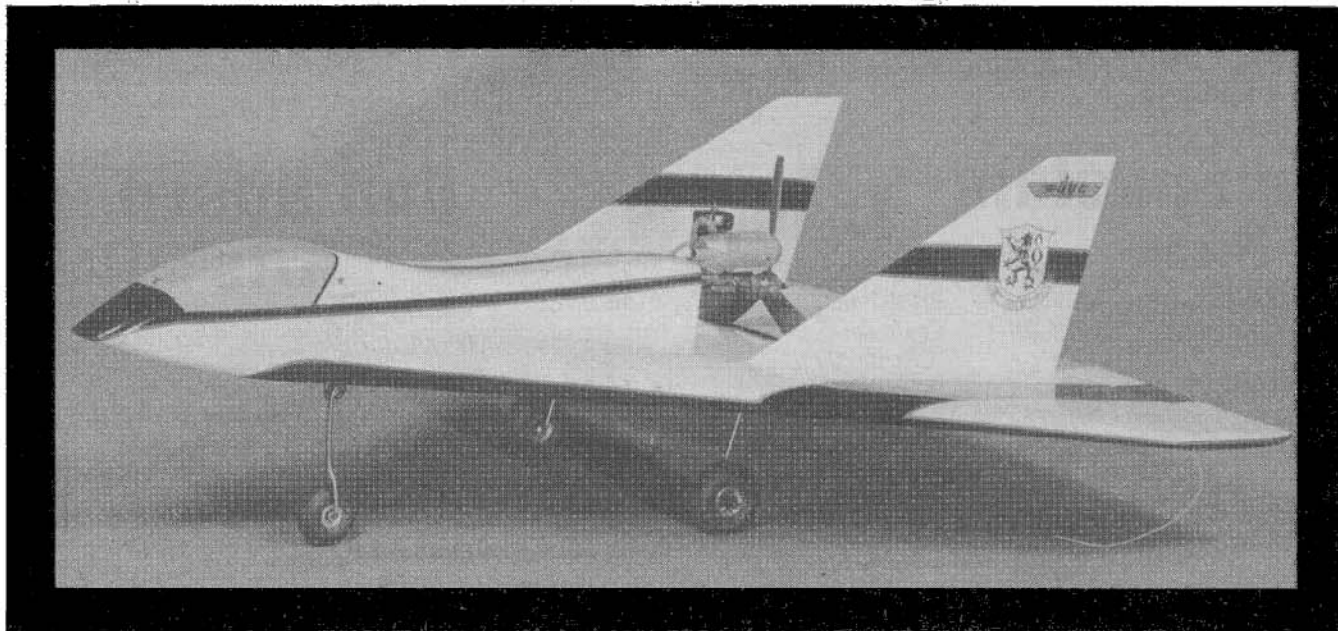


FORCE ONE



All my modeling life, delta-winged airplanes have fascinated me. One of my first single channel models was a delta.

About ten years ago I designed a delta-wing model, from which a whole series of deltas was built. Each one had something improved. Most had the engine up front; some at the back.

The model I am introducing to you now is the first mid-engined effort. It has the best flying characteristics yet. It is easy to build, and the best looking, too.

This model is very fast at full throttle, but can fly so slowly that it almost hovers without stalling. Its small size makes it ideal for easy transportation. The model can be built and flown by any beginner with enough experience to be able to take-off and land a conventional aircraft by himself.

CONSTRUCTION

Study the plan. All parts are numbered and will be referred to by number in the construction article.

Cut out all of the parts. Drill all holes where shown. Make sure that the fuselage sides are cut from balsa of the same density. The 1/4" x 1/4" spruce stock must be straight.

To speed up construction, I use cyanoacrylate on everything except the firewall, nosegear mounts, and mains.

Wing:

Right on top of the plan, glue together the 1/4" x 1/4" spruce leading edge (1), trailing edge (3), and tips (2).

After many prototypes, this mid-engine delta-wing is the designer's latest effort. It has superb flying characteristics, good looks and, best of all, easy to build.

