

BUILDING AND FLYING INSTRUCTIONS:

Powered by a Pratt & Whitney J-57-P4 with afterburner, the "Crusader" holds America's speed record of 1,015 m.p.h., and has made the fastest transcontinental run at the time of this writing. It is the first carrier based aircraft to exceed 1000 m.p.h.

The basic design is excellent for ducted fan free-flight or controlled model flying. Its highly sweptback wings provide excellent longitudinal and lateral stability. Original test designs flew almost out of sight. The duct system incorporated into the design is the subject of over five years of experimentation, and while its construction may seem alien to you at first, it is very easily assembled and will present no structural difficulties. The cutaway view of the fuselage will clarify construction.

For maximum performance, light weight is of prime importance, since the efficiency of the ducted fan system does not begin to compare with a conventional prop arrangement for thrust. The landing gear has been designed in such a manner as to make it instantly removable for higher performance flying when desired. A good engine equipped with a pull starter is most important. The design may be modified to use a conventional engine and prop to the nose as indicated in the side view. This is optional of course.

Before beginning construction, study the plans carefully. All balance points are identified by a letter and a number, the letter indicating wing, stabilizer, fuselage or duct structure. The number sequence indicates suggested order of assembly. Special instructions for control and free-flight versions are incorporated on the plan. Remove all parts from the die-cut sheets and arrange for convenience, as you proceed.

WING CONSTRUCTION: Left and right panels are on plan. Airlift is flat bottomed and the wing is very easily assembled. The wing detail at the right-center of the plan clarifies any questions on its assembly. Spars meet at the centerline, tips are blocked up 1" and gussets of strip balsa are cemented in place. Spars are cemented flat across the bottom of the airdraft from W-1 to W-1.

STABILIZER: The stabilizer too is extremely easy to assemble, and is also detailed next to its plan layout. Points to consider are the leading edge, leading edge sheathing and trailing edge which should not be trimmed flush with the end rib, as they insert into the positioning notches in the fuselage outline. The stabilizer halves each have 1" dihedral (measured from the fuselage siding). A 1/16" wire stabilizer passes is used to allow a degree of flexibility to the otherwise vulnerable stabilizer mount, and at the same time minimize duct strain interference. Note in the detail, the outer stabilizer must give five degrees up and down on this 1/16" wire for control action. Wire should pass through bearings in fuselage and pivot freely. The wire elevator horn should be bent in so as to pass between duct and fuselage siding. Allow no binding. Structure may be modified to conventional elevator surfaces (See three-view) if desired. Use wire and tubing type hinges.

FINISHING CONSTRUCTION: Layout over side view and refer to detail at top right of plan. Note the leading edge passes into the fuselage as deep as the duct wall. Offset rudder tab to right 3/16" for controlline.

DUCT COKE: Two die-cut cone paper panels (with slots) are provided. Die-cut formers D-1, D-2, D-3 and D-4 are cemented to the 1/16" x 1/4" strips, laid out over the side view which shows the duct cone, radial formed plastic cones, followed by D-5 and D-6 die-cut vanes installed between D-1 and D-2 and the smaller die-cut units D-10 and D-11 which are airfoiled as shown on the side view. Angle with care for maximum thrust. Assemble tail vanes D-6 and D-7 and fan at side with D-8 units. Note adjusting tabs.

DUCT WALL: This again is formed of two large die-cut sheets of paper, cemented into a tube which is formed around P-17 cast jig (temporary structure which is removed after assembly). Layout former F-14, 15, 16 over that cross-sectional drawing, and slip over duct wall, cementing in position. Use same with P-11, 12, 13 and the plywood firewall. Now the Duct Cone Assembly may be cemented in place within the main duct.

