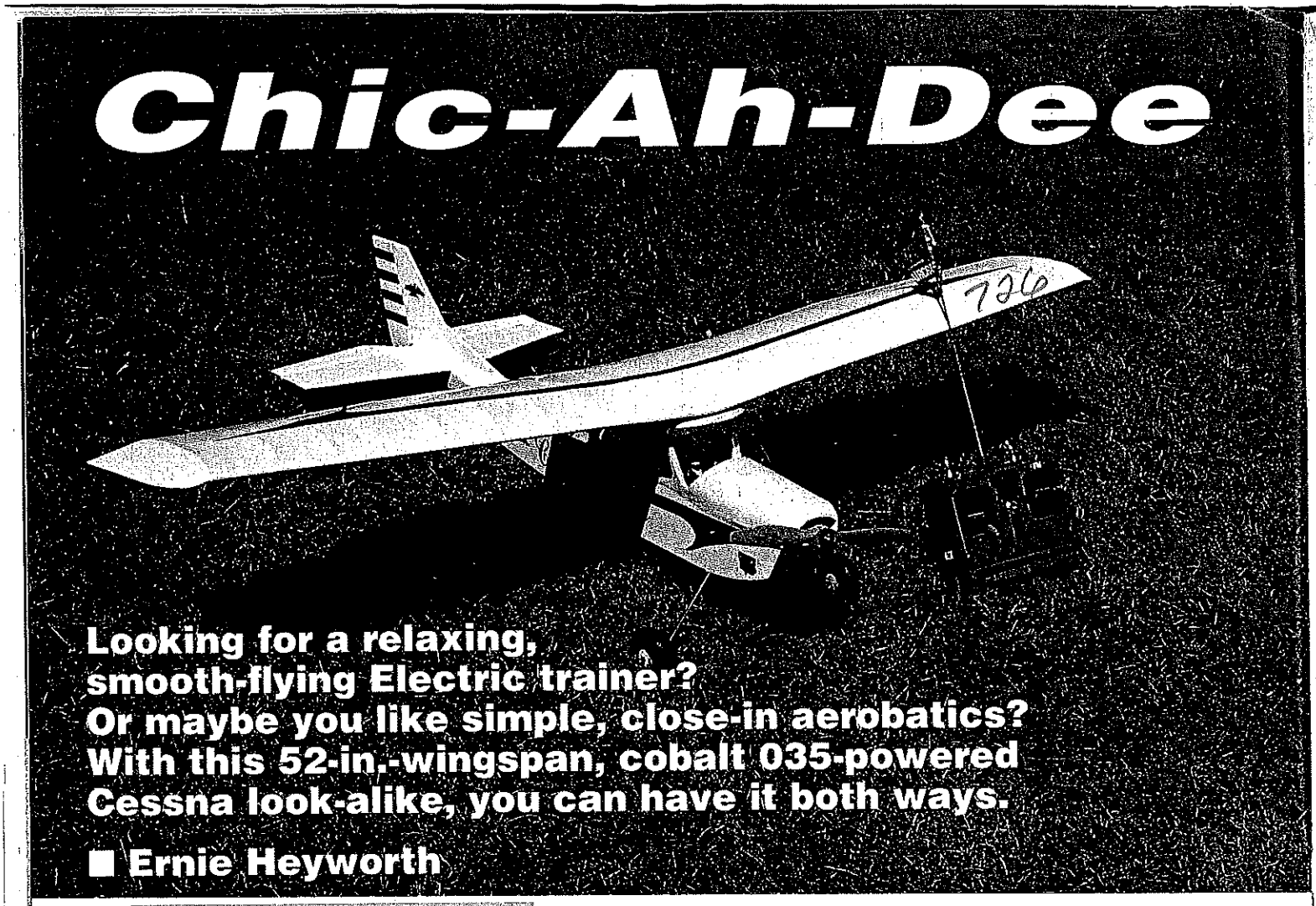
Chic-Ah-Dee



Looking for a relaxing, smooth-flying Electric trainer? Or maybe you like simple, close-in aerobatics? With this 52-in.-wingspan, cobalt 035-powered Cessna look-alike, you can have it both ways.

■ **Ernie Heyworth**

TRACING a project to its beginnings can be harder than you'd think. But with the RC Electric Chic-Ah-Dee, pulling out the facts was easy.

Lying around in my workshop were eight six-cell battery packs (left over from an Old-Timer Comet Clipper powered by an Astro Flite geared cobalt 15)—yet the only kits I had available required seven-cell packs and 05 motors.

What to do with the six-cell packs? Picking a motor system was easy—I decided on an Astro Flite cobalt 035. Picking a plane was harder. I'm partial to models that look like full-scale airplanes—Cubs, oldies, Cessnas, or the like.

