SHOCK

The Shockwave is an .049 powered two channel airplane designed for the Ace tapered foam wings. The wing loading of this aircraft is a bit higher than your normal Half-A trainer so it is definitely not recommended as a beginner's project!

With the sale of ultra-miniaturized radio gear, you can now concentrate on designing the cleanest possible airframes around it.

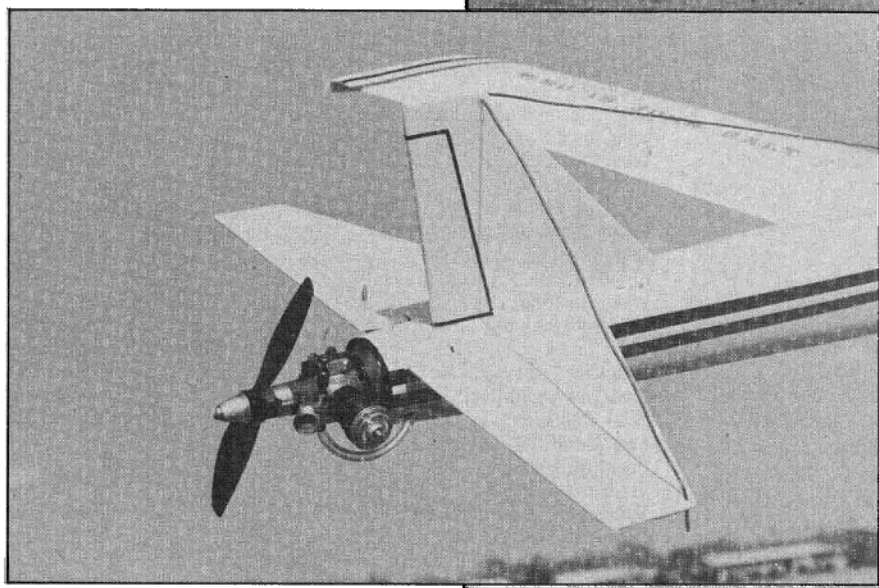
Any of the celebrated Cox engines can be used, of course (including the reeds) but the most potent combinatioin is the Tee-Dee .049 or .051 with the tank under pressure.

The prop I ended up with, after much experimentation, was a 5½/3 Tornado pusher (available from Sig).

CONSTRUCTION

First, cut out all of the parts as specified on the plans. Mark off the bulkhead locations on the inside of each 3/32" fuselage side. Contact cement the triangular stock to the fuselage sides.

Using a 90° cardboard jig to insure precise alignment, glue bulkheads F-2 and F-3 to the right fuselage side.