By L. Mikulasko

Mark the location of the ribs on both the leading edge and trailing edges. This will be the basis of the frame for the wing.

When dry, lift the leading edge from the plan and put approximately 2" support under the nose, leaving the trailing edge on the bench. From now on, you don't have to build on top of the plan.

Glue the ribs (W3, W4, W5, W6, W7) into the frame after you have sanded the front of each rib to conform to the angle of the leading edge, for more gluing surface.

Now you will be building the leading and trailing edge of the propeller cutout. Take the small half-ribs (39), and glue them to the strip (18), and glue the half-ribs (40) to the strip (19). Sheet both sides with parts (12) and (13), and sand to a smooth finish.

Now take these two parts and glue them between the ribs (W2) on the positions marked for the leading and trailing edge of the cutout. Then glue

the plywood stiffeners (8) on the inside of the two (W2) ribs. Glue the resulting sub-assembly into the main frame.

On the inside of the plywood ribs (W1), glue the triangular stock (5) in place where the 1/4" ply bulkhead (4) is going to be located.

Glue the plywood nosegear bulkhead (4), and the balsa bulkhead (21) between the ribs (W1), making sure that everything is square. Glue this sub-assembly into the frame.

Between the leading and trailing edge of the propeller cutout, glue the half-ribs (41).

Glue in the spars (7). When the glue is dry, cut the top spar off just inside the center ribs (W1).

Glue the trailing edge sheeting (9) on the top and bottom of the wing. Keep the trailing edge on a flat surface while the glue is drying.

