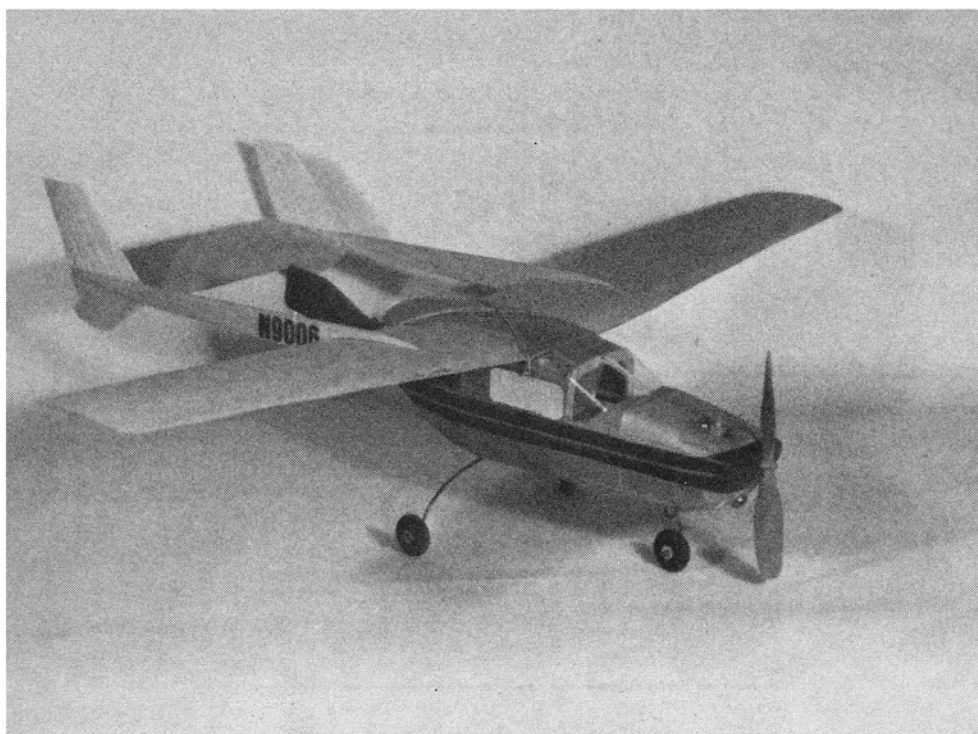




Boom-Boom

Try this one for some school yard fun. A CO₂ pusher design that can be built as a profile or full-bodied ship./Al Lidberg

"Boom-Boom" is a fairly close-to-scale sport model of the Cessna Skymaster that is designed to use a CO₂ motor.

I wanted to build some kind of a pusher, but thought about a twin using CO₂. Leafing through an old issue of *Air Progress* (Jun/Jul '63), I came across photos and a 3 view of a prototype Skymaster with fixed landing gear. With a little bit of sketching and head scratching I produced the concept of a model twin, that required only one motor, operating as a pusher. Some compromises were made in scaling the Skymaster drawing to produce Boom-Boom. The booms were moved about 1/2 inch further apart to clear a reasonably sized prop and the motor was moved as far forward as possible to minimize the amount of balance weight that might be needed later on in the nose. To retain the appearance of a twin, a prop was needed at the front end. So I included a peanut scale 4 inch diameter rubber power prop. The little prop was bent to a high pitch for easier free-wheeling and stuck on with a large straight

pin. My model was only flown with the little prop in place. I would guess that longer, higher flights are possible without the drag of the extra prop, but then I wouldn't be able to call it a twin, would I?

Operation

In operation, Boom-Boom is fairly impressive because both props turn throughout most of the flight. The model can be adjusted to fly around at a very low altitude which makes it look quite realistic. Construction of the plane is fairly simple and if you would like, Boom-Boom can be built as a profile model. As a profile, all the formers, stringers and landing gear parts can be left off with a considerable savings in construction time and model weight.

Construction

The wing is begun by selecting a light piece of 1/16 inch or 1/20 inch balsa sheet. Some cuts of balsa bend easier across the sheet—be sure to pick out the wing wood with this in

mind. A too-stiff sheet will cause the wing panels to straighten out between the ribs, giving the wing a warpy, scalloped look. All the ribs are made from the one pattern, with the excess material sanded off after the ribs are glued to the wing panels. Glue the ribs in place using clothespins for clamps, as shown in the photos. After the ribs are glued in, cut the wing in half at the center. Block-up each half to the proper dihedral so the root ribs can be sanded to the proper joining angle. With both halves prepared, rejoin them with glue.

