowl are $\frac{1}{8}$ " sheet. The lower cowl block of soft balsa is installed after the engine is mounted in place. You can alter these cowl blocks to fit around your engine.

TAIL SURFACES: The tail surfaces are very simple to make. The rudder (shown full-size on the plans) is cut from 1/16" sheet. The stabilizer is made in one piece, the main $\frac{1}{8}$ " square spar running the full span. The tips are shown full-size for your convenience. After the cement has set, you

may shape the trailing edge to the proper taper.

Cover the stabilizer in the conventional manner with tissue. We recommend using colored tissue rather than resorting to colored dope. Assemble the tail group as shown in the assembly sketch. The tail may be cemented to the fuselage, held on with rubber strands or, best of all, made to pop-up with a fuse.

WING: The wing is of conventional construction. Cut the necessary wing ribs from 1/16" sheet. Pin the trailing edge and the main spar to the full-size plans. Allow to dry and then remove from the plans and install the proper dihedral. Note that the center section is flat. Now add the top 1/16" x $\frac{1}{8}$ " spar and the leading edge. The 1/16" sheet wing tips are shown full-size.

Cover the wing with tissue as you did the stabilizer. The wing may be cemented in place on the fuselage, or it may be held in place by rubber bands.

FINISHING: Cover the rudder and entire fuselage with light grade tissue or Silkspan. This will help prevent the wood from splitting on hard impacts. Treat all tissue covering with a light coat of water to shrink, and then brush on two thin coats of clear hot fuel-proofer over all. You can brush on several coats of fuel-proofer around the engine mount. The original model had 1 $\frac{1}{2}$ " diameter Trexler balloon wheels. A drop or two of heavy cement

UP! COMET'S

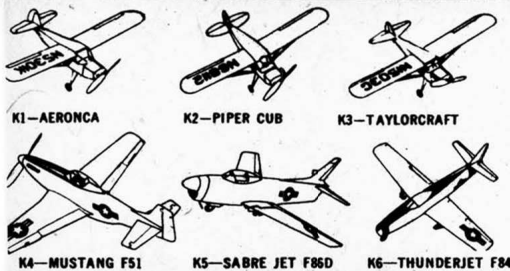


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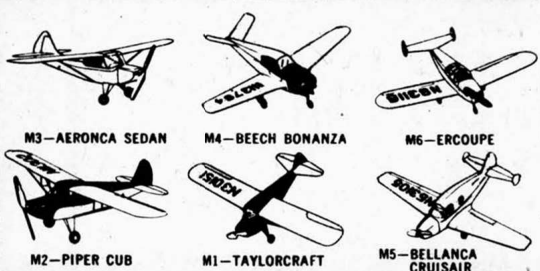
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at the end of the axle will retain the wheels in place.

FLYING: The original model balanced perfectly with an .020 engine in place and needed a couple of finishing nails pushed into the fuselage rear when the larger engine was installed. Flights should present no difficult problems. Best flights were with adjustments that gave a large circle to the right, with and without power. To obtain this flight path, first adjust the glide with the rudder and wing warpage, and then follow through with side-thrust adjustments to the engine to keep the same circle.

Don't forget to set your dethermalizer before each flight if you're using an .049 engine.

BILL OF MATERIALS (Balsa unless otherwise specified)

- 2-1/16" x 3" x 36" (medium soft) . . . Fuselage, bulkheads, ribs, rudder & wing tips
- 1-1/8" x 2" x 12" (medium soft) . . . Fuselage cowl, stab. tips
- 1-3/16" x 1/4" x 30" (hard) . . . Wing leading edge
- 1-1/16" x 1/4" x 30" (hard) . . . Wing spar
- 2-1/16" x 1/8" x 36" (hard) . . . Wing spar & stab. ribs
- 1-1/8" x 3/8" x 12" (hard) . . . Wing trailing edge
- 1-1/8" x 3/8" x 12" (hard) . . . Stab. trailing edge

Silkspan covering; 1/16" steel landing gear wire; dope; 1/16" plywood firewall; 1/2" diameter air wheels; fuel-proofer (clear); cement; 1/2" diameter balsa tail wheel; .040" wire tail wheel strut; .020 to .049 engine.

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