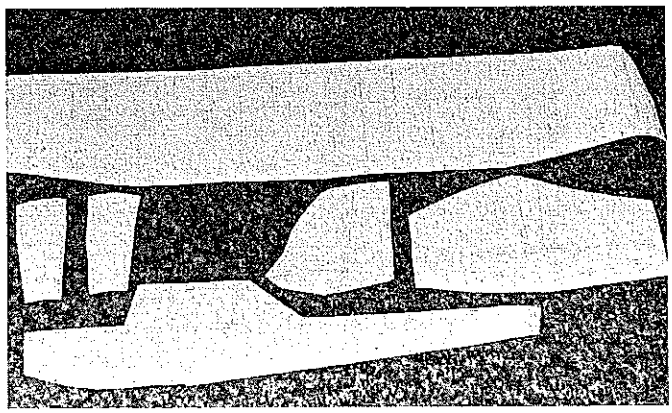
I found a few realistic kits, but none of them met all my needs. The Great Planes Cub might have come close, but it needed the usual 05 motor and seven cells. The Cub also had too much wing (57 in.) and too much weight (48 oz.). Even for a seasoned kit-basher like me, modifications looked impossible.

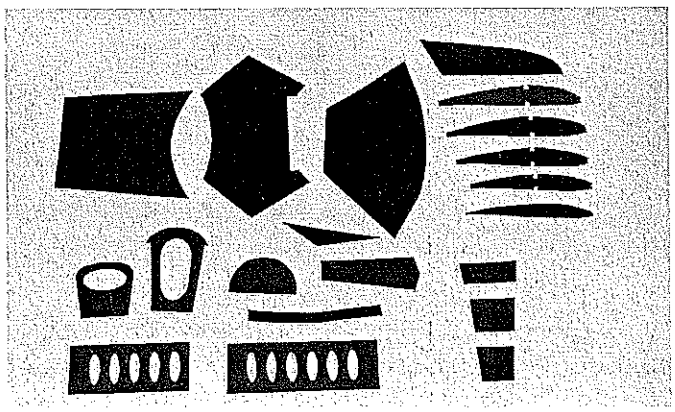
Another consideration was that I fly anywhere and everywhere—ball diamonds, farm fields, slope sites, you name it. To survive my antics, the model had to be able to get in close. Heck, it had to be able to drop in over trees, wires, and cows.

The more I thought, the closer I got to the drawing board.

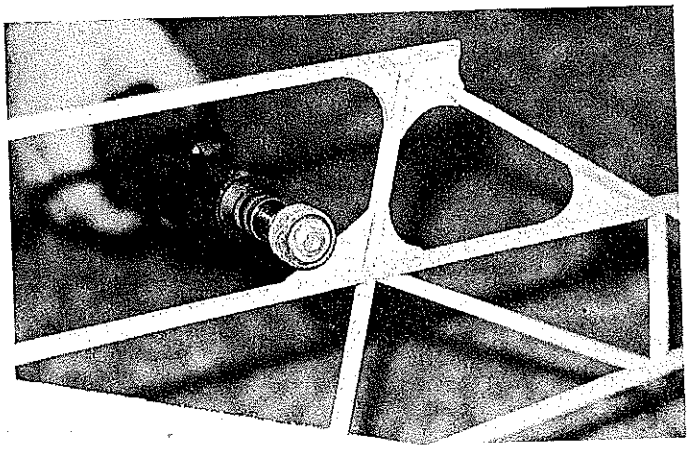
The first thing I did was to sit down and write a good set of design rules—features that pleased me and that would be fun for the beginning Electric flier. Here's the want list I came up with:

- An 035 motor or the equivalent, using six-cell battery packs.
- A wingspan that could be cut from typical wood lengths—36 and 48 inches—without a lot of waste.