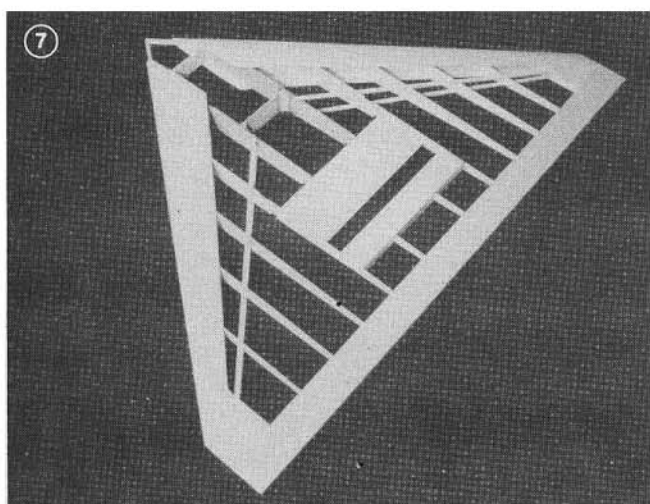
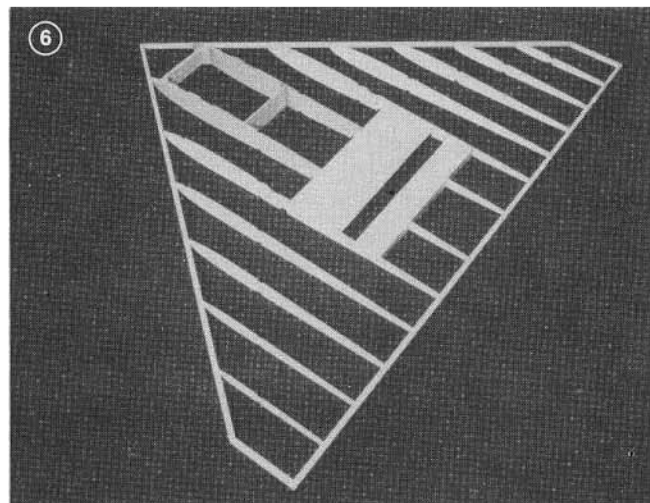
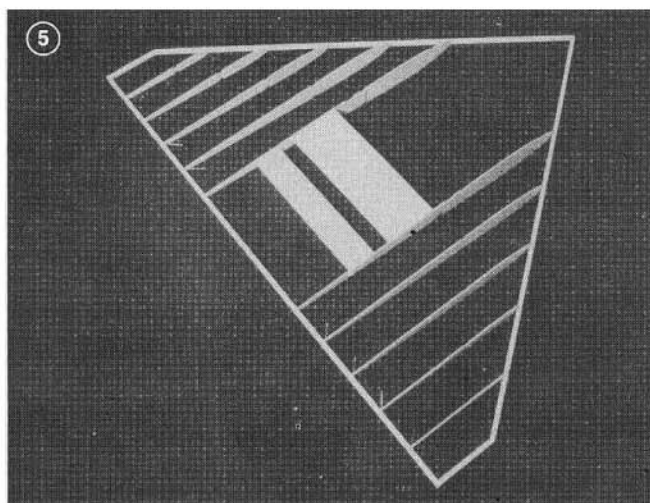
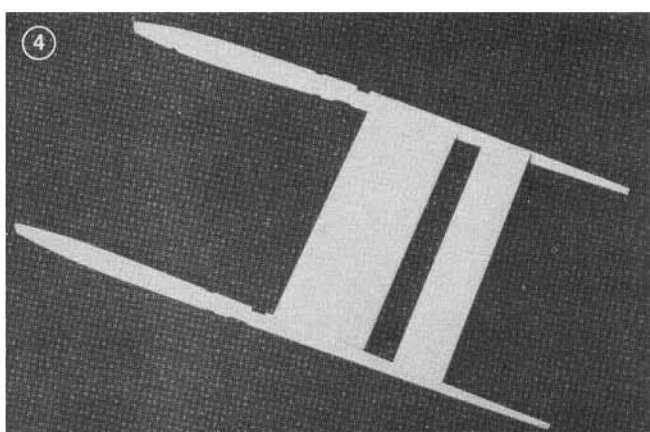
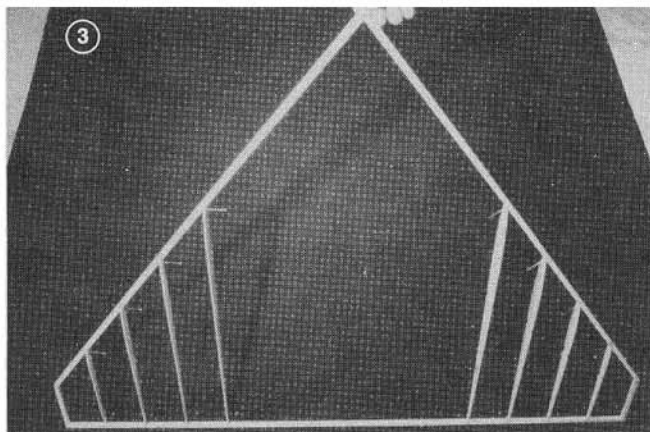
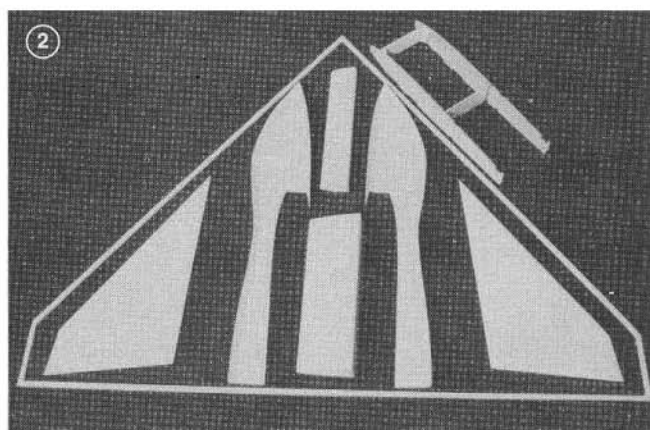
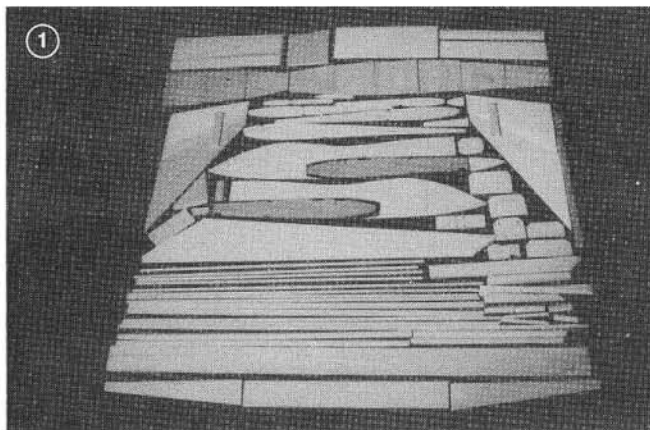
Glue the balsa strips (6) on both sides of the leading edge, top and bottom, and sand to the contour of the ribs.

