



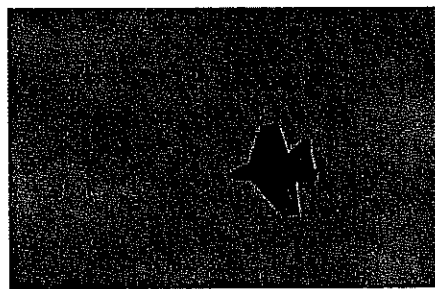
Above: The author and grandchildren Daniel (L) and Emily Rose (R) get ready for an exciting flight. Below: The White Electrician on an overhead flyby. It's fast and maneuverable.

WHEN I SAW the RC Combat model built by Svetlana Filippova of Russia, I was so motivated that I began developing the White Electrician. I have never actively participated in control line flying, but I have always been intrigued by the extended wing-to-tail configurations flown in control line combat. When I saw Svetlana's RC Combat version, I immediately recognized the resemblance to the typical control line combat model, furthering my inspiration with imagination as to its potential in Electric aerobatics.

In developing the White Electrician, I started by bashing Svetlana's design with design and construction changes for the conversion to an electric-powered aerobatic model.

The White Electrician is basically of all-balsa construction, employing an Astro Flight 05 cobalt motor powered by seven Sanyo 800-mAh Ni-Cd cells. Although there has been controversy about Electric aircraft performance, building this model should eliminate any doubt. You will find that it has very high performance and is capable of any maneuver.

It was initially flown at the KRC Electric Fly in Quakertown, Pennsylvania, in September 1992. The first flights used a six-cell Ni-Cd pack, and performance was nominal. Adding an additional cell results in outstanding (and optimum) flight perfor-



This high-performance Electric model can execute any maneuver.

■ **Joe Beshar**

mance. The White Electrician uses a folding prop without conventional landing gear—it is hand launched—which works out well.

The White Electrician is impressive, as it does fly quite rapidly, and it resembles the F-14 fighter because of the twin slanted rudders, sleek fuselage, and retracted landing gear appearance in profile. The bottom of the

fuselage is lined with foam tape to act as a skid, and the tape adequately protects the fuselage bottom from landing damage.

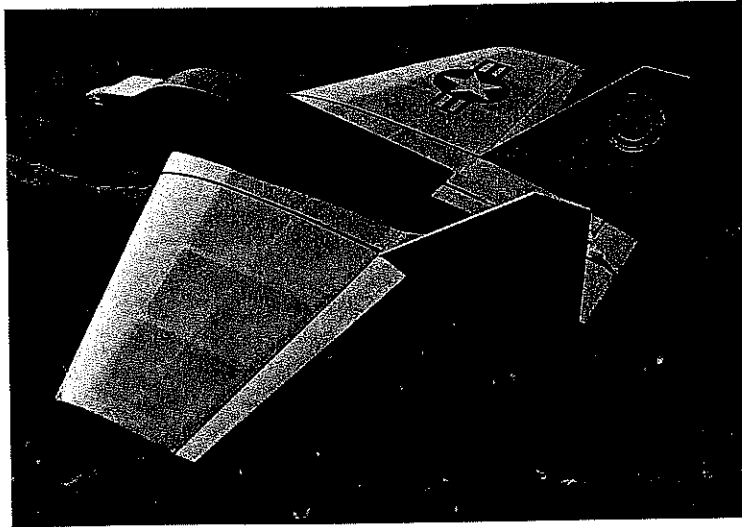
The folding propeller also protects the model when it lands. The motor's *on/off* controller and brake position the propeller prior to landing. Thus, the White Electrician is landed dead-stick with the prop folded, avoiding blade fractures.

FUSELAGE CONSTRUCTION

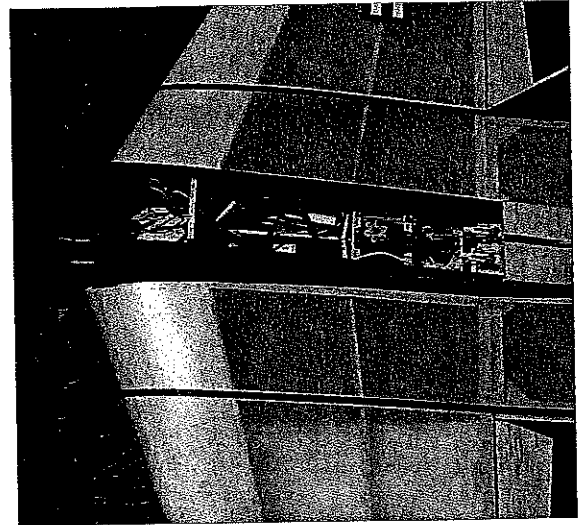
As with all Electric models, the fixed weight of the battery pack causes one to be concerned with the material weights, so that the weight of the completed model is minimal.