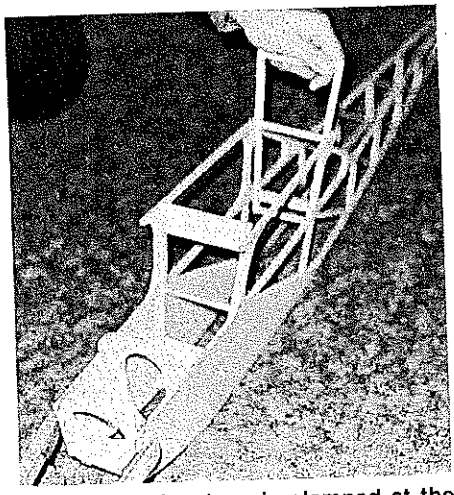


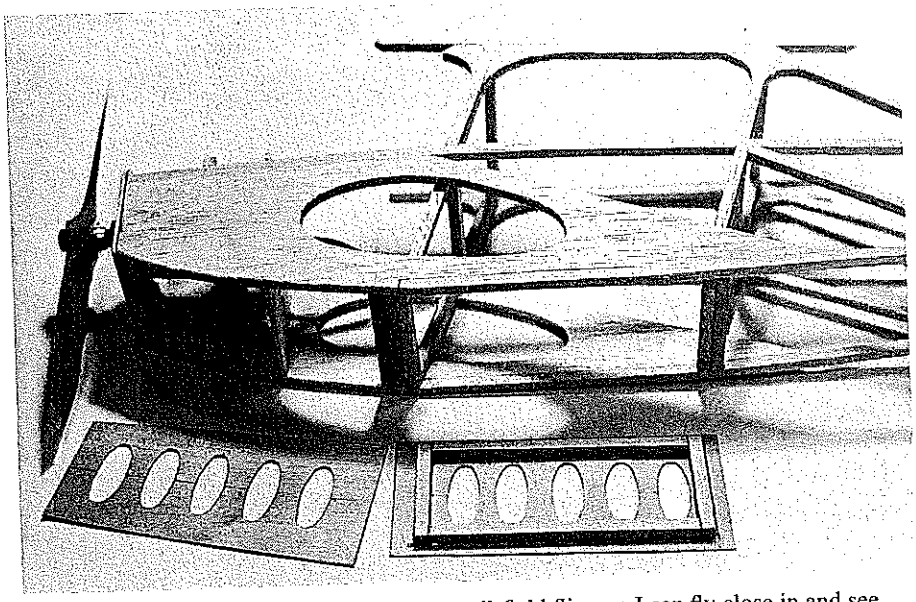


Left: Cut up the plans; lay out the sections for the built-up parts on the building board and cover them with waxed paper. Right: Glue (or copy) the plan parts templates to old file folders and cut them out.



Left: The nose block is laminated from three cross-grained pieces of 3/16 balsa sheet for strength. Right: Oversize 3/16-sheet fillets are dressed to a tidier size and shaped with a drum sander.





Above: The fuselage is clamped at the front and rear while stick formers 3 and 4 are being inserted. Right: Detachable hatches and opening for servos.

• A wing loading of around 12 oz. per sq. ft. or less. (I use my lighter planes for slope soaring after taking off the props.)

• The model should look like a specific full-scale airplane.

• I want a landing gear for touch-and-goes, and I want to use the model for takeoffs from the ground.

• Easy to build and rebuild.

• Easy to take on long trips or to load in one piece into a small car.

• Easy to load and reload the battery pack.

• Simple to fly, so I can relax. Smooth-flying even on windy days.

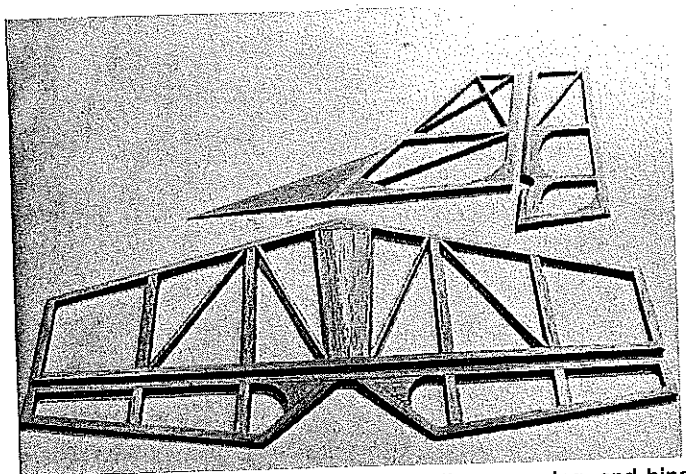
• Access to radio and motor controls.

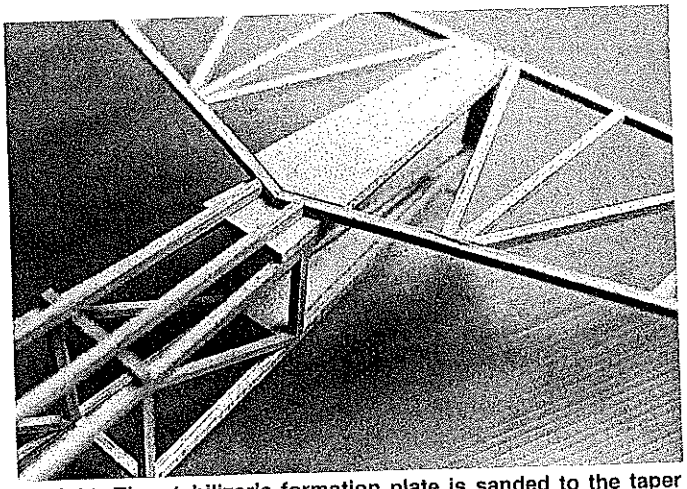
• A backyard or small-field flier, so I can fly close in and see the plane.

Whoa! Could I achieve all that in one model? I decided to build a few to find the right compromise. At the time this article was written six Chic-Ah-Dees had been built, no two of them alike. The variations are shown on the plans, so you can choose any that sound like fun (They're *all* fun!).

