

# HOME BUILT

BY DAN SAVAGE PHOTOGRAPHS BY KEN ADAMS

## F-106 Delta Dart

A patriotic interceptor for electric power

In 1949, the USAF wanted an advanced interceptor capable of outperforming the new Soviet bombers. The F-106A was accepted into service in 1956 and it served until the 1970s when the F-15 Eagle began showing up. The F-106s then went to six Air National Guard squadrons including the 159th Fighter Interceptor Squadron of the Florida ANG. Because of its serial number (58-0760), this aircraft was selected to receive a special paint job to commemorate the USAF's bicentennial celebration in 1976 and I duplicated it here for this model.

Though the F-106 is a sport-scale model, it does feature a fully cambered airfoil with a reflex trailing edge (TE) and scale leading edge (LE) droop. Since I fly off hard surfaces, I included retracts. The plans also show bungee launch mounts. The model

can be powered by most of the popular 70mm tractor fans or the WM400 pusher fan. I recommend using between 350w and 800w of power.

### LET'S GET BUILDING!

The parts are already laid out for you and grouped by wood type and thickness. If you don't want to cut the parts yourself, I offer a laser-cut wood short kit (as well as a full-color, photo-illustrated construction guide in PDF format) on my website, [savagelight.com](http://savagelight.com).

Start with the Vertical Fin. Glue R1 through R5 to make the vertical fin then set the fin aside then move on to the wing. Make four 1/16-inch balsa wing skins. Glue four 2-56 blind nuts into the main landing gear mounts. Glue MG2 and MG3 to W2 and W3. Make a right and left set. Assemble these together with WS1 and WS2 and

This is a great-flying model of a Century series jet fighter. The plans can be used to build the model with retracts or for bungee-launching. The model can accept most 70mm tractor fans as well as the WM400 pusher fan. The plans include templates for the WM400 parts. (Photo by Ken Adams)



W1B. Secure this inner wing assembly to the board. Secure the remaining ribs to the board. Bevel the front of the ribs to match the leading edge. Draw a line 1/16-inch from the edge on the wide face of the leading edge stock. Align this so the line you drew is even with the top of the wing ribs. Glue the LE to the front of all the wing ribs and glue all the joints of the inner wing assembly. Next, glue the square balsa wing spar to the ribs. Using medium CA and carpenter's glue, sheet the bottom of the wings, front then the back. Let the glue dry overnight.

Remove the wings from the board and cut the building tabs off the ribs. Glue the wing jig pieces to the plane and tack glue the wings to the jigs. Add the balsa wing spars, balsa vertical grain shear webs and servo mounts. Sheet the top of the wings, front, then back. Mark the profile of the Root Rib Template and W7 on the ends of the LE. Shape the top of the LE then the bottom. Glue the TE to the wings and shape the TE. Glue W7 to the wing tips.

**THE LARGE DELTA WING KEEPS THE WING LOADING SPORT MODEL-LIKE, SO IT CAN BE SLOWED DOWN FOR NOSE-HIGH LANDINGS**



### SPECIFICATIONS

**Length:** 49-½ in.

**Wingspan:** 28 in.

**Wing Area:** 380 sq. in.

**Number of Channels:** 3 to 5 (elevons, throttle, retracts, nosewheel steering)

**Weight:** 48-64 oz.

**Wing Loading:** 17-23 oz./sq. ft.

**Fan Unit:** 70mm tractor or WM400 pusher.

**Power required:** 350w to 800w (3S LiPo)

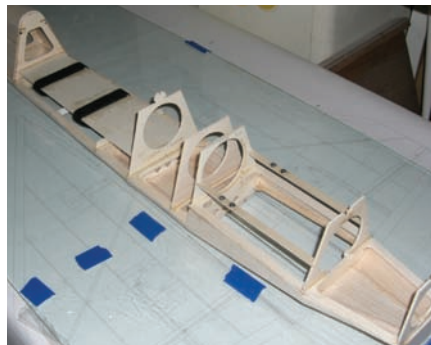
Glue a W8 to the W7. Shape the top of the tip to match the wing, then shape the bottom. Cut the elevons from the wings. Glue the balsa control horn doublers into the elevons, then glue the elevon spars to the wings and elevons. Mark the hinge locations and install, but do not glue the

hinges. Install the elevon servos and make the up elevon linkage. Be sure to set the wings aside for now.

