

Although not quite as elegant as some of the gliders that have recently graced the pages of R/C Modeler, the E-Z II was designed mainly to be E-Z'ily built and, not necessarily, to be E-Z on the eye. However, it has a certain appeal, if mostly to the wallet, but it flies much better than it looks anyway, and that's the name of the game, after all.

This model was actually designed for Lisa, my 10 year old daughter, who had been expressing an interest in learning to fly R/C gliders. I took her request one step further, however, by drawing something so she could also learn a little about building models and, in fact, she did build almost all of the prototype shown here.

When planning the design, I decided that, wherever possible, pieces would be 36" long, or simple divisions of 36", and that no involved wood cutting would be necessary, hence the very simple lines shown on the plan. Most of the

model is built from 1/4" square balsa, and so, if you're planning to build one of these models, it's worth looking well at the local hobby shop's supply, and picking out the better pieces.

As mentioned before, Lisa built most of the structure, and I helped as little as possible; my main contribution being to straighten up a few pieces here and there, and to cut and glue the wing joiners in place. A further item that we discovered during construction was that it proved much easier for Lisa to make pieces using a small hand saw, than by using a knife or razor blade; sawing also providing a straighter and smoother cut. One exception to this was the wing ribs, which are also discussed later in the construction notes and are easily cut using a razor blade and a straight-edge.

Most of the structure was completed during a couple of weeks of evenings, and covering took another two nights — so, if you're looking for a quick project, or something for your children to learn fly-

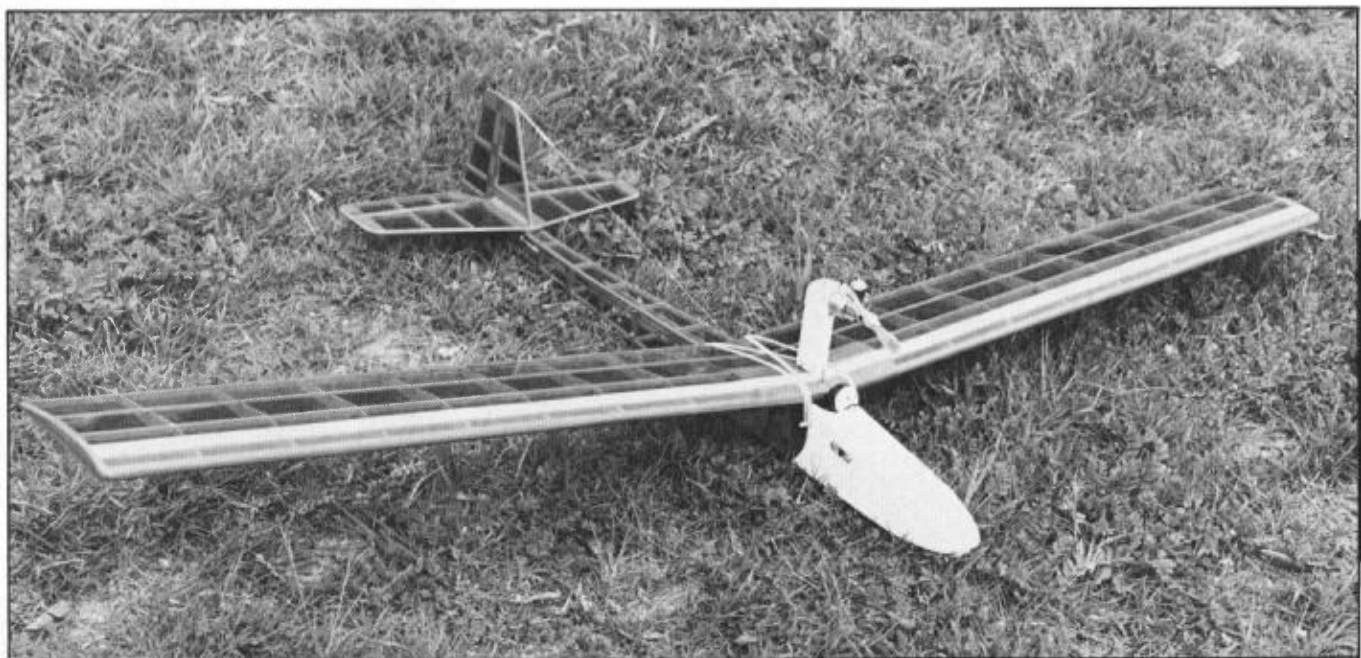
ing on, try our glider - - - it's E-Z II. This was proven, conclusively, by the prototype built by RCM's Fearless Leader. It's the one shown in the photos with transparent covering and an optional power pod. While he did have far more difficulty than Lisa in building the EZ-II, he did manage to complete it with only occasional assistance from other RCM staff members.