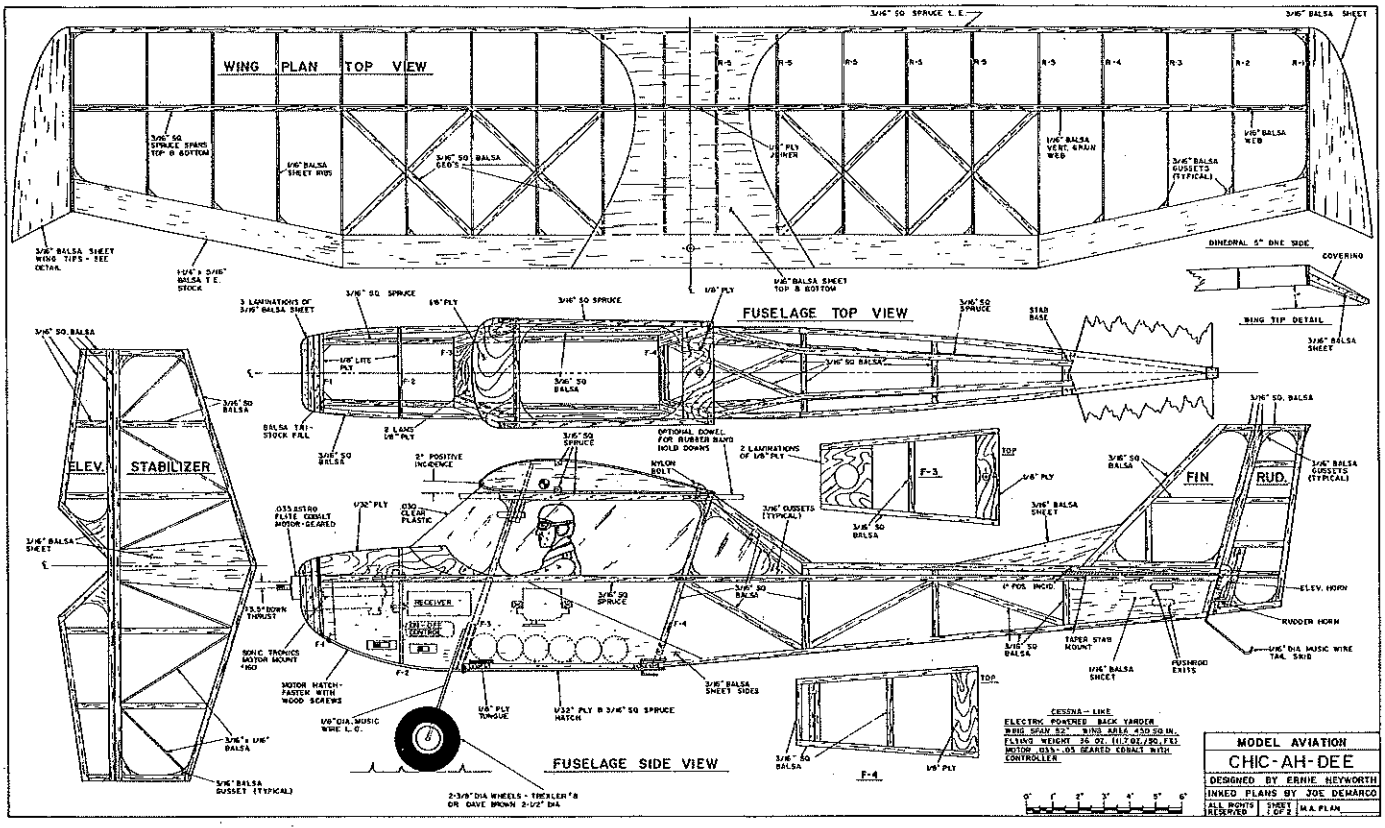
Here's a rundown of the options:

• The motor mounting varies with different builders. I like the new Sonic-tronics #160 motor mount bolted to the rear firewall.





Left: The tail feathers are ready for sanding, covering, and hinging. Right: The stabilizer's formation plate is sanded to the taper needed to give the 1° angle of incidence, then glued to the fuselage longerons.



RC Chic-Ah-Dee

Type: Semiscale Electric

Wingspan: 52 inches

Recommended motor size and type: 035 Astro Flite geared cobalt with six-cell battery pack

Number of RC channels recommended: 3 (rudder, elevator, motor control)

Expected flying weight: 37 ounces

Type of construction: Built-up

Type of covering/finish recommended: Lighter weight plastic films (UltraCote, Solarfilm, EconoKote, etc.). Balsarite on wing rib bottoms and edges.

• The wing can be mounted either with a 3/16 dowel-tongue in the front and a plastic bolt in the rear or with the conventional rubberband method.

• A tail like a Cessna's: either a civilian model or a military L-19 Birddog.

