

"Styro-Mite" Wotta Flyer!



Cox .010 Powered Rudder-Only Radio Plane Uses Relayless Tone Receiver

■ The fantastic power of the new Cox .010 glow plug engine and the lightness of the new Citizen-Ship LT "3" relayless tone receiver provide a combination that is hard to beat for limited-area R/C flying. Experience gained with .010 F/F models proved that this smallest of engines is capable of lifting much more than we all first anticipated.

To determine if an .010 powered R/C job was possible, the powerplant was first fitted to a free flight model designed for the larger .020 Cox. No difference in climb was discernable. Weight was gradually added until the model was still climbing with a 10 ounce payload. From these tests it became evident that an .010 R/C model was indeed possible.

The next logical step was to design a model limited to an all-up weight of under 10 ounces. Styro-Mite is the result. Through use of Styrofoam and sheet balsa construction, this compact and exceptionally rugged little craft will take much more abuse than many larger models.

Before starting construction, bear in mind the ultimate goal of under-10-ounces. Choose the lightest balsa you can find for the wing and stabilizer sheets. The rudder stock should be preferably of the quarter-grain variety. The 1/32" fuselage sheets should also be light but have some quarter-grain mottling. The added stiffness of this cut is important especially for the triangular section aft of the cabin area.

Start construction by cutting the Styrofoam to outline shape. This is most accurately accomplished if it is done on a jig saw. If it is to be cut by hand, a #26 X-acto blade will do a good job. Care should be taken that the cut edges are square since any incorrect angularity will affect future alignment. Cut out the receiver and escapement compartments, the battery box recess and the opening at the rear that accommodates the torque

rod and escapement rubber before gluing the halves of Styrofoam together. Elmer's Glue All works very well on Styrofoam, or almost any of the white glues will do. Do not use model airplane cement on any joint which contacts the Styrofoam. Cut the 1/16" sheet bottom piece to shape. Note that this piece extends from the tail to approximately 1-1/4" under the Styrofoam cabin section to which it is glued.

Working with Styrofoam and gluing balsa to it is perhaps alien to the average model builder . . . so a few hints are in order. Apply the glue to the Styrofoam. Spread it evenly with your finger and make sure enough is applied to fill the porous surface. All glued parts must be either pinned, clamped or weighted down to insure a good bond. Parts can be worked in a few hours but the glued parts are best left untouched for approximately 8 hours. When gluing balsa to a curved section of Styrofoam, such as the bottom of the fuselage toward the nose, proceed as above but moisten the balsa on its outside surface. This will prevent the balsa from curling away from the joint.

Getting back to the fuselage construction, make up the nose wheel binding the wire to the 1/16" plywood mount. Recess the Styrofoam and glue the plywood in place. Glue on the remaining bottom pieces, grain spanwise and the

1/32" sheet at the rear of the cabin section. (While this is drying work can be done on the wing and tail surfaces.) Fabricate F-2 from 1/8" sq. and cement in place. Add the 1/8" sq. backbone strip and F-3.

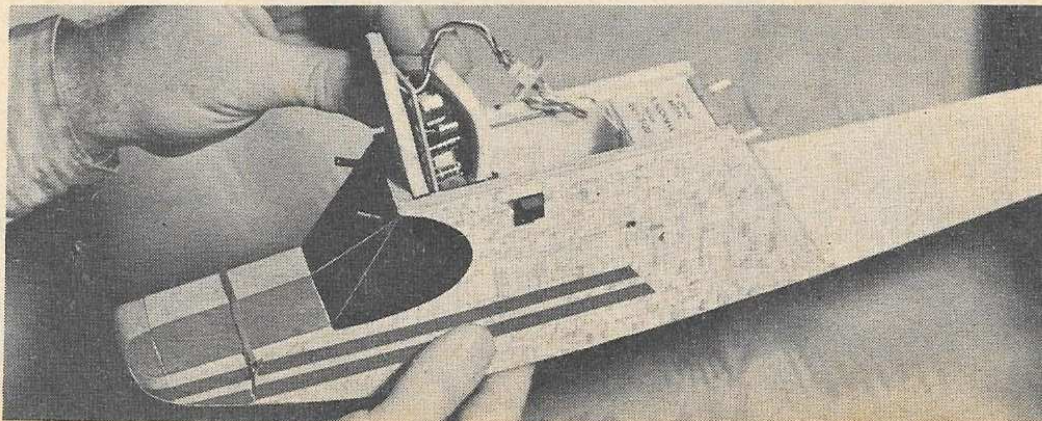
Mount the escapement to 1/16" plywood. Note the plywood mount is of sufficient height and width to insure a good bond to the Styrofoam. The 1/8" x 3/16" backing strip should be left long enough to extend through the sheet sides, thus locking the mount in place.

