CONSTRUCTION

FUTURE SHOCK

by BILL EVANS

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MANY OF the aircraft in the Scimitar Series have been electrified (power ranges from Cobalt 05s to 60s), and many of you have built the slow-motion electric version—the Charger; nevertheless, the Future Shock is the first Scimitar designed specifically for both electric and glow power.

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SHOCKING POWER

Tom and I discussed two concepts, and then ideas quickly began to flow. Astro Flight's* Bob Boucher sent us a Cobalt 25 super-wind FAI motor. Trinity* contributed 16 of their 1400mA pushed cells. Bob welded the cells together, installed his new gold connectors and topped everything off with his new speed controller. Larry Sribnic of SR Batteries* rushed a pack of his 1100mA cells—16 of them—to me. (My Futaba* 7UAF radio has never had even a glitch with one of these.)

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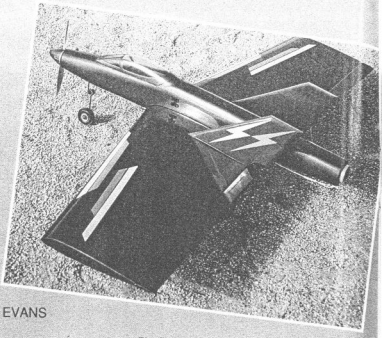

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This version has a side-mounted K&B .65 engine and a Mac's flow-through pipe.*

SPECIFICATIONS

Type: Scimitar Series

Wingspan: 56 in.

Wing area: 800 sq. in.

Airfoil: ESA (Evans Scimitar Airfoil, semisymmetrical reflexed)

Length: 40 in.

Power: Astro Flight Cobalt 25 racing motor, 16 1400mA batteries; or .40 to .60 glow engine

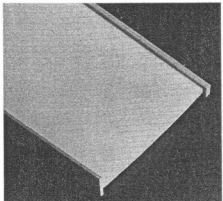
No. of channels req'd: 4 (throttle, nose wheel, elevons—2 servos)

Fuselage construction: balsa and ply

Wing construction: balsa and foam

Weight: 6½ lb. (electric), 5 lb. (glow)

Wing loading: 19 oz./sq. ft. (electric), 14½ oz./sq. ft. (glow)



The ⅛-inch-thick, balsa, leading-edge undercap and the ¼-inch-thick balsa trailing-edge spar have been glued and pinned to the foam-core.

Then it was time for me to do my part. The new ship had to look different, and I decided on a 60-size Scimitar wing, but I reversed the wing taper; instead of the typical swept-forward trailing edge, the Future Shock has a straight one. I also decided to reverse the taper on the elevons and make the tips wider than the root. The sleek fuselage has a forward-mounted canopy; and mounted on the wing, just outboard of the fuselage, there are two fins canted outward—again, something different. With the drawing complete, it was time to stir up some balsa dust!

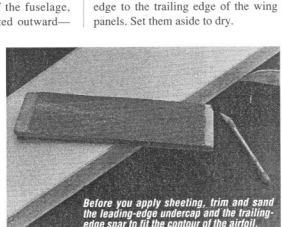
As is typical of Scimitar construction, the box fuselage has tri-stock in the corners for rounding (been doing this for years). The foam wings are partially sheeted with 1/16-inch balsa bonded with Soaring Research* Corefilm. The basic construction took about six hours, and I took longer than that (always do!) to cover the plane; installing the motor and radio took a further six hours.

CONSTRUCTION

If you follow the plans carefully, building the Future Shock will be as rewarding as flying it.

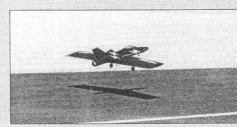
The Future Shock's construction is typical of the Scimitar Series. The fuselage has two sides, top and bottom pieces, a firewall, one former and ½-inch triangular longerons. For its lightness and strength, I chose foam for the wing, which is sheeted with 1/16-inch balsa. If you aren't adept at cutting your own foam-cores, you may order Future Shock cores from Soaring Research* ($20 each set, plus $7 per set for shipping).