Construction

General: Think light. (Not Bud Lite—that might make you heavy.) Keep the model's weight in control and at a minimum *where it counts*. Here's how I accomplished that with the Chic-Ah-Dee:

• Covering: Use the lighter plastics (UltraCote, Solarfilm, EconoKote, or the equivalent)—no fabrics, no paint.

• Small servos. I like the Airtronics 94831, with Kyosho's auto-cutoff or Jomar's SM5 as a controller.

• Selected wood—from Balsa USA or your local hobby shop.

• After you install a corner gusset, take a one-inch sanding drum in a Dremel FreeWheeler and grind in a radius.

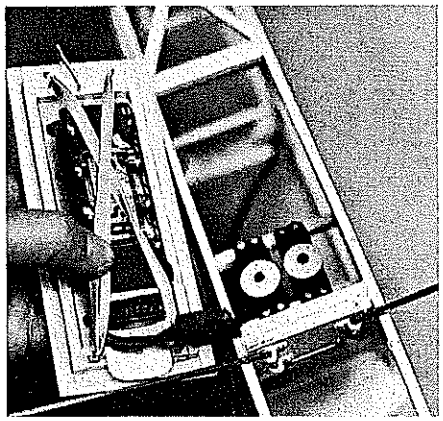
• Don't use a tail wheel.

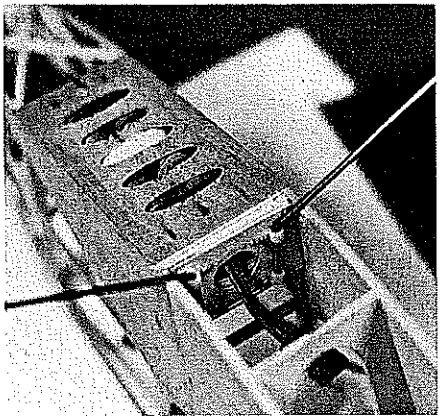
• If you're not allergic to CyA (cyanoacrylate glue), use it—but be careful to select the right kind. Some CyAs can produce weak joints because they don't permeate the wood.

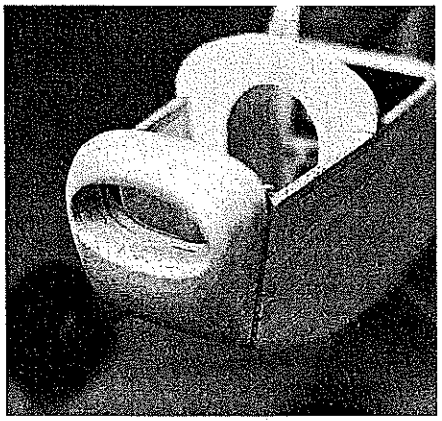
• If all else fails, try a little sanding. While you want to use the softer woods and lighter glues in the rear structure and wing tips, don't worry about heavier woods and glues in the area forward of the center-of-gravity. Use strong wood in the spars and longerons and in front around the crash zones.

• Use Trexler Balloon Wheels #8 or Dave Brown's 2½-in. wheels cut in half.