CONSTRUCTION

WINGS:

As we stated previously, one of the design rules we established was that most major dimensions would be three feet, so it should come as no surprise to discover that each wing panel happens to be 36" long, giving a total span of 72". The only other item that may raise an eyebrow on the experienced builder is the wing rib. Now ribs are usually wonderfully curvy creations, with exotic names such as Rhode St. Genese 28, or

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E-Z II



It may not be as easy on the eye as some graceful soaring machines, but it is easy to build and to fly. In fact, this six foot span slope or thermal soarer is an excellent knockabout sport machine, or is a trainer for that young RC'er in the family. The E-Z II can be hi-started or launched with the optional power pod.

By Jack and Lisa Headley

E-Z II

Designed By: J.W. Headley

TYPE AIRCRAFT

2 Channel Glider

WINGSPAN

72 Inches

WING CHORD

7 1/2 Inches

TOTAL WING AREA

540 Square Inches

WING LOCATION

Top Of Fuselage

AIRFOIL

Flat Bottom

WING PLANFORM

Constant Chord

DIHEDRAL, EACH TIP

4 Inches

O.A. FUSELAGE LENGTH

40 1/2 Inches

RADIO COMPARTMENT AREA

(L) 11" X (W) 2" X (H) 2 3/8"

STABILIZER SPAN

18 Inches

STABILIZER CHORD (incl. elev.)

4 3/4" (Avg.)

STABILIZER AREA

82 Sq. In.

STAB AIRFOIL SECTION

Flat

STABILIZER LOCATION

Top of Fuselage

VERTICAL FIN HEIGHT

5 3/4 Inches

VERTICAL FIN WIDTH (incl. rudder)

5 1/2" (Avg.)

REC. ENGINE SIZE

.049 (on optional power pod)

FUEL TANK SIZE

Tank Mount

REC. NO. OF CHANNELS

2

CONTROL FUNCTIONS

Rudder & Elevator

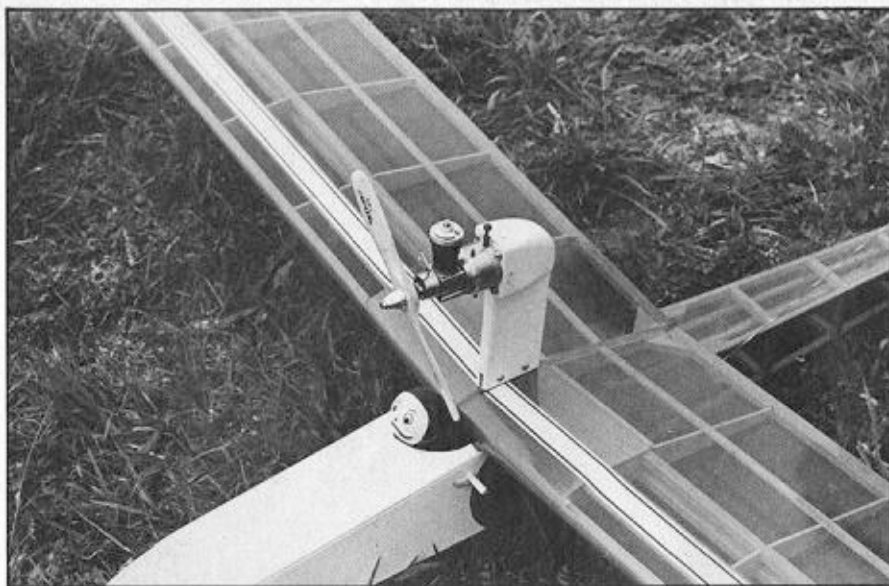
BASIC MATERIALS USED IN CONSTRUCTION

Fuselage Balsa & Ply
Wing Balsa
Empennage Balsa
Wt. Ready-To-Fly 27 Oz.
Wing Loading 7.2 Oz/Sq. Ft.