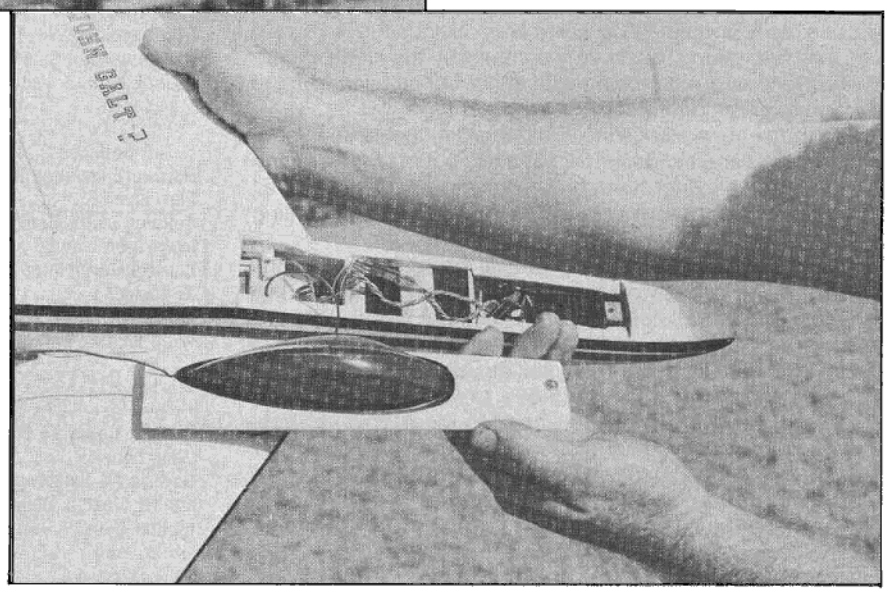


By James Prell

Now, lay the fuselage on its back on a flat surface. Line up the left fuselage side with F-2 and F-3 and glue in place. Using rubber bands to bow the fuselage sides together at both front and rear, wedge bulkheads F-1 and F-5 into place. After carefully checking for any misalignment or distortion of the fuselage, glue F-1 and F-5 into place. (I used 5-Minute epoxy on all the bulkheads.) Carefully check for built-in warps here --- they are hard to get out once the glue has cured.

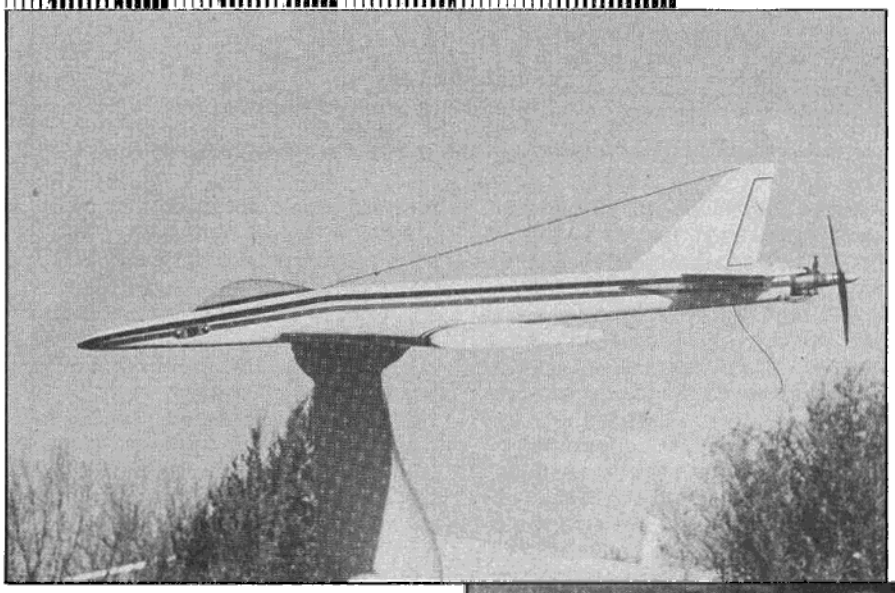
The elevator servo is now mounted on 1/4" square pine beams and S-1 and S-2 are epoxied to the beams. Line up the bottoms of both S-1 and S-2 with the bottom of the right fuselage side and epoxy in place. The receiver is mounted in the same way.