Cut out the booms and trim them to fit the wing. Cut out the fins and glue them to the booms. Sand the booms to thin them out near the fins and to round off the corners. Cut out the stabilizer and glue a couple of pieces of thin aluminum sheet or paper/wire twist tie on the bottom to hold bending adjustments. Slide the booms in place on the wing and pin the stab in place to check the alignment. When these parts line up they can be glued.

The body is based on a center core of 1/8" sheet. With the addition of the wing mount and motor mount, Boom-Boom can be constructed as a profile model as noted earlier. Paint on the windshield and side windows then add trim to relieve the otherwise "plain vanilla" look of the profile.

Install the landing gear wires by sandwicing them between thin plywood circles then epoxy or Hot Stuff them to the core. Cut out the LG notches and attach a circle over each notch. Hot Stuff and baking soda or epoxy the wires into the notches. When this has set, add the other circles. The result will be a surprisingly strong landing gear arrangement for a small model. Make up the wing mount and glue it on now. Cut out each former half and glue them to the core. If you want to save some weight, lightening holes can be cut in the core. Install the main 1/16 inch square stringer to help support the formers. Use a piece of 3/32 inch square or 1/8 inch square as a flexible straight edge to locate positions for the other stringers. Use your own discretion on how many stringers to install, however, more stringers means more weight, but a smoother covering job. A thin file or hack saw blade can be used to cut the other notches. After the stringers are installed, add the blocks at the front and rear. Add some 1/16 inch sheet fill-in pieces to outline the windshield base. Add the gussets and bamboo wing hold downs for the rubber bands. Carve and sand the blocks to shape. Temporarily pin the wing in place and trial fit the 5B and 8A formers. Glue these to the wing along with the upper piece of the core and the two side fairing pieces. The side pieces require shaping to fit the wing surface and to conform to a finished shape. Add the plywood motor mount and test fit the motor, tubing and tank assembly at this time. The tank can be fed into the body through an uncovered panel on the right side, just ahead of the motor. The charger fitting can be bolted in place or left hanging. On my model, I glued a 1/16 inch ply rectangle in place; it's supported by the body core and noseblock. Put 2-56 screws down through the ply and thread into the fitting. On my CO₂ models, I simply let the charger fitting stick out somewhere, that my 2 fingers can get behind it for support when charging. Bend the tubing to allow the tank to be as far forward as possible. The tank is held by the structure, but pad it a bit with some crumpled tissue. Problems with the tank frosting up, can be cured with proper airflow through the body

near the tank. With the motor/tank etc. installation done, you should be able to remove the powerplant in a few minutes so it can be installed in another model.

Remove the motor/tank now to permit sanding and covering. The body of Boom-Boom requires the use of small pieces of tissue for a smooth covering job and no wrinkles. Cover and lightly water spray the body with a couple of coats of very thin dope. Apply a light coat or two to the sheet balsa parts. Contrasting tissue or colored dope trim are now added.