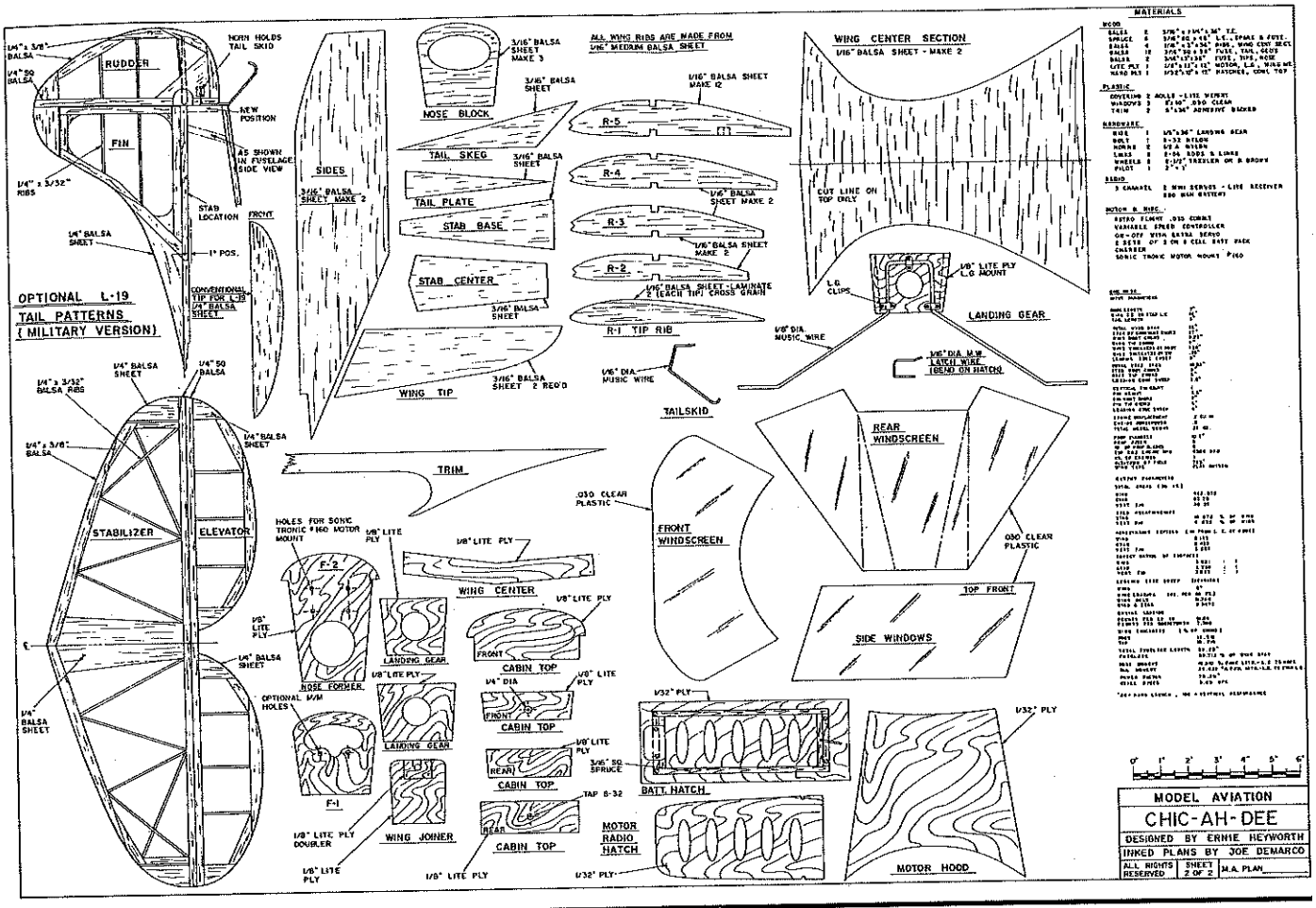
Study the plans to see what templates you'll need to make. Glue file-folder material to the back of the plans and over







Left: The quick-release battery pack is attached to the hatch cover with rubberbands on open hooks. Note the lip at the front and the wire latch at the rear for securing the hatch to the fuselage. Center: Four nylon nose gear blocks attach the one-piece wire landing gear to its ply mount. Right: The nose block has been laminated and carved.



each group of templates—3/16, 1/16, 1/32, 1/8 and .030 in. Be careful to cut on the line. Feel free to modify the fit as necessary.

Locate the center-of-gravity (CG) 2½ in. behind the leading edge of the wing, or up to ⅛ in. forward of that point. Make the model nose-heavy for the first few flights, then remove weight as you acquire the feel of the airplane.

Carry the big battery pack directly on the CG; that way, changing the battery packs won't affect the balance. Use the centerline of the fuselage center longeron as a reference for the angle of incidence. The stabilizer can be at a positive 1° angle. This not only makes the model fly tail-high, but also changes the thrust angle by kicking the nose down.

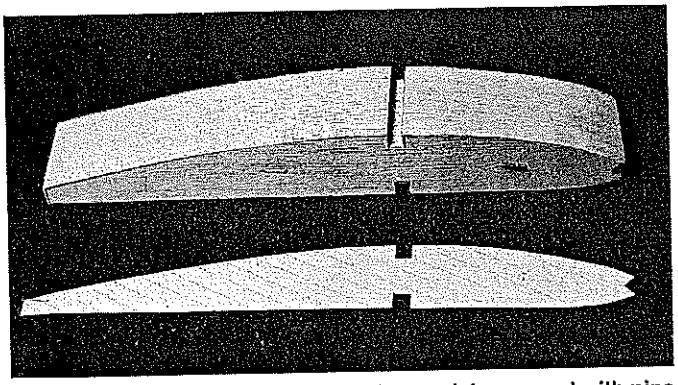
The wing is at a positive 2° angle to the centerline, but it's at only a positive 1° angle to the stabilizer. This produces a flat glide. Use a Robart incidence meter, if available, for a final check. You can also use the incidence meter to check for warps in the wing and stabilizer.

