The author's wife, Nancy, poses with the unusual two channel V-1 Buzz Bomb.

V-1 BUZZ BOMB

A completely unique model with equally unique construction techniques for two channel digital rigs or the Ace R/C pulse proportional system. By James M. Petro.

● 99.9% of all R/C models of all kinds have been designed with the reflection that they are the ultimate temple for our expensive radio gear. Only Ace R/C advocates slip-in equipment for easy transfer to a whole stable of pulse rudder models. I, for one, enjoy building too much to want my digital gear locked up in only one model, and I can't afford several radios for each of my favorite planes, cars and boats. This semi-scale V-1 Buzz Bomb is my best attempt at achieving an interchangeable arrangement.

A further claim to uniqueness is the choice of construction materials. The nose cone and tail feathers on this bird are the only pieces of that expensive substitute for gold called balsa. Even these could easily be eliminated and a molding and foam-board used instead.

From the photos in this article you can decide if you want to build one. There are no three-view drawings of the completed plane because this model goes together in simple sub-assemblies that magically turn into a flying machine.

A follow-up to the V-1, using the same tube-type structure and Ace foam wing is presently in the works. It is a semi-scale WW II Japanese Baka Bomb. Ace has its series of "War Birds", and I have the "Bomb Birds"! Circular cross section planes aren't too common, but maybe a B-29 or B-36 or - - -

Oops, let's quit dreaming and start building. Round up the stuff on the Bill of Materials and we'll put it all together as sub-assemblies of: (1) Warhead, (2) Engine Tube, (3) Tail Fins, (4) Wings, (5) Fuselage, and finally, (6) Control Systems.

The V-1 is a very distinctive silhouette with high jet engine mounting and the red crepe paper "flame" streaming behind. Both rudder and "rollavator" models have had exceptional hands-off stability. We even took the .049 engine off the digital model in the field and it was a good glider without any other changes in trim or weight.

BILL OF MATERIALS

Two — Estes Nose Cone No. 31 (Cat. No. 681-BNC-7OAJ)
Two — Estes Body Tube (Cat. No. 651-BT-70)
Five — Estes Coupler (Cat. No. 671-JT-70A)
One — Estes Body Tube (Cat. No. 701-BT-60D)
One — Estes Coupler (Cat. No. 651-JT-60C)
One Pair — Ace Constant Cord Wing Set
1/8" thick plywood
1/8" thick balsa
1/16" thick balsa
Ace Glider Skid
Gold-N-Rod GRF-36 Rigid Fiberglass
Piano Wire
Spruce
Small screws

WARHEAD

N-1 1 — Estes Nose Cone No. 31 (Cat. No. 681-BNC-70AJ)
N-2* 1 — Coupler (Cat. No. 671-JT-70A)
N-3 1 — Section of body tube 3¼" long* (Cat. No. 651-BT-70)

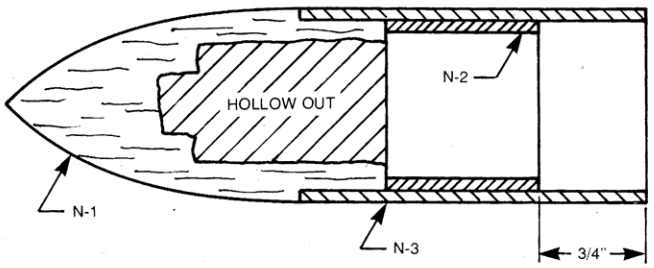
(1) The original model used an MRC digital radio and fit in easily with the material listed. Longer equipment may require a lengthened nose section; for the latter use two couplers* and a 4½'' long tube.

(2) Hollow the nose cone N-1 to fit the battery pack and any possible nose weight that may be needed in the pre-flight balance.

(3) Lightly sand the inside of the body tube section N-3, clean out, and glue to the nose cone base. All body tube areas that are to be glued must be sanded to make a better bond with the plastic binder and filler used in making the tube.

(4) Coat the inside of the tube with glue only where coupler N-2 fits and slide the coupler inside all the way to the base of the wood nose cone. The 3/4'' socket will fit the main body.

(5) When the glue is dry, this assembly may be finished. The original was covered with red Solarfilm.



ENGINE TUBE

E-1 1 — Body tube (Cat. No. 701-BT-60D)
E-2 1 — Coupler (Cat. No. 651-JT-60C)
E-3 1 — 1/8'' thick x 1-9/16'' diameter plywood disc.
E-4 1 — Gold-N-Rod GRF-36 rigid fiberglass x 6'' long.

(1) Starting 1½'' inside and back about 2½'', roughen the inside of one end of the E-1 tube. Clean and glue coat this section and insert the E-2 coupler 2'' back. Let dry.