The fuselage is constructed from $\frac{3}{16}$ and $\frac{3}{32}$ sheet balsa. Trace the side outlines from the plan, transfer, and cut two sides from $\frac{3}{16}$ sheet balsa, including the opening for the main wing section. Cover the plans with clear plastic food wrap, and position the sides over the top view at 90° to the tabletop.

Cut formers 1, 2, and 3 from $\frac{3}{16}$ sheet balsa. Construct the firewall sandwich by cutting, laminating, and gluing $\frac{1}{8}$ plywood, $\frac{1}{8}$ balsa, and $\frac{1}{8}$ plywood forms as shown. Drill the engine mounting holes per the detail layout, and install four blind nuts for the Sonic-Tronics motor mount. The hole in the center of the firewall allows later passage of the motor wiring into the main fuselage section.



Three-quarter rear view shows color scheme and markings. Twin slanted rudders give appearance of F-14 fighter.



Top view with $\frac{3}{32}$ balsa hatch removed shows completed radio installation. Covering is white Micafilm.

Assemble and glue the sandwiched firewall and formers over the top view as shown. The top and bottom of the fuselage are cross-sheathed with $\frac{3}{32}$ balsa, providing an open hatch at the location marked on the plans. The open portion shown at the fuselage bottom by the battery pack is also left without sheeting for battery access.

The hatch is removable; for strength and stability, it requires $\frac{3}{32}$ sheet inside stiffener rails, profiled and glued as shown. Cut, assemble, and glue two holders at the front of the hatch as shown. This allows the hatch to slide into position and be retained in the fuselage while it can still be removed easily.

The Sonic-Tronics electric motor mount is attached to the firewall with $\frac{3}{4}$ -inch-long 4-40 Allen-head cap screws. The Astro Flight 05 cobalt motor is attached to the mount and held in position with rubber bands. While it is a builder's option, I do not use the plastic wrappers that are supplied with the Sonic-Tronics motor mount—I

prefer using #62 rubber bands wound tightly around the motor. This method gives flexibility to the motor mounting and avoids damage if it is subject to crash impact.

Note from the plans that the bottom of the fuselage next to the battery compartment is left open. This serves as exposure for cooling and provides a means of removing the battery for changeover, etc., as desired. A piece of Velcro between the battery pack and compartment can be used to hold the battery in place if the fit is not otherwise satisfactory.

WING CONSTRUCTION

The entire wing is framed, sheathed, and cap stripped from balsa. Place clear plastic wrap over the wing plans, and position the $\frac{1}{4} \times \frac{3}{8}$ leading edge as shown. Position the $\frac{3}{8}$ square trailing edge over the plans. Cut all the ribs from $\frac{3}{32}$ balsa in accordance with the templates on the drawing. The spar slots ($\frac{3}{16}$ square front, $\frac{1}{8} \times \frac{1}{4}$ rear) are cut in the C rib and two #5 ribs. Glue