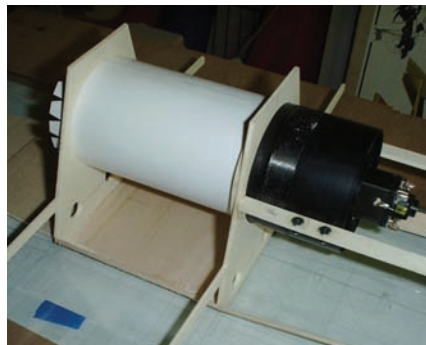
### THE FUSELAGE

Set up the fuselage jig then tack glue K1 to the jig. Secure K2 to the board. Glue B1B,

B2B, B3B, B4B, B5B, B6B, BH4, B8 and B9B to K1. Glue B10B to the top of K2 and the back of K1. Glue B11B and B12B to K2. Reinforce the joints between B10B and K1 and K2 with ½-in. triangle stock. Build the hatches then the balsa stringers in the bottom bulkheads and hatches. Remove the hatches from the fuselage. Sheet the bottom of the fuselage then do the same with the hatches. Remove the fuselage bottom from the board, flip it over and re-secure it to the board. Glue four 2-56 blind nuts into NG1 then glue NG1 to the top of K1. Glue bulkheads B1T to B6T to K1. Glue two NG2 to the top of NG1 and the front of B4T. Glue two C1 cockpit rails between B3T and B4T. Glue C2 to the cockpit rails. Glue the balsa stringer to B1T and C2 and



The forward fuselage construction is complete. The battery tray is in place and the fan mounting rails have been slipped into place in preparation for installing the fan unit and building the inlet ducts.



The fan is assembled and screwed to the fan mounting rails. The aft inlet duct is rolled from 100# Bristol paper. It is sized so the air flows smoothly into the front of the fan.

# HOME BUILT



to B4T–B6T. Sheet the forward section of the fuselage and combing between B1T and B4T. Glue two C3 to the cockpit sides then glue C4 windscreen frame to the top of the combing. Bevel the front of both C5 windscreen halves then glue the balsa stringer to C4 and B4T. Glue the C6 canopy to enclose the cockpit then sheet the top of the turtle deck to B6T.

Glue the fan-doubler to B10T and the battery tray spacer to K1 over B8. Insert the battery tray into B6T and B9T. Glue B9T to K1. Now glue the battery tray to B6T and B9T. Glue bulkheads B10T through B12T to the top of K2. Cut the aft inlet duct out of 100# smooth Bristol paper. Roll it into a tube and glue the overlap using carpenter's glue. Insert this through the back of B10T

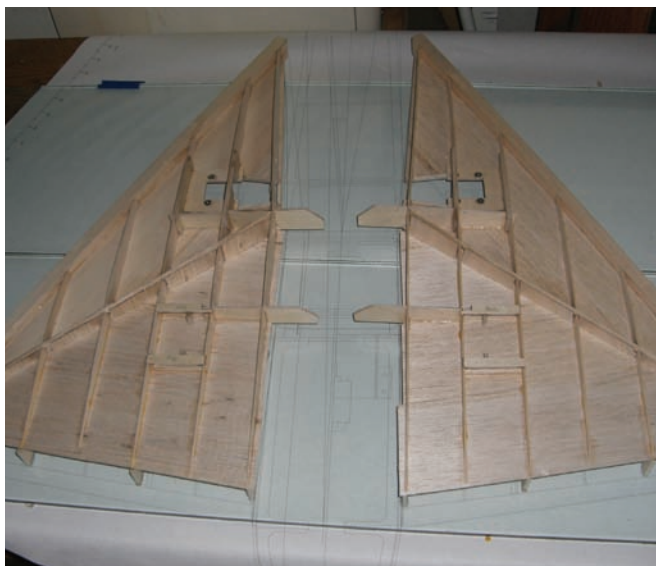
into place between B9T and B10T, but don't glue it yet. The back of the inlet duct will be even with the glue joint between the fan doubler and B10T. It should fit snugly into the holes in B9T and B10T.

Glue 2-56 blind nuts into the holes in the fan mounting rails. Place the fan mounting rails into the slots in B10T and B11T, but do not glue them. Remember to keep the blind nuts on the top as the fan is mounted from the bottom. Insert the fan into the hole in B10T/B10B. Push the fan and aft inlet duct together to form a tight joint, and then screw the fan to the mounting rails. Glue the fan mounting rails to B10T and B11T. Tack glue the aft inlet duct to B10T. Remove the fan and glue the duct to B9T and the fan doubler. Glue the spar

pockets together then glue the pockets to the back of B9T and the front of B10T.