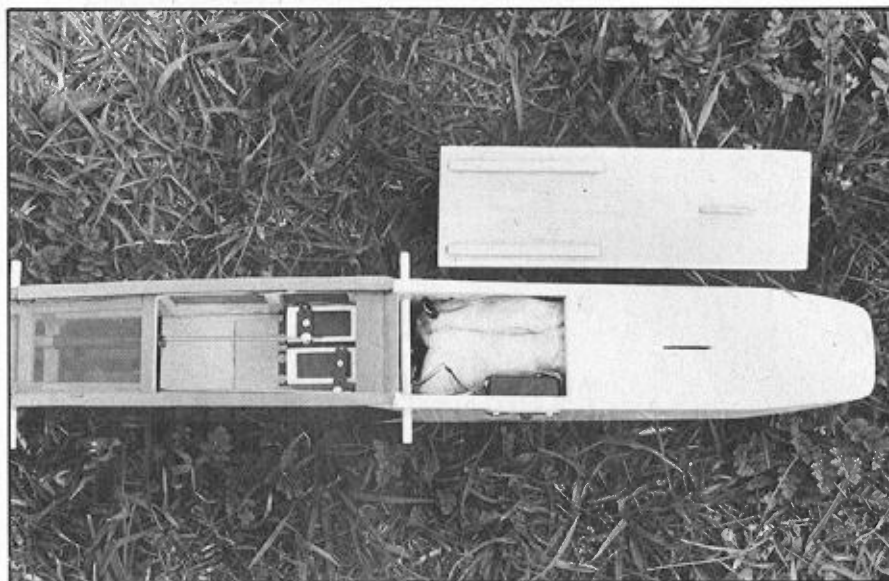
MATERIALS LIST

- 18 — 1/4" x 1/4" x 36" balsa; basic framework & main wing spars
- 5 — 1/4" x 1/2" x 36" balsa; wing L.E., T.E.
- 4 — 1/8" x 1/8" x 36" balsa; wing spars.
- 2 — 3/32" x 1/4" x 36" balsa; wing spars.
- 1 — 1/4" x 4" x 36" balsa; fuselage, empennage braces, wing tips, gussets, dihedral braces.
- 1 — 3/32" x 4" x 36" balsa; wing ribs and hatch floor.
- 1 — 1/16" x 4" x 36" balsa; hatch sides, spar webs, wing sheeting.

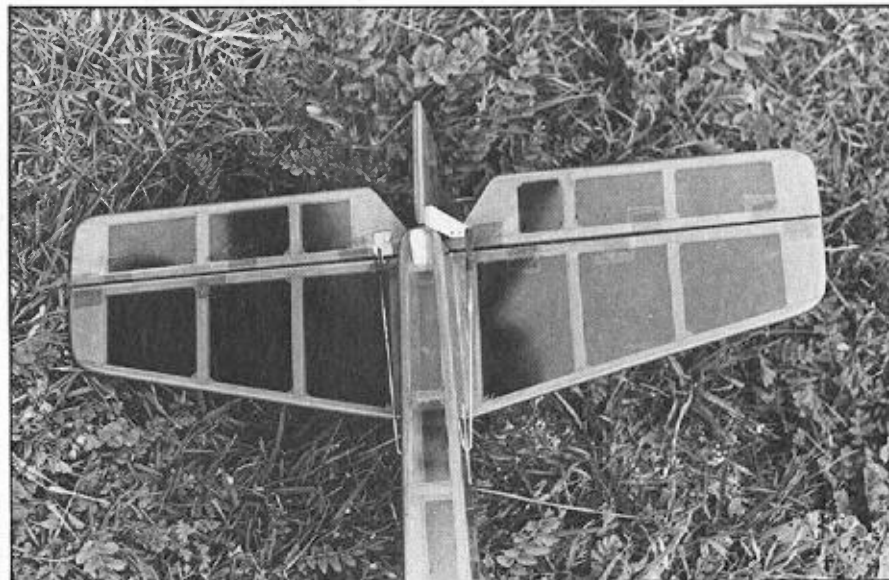
Scrap 1/8" ply (optional power pod, tow hook base); 3" x 3" block or scrap 1" x 3" x 3" balsa (nose block); pilot (optional); Golden Bee .049 (optional); 5 1/2/3 or 6/4 prop (optional); nose skid (optional); hinges; Solarfilm or MonoKote.