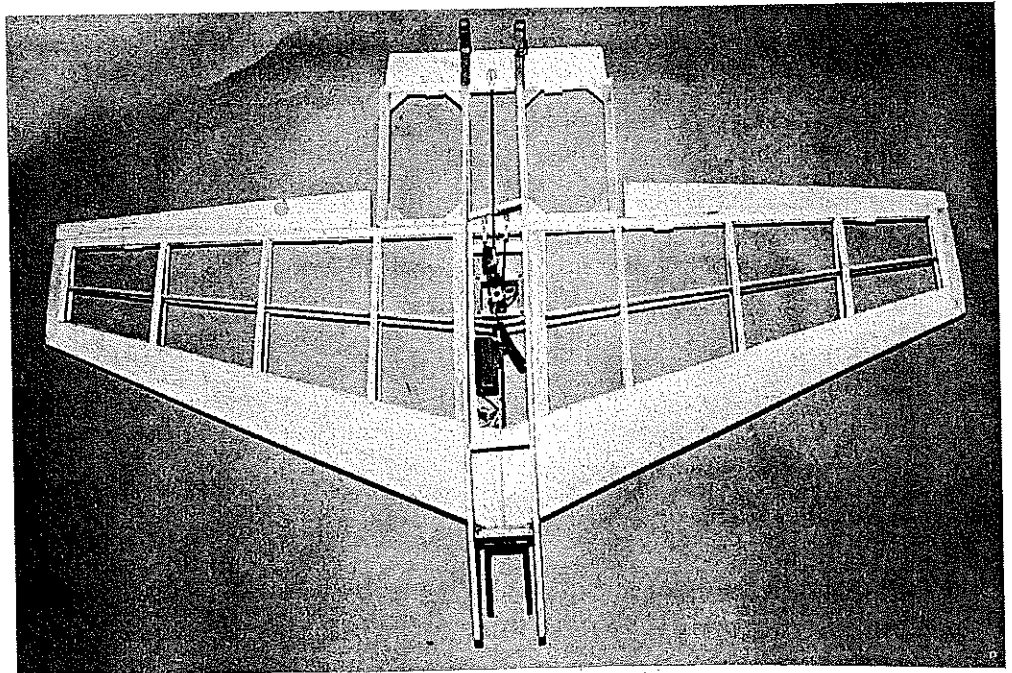
the ribs in place for the basic wing assembly.

Lay the spars across the ribs; mark the slot locations in ribs 1, 2, 3, and 4; and cut the slots as marked. The two $\frac{3}{16}$ spars and two $\frac{1}{8} \times \frac{1}{4}$ spars are assembled and glued in place as shown.

The leading edge is sheathed from $\frac{1}{16}$ balsa to the center of the $\frac{3}{16}$ spar at top and bottom. Ribs 2, 3, 4, and 5 have $\frac{1}{16} \times \frac{1}{4}$ cap strips. The top of the #1 ribs are cap stripped with $\frac{1}{16} \times \frac{3}{4}$ balsa as shown. The wider cap strip provides a platform to attach the wing covering.