Start by cementing the ⅛x1-inch balsa leading-edge undercap to the leading edge of the wing panels, and cement the ¼x½-inch balsa trailing edge to the trailing edge of the wing panels. Set them aside to dry.



Before you apply sheeting, trim and sand the leading-edge undercap and the trailing-edge spar to fit the contour of the airfoil.

PHOTOS BY BILL EVANS



FLIGHT PERFORMANCE

I've often been asked, "Why do you fly Scimitar Series aircraft? Because you *designed* them?" My answer is one word—*performance!*

As we all know, there's a point at which lift is terminated by a reduction in forward motion and an increase in the wing's angle of attack. When this happens to a conventional airframe (one with the horizontal stabilizer mounted aft of the wing), the model falls, the wing may rotate axially (left to right), and a vertical descent results. Only if it has enough altitude to regain sufficient forward motion can the aircraft be saved.

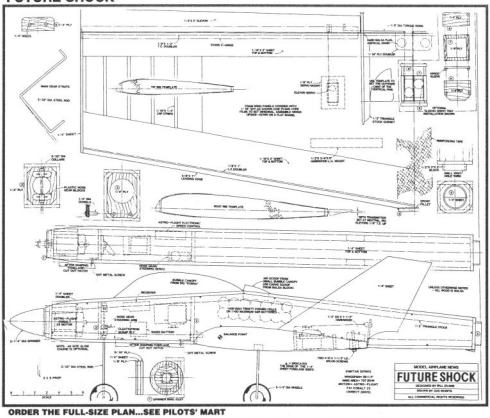
None of this applies to any aircraft in the Scimitar Series; stall does *not* occur. Instead of stalling, any Scimitar design will automatically drop its nose slightly and continue in normal forward flight! That's one flight advantage of the Future Shock—no stall.

A second advantage of the Scimitars is their wide speed range. No matter how much power you give them, they just go faster—no Dutch roll.

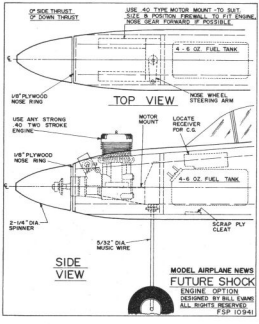
Third, they will also slow to a crawl (because they don't stall) and set down like a hang glider.

Finally, the Future Shock will remain in the attitude you direct it to. Blip a little left aileron and it will hold in a left turn—hands off—and, without strong wind, it will continue to do 360s until you decide it's time to quit.

Scimitar pilots have enjoyed these superior flying capabilities for more than 20 years.



ORDER THE FULL-SIZE PLAN...SEE PILOTS' MART



Next, cut the fuselage parts out of balsa and plywood stock. Clamp the former and the wing's center plate together, and drill holes through them for the ¼-inch-diameter dowels that go through both. (Drilling them in this way will ensure that they'll be properly aligned.) Now pin the ¼-inch front and rear bottom fuselage pieces down onto your work surface; they should be on a straight line and separated by the width of the wing cutout on the fuselage sides. Pin the ½-inch tri-stock down on one side of each bottom piece, ¼ inch away from the edge.

Pin one fuselage side into place, and then the firewall and the former. Now apply thin Hot Stuff* to the edges of the ½-inch tri-stock where it meets the fuselage side; the glue will run into the joint and bond the pieces together. Also apply Hot Stuff to the firewall and the former. Repeat these steps for the second fuselage side. Pin and cement ½-inch tri-stock to the inside of the fuselage top, and fill the engine compartment (to the nose ring) using ¼-inch balsa sheet. Sand the top smooth, and install the top sheeting. When the glue has dried, remove the fuselage from the work surface and run CA into any joints on the inside of it that you might have missed. To finish the fuselage, carve and sand it to shape.

Carve and sand the wing's leading- and trailing-edge balsa so that the sheeting will fit nicely over it. Apply the sheeting (I used Corefilm), then pin and cement the ⅜x1-inch leading-edge cap to the leading edge. Sand the wing panels to shape, then apply the tip plates and join the wing halves with 5-minute epoxy. To join the elevons to the wing, I used an X-Hinge (available from Soaring Research), but no matter which hinge system you use, seal the gap to improve the efficiency of the airframe.