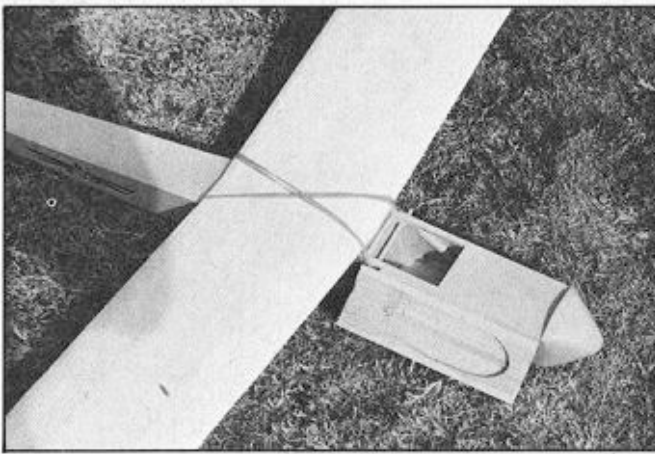
The bolt-on .049 power pod can easily be removed.



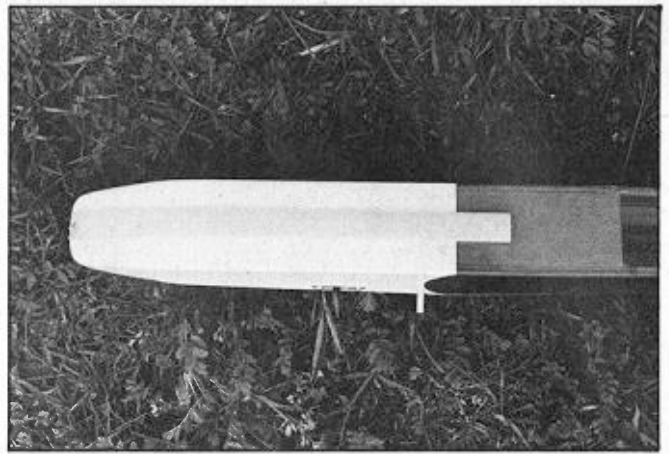
The radio and servo compartment. Note hatch hold-down.



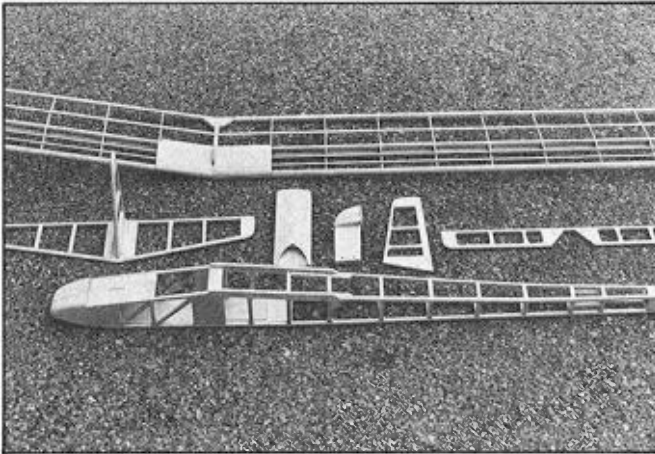
The empennage is light and strong. Note control linkages.



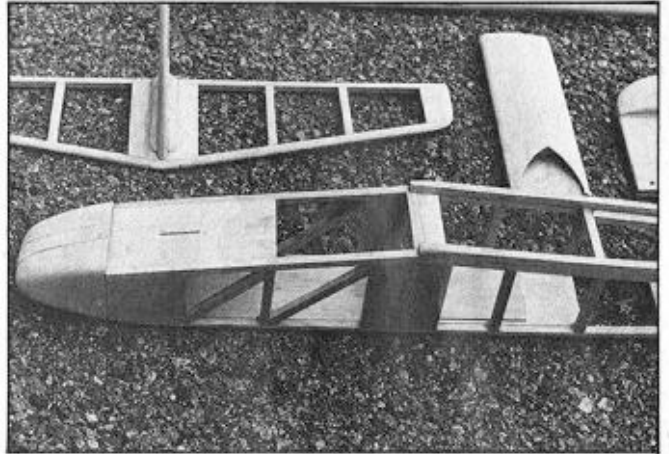
Author's prototype with side hinged front hatch.