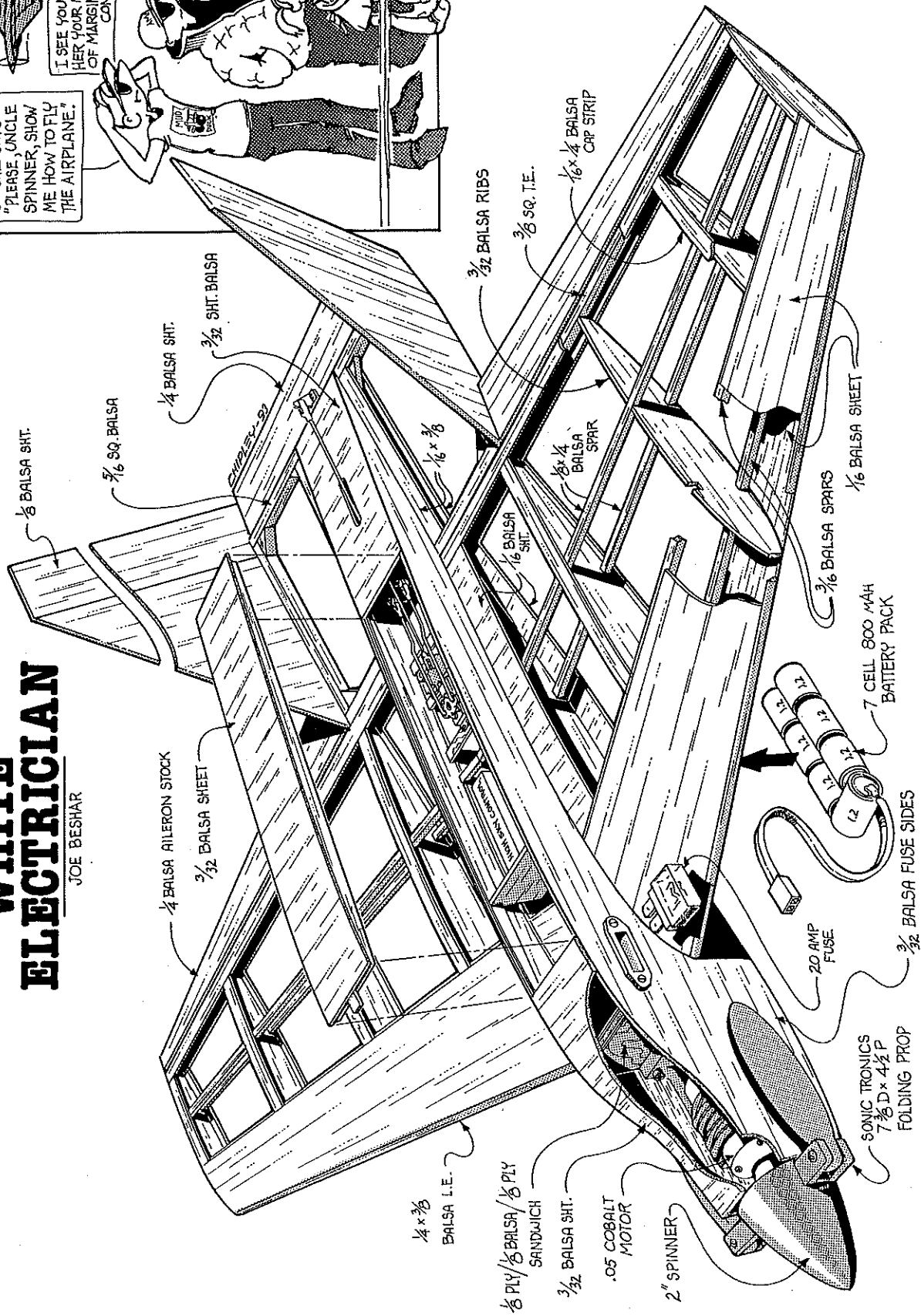
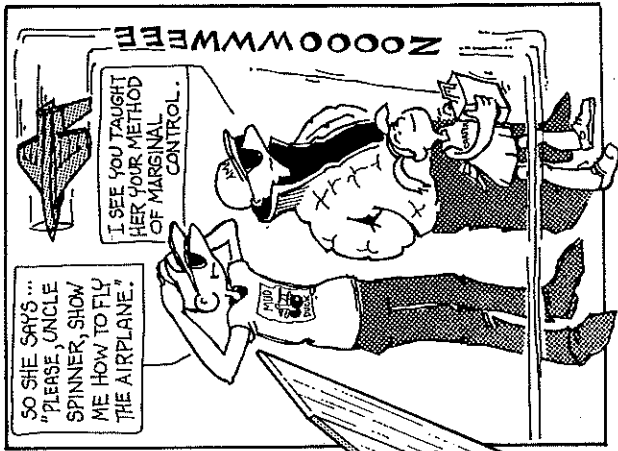
Cross-sheet the bottom of the wing between the #1 ribs with $\frac{1}{16}$ balsa to provide a platform for the receiver, battery, controller, and battery compartment. The ailerons are cut and shaped from $\frac{1}{4}$ -inch sheet balsa, trimmed as shown on the plans, and slotted for installation of Easy Hinges. The aileron control rods are fitted and sized as shown on the top view. Standard pushrod

Overhead view prior to planking and motor installation. All-balsa construction saves weight—especially important for Electric models.



WHITE ELECTRICIAN

JOE BESHAR



White Electrician

Type: RC Electric Sport

Wingspan: 35½ inches

Recommended motor size and type: 05 cobalt

Number of RC channels recommended: Three

Expected flying weight: 34 ounces

Type of construction: Built-up

Type of covering/finish recommended: Micafilm

assemblies serve this purpose, but they must be reworked to fit this layout.

EXTENDED TAIL SECTION

The extended tail section is built from $\frac{5}{16}$ square balsa as shown in the top view. The leading portion is prepared to accept the aileron control rods in the same manner as the main wing section. The elevator is cut and trimmed from $\frac{1}{4}$ -inch sheet balsa. Easy Hinges are used, as on the main wing ailerons. The side members are chamfered to a 10° angle for the rudder assembly.

Assemble and glue $\frac{1}{16} \times \frac{3}{8}$ top and bottom filler strips, as shown on the side members, to serve as a covering platform.