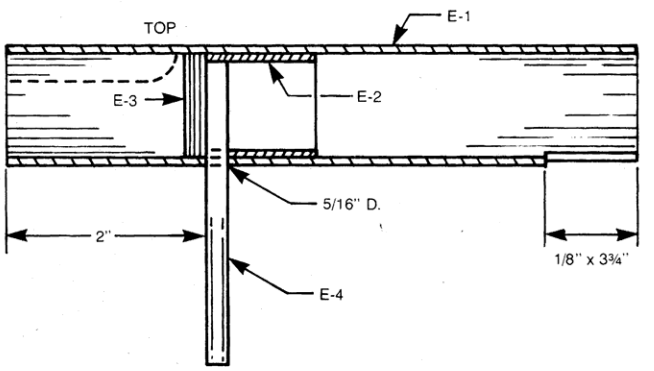
(2) Drill plywood disc E-3 for the engine screw mounting holes. Glue inside the tube and around the disc and slide the disc against the coupler. Let dry. Mark E-1 at the top so the engine mounts upright.

(3) Mark a center line along the top and bottom of the tube using a drawer or jig to draw accurate lines. Drill a 5/16'' diameter hole flush with the back of the disc and only on the bottom of the tube, centered on the line.

(4) Centered on the line at the bottom back end, mark and cut a 1/8'' wide x 3¾'' long slot for the vertical fin.

(5) Roughen, clean and glue the E-4 rod into the tube making sure there is plenty to hold to the tube and the back of the disc.

(6) Pre-finish this assembly now, and check for proper engine fit, cutting any necessary clearance. Fuel proof the engine section.

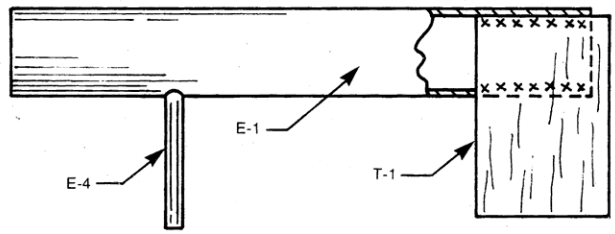


TAIL FINS

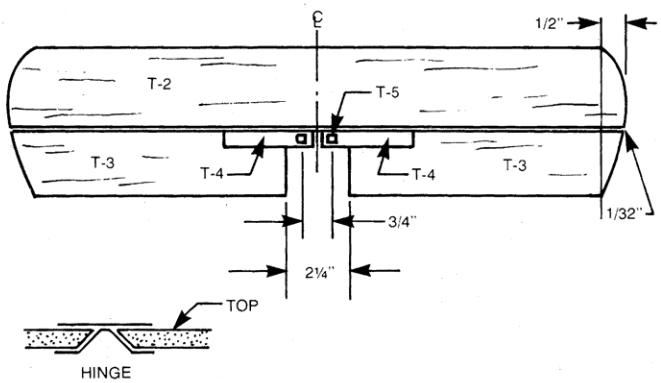
T-1 1 — 1/8'' thick x 4'' wide x 5⅛'' long balsa.
T-2 1 — 1/8'' thick x 2'' wide x 16'' long balsa.
T-3 2 — 1/8'' thick x 1½'' wide x 6¾'' long balsa.
T-4 2 — 1/8'' thick x 3/8'' wide x 3'' long spruce.
T-5 2 — short nylon control horns.

(1) Round the leading and trailing edges on T-1. Sand the inside top of the engine tube E-1 above the slot and glue T-1 at the top and at the slot, making sure that T-1 lines up with the fiberglass rod E-4.

(2) Cut out horizontal fin T-2 and ''rollavators'' T-3 as shown and sand. Glue the T-3 and T-4 pieces together. When dry, bevel the



hinge edges on T-2 and T-3 at 45°. Install continuous film strip hinges and T-5 control horns. For pulse rudder, join T-2 and T-3 with wires for trim changes only.



WINGS

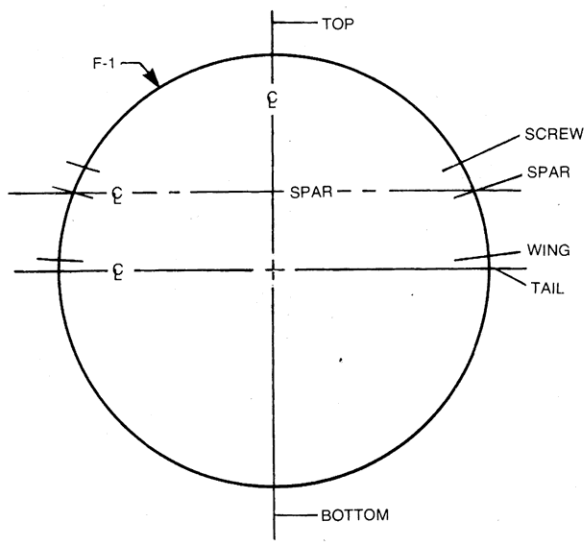
W-1 1 pair — Ace constant chord No. 136192.
W-2 2 — 1/16'' x 1½'' x 6'' balsa.
W-3 2 — light piano wire or leading edge tape.
W-4 Fiberglass strapping tape (optional).

