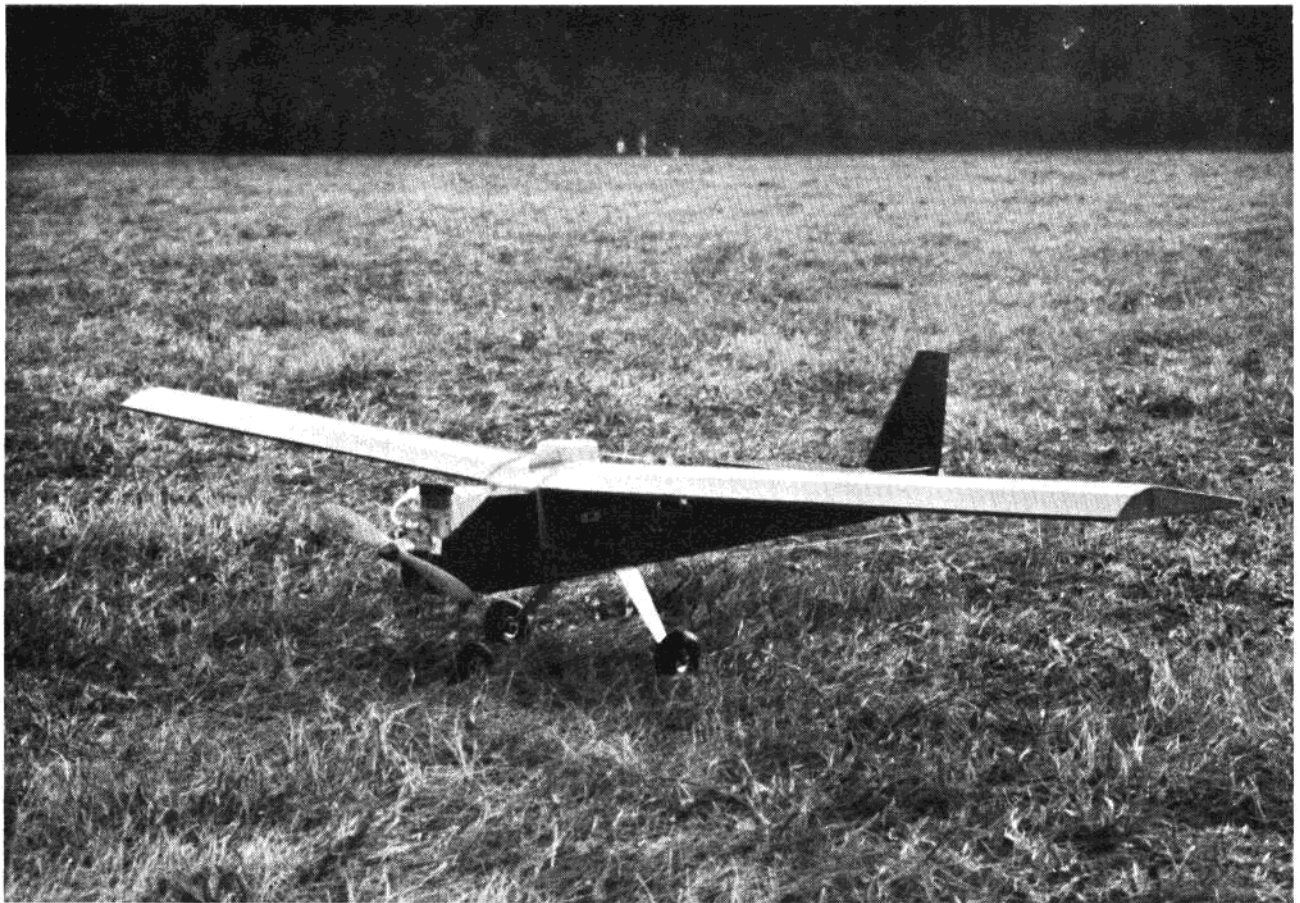


Dennymite

by TOM ABBERGER



The Denny-mite is not intended for the sophisticated or advanced scale modeler. Rather, it is for the modeler who wishes to design and build large flying models in less time and at low cost, with no sacrifice of perfection or beauty of workmanship.

My own motives for attempting the cardboard foldcraft design concept were quite personal. Every five years, my wife has presented me with a newborn son (three, plus one girl) to share the modeling hobby. My spouse continues to exhibit great tolerance in the matters of castor fumes in the basement, grass- and oil-stained trousers, piles of modeling magazines at every convenient location, and high electric bills. Modeling is our way of life.

