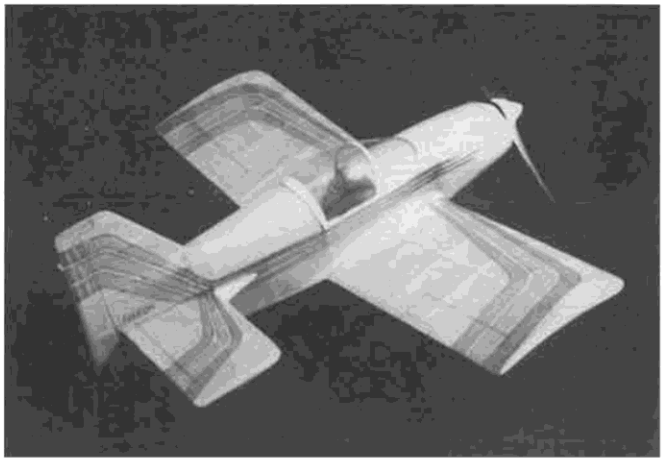

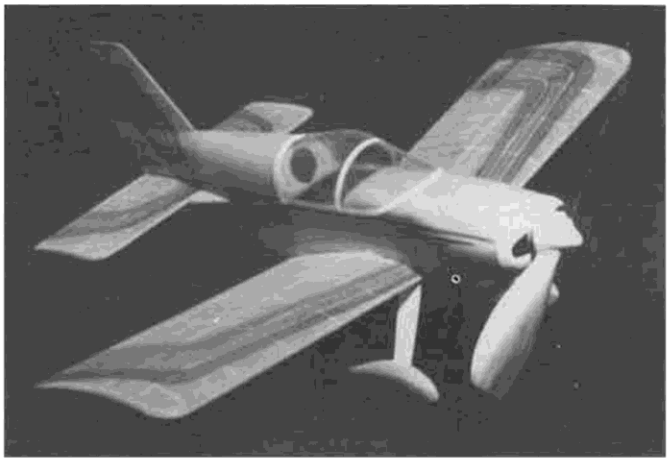

Lots of wing area within 13-inch span, but also very close coupled, this one is a challenge to trim and fly. Decorations are also a challenge in trimming of a different sort. Explained in text.

BD-8

PEANUT SCALE

By WALT MOONEY

• Jim Bede is well known in homebuilt circles. While all his projects haven't been completely successful, they have all been extremely interesting. He has a creative, aeronautical brain. The BD-8 is a product of his fertile brain. It's a simple, all metal aerobatic airplane. The first homebuilt version has been completed, so a Peanut Scale model of the BD-8 needed to be built.

Now the original BD-8 was built with zero dihedral, so the model in the photo was also built with zero dihedral. Your first reaction is probably, "It'll never ever fly that way!" Not so, it flys just fine, after all, the Peanut Scale rules allow hand launching, and this is a stunt plane. So hand launch it and trim it to fly upside down, I did and it works great! (We must give the credit for these ideas to Dick Baxter, who first suggested, "So it won't fly right side up . . . try it upside down.")

Although the model was built without dihedral, a concession to reality is the use of thick root ribs so at a later point in time the wings can be removed, the root ribs beveled, and dihedral installed.

During the testing period on this model, it was established that it would fly fine upside down from a hand launch. Will it R.O.G. and then roll over and fly inverted? Not likely, with a fixed horizontal tail. But, suppose it had a pendulum-controlled horizontal, could it then be trimmed longitudinally to fly either side up? Certainly, but whether it will survive the slow roll on takeoff is a question.

Well, it was tried. The tail was pivoted at its quarter chord point for zero aerodynamic moment and then staticly overbalanced, so the leading edge moves down regardless of what side up the model is flying. Trial and error located a couple of suitable tail motion stops, the model still flies fine upside down, and R.O.G.'s quite nicely. After taking off, it starts to roll to the left because of propeller torque and slipstream and crashes before it gets inverted. From a hand launch with the model pointed up at 30 degrees it will sometimes accomplish the roll, but from takeoff, no success.

The wings were removed and one inch of dihedral installed under each wing tip. The model now flys fine right side up, and does nice takeoffs and landings. It won't fly upside down any more though.

Because of the letters received after the comment was made that the prototype Fokker Triplane model was untrimmable, there will be no statement that the slow roll on takeoff followed by inverted flight can't be done by the BD-8 model, but the model in the photos wouldn't do it with a pendulum tail.

The BD-8 is an interesting and simple configuration that lends itself to becoming a good Peanut Scale subject. The aspect ratio of the wing is low enough to allow a lot of wing area. A lightweight model might even give the Laceys and the Fikes a run for their money.