Bevel the inside trailing edge of both inner inlet walls so they form a smooth taper. Glue them together then finish the outside faces of the inner walls. Leave these top and bottom edges of the inner inlet walls bare to make a good glue joint. Glue the inner walls between B6T and B9T. Glue the  $\frac{3}{32}$ -in. balsa filler piece along the top of K1 between B6T and B9T. Glue the inlet bottom I3 to the top of the filler piece. Now you can glue inlet top I2 to the back of B6T and the top of B9T. Cut out two forward inlet duct walls and doublers from 100# Bristol paper. Don't glue the inlet doublers to the inlet ducts yet. They will get glued in after the inlet construction is finished. Working from the back to the front, push the forward inlet duct tightly against the aft inlet duct. Tack glue the forward inlet duct to the back of inner duct walls. Tack glue the front of the inlet duct to the inboard corners of I1, I2 and I3. Glue the paper inlet duct against the top and bottom edges of the inner duct wall. Work on the bottom first, then glue the top. Glue the aft inlet duct to the outside of the forward inlet duct. Glue the inlet doublers to the outer inlet ducts using thinned carpenter's glue.

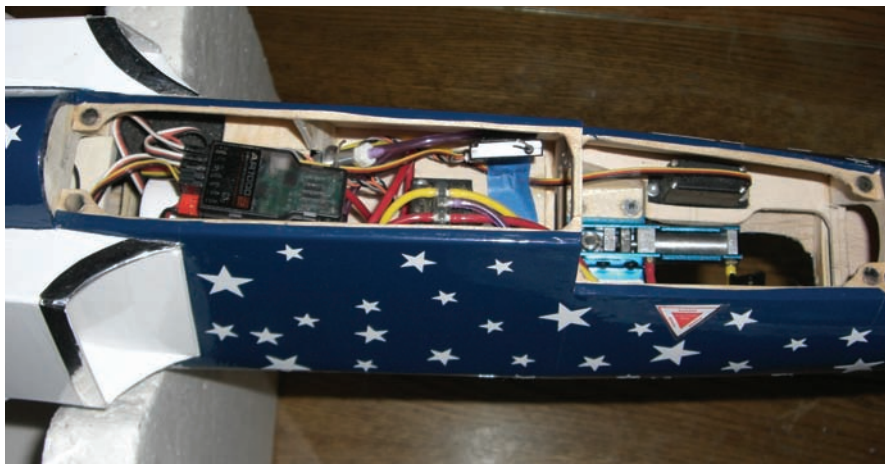
Glue  $\frac{3}{32}$ -inch balsa between I2 and I3. Glue the FS1, FS2 and FS3 fuselage side pieces to the aft fuselage. Glue two balsa stringers from B10T to B11T and B12T. Use  $\frac{3}{32}$ -inch balsa to sheet the top of the aft fuselage. Leave a slot for the vertical fin.



The wings are built upside down on the plans. The wing ribs have building tabs to ensure a straight set of wings. Here, the basic wing construction is nearly complete. The top wing spar, shear webbing and elevon servo mounts have been glued into place.



The only thing left is to shape the nose block, rudder fairing block and rudder, then glue them to the fuselage and it's time for final finishing and my favorite part—flying!



**Trying to install all the necessary components through the tiny cockpit hatch proved to be like building a ship in a bottle. This hatch has since been moved to the bottom of the nose section to give easy access to the roomy fuselage.**

Glue B7 between the inlets and the top of the battery tray. Glue balsa stringers to B6T, B7 and B9T then sheet with balsa and then glue the top and bottom inlet lips to the fuselage sides. Make sure the inner face is flush with the inside of the Bristol paper inlet duct. Glue the side inlet lips. Fit, but don't glue the 1/16-inch balsa inlet splitter plate so it rests on the side of the fuselage. Sand the trailing edge of the splitter plate so it forms a smooth ramp into the inlets and round the front then glue it into place. Shape the bottom of the aft fuselage fairing block to match the top of the fuselage profile. Round it down, then glue it into place. Be sure to sand the fuselage smooth.