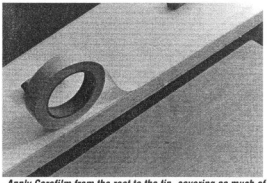
When building a Scimitar-type aircraft, there are three "musts":

- Set the CG as shown on plans.
- With the elevator trim set at neutral, set the elevons to have ⅛ inch of up-trim.
- Set the nose wheel so that the wing's leading edge is ¼ inch higher (in relation to the ground) than its trailing edge, measured at the hinge line.

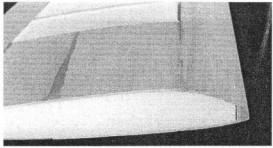
MOMENT OF TRUTH

The moment of truth was drawing near. I charged the Trinity 1400mA pack with the Astro DC/DC charger at 5 amps for 20 minutes. Power? You bet! Two pounds of batteries put out a lot of power. The tip speed of the 9x6 prop is more than 400mph; that's more than 16,000rpm!

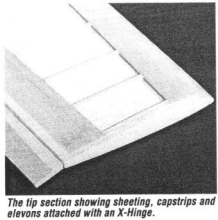
I videotaped the checkout flight. The Future Shock went straight down the runway and lifted off easily; climb-out was straight up to more than 200 feet, and speed almost equaled what I'd obtain with a .40 glow engine. Loops followed by five or six fast rolls and inverted low passes at full power are a sight to behold. When, after 2½



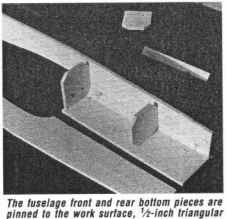
Apply Corefilm from the root to the tip, covering as much of the core as possible. Leave 1/16-inch gaps between the strips of Corefilm.



The root section showing the sheeted wing with a view of the ⅛-inch-thick undercap and the leading edge shaped to the airfoil.



The tip section showing sheeting, capstrips and elevons attached with an X-Hinge.



The fuselage front and rear bottom pieces are pinned to the work surface, ½-inch triangular stringers, the wing former, the firewall and the left fuselage side have been pinned and CA'd into place. Note: for the electric version, the motor mount is part of the spinner-ring assembly (see plans).

When using electronic mixing, the elevon servos are mounted outboard on the underside of wing.

of the ship and want one, but don't fly electrics. With a glow .40, it flies really well. (I have a K&B* .65 in my glow version.) The plane also flies well with the standard Astro Cobalt 25 and 14mA cells.

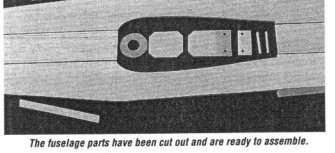
The right fuselage side and the top ¼-inch triangular longerons are in place, and the ¼-inch balsa-sheet nose fill has been installed. Before the fuselage top pieces are attached, the fuselage top must be smooth.

minutes, I received the signal that power was running down, I landed. For such awesome power, that's a lot of time in the air, and there was still enough power left to taxi back. Flight tests with the SR 1100 Max 16-cell pack, which weighs half a pound less than the 1400 pack, lasted slightly longer than 1¼ minutes—comparably fast, given the lower weight.

Even though the Future Shock was designed for electric power, I've built and flown a .40 glow-engine version. I did this for those who have seen and liked the looks

Most of those who have seen videos of the Future Shock flights say that, because of the prop's sound at such high rpm, if they didn't know it was electric, they would have thought it was glow-powered.

Flying is a breeze, and the photos tell the story. The Future Shock responds to commands and will not stall—just drop its nose a bit, and it keeps on coming. It will slow to a crawl as well as rip through the air at full power, and that's a sure recipe for fun—and that's what it's all about.



The fuselage parts have been cut out and are ready to assemble.

**Addresses are listed alphabetically in the Index of Manufacturers on page 137.* ■