Make up the torque rod assembly and install it. Add the 1/16" sq. braces and the sheet gussets and braces. Sand the 1/8" sq. backbone to conform with the triangular shape of the sides. Cut the fin to shape and cement it to the backbone. Cement on the 1/32" sheet sides making sure that they are also cemented to the braces, gussets and the fin.

Now is the time to do all the hook-up wiring. Install the switch and jack mount where shown. The jack mount should be flush with the Styrofoam so that it can later be glued to the cabin side piece. When everything is working to your complete satisfaction, the cabin area can be closed up. Use scrap pieces of Styrofoam keeping them as thick as possible. Don't forget to leave an opening for access to the escapement rubber hook.



Designer-author Aubrey Kochman with his tiny R/C job. Ship was center of attraction at LIDS' Long Island contest.

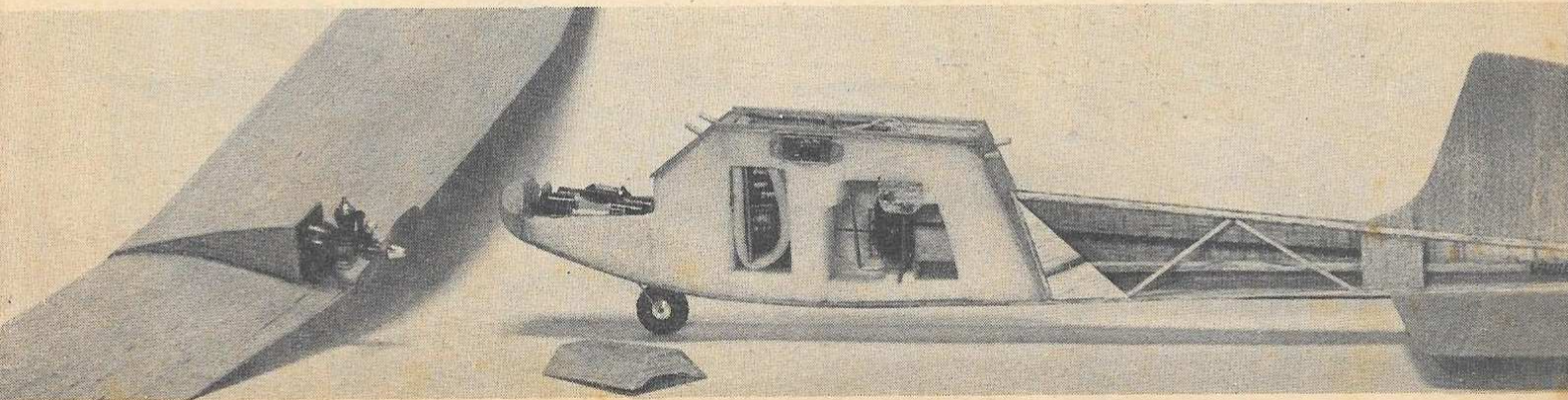
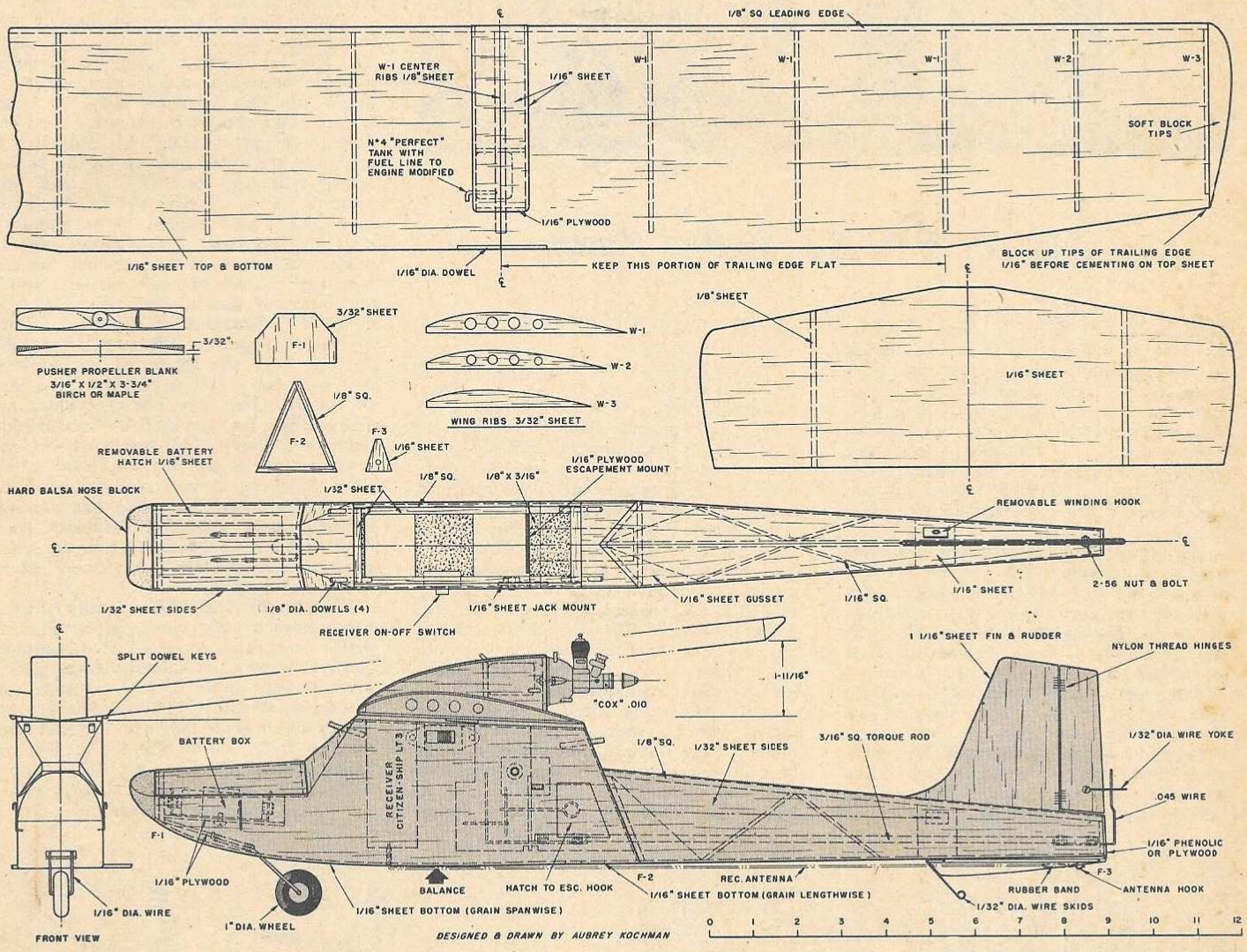
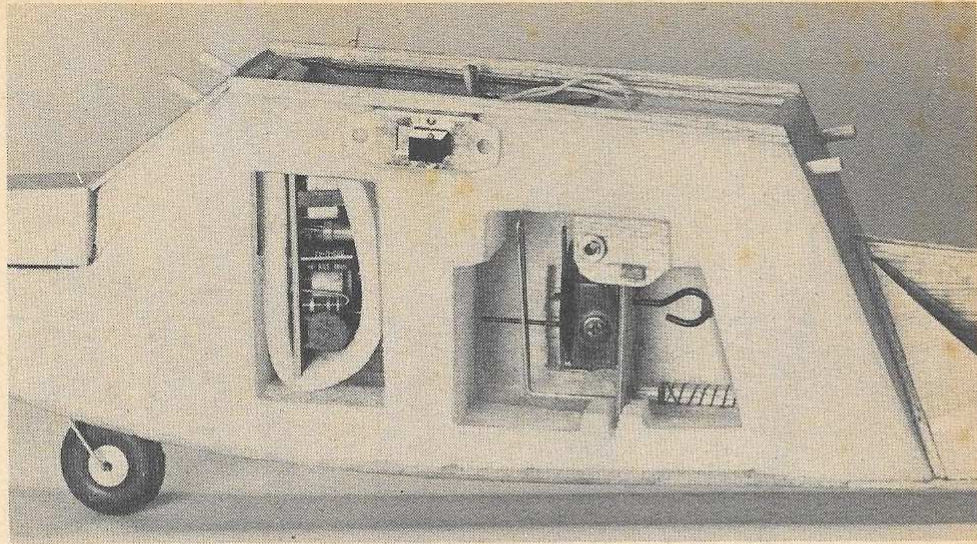


Stuffing Citizen-Ship receiver into Styro-Mite; Styrofoam bed protects it in event of crash. Fiberglassed nose.

Man, you're going to have a tough time tearing up this fuselage! Components shown before side was sheeted (Johnny Kay pix).