### FINAL ASSEMBLY

Cut holes in the root rib and matching holes in the fuselage sides for the servo wires and retract air hoses. Secure the WJ4 wingtip jigs to the board. Slip the wings into the spar pockets. Make sure that both wing panels have equal incidence. Use scrap balsa filler pieces to fit between the wing and fuselage. They just need to fill the gap. Double-check that the fuselage/wing alignment is correct. Glue the filler blocks to the wing only. Flip the fuselage over and repeat the procedure for the bottom. Remove the wings from the fuselage. Shape the filler pieces to match the wing. Put a thin film of epoxy on the stub spars and on the inside of the spar pockets. Slip the wings into place and weight the wings while the glue sets. Once the epoxy is dry, glue the filler blocks to the fuselage using thin CA. Bend the landing gear struts and install the main gear retracts in the wings. Cut open the wheel wells and glue and shape the soft balsa nose block.

Once you glue the vertical fin inside the fin pocket, your model is now ready to be finished however you choose!

### IN THE AIR

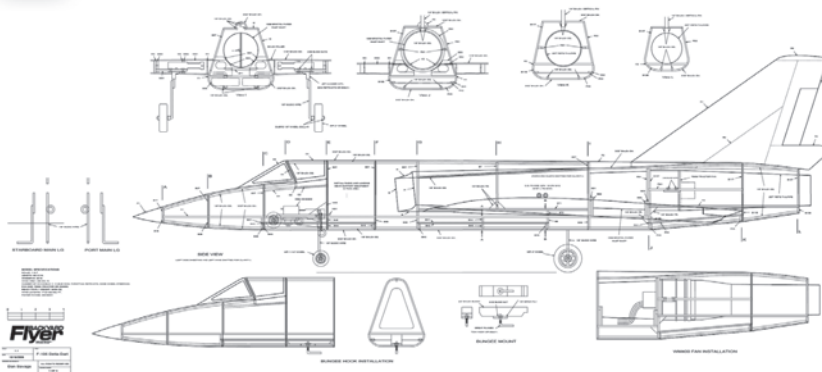
The F-106 is smooth and easy to fly and is as maneuverable as any other e-jet. It tracks straight on the ground and in the air. The large delta wing keeps the wing loading sport model-like, so it can be slowed down for nose-high landings. The model should be balanced upright on a balancing stand in a range of 22- to 24.5-percent of the MAC. The initial test flights were flown

at 22.5% and the CG was progressively walked back to 24.5% over successive flights. Don't be tempted to alter the scale nose-down ground stance as the model has no problems rotating off the ground, even at the forward CG limit. On a smooth surface, the model accelerates quickly and lifts off in 150 to 200 feet.

Because of the short wingspan, it can be sensitive on the roll axis, so don't go beyond the recommended throws. It is very stable in pitch and goes where you point it. It really likes to be flown through large, jet-like maneuvers. High-alpha flight will present no nasty surprises. You raise the nose and it slows down. The model lands best when you keep nose up slightly and use power to control the descent rate. When you're ready to land, bring the model to pattern speed and altitude. When the model is on the downwind leg of the pattern and abeam the touchdown zone, reduce power to begin descent. The model is lightly loaded for a jet, so it's capable of remarkably slow flight. Raise the nose to a landing attitude to flare and touchdown on the mains. If you keep the nose high after landing, you can use the big delta wing for aerodynamic braking—it looks pretty cool, too. The F-106 never fails to get attention. It's rarely modeled, which is a shame because it has a lot of things going for it. It's different and fun to fly and has the sparkling performance to match its sleek lines. ✈



To order the full-size plan, visit [AirAgeStore.com](http://AirAgeStore.com)



### K1110A F-106 DELTA DART

Designed by Dan Savage, this highly unusual EDF-powered Jet is sport scale but includes a fully cambered airfoil, reflex training edge and scale leading edge droop. Featuring basic wood and lite-ply construction, it has excellent flight performance. As with all Delta-wing airplanes, it has very good slow-speed performance. Designed to use a 70mm EDF unit and retracts, the Delta Dart also has a laser-cut short kit and a step by step guide available from the author at [savagelight.com](http://savagelight.com)  
**Wingspan: 28 in.; Length: 49-1/2 in.; Radio: 3 Channels; Throttle, Elevator/Ailerons (w/elevon mix); Power: WeMoTec Minifan 480/Kyosho AP-29L hybrid; LD: 2; 3 sheets; \$24.95**