Glue on the leading edge sheeting (10). I suggest that you glue this sheeting at the leading edge first, top and bottom, making sure that the leading edge is straight. Then, when that glue is dry, glue the sheeting to the ribs. All of this can be done up in the air, without a jig.

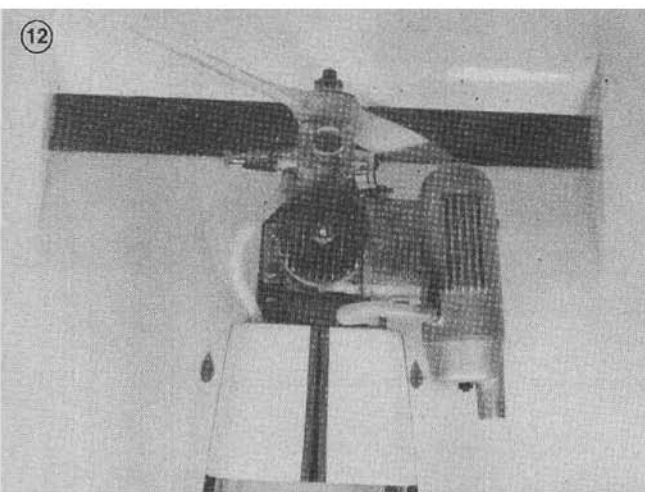
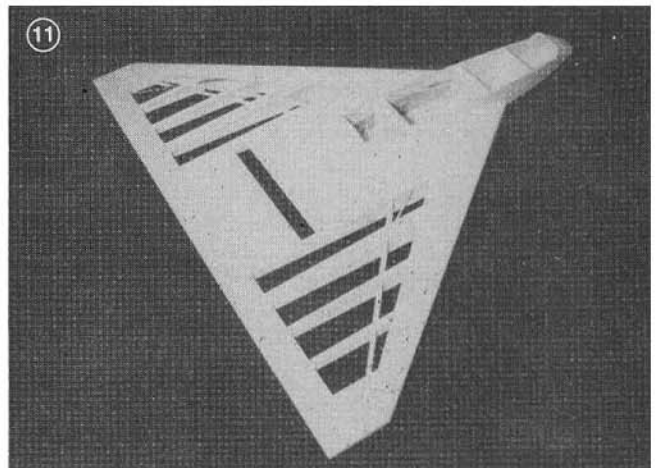
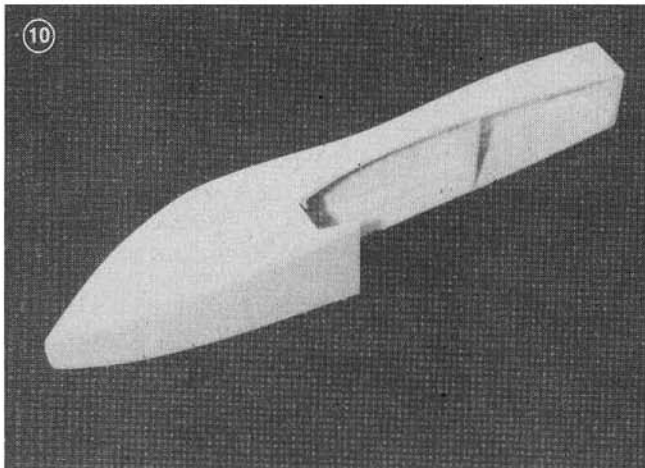
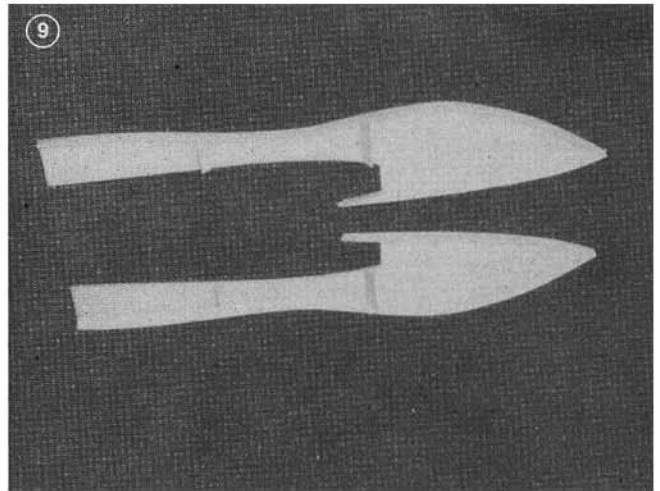
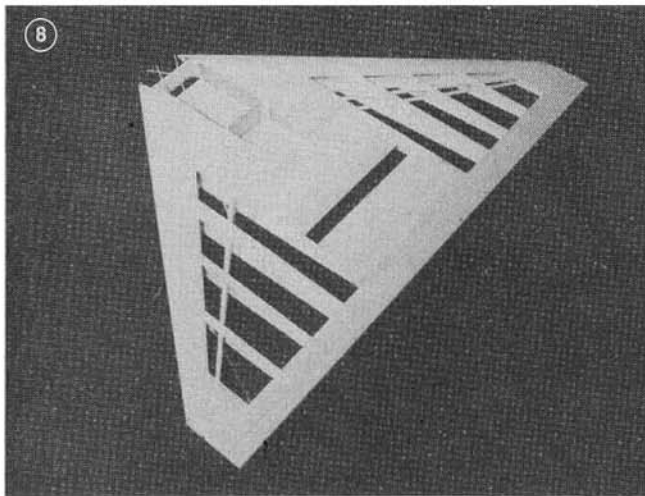
Glue in the hardwood block (20) for the main gear. This block should have the slots for the 5/32" piano wire already made.