In addition to our flying club activities, my sons have their own private flying strip behind our home outside the city limits. Their usual summertime greeting, which is music to my ears each evening, is, "Can we fly tonight, Dad?" But when the youngest child, at the

tender but aggressive age of four, demands his own flying models and equal flying time, along with the older boys, then a totally new concept for the supporting logistics of time and materials is required. Our approach led to the fold-up cardboard method of building.

By using this technique, my sons have been provided with do-it-yourself kit ideas which use corrugated cardboard sheet stock in place of balsa or plywood. The most unique feature of these aircraft is that the fuselage and/or wing is made from one piece of corrugated paper board, folded, and contains only one seam. Corners are filled in with 1/8" square balsa strip.

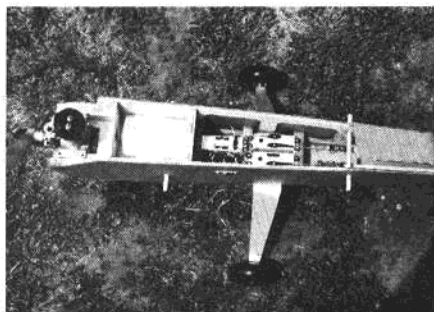
The fold-up idea has enabled us to build, in short order and at low cost per plane, many more of the slab-sided designs such as Das Little Stik or Ugly Stik, Square Shooter, Fokker D-VII, Nieuport 17, etc. Surprisingly enough, fold-up flying models constructed for the larger 45 to 60 size engines proved to have a service life equal to, or greater than,

conventionally built RC designs. Another of the many advantages of working with paper stock is its compatibility with any of the glues, dopes, cements, lacquers, enamels, resins and/or covering materials which require heat in application.

The Denny-mite design is intended as an example of what can be done with the one-sheet fold-up concept of construction. The technique can be applied to more sophisticated designs, with equivalent savings in time, patience and money.

Construction: This method uses a drawing the actual size of the model, which is presented as a flat layout development or drawing of the body. The intended design is laid out flat as it would appear if a completely built fuselage were unfolded. The pattern is designed in one piece so that, when the blank sheet is cut according to the layout, the cut-out piece provides the required size and shape when bent up or rolled into the finished structure.

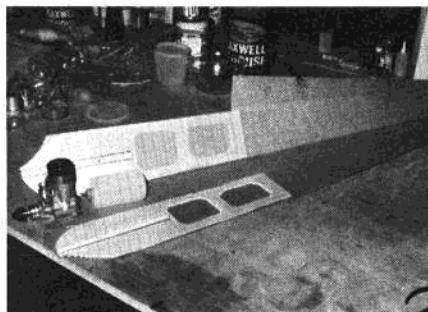
Rugged, quick-built, sport trainer made almost entirely of corrugated cardboard. Can be built directly from these plans.



Cavernous fuselage contains any size radio/servo. Large Fox 60 used for brute power, but a 35-45 size is adequate.

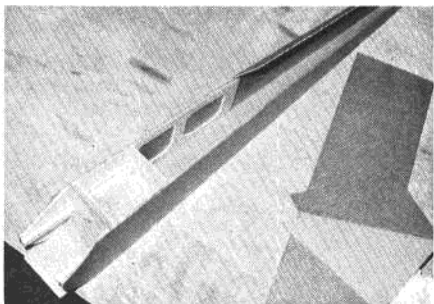


Almost finished, controls installed before gluing down the fuselage top. Note rails around aileron servo for wing alignment.

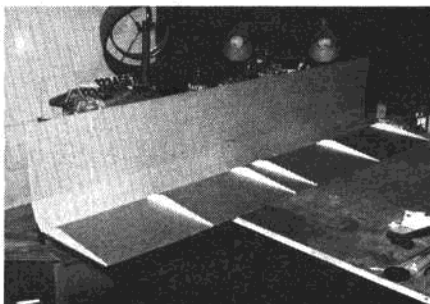


Epoxy hardwood engine rails to plywood doublers, then contact cement them to sides.

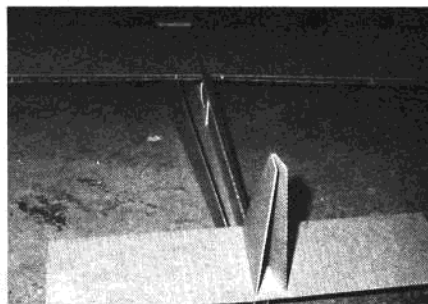
Entire fuselage made of one piece cardboard. Notice constant nose to tail taper.



Spanwise corrugations give wing its strength and permit bending for airfoil shape.



Note corrugations on stab are cordwise. Flat rudder/elevator are double thickness material.