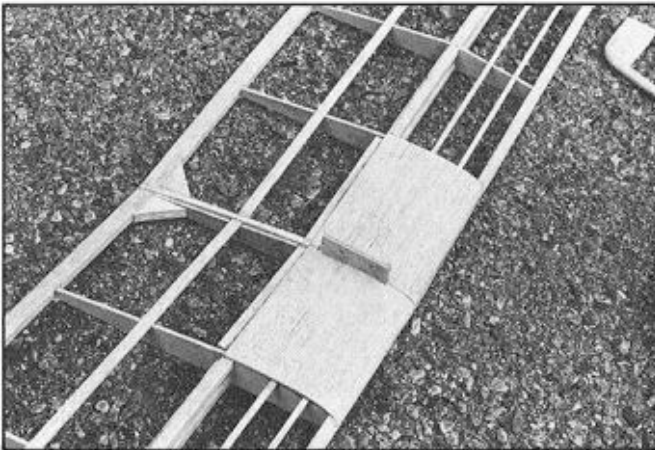
Strip of nylon over double stick tape serves as landing skid.



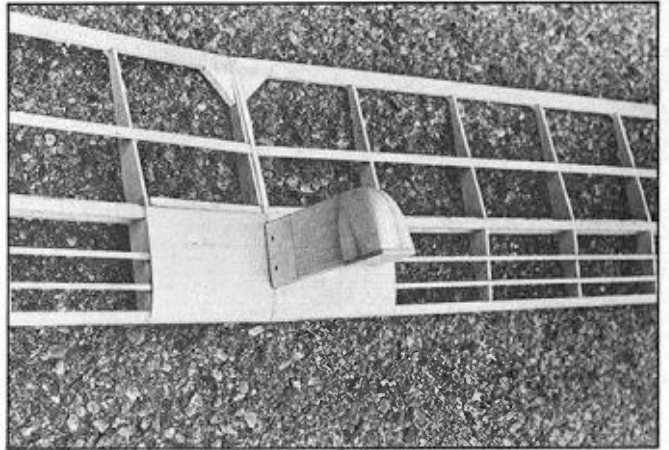
The framework of RCM's prototype of the E-Z II.



Close-up of nose, hatch hold-down, and radio compartment.



Power pod mounting tab is part of plywood center rib.



Optional power pod slipped in place over mounting tab.

Gottingen 501, and don't resemble our own creation at all which, incidentally, we've named the "Flying Triangle".

This is one of the simplifications we've made for the junior builder and it does speed up the construction time. The actual airfoil section is, of course, created when the upper surface spars are added, and these transform our triangle into a Clark Y, our favorite airfoil section.

Building the wing begins with cutting out a batch of these ribs, which are then notched for the 1/4" x 1/4" spars. Pin

down on the plan the leading edge (unshaped), the lower 1/4" spar, and the trailing edge (shaped as shown). Now cement all except the center rib into place, followed by the upper 1/4" square spar. Now make up the other wing panel, remembering to omit the center rib also, and join these together in the center using the sheet braces. The central ribs can now be installed, then the upper surface spars, followed by the wing tip ribs. Rounding off the leading edge finishes the wing construction.

FUSELAGE:

Begin the fuselage construction by first looking through your supply of 1/4" square balsa and selecting two strong and stiff pieces for the lower longerons, and two strong, but flexible, pieces for the upper longerons. Now we will make up one fuselage side frame. Pin down on to the plan one upper and one lower longeron, then add the uprights and the 1/4" sheet pieces. After this has dried, make up another identical side frame,

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then sand both of these frames lightly all over. Now join the sides together, first at the front, using the 1/4" sheet floor and the two frames F1 and F2. Next, cement the frames together at the rear using frame F3, and then fill in all the remaining cross pieces and sheet items. Now sand this assembly all over lightly after

which you can make and attach the nose block and the wing rails.