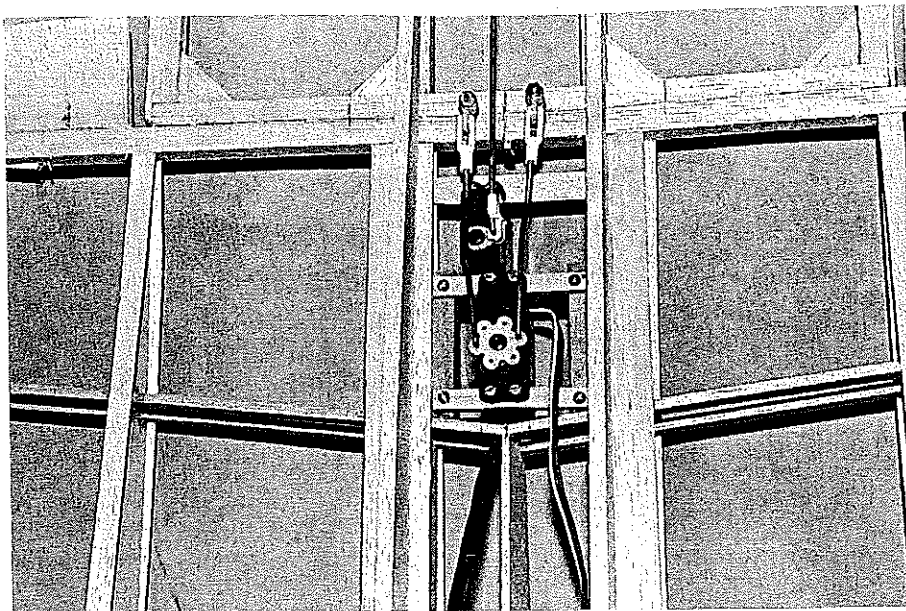
INTERNAL RIGGING

The tail section is clamped to the wing to establish the pushrod assembly relationship. This enables the aileron control rods to be sized, fitted, and positioned.

The servo mounting members are $\frac{1}{8}$ plywood rails $\frac{1}{4}$ -inch wide and $\frac{1}{4} \times \frac{3}{8} \times 1\frac{3}{4}$ hardwood mounting blocks sized and positioned as shown on the plans. The

Astro Flight cobalt 05 motor is rubber-banded to SonicTronics mount.

Seven-cell 800-mAh battery pack is also visible. Partially open forward fuselage allows cooling and battery access.



Piggyback-mounted Airtronics Micro (aileron) and Microlite (elevator) servos. Moving surfaces attach with Easy Hinges. All wing parts are balsa.

elevator servo is an Airtronics Microlite; the aileron servo is the Airtronics Micro. The servos are mounted and screwed into position after the blocks and rails are assembled. At this point, the pushrods and clevises are fitted to the elevator and ailerons.

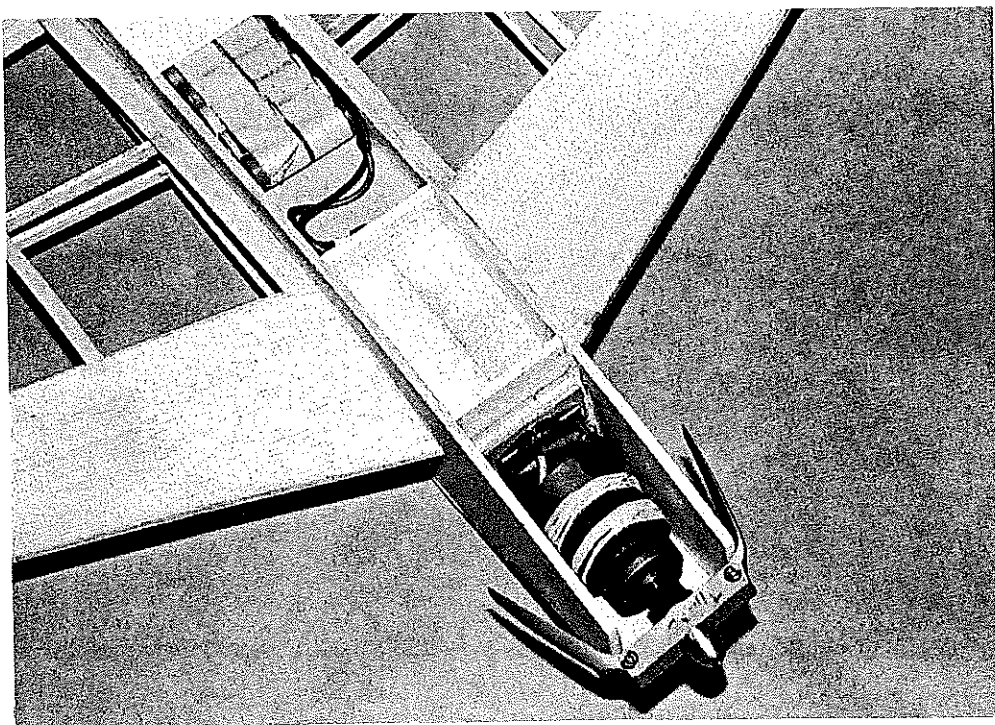
The section of rib C between the $\frac{1}{8} \times \frac{1}{4}$ wing spar and the $\frac{3}{8}$ square trailing edge is removed to provide installation clearance for the servo assemblies. The High Sky Controller, which is an *on/off* controller for the motor, is located in the cavity between ribs C and #1, and the receiver and 100-mAh receiver battery pack are opposite to it. (The 100-mAh receiver pack was used to save weight; a 250-mAh pack could also be used if desired.)