Materials and Tools: These are indicated in the plan and photographs. Sheet stock size in length and width must meet the overall dimensions given. The working area should be a flat surface large enough to support the complete single fuselage or wing sheet stock. Drawing tools required to transfer or enlarge the design to the intended size on the sheet stock are minimal: yardstick, square or triangle, lead pencils and eraser. Cutting tools are an X-acto knife and a steel guide, such as a large carpenter's square. Good substitutes are a venetian blind slat or a standard carpenter's hand saw with handle removed. The steel guide is used to insure clean straight cuts and incisions in cardboard sheet and to avoid possible finger cuts. Keep fingers back from the cutting lines.

The Dennymite fold-up pattern is drawn as illustrated by steps one through four. The fuselage is based upon a perfectly flat bottom and its dimensions can be enlarged to actual size starting from a bottom centerline. Actual

size dimensions for the Fox 60-powered airplane are given.

All fold-up lines are to be cut only halfway through to incision depth. On such lines, use moderate cutting pressure only. When cutting the complete fuselage outline, a clean smooth cutting stroke must be used. The steel guide must be used to insure the straight clean edges necessary for perfect alignment when folded.

Fuselage doublers can be added after the actual folding procedure, if desired. The folding will be smoother if the line to be folded (line cut halfway through) is aligned along the edge of a square-edged work table and then popped downward to make the fold.

Horizontal stabilizer and vertical fin are double thicknesses of corrugated cardboard when completed. Use contact cement if available; if not, weight must be used to hold the sandwich construction down flat until dry.

Wing construction is essentially the same

as the folded fuselage. After completion of wing cutting and initial popping procedures, position and cement wing ribs on the inside of the bottom surface, as shown by photograph and pattern. Sections of standard one-in. high yardstick material can be cemented between ribs 3 and 8 prior to gluing down the top of the wing to rib upper edges and the trailing edge.

If the wing is to be used on an aircraft without ailerons, build the wing in two halves with centerjoint ribs canted to provide two inches of dihedral at each wingtip. On either a one- or two-piece wing, apply a liberal coat of epoxy or fiberglass resin on both top and bottom sides of wing at the centerline joint and rubberband hold-down areas.

Use epoxy or fiberglass resin at the engine bearers, engine and fuel tank compartments. Use epoxy or resin at the stabilizer and vertical fin root areas on the Dennymite design.

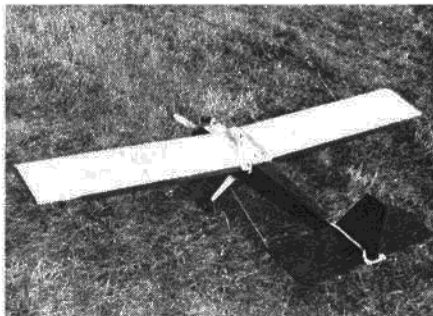
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Secure 1/8" sq. strip balsa with ordinary model glue at fold lines and pin until dry. Scotch Brand Magic Transparent Tape No. 810 can be used effectively at fold-up seams, if desired. All open edges on the cardboard can be sealed with model cement, or appropriate-sized cap strips may be glued on and sanded to shape when dry.

The Dennymite horizontal stab has been drawn to be integral with the fuselage bottom for improved trim. The slight amount of fuselage cutting required to make this installation (as shown on pattern) is worthwhile. A deviation from the landing gear installation shown is the substitution of a tail-wheel for the nose-wheel. Consideration must then be given to positioning the main gear just behind the leading edge of the wing and the gear dowels placed accordingly.



Aileron servo fits through top and bottom wing skin. Tight balsa box around it protects servo from fuel/exhaust spray.

Finishing: The Dennymite in the photographs was finished in Super MonoKote Black, without any additional external strengthening of the natural cardboard prior to covering. However, cardboard is porous and accepts dope well without swelling. It greatly increases in sheer strength with each coat of dope applied.

Spray-on enamel affords greatest coverage and a fine gloss. Sprayed dope requires several coats, but then impact dents are easily

repaired by grafts using Ambroid or a similar glue with acetone thinner. Coverite with normal doping procedures provides an excellent finish. Fiberglass resin or Hobbypoxy resin squeegeed into the surface, sanded and primed, then sprayed with acrylic finish, provides hard, tough, glass-like structures.

The least expensive finish is adhesive-backed Contact shelf paper (Comark Plastics) which also comes in glossy white. This heavy but amazing stuff comes in 18-in. rolls, 25 yd. long. The 3M plastic tapes, available in 3/4-in. and 1 1/2-in. widths, 130 in. to the roll, in all colors, make excellent trim materials.

Whatever finish is selected, use the lightest covering needed to provide the structural rigidity demanded by the required engine size. Balancing and trimming procedures must be accurate. This is not a "Corrugated Crow"—these cardboard fold-ups are tough and can really fly.