The nose piece is cut out of some hard



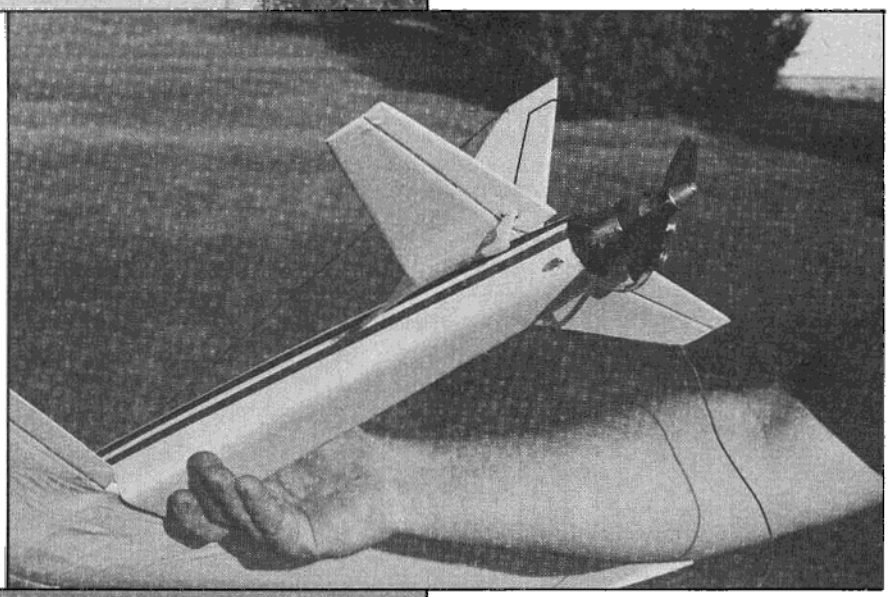
SHOCKWAVE

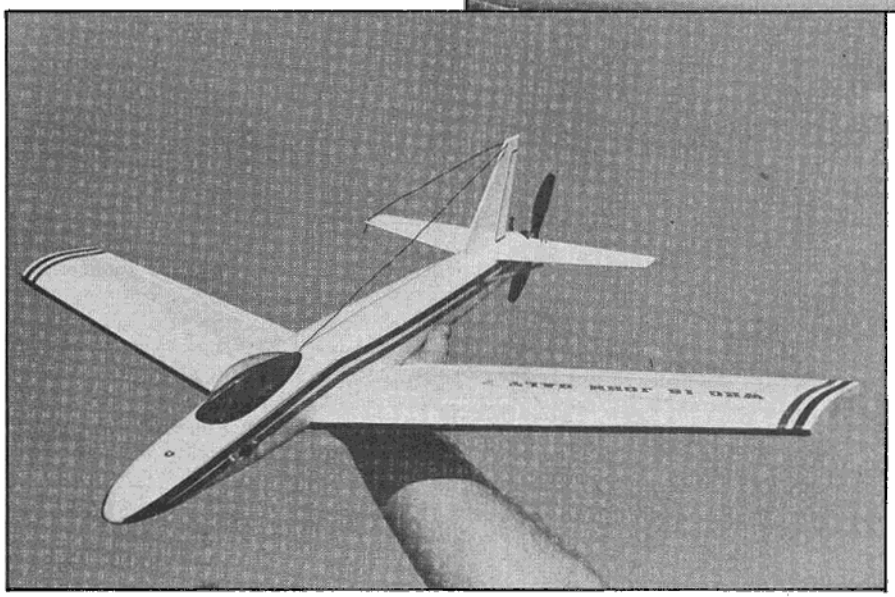
Designed By : James Prell



TYPE AIRCRAFT
1/2A Pattern/Sport
WINGSPAN
34⅜ Inches
WING CHORD
5" (Avg.)
TOTAL WING AREA
176 Square Inches
WING LOCATION
Low Wing
AIRFOIL
Semi-Symmetrical
WING PLANFORM
Swept-Taper
DIHEDRAL, EACH TIP
1/4 Inch
O.A. FUSELAGE LENGTH
35⅛ Inches
RADIO COMPARTMENT AREA
(L) 9¾" X (W) 2" X (H) 1¾"
STABILIZER SPAN
12 Inches
STABILIZER CHORD (incl. elev.)
3" (Avg.)
STABILIZER AREA
33 Square Inches

The Shockwave is a 1/2A powered, two channel airplane designed for fast construction using the Ace tapered foam wing. Although designed for both sport and pattern flying, the Shockwave is definitely not for the beginner!





STAB AIRFOIL SECTION
Flat
STABILIZER LOCATION
Top of Fuselage
VERTICAL FIN HEIGHT
3½ Inches
VERTICAL FIN WIDTH (incl. rud.)
3" (Avg.)
REC. ENGINE SIZE
.049-.051 Cubic Inch
REC. FUEL TANK SIZE
1-2 Ounces
LANDING GEAR
None
REC. NO. OF CHANNELS
2
CONTROL FUNCTIONS
Elevator and Ailerons
BASIC MATERIALS USED IN CONSTRUCTION
Fuselage ..... Balsa and Ply
Wing ..... Foam & Balsa (Ace Mini Foam Wing No. 50L 101)
Empennage ..... Balsa
Weight Ready-To-Fly ..... 26 Ounces
Wing Loading ..... 21.3 Oz./Sq. Ft.

balsa and hollowed out. If you need ballast to bring the C.G. within limits, you now have a place to put it. (I epoxied 3.75 ounces of lead pellets into it.) With the modifications I have made (a longer nose moment arm and moving the elevator servo forward) you will probably not require as much. (Build the tail "light".)