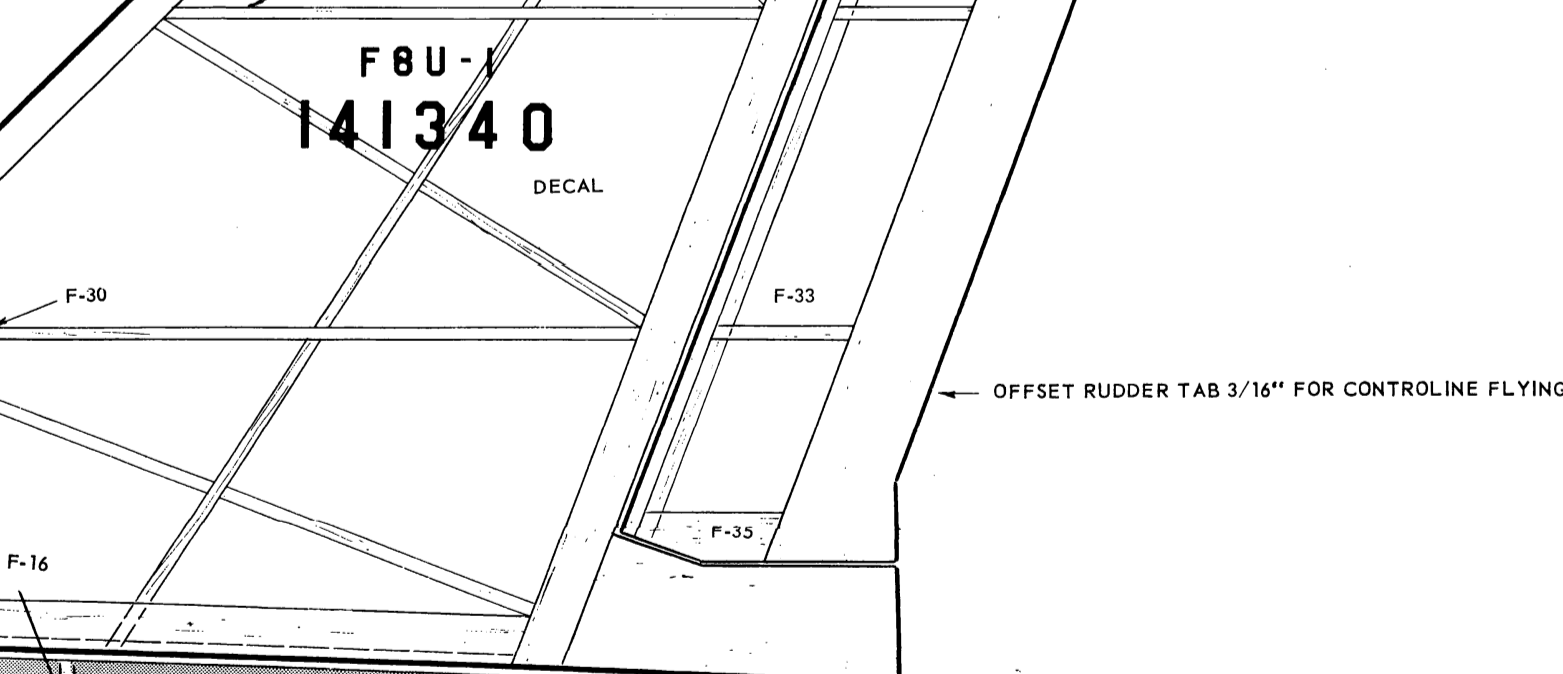
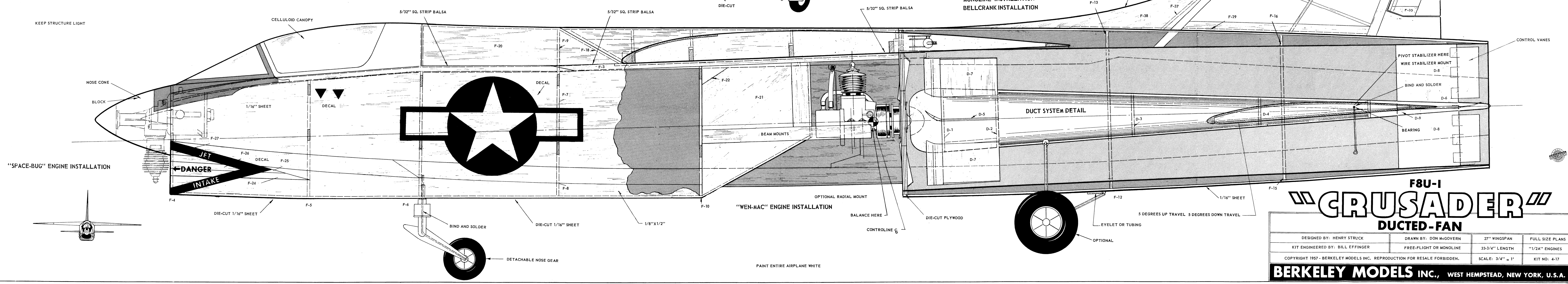
FUSELAGE CONSTRUCTION: Die-cut siding F-1 and F-2 units are applied together and allowed to dry. All remaining formers are assembled, and the siding is cemented to the firewall and aft formers. When dry, pull in toward nose and proceed to install forward structure as detailed. This is overly much self explanatory as you proceed. The 5/32" sq. upper longerons help in alignment, and provide a rest for the wire and canopy. Portions of the extensive sheathing are die-cut, such as the bottom forward sheathing, the small strips to sink the lower nose, wire fitting sheathing, and sheet for the area in front of the canopy.

Suggested engine installation is detailed and material provided for same. A radial plywood mount is also provided, with the understanding that you must rigidly mount it and brace it in such a way that the lighter fan is in exactly the position indicated. A pull type starter should be used. These are made to fit most engines and are obtainable at your dealer.

The wing on free-flight versions should of course be removable, and may be retained in the conventional manner with wing rubber attached to wire hooks or dowel pegs. An internal rubber wing mounting method may be used for improved appearance.

CONTROL INSTALLATIONS: Either "Control" or "Monoline" type control systems may be used, with a recommendation for the "Monoline" system, as air drag is less, and lines need not be so tight for control. Suggested mounting is detailed on the plan. The leadout or leadover should pass through the wing, parallel to the ground and sweeping rearward toward the left wing tip three to five degrees.

FLYING INSTRUCTIONS: Check the balance of the model, and add a bit of ballast if necessary to bring C.G. within range. Put trim rigging, a calm bar and gusty field are desirable. Hand glide the model and adjust trim for a stall free glide, without noticeable turning or diving tendencies. Adjust for a fairly fast rather than overly long glide. Start engine and run at peak power. Launch model and observe flight path. Model under power should make wide turns, with adjustments made on this. The duct is necessary. Clean excess fuel exhaust residue from duct every few flights. Test as conventional model in dead calm air, with engine pointing. Avoid over-control, and fly at first on fairly short lines. In the air your "Crusader" will be a real thrill.



F8U-1 CRUSADER DUCTED-FAN

DESIGNED BY: HENRY STRUCK DRAWN BY: DON McGOVERN 27" WINGSPAN FULL SIZE PLANS
 KIT ENGINEERED BY: BILL EFFINGER FREE-FLIGHT OR MONOLINE 33 3/4" LENGTH 1/2" ENGINES
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