Glue the sheeting (11, 14) on the

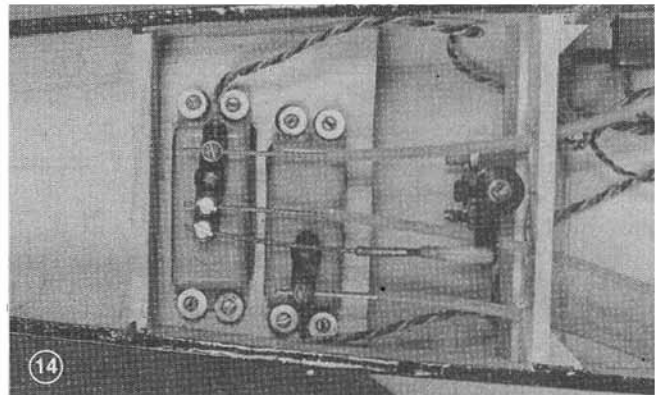
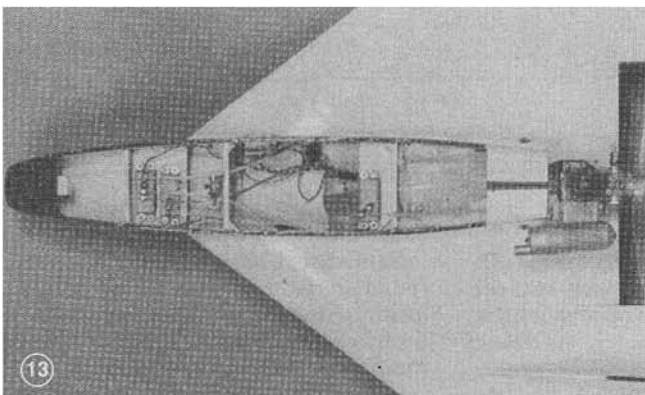




(1) Individual parts for Force One, assembled for inventory. (2) Wing frame, with fins, fuselage sides, leading and trailing edge of the propeller cut-out and wing center plywood subassembly. (3) Wing frame with some of the ribs glued into it. Note that it is raised off the board, keeping its shape without a jig. (4) Propeller cut-out subassembly. (5) Propeller cut-out subassembly in main frame. (6) Completed wing frame. (7) Spars and some sheeting applied to frame.