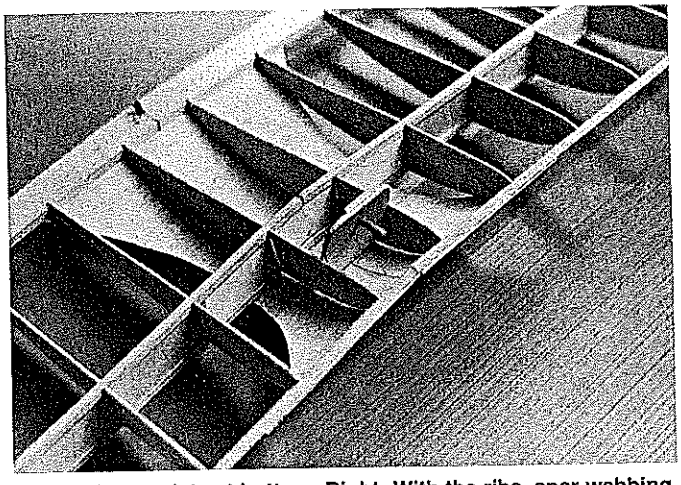
Set the elevator and rudder at full throw for the test flights—one-half throw each way. Use an experienced test pilot, but don't let him take over. In resetting the control throws, listen to his opinion, but use your own judgment too. I like 1¼ in. total left-and-right throw and 1¼ in. total up and down.

The geared 035 motor provides adequate power. If you use more power, the Chic-Ah-Dee becomes sporty—it'll hang on the prop instead of stalling.

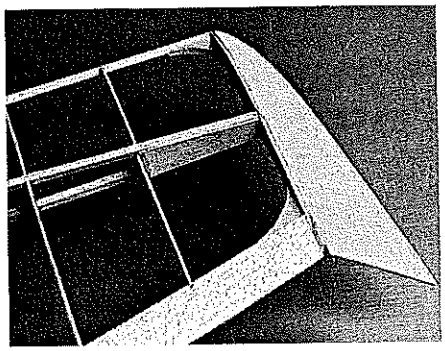
Use a 10 x 7 or 10½ x 6 propeller. The battery packs can be either five-cell or six-cell, using the mAh rating of your choice. The length of your flights depends on how you fly and the condition of your batteries. Whether you use a bona fide speed controller or simply rely on the on/off switch depends on your flying style. I thought I couldn't live without state-of-the-art speed control, but the on/off switch worked out fine.

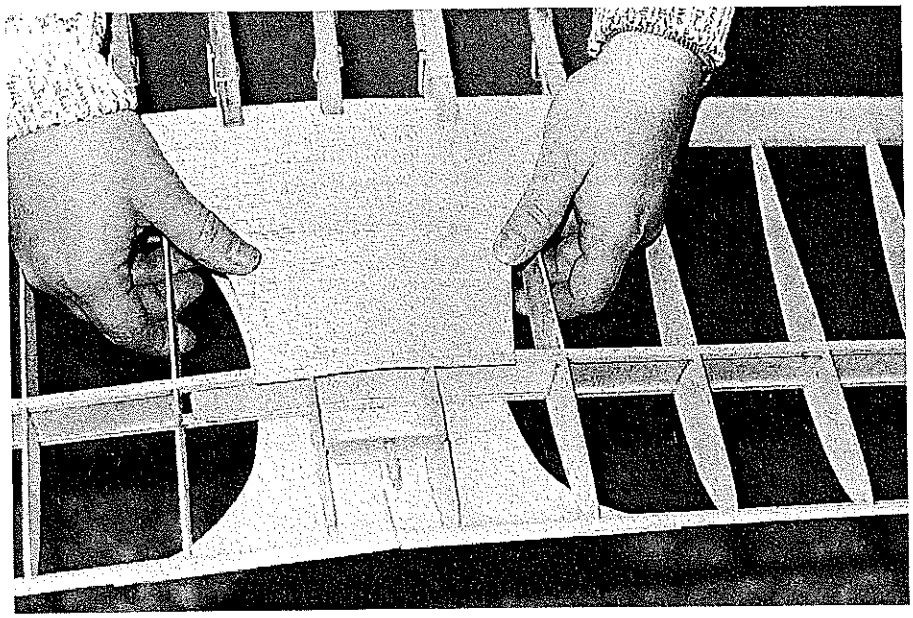
Wing: The wing and stab are as light as I dared to build them. Be sure to check the wing for warping when you attach the covering. If





Left: Wing rib stack being shaped. The stack is secured with pins. Note the rib template at bottom. Right: With the ribs, spar webbing, wing bolt, and locator dowel installed, the wing is ready to accept the bottom sheeting.





Above: Note the downward angle of the Hoerner-style wing tips and the use of reinforcing gussets and webbing.

Right: The gentle dihedral permits use of one-piece bottom wing sheeting.

you fly in very strong winds, reduce the 13% airfoil to 10% or 11%. The thinner airfoil will penetrate much better, but the thicker one gives better performance.

You may want to saw notches for the gussets in the trailing edge instead of gluing them in as shown on the plan. You also may want to either reinforce or double the tip ribs. It's important to use all the webbing shown.

For the correct dihedral, raise one wing tip five inches above the worktable, and place the opposite wing flat on the table's surface.