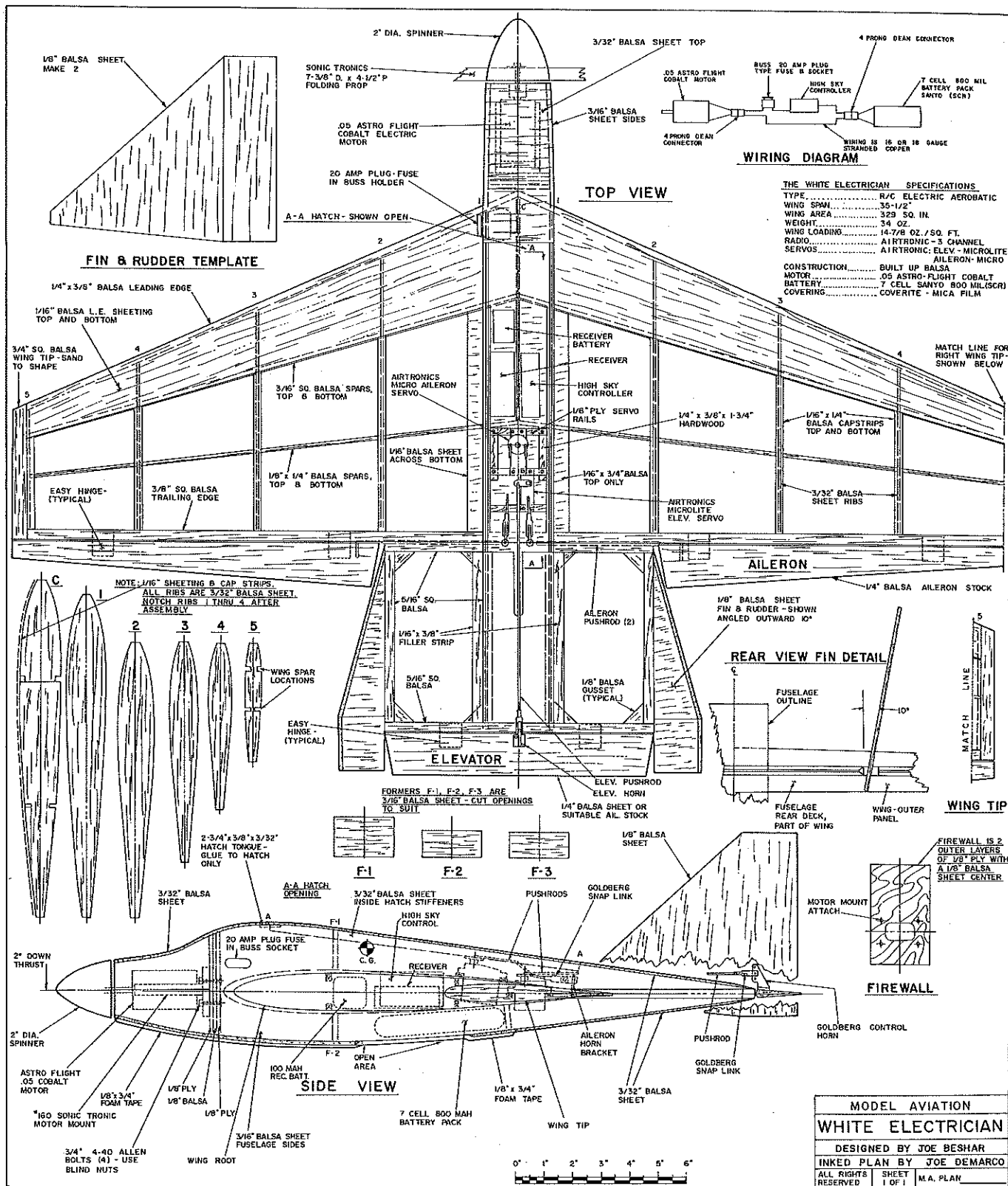
The 20-amp plug fuse and Buss holder are installed as shown on the plan. At this