(8) Completed wing. Note leading edge trimmed back to the first bulkhead. (9) Fuselage sides with triangle stock in place. (10) Complete fuselage. (11) Fuselage in place, structure ready for covering. (12) Close-up of mounted O.S. .40 engine showing propeller cut-out. (13) Radio installation. Notice, battery and receiver just in front of throttle servo. Space in front of them should be filled with foam. (14) Close-up of radio installation.



bottom of the wing, between ribs (W2).

Glue in the pushrod tubes. Don't forget to glue in the NyRod outside tubing into one wing for the antenna wire.

Finish the sheeting on the top of the wing, and glue on all capstrips (16, 17).

Under the top capstrips at rib (W3), glue in the triangular stock (43) on both sides to stiffen up the area for the fin. See cut B-B.

Glue in the balsa strips (22) on both leading edges and, at the wing tips, balsa sheet (42).

Sand the leading edge to a nice round shape. Note: Do **not** sand the leading edge sharp! This will result in a wicked high speed stall tendency in the finished model.

Cut away the leading edge sheeting and 1/4" x 1/4" spruce between ribs (W1) back to bulkhead (4) where the fuselage will plug in.

Sand the whole wing ready for covering.

Glue the fins together and sand them with fine sandpaper.

Cut out the elevator (25) and ailerons (24) out of trailing edge stock. You can sand the aileron tips so that they have built-in washout.

Fuselage:

Before starting the fuselage construction, make the cuts in the fuselage sides (28) where the top hatch will be separated. Do not separate these hatch pieces from the fuselage sides. We will do this later. Just score the cuts deep enough to make them easy to separate when the structure is complete.

From RCModeler Mar. 1982

Make the indicated cuts into the triangle stock (31) about 1/2" apart, two-thirds of the way into the wood.

Glue this triangle stock on the inside of the fuselage sides, and triangle stock (32) to support bulkheads (35, 36).

Now glue in the two bulkheads (35, 36). These two bulkheads will have to be cut straight across where the top part will be in the hatch and the bottom half in the fuselage.

Glue in the engine firewall (38) and add the corner supports from triangle stock (32).

Glue in bulkhead (34), and squeeze in the nose of the fuselage so that it has the same width as shown on the plan, and then glue the top sheeting (30) and nose bottom sheeting (29).

Round the fuselage corners and sand the whole fuselage with fine sandpaper.

Now separate the hatch.

Place the fuselage in position on the wing and mark the inside contour of the fuselage on the wing sheeting. Then cut out the sheeting on these lines.

Mount the steerable nosegear bracket on plywood bulkhead (4).

Glue the fuselage to the wing and cut out the hole in the bottom for the nosegear to go through.

Glue the plywood piece (37) to the hatch, and the 1/4" plywood piece (33) to the fuselage.

Finishing:

Finish the model using your favorite method. I covered my wing with polyester lining material, purchased in a fabric store. This polyester fabric compares in strength and consistency with regular Coverite, but without the adhesive.

First, you brush on Balsarite or clear dope to the frame. Then, with a hot iron, you attach the fabric to the frame at the leading edge, trailing edge, tips and center.

Before you shrink the material, brush clear dope on the spots you just attached, so that they don't let go. When this has dried, go over the whole wing with a hot iron, set for very hot. You can now dope and finish the rest of the structure.