Before sheeting the bottom of the wing center, finish enough of the fuselage so that you can mount the wing hold-down tongue. Be sure to install the dowel at the correct angle and far enough into the wing to be held securely. Allow this assembly to dry overnight, with the wing on the fuselage and a 1/16 shim added for the bottom sheeting.

Use 1/16-sq. spruce spars and 1/16-sq. balsa geodetic bracing. Angle the tips downward, like Hoerner-style wing tips: I think this helps the Chic-Ah-Dee fly slowly and turn without tip stalling.

In sheeting the 3-in. area in the top front center of the wing, you'll need to join the pieces in the center. The rest of the center sheeting can be installed crosswise in one piece without having to be cut at the center. This strengthens the wing without the addition of fiberglass.

Use Balsarite on the bottoms of the ribs. Iron the plastic covering onto the perimeter and then onto the ribs.

Fuselage: Build both sides over the plan, using waxed paper to separate the halves. Remove the sides from the plan, and sand them carefully. Join the sides together at the rear. Install former 1 at the front.

Build frames 2, 3, and 4. Mount the landing gear parts.

Open the fuselage, and insert frames 2, 3, and 4. Fit and install the remaining top and bottom crossmembers. Insert the tail plates. Add the longerons between the cabin and stabilizer.

Note that the horizontal stabilizer base is at a positive 1° angle to the main base part. Taper a piece of 1/16 sheet for this part, and mount it to the fuselage.

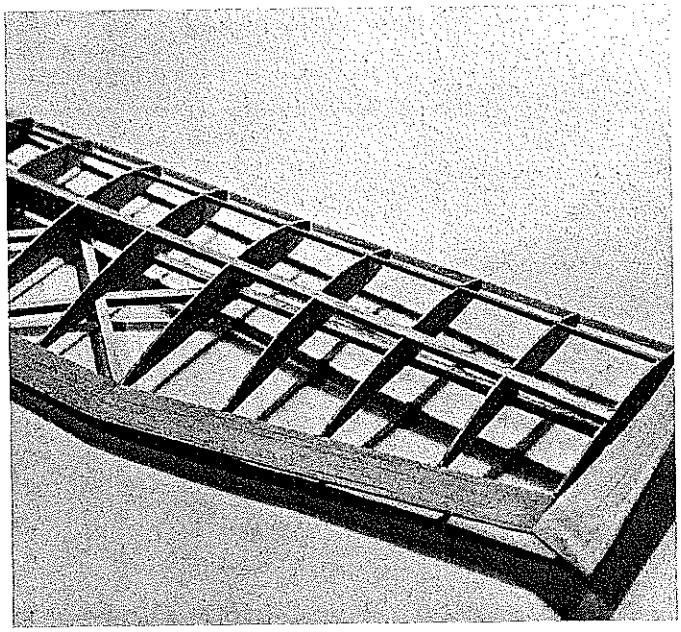
The two hatches are detachable. Fasten the hatches closed with screws or with a tongue-and-latch wire system.

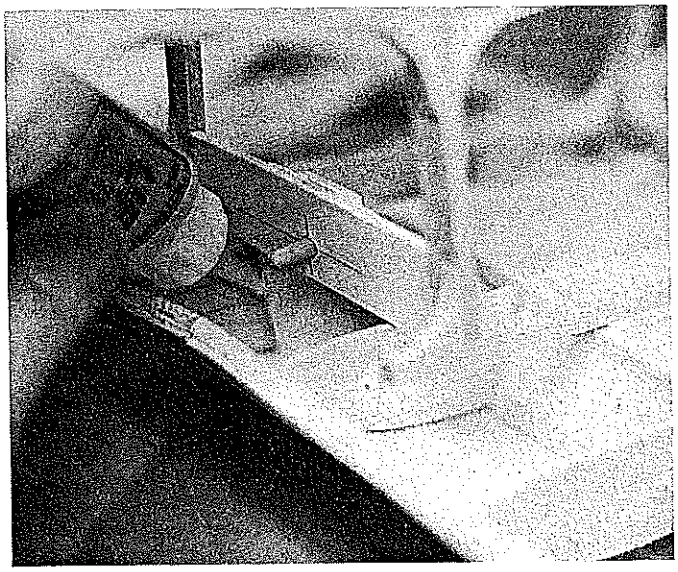
The nose block is three pieces of 1/16 balsa sheet laminated and shaped. The top cowling can be .030 paper or 1/32 plywood.

Feel free to recut all templates on the plan to better fit your model. Your version has probably taken on subtle differences by now.

Make the gussets from 1/16 sheeting. Cut them with the grain along the hypotenuse, then grind away excess material with a drum sander or Dremel tool.

Vertical and horizontal stabilizers: Construction is conventional. Be sure to use a double application of glue on all joints. Also, don't forget to sand them well.





Left: The completed wing is ready for covering. Geodetic arrangement of center-section crossmembers greatly strengthens the structure. Right: Glue in the front locator piece assembly while the wing is fitted to the fuselage.