point, the motor wiring can be assembled and soldered, using 16- and 18-gauge stranded copper wire. Four-pronged Dean's connectors link the motor and battery sections. Two prongs of the connector are used for each of the terminal connections—two for the positive pole and two for the negative pole—providing very low resistance through the wiring system.

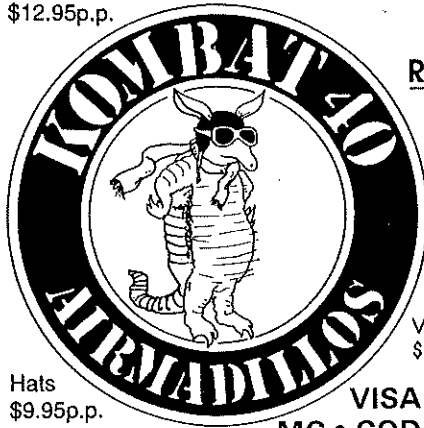
Battery charging is accomplished by disassembling the four-pronged connector at the battery section and charging from that point; this eliminates the need for an arming plug.

The same principle is used for the radio *on/off* switch for the receiver. No *on/off* switch is provided for the radio in the unit. The plug is disconnected from the 100-mAh battery for the rapid *off* position and assembled for the *on* position. An *on/off*





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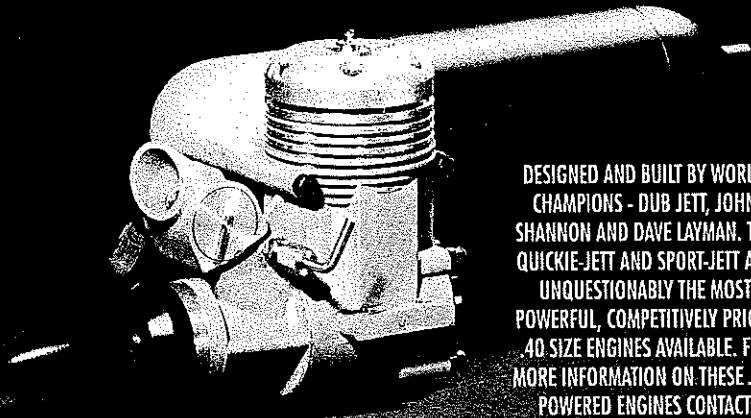
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switch can be employed if desired, but again, for Electric flight you must always address the weight factor, and possibly compromise convenience in certain areas.

ASSEMBLY

The unit is separated at this point so the fuselage can be covered. The White Electrician is covered with Coverite's Micafilm, which requires the application of Balsarite at the locations where adhesion is desired. This excellent material is very light, strong, and heat-shrinkable as well as heat-adhering.

After the fuselage is covered, the wing is permanently assembled, and the tail section is positioned, capturing the aileron control rods, and permanently glued in place. The wings and extended tail are covered after assembly. Ailerons and elevator are covered, disassembled, and installed with Easy Hinges as described earlier, and glued permanently in place with cyanoacrylate (CyA).

The rudders are covered entirely, except for the area where adhesion to the extended tail section is required. The Micafilm is trimmed from both surfaces for a strong glue joint between the extended tail section and each rudder.

Apply foam tape skid strips to the bottom of the fuselage. Decals and desired trim can be applied at this point, along with any cosmetic additions to complete the White Electrician.

FLYING

Check out all controls, and make sure that the center of gravity is at the location shown on the side view. Charge the batteries, and check for peak capacity. Check out the radio system for operation. With the seven-cell Sanyo 800-mAh pack in position, plug the 100-mAh power supply to the receiver, make sure that the throttle knob on the transmitter is in the *off* position, and install the fuse in the Buss plug just prior to launch.

Launch the model briskly into the wind. Be aware of the high-performance characteristics of this model, as the slightest control movement will adjust the attitude of the White Electrician.

I trust you will enjoy the White Electrician as much as I have. Good luck and good flying! →

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