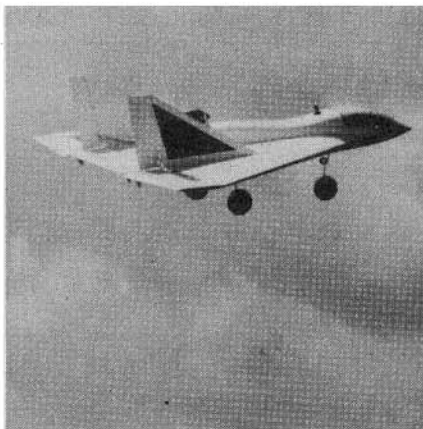
Cut out the slots in the top wing capstrips (16) for inserting the fins (27).

Glue the fins into these slots and glue the sub-fins (26) to the bottom of the wing.

Apply three coats of dope, sanding lightly between coats. If you need to fill some uneven spots, now is the time to do it.

Sand the whole model to your satisfaction, cut out the fabric around the pushrod holes, and make the slots for the hinges.

Fuelproof the tank compartment.



FORCE 1

Designed By: Laddie Mikulasko

TYPE AIRCRAFT

Sport Delta

WINGSPAN

36 1/2 Inches

WING CHORD

16 3/4 Inches (Avg.)

TOTAL WING AREA

611 Sq. In.

WING LOCATION

Low Wing Delta Design

AIRFOIL

Symmetrical

WING PLANFORM

Tapering L.E.

DIHEDRAL, EACH TIP

None (Thickness Taper Only)

O.A. LENGTH

34 Inches

RADIO COMPARTMENT AREA

(L)10 3/8" x (W)3 1/2" Avg. x (D)3" Avg.

VERTICAL FIN HEIGHT

7 1/4 Inches

VERTICAL FIN WIDTH (incl. rudder)

8 Inches Avg.

REC. ENGINE SIZE

.40 Cu. In.

FUEL TANK SIZE

8 Oz.

LANDING GEAR

Tricycle

REC. NO. OF CHANNELS

3

CONTROL FUNCTIONS

Elev., Throt., Ail.

BASIC MATERIALS USED IN CONSTRUCTION

Fuselage	Balsa & Ply
Wing	Balsa, Ply, Spruce
Empennage (Rud)	Balsa
Wt. Ready To Fly	72 Oz.
Wing Loading	16.9 Oz./Sq. Ft.



Apply your favorite color finish. Note: make sure that the model has two distinctive colors, separating the top and bottom of the airplane. This will help you better recognize which way the model is flying.

Install the landing gear, servos, engine, etc., and pull the antenna through the NyRod provided for it.

Install the hinges and, when all movable surfaces are attached, pull out all the pins from the hinges, separating the movable surfaces from the wing.

With "Hot Stuff" or "Zap," glue each half-hinge into its place. Be careful not to get glue in the holes for the pins. To prevent this, I smear light oil on the hinge line and wipe off the excess.

Attach the elevator and ailerons to the wing with a single piano wire through all the hinges, and bend the ends up.

Connect the servos to the movable surfaces. The elevator, at neutral, should be 1/8" up. From there, the movement should be 1/2" travel, up and down. The aileron travel should be 3/8" either way.

Install the fuel tank. Fuel pickup is in the middle of the tank, at the bottom. Use the standard "clunk" arrangement.

Check the Center of Gravity. Use the battery pack to get the C.G. in the proper place. To prevent any surprises on the first flight, the C.G. must be as shown on the plan.

Flying:

This model does not have rudders because I found them to be ineffective, working together. Maybe if they moved independently, with the left one for turning left and the right one for turning right, they would be worthwhile to have. The model flies just fine without rudders, however.

For flying, you have to have a pusher propeller. The engine exhaust can be facing into the flight direction. It doesn't seem to affect engine performance.

Make some taxi runs so that you get used to steering on the ground with aileron stick movements. Make sure that the model runs straight with the aileron stick in neutral.

Face the model into the wind and give it full power. Let it run a few yards and then give a little up elevator. The model will get airborne in no time. You will find the model very stable at all speeds. It is capable of all maneuvers except spins and knife-edge flight. You'll be delighted at how easy it is to land this airplane. Just cut the throttle and point the aircraft where you want to land, and she will come down like she is on rails. Enjoy flare, and that's it.

Enjoy building and flying Force One. □