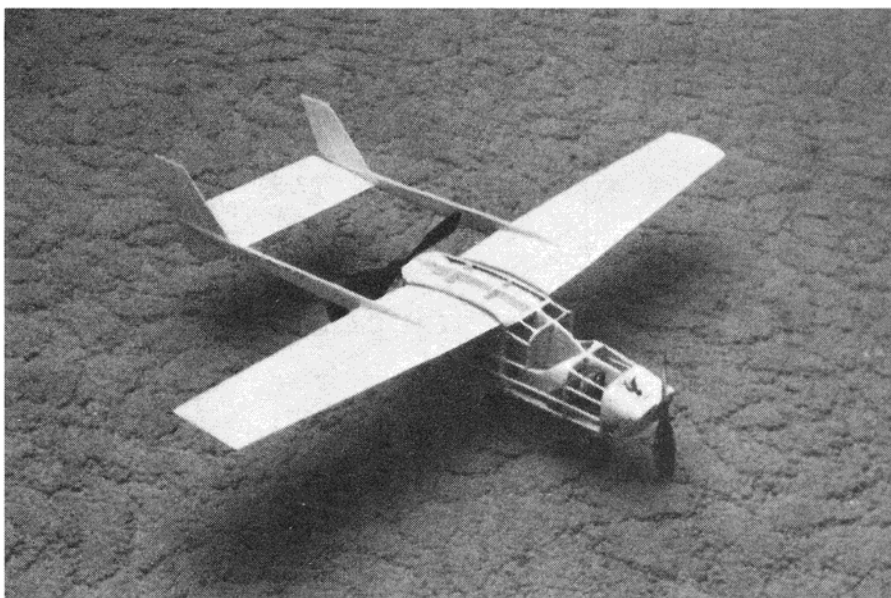
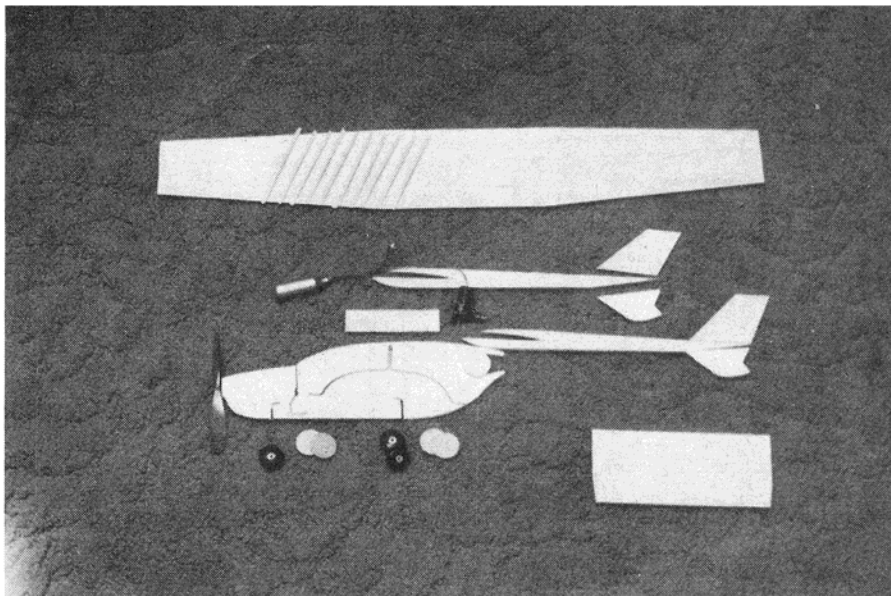
The windshield is made in 2 halves. Use a paper pattern to determine the correct shape. When satisfied with the fit, cut out 2 pieces of .010 inch clear butyrate plastic. Glue the plastic in place very neatly using the film splicing cement. Hold the windshield in place with small pieces of masking tape, and apply small droplets of the cement between the tapes. Mark out side windows with chrome Monocoat scraps, dark tissue or paint.

Reinstall the motor assembly and use a Tern Aero/ Hi Flier prop (supplied with Hi Flier rubber models). Trim about 1/2 inch from each tip, and drill out to fit the Telco prop screw and then balance. The prop is installed facing in a normal direction for the airplane, i.e., front of prop faces the front of the plane. Flip the motor backwards and make sure it is blowing air toward the back of the plane, for flight. Add the front, free-wheeling prop along with the wheels. Williams Bros. 3/4 inch wheels work nicely, but other light weight wheels of about the same size are also suitable. For a nice finishing touch, add some small spinners. Carve them from balsa and sand, dope and tack glue them to the props.

Check the balance and add some weight to the nose if necessary. It's time for a test glide so search out some of that tall grass that we've been reading about for years but never seem to be able to find when it's needed. Boom-Boom is fairly heavy with the sheet balsa surfaces so it will require a fairly fast glide speed. Go ahead and throw it a little harder if the first few glides are disappointing. Try for a fast, flat glide with a 50-60 foot diameter glide circle. Use the bendable part of the stabilizer to adjust the glide attitude by bending it up to slow down a dive and bending it down to cure a stall. Similarly, the rudders can be warped to correct or establish a turn.

Conclusion

After a few glides that look promising, charge up the tank with a gas charge (charger pointing up), and run the motor at a low throttle setting. Hold the model by the body under the cabin area and launch straight out. Make sure your hand clears the main wheels. If the throttle setting is too low, you'll get an extended glide, because of how close the adjustments are. A bit of down-thrust may be required (thin ply or card stock shims between motor and mount at the top), especially if a fast climb is desired. Advance the throttle in small stages to obtain a shallow, realistic climb. Liquid charges (charger pointing down) can now be used to obtain longer runs. Remember, Boom-Boom is a sport model and isn't intended to be a fast, high climber. Hope you enjoy this pseudo twin and if you don't tell anybody, they'll think it has 2 motors. Put the fun back into modeling—fly CO₂.



Here is the finished framework ready for covering. Note the charge fitting near the front "dummy" prop. The Boom Boom may be built as a profile if you wish (top). These are the parts needed for the profile version. The landing gear could be left off for more weight savings. This flight shot was staged (below). Al could not get close enough for an actual flight photograph, but it does fly well.