Glue the 1/4" soft balsa on the fuselage from F-4 to where the dowel-pin is inserted for the radio access hatch. The 1/4" balsa, which forms the access hatch for the radio gear, is now tack glued in place. Start gluing the 1/16" crossgrain balsa to the bottom of the fuselage. Now, glue the 1/16" balsa to its 1/32" stiffener. Glue this assembly to the 3/8" triangular stock on the bottom of the fuel tank compartment. (Don't glue this assembly to either F-4 or F-5.) Glue both the nose piece and F-6 (the firewall) to the fuselage (epoxy both).

Using coarse sandpaper, you now have a bit of sanding to do! You want your final fuselage shape to resemble the dotted lines shown going through the upper left hand corner of bulkheads F-1 and F-2 on the plans. Round off all four corners so they look like this.

Measure 3/8 up from the bottom of F-4 and F-5 and draw a line between them. Using a very sharp X-Acto knife, cut through the fuselage sides to form the fuel tank access hatch. A 1/16" dowel pin is glued to the 1/32" ply stiffener which will slide through a pre-cut notch in F-4. A small wood screw will secure the aft end of the hatch to F-5. The vent tube for the tank will exit from a 1/4" hole shared by both the access hatch and fuselage side.

The mounting of the tail surfaces are self-explanatory. The 1/16" wire elevator connector is epoxied into place only when the horizontal stabilizers have been glued into place and the elevators have been hinged. When this is done, very carefully glue a piece of 3/32" balsa between the 1/16" wire and F-6. Now, glue a 3/16" piece of soft balsa between F-4 and F-6. Sand this down until it follows the contour of the fuselage in front of it.

The canopy is a 7" size cut down to 6". It is epoxied in place and 1/8" pinstriping tape is contact cemented around the base of it. The fuselage is covered with white Solarfilm and red and black pinstriping tape was used as trim. Of course, final finish is entirely in the hands of the person building it, so give your imagination free rein!

Wing:

The wing is built from an Ace Pacer wing kit. The instructions are followed exactly in regard to trailing edge installation. The aileron linkage was purchased at the local hobby shop. The leading edge is a piece of 3/8" x 5/8" balsa.

The sweep in the wing was made by lining the leading edge up with the plans and marking, with a ruler and pen, the places to cut at the root and tip of the wing. I cut the right wing first, and took the left wing and laid it upside down over the right hand panel as shown on the plans. It was cut with the same procedure as the first. The trailing edge stock shown between the aileron and tip spill plate is 1/4" x 3/4". The method of hinging the aileron and elevator is up to the builder. I used my nylon thread sewn in a Figure 8 pattern. After sanding the wing, I covered it with white Solarfilm.

The wing is held on with a 1/8" dowel and two 4/40 nylon bolts which tap into hardwood blocks epoxied to the inside of the fuselage just above the wing. In order to prevent deformation of the foam by the 4/40 bolts, I drilled the holes through the wing oversize, and epoxied brass tubing inside.

The 2½" wide center section of the wing is made out of a constant chord section which is part of the Pacer wing kit.

Remember, the only dihedral is that which is built into the wing by the root-to-tip taper. Make sure the top of the wing is built absolutely flat.

Flight Characteristics:

If all you have flown before are trainer-type aircraft, approach the first flight of this one very carefully.

I would recommend that you have at least five or six hours at the stick with other Half-A pattern ships before attempting this one.

Believe it or not, that pusher prop will not touch your arm when you hand-launch it. Get a firm hold on the fuselage, just behind the wing. Have all control surfaces trimmed in neutral.

Now you don't exactly have to be Marty Liquori, but you do have to be able to run! Run forward about 30' and launch it flat, level and **hard!** Just pretend you're throwing a fastball from about 2' over your head. About 20' after you have let go of it, ease in a little "up" on the stick.

In the next twenty seconds --- until you start to get ahead of it --- you are going to think you just launched a Fourth of July bottle rocket! After trimming the Shockwave out, you can begin to explore its aerobatic capabilities. It will do consecutive inside or outside loops, four point rolls, will climb inverted, and does the neatest hammerhead stalls under power I've ever seen. Inverted flying is limited only by how long your engine will run.

When the engine does die, don't let your plane get too far away. This airplane glides flat, but **hot!** □

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