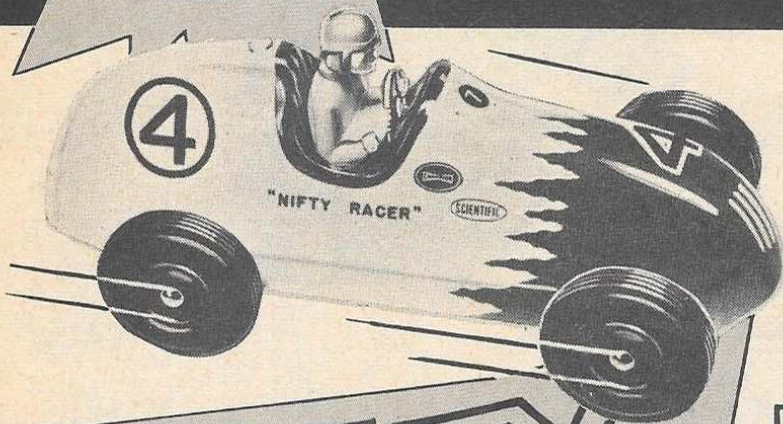
Cut the Styrofoam to shape to form the cabin windshield and cover with 1/32" sheet. Cut the side sheets to shape. Cut necessary holes for the switch, jack and the escapement mounting brace. Glue the sides in place. Lay the fuselage on its side and weight it down with heavy objects. Books work well. Use plenty of weight. Don't be afraid you'll crush the fuselage. You won't.

The battery hatch cover is formed from 1/16" sheet. It is held on via hooks and rubber bands. The nose block is cemented to F-1 and shaped as shown. As the nose will take the full brunt of any nose-over landings it is wise to fiber-



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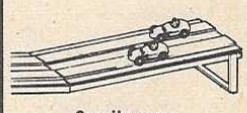
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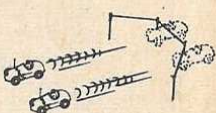
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Styro-Mite

glass the front of the nose block and the bottom of the fuselage rearward to a point over the wheel.

The sheet wing design was chosen because of its resistance to warps and its ability to take rough landings without puncturing. If you have a flying site that is not infested with tough reeds, a built-up paper covered wing may be substituted.

The sheet wing is constructed in halves. Cut the bottom sheets to outline. Cement on the 1/8" square leading edge. Add the ribs. Bevel the trailing edge and shape the leading edge. Pin the sheet to the workboard. Raise the trailing edge tip 1/16" as shown. Cement on the top sheet. Constantly check for warps during the cement drying period. Any built-in warps will be very difficult to remove later. The wing halves are cemented together glider-fashion. Bevel the center ribs until the proper dihedral angle is achieved. Do not increase this angle. Slightly less dihedral will be perfectly all right. When the wing halves are firmly cemented together add the engine nacelle. For those of you who are a little dubious about a pusher design or feel that carving a pusher prop is beyond your ability, Styro-Mite will fly equally as well as a tractor. Simply build up the engine nacelle so that the prop is forward of the windshield. Keep the balance point as shown by shifting the batteries rearward or by adding a few extra coats of well plasticized dope to the tail surfaces.

For all test flights of short duration, the standard .010 tank will do nicely.

However for longer flights the Perfect #4 tank, modified as shown, may be installed in the nacelle.

The propeller that gave the best performance is shown on the plans. Keep its airfoil fairly thick especially where the starting spring engages it. Carve a smooth prop and take care that it is balanced.

Finish the model by going over the entire craft with fine sandpaper. Apply about 3 coats of clear dope and trim with 2 coats of colored dope. Lee's dope was used throughout and worked very well.

"Styro-Mite" Bill of Materials (Balsa Unless Otherwise Noted)

Two pieces 1/16" x 6" x 36"; (2) 1/16" x 3" x 36"; (2) 1/32" x 3" x 36"; (1) 3/32" x 3" x 36"; (2) 1" x 4" x 12" Styrofoam; (1) 3/16" x 3/16" x 36"; (2) 1/8" x 1/8" x 36"; (1) 1/8" x 1" x 36".

Also 1/16" plywood; 1/8" dia. birch dowel; scrap blocks; wire; cement; clear dope; colored dope; Elmer's Glue All; 1" wheel; #4 Perfect fuel tank; 3/16" x 1/2" x 12" birch or maple.

When trimming with this dope it was found that the masking tape should be removed as soon as the second coat has been applied. Remember, the lighter the model the better so don't weigh it down with unnecessary coats of dope.

No offset thrust adjustments were required on the original but yours may require some. This may be due to either the degree of propeller accuracy or a slight misalignment of flying surfaces. Make all test flights in calm air with winds under 5 mph. Once trimmed out properly, Styro-Mite will surprise you with its wind penetrating ability.