This completes the basic fuselage, but don't begin any covering yet, as the next task is to cement the tailplane into place, followed by the fin.

The cockpit cover-radio hatch, as shown on the plans, is probably more elaborate than it needs to be and, if required, a piece of 1/4" sheet cut to the fuselage outline can be substituted. However, the hatch, as drawn, provides

a small amount of scale appearance and helps disguise some of the angularity of the fuselage. Begin construction by making the base plate H3 from 3/32" sheet, and cementing on the two triangular pieces H1 and H2. Sand the edges of the base slightly to the contours of the triangles to provide a little more gluing area, then cement the 1/16" "roof" pieces (H4) into place. Sand away all the sharp edges, then cut the cockpit sides to the final shape.

TAIL PIECES:

Begin with the horizontal tail and, in particular, the stabilizer (that's the front bit). Use good quality 1/4" square for the longer pieces - - - softer stock can be used for the cross members. Now for the back piece, or elevator. Here it's important to select a tough piece of wood for the front spar, as this piece has to transmit the control load from the "horn side" to the other side. Make certain also

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that the back spar of the stabilizer and the front spar of the elevator are straight, otherwise the hinges will not operate freely. The fin and rudder are built in a similar manner and the above comments regarding wood strengths apply here also.

Once all these pieces have been built, sand the leading and trailing edges and the tips to a semi-circular shape, then sand lightly all over. Now to assemble these items on the fuselage, and again we begin with the stabilizer. Before finally cementing this into place make sure that its alignment is correct and, if not, sand the fuselage longerons lightly until it is. When satisfied, glue the stab into place.

Next comes the fin, which is not placed in the center of the horizontal, but slightly to the right of center. Although this may look at a little odd, it does permit the rudder control to operate a little better. If you intend to use MonoKote or Solarfilm as a covering material, it's now time to cover these pieces, plus the rudder and elevator. When the covering is completed, attach the elevator, using your pet style of hinges, then hang on

the rudder. Before the rudder is finally fitted, make sure that the elevator has ample clearance and operates freely. Attach the control horns now, and hook up the push rods, and the tail section is complete.

RADIO INSTALLATION:

This will, of course, depend on what type of radio you intend to install. On the prototype, we used two separate servos for elevator and rudder; these being positioned in the fuselage under the wing. The battery pack and the receiver were placed in the nose region together with the necessary nose weights. If, however, you have the two channel brick type radio, try putting everything in the

nose compartment, and this will probably save a little weight. The plans show the installation we used on the prototype.

OPTIONAL POWER POD:

RCM's prototype, built by Don Dewey, shows an optional power pod that can be installed and easily removed whenever desired. The photographs are self-explanatory and illustrate how the pod simply bolts on to a plywood tab on a plywood center rib. If desired, the front hole could be enlarged to a slightly curved vertical slot so that the engine thrust could be easily adjusted at the field. Another option would be to simply strap on a D & R Power Pod, designed

for .049 engines, and available at most hobby shops. Either way, the power pod can be removed for Hi-Start or slope soaring.

FLYING:

No, we're not quite ready to go off flying just yet, first we need to do a little balancing. Install the radio gear in the correct location, put on the wings, and check the location of the Center of Gravity. It will probably be too far back (it always is), so tape some lead weight to the nose just behind F1 until the balance occurs at the point shown on the plans. Now remove the radio and the wings, then epoxy the weight to F1. When this epoxy is set, and not before, re-install

the radio, and it's off to the flying site. Our prototype flew well with the C.G. as shown, but individual models may require more or less lead, so don't be afraid to experiment.

We also discovered that some right trim was required; and eventually traced this to a slight warp in the wings which was then ironed out.

EPILOGUE

We'd hoped to report at this time that Lisa was now an expert R/C flyer, but due to the perversities of nature, 'taint so. Since the model was completed we've had a record string of rainy weekends, and on the rare days when flying was possible, the wind has been so light that any training sessions were out of the question. However, sufficient flying has been done with the model to thoroughly check out its flying characteristics, and now it's a simple matter of waiting for Mother Nature to get with it so our training can begin. □