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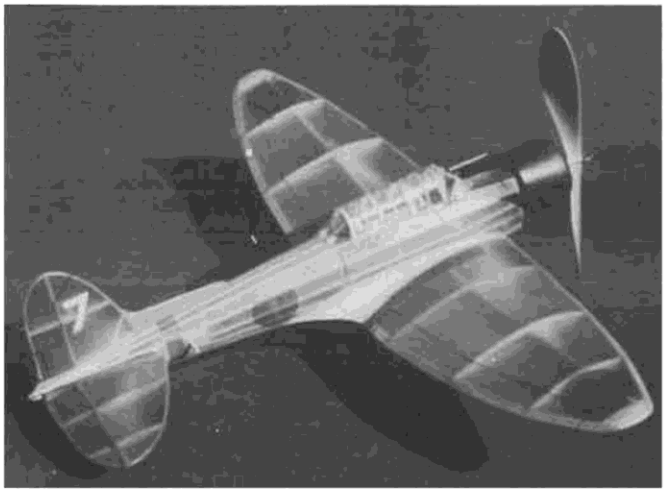
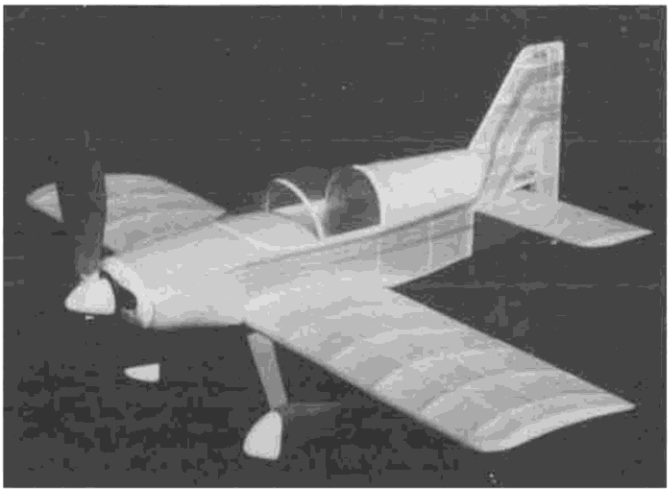


Walt's next Peanut is this Aichi A3D "Val", with authentic orange, red, and black warbird color scheme. Watch for it.



With zero dihedral per scale, the BD-8 model flew fine . . .upside down only! Read about it in text.

The model construction is conventional throughout. There are no spectacular new techniques used in building it. I note, looking at the photos, that I forgot the tail strakes. The engine cowling is carved from block balsa cemented over the basic balsa stick fuselage frame. Although this could be lighter in weight if the cowl blocks were hollowed, the extra weight is not a penalty unless you build the rest of the model very lightly, in which case you know enough about modeling that you don't need any building comments.

The top decking aft of the cockpit is 1/32 sheet balsa, back to the last former. Because the bend radius from there back to the rudder spar is pretty small, one centerline and two side stringers are used to maintain the aft fuselage shape. The area under the windshield is wrapped 1/32 sheet balsa. The nose block and its backing block is made from 1/4 thick balsa. The backing block should be made carefully to be a snug fit in the front opening in the fuselage framing. One problem most beginners experience is a loose backing block that allows the nose block to fall off as soon as the motor tension is gone. The dangling noseblock and propeller will work like a dethermalizer, but they really ruin the glide. Besides, a loose noseblock will not hold accurate thrust adjustments. A good-fitting, relatively thick backing block helps solve these problems.

Wing and tail structure uses the conventional multispar approach. The horizontal tail tips have the same airfoil shape (symmetrical) as the rest of the ribs. The rib shapes for the wing and horizontal tail are shown on the side view. The wing tip shape is different from the wing ribs and is shown at the right wing tip on the plans. The vertical tail ribs are shown above the top of the vertical tail on the plans.

In this article, as in several previous articles, I have called out several different thicknesses of sheet balsa. If necessary, and to reduce costs, a single sheet of 1/16 sheet balsa will suffice. The thick pieces can be laminated, cementing several layers of sheet together. The grain of the layers can be crossed for items, like the noseblock, for added strength. The sheet can also be sanded thinner using a flat supporting surface and a sanding block. Of course, if you intend to make several Peanut Scale models from the plans in *Model Builder*, having several thicknesses of sheet balsa will save time in construction.

The BD-8 model is covered with white tissue. After water shrinking and the first coat of dope, the color trim can be cut out of tissue paper and doped in place. This turns out to be worthy of some technical discussion. Since only one BD-8 has been built so far, there is only one authentic color scheme. This is white overall with three color stripes, green, yellow, and red. The green stripe is uppermost. The stripes are separated by a thin white line. The stripes are thickest at the trailing edge of the rudder and taper to a disappearing point at the front end. The green stripe ends 1/16-inch aft of the noseblock separation line, the yellow a half-inch further aft, and the red another half-inch aft. Because of the long sinuous shape of the stripes, and their thin white separation, they are difficult to cut out of tissue without some sneaky techniques.

First, get an old magazine or catalog to use as a smooth cutting surface. Tape down sufficient layers of colored tissue to make all the stripes. That is, at least two layers of green, yellow, and red. Make sure all the layers of tissue are smooth and without wrinkles. Now, on vellum or tracing paper, lay out the stripes required with a sharp pencil. Use the side view of the plan as a guide. Tape this on top of the tissue that was taped on top of the magazine. Because all the stripes have to be separated by a constant amount, any error in cutting or placement will be immediately apparent, therefore, we will cut out all the stripes at the same time. Using a sharp blade, cut along all the pencil lines. This will give us six tapered green, yellow, and red stripes, plus twelve thin parallel stripes of which only two green, two yellow, and two red tapered stripes are the correct ones for application. There is probably no easier way to obtain your close tolerance striping. Carefully select the correct stripes for application.

Start with the yellow stripe and dope it down on the rudder in the correct location, then dope it along the downsweep onto the fuselage. Now stretch out the long tapering thin end and, holding the point on the nose of the model, dope it down on the fuselage, working from the aft end to the front. The next stripe is placed adjacent to the first but separated by a sixteenth of an inch for its entire length, using a similar doping sequence. While the dope is wet, the stripe can be pushed around by the brush to make minute location adjustments. This procedure is continued for all three stripes on both sides of the airplane.

Control surface outlines and registration numbers, N88DH, are black ink. Wheels, back face of propeller blades, and engine air inlets are flat black paint. Front faces of the propeller blades are painted aluminum. Use thin white plastic tape to simulate the cockpit framing.

The model should be made to balance at a point half way between the two top spars.

If you feel the urge to be different, build your model without dihedral and fly it upside down (or else move to Australia to make your test flights). •