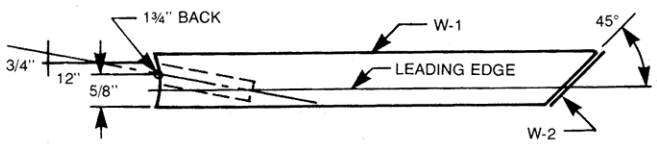
(1) Draw parallel reference lines on the fuselage tube F-1 (see pattern). Using coarse sandpaper wrapped around the tube, carefully sand the root of the wing to match the body contour using the leading and trailing edge flash marks and a reference line as guides. Check to see that the wing fits square to the tube.

(2) Make a 3/8'' diameter x 5'' deep spar hole in the root 1¾'' back from the leading edge.

(3) Bevel the wing tip at 45° and glue piece W-2 on the flat beveled area.

(4) Sand the wing surfaces and clean. Reinforce the leading edge





with tape or light piano wire glued along the flash mark.

(5) Cover the wing with Solarfilm at this time. The optional W-4 tape may, or may not, be put on the top and bottom to stiffen the wing. The original didn't use it and the Solarfilm worked well by itself.

FUSELAGE

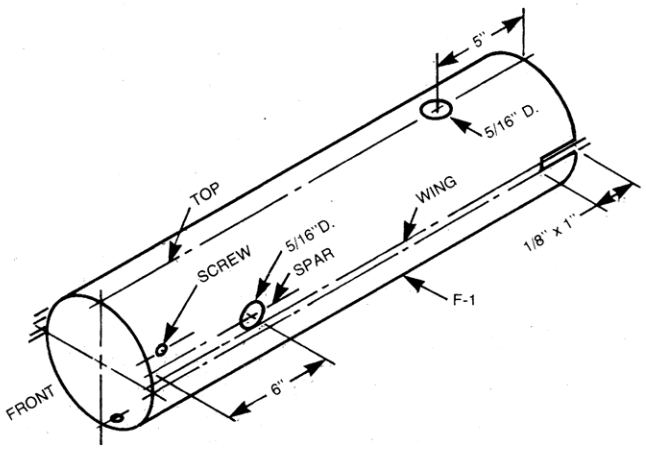
F-1 1 — Body Tube (Cat. No. 651-BT-70)
F-2 5 — Coupler (Cat. No. 671-JT-70A)
F-3 1 — Nose Cone No. 31 (Cat. No. 681-BNC-70AJ)
F-4 1 — Ace Glider Skid
F-5 3 — 1/8" thick x 1/2" x 1/2" plywood.
F-6 1 — Gold-N-Rod GRF-36 Rigid Fiberglass x 12" long.
F-7 1 — No. 4 screw and washer.

(1) Re-check the reference lines drawn on F-1. Sand the front half and the back inch inside the tube.

(2) Glue the five F-2 couplers in as indicated. Let dry.

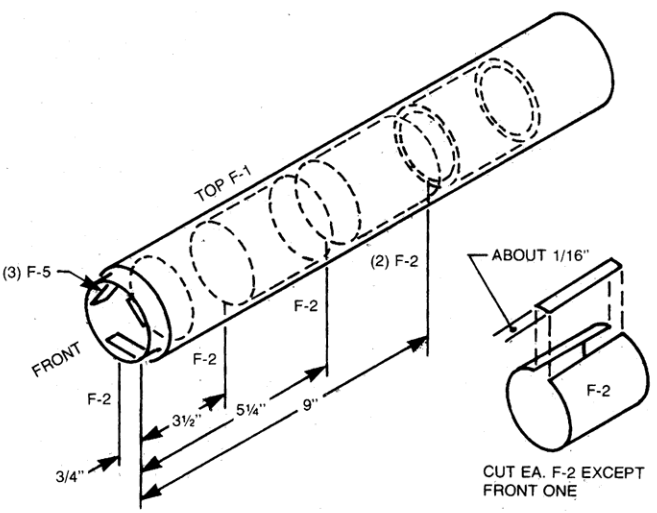
(3) Use the reference line pattern and cut F-3 in half. Hollow the lower base end for control clearance. Slot cut the upper half 1/8" x 4".

(4) Slot the back end sides of F-1 1/8" x 1" to fit fin T-2. Make two 5/16" diameter holes for the wing spar F-6 at 6" back from the front end on the spar reference lines. Make one 5/16" diameter hole as indicated on top for E-4. Glue F-6 in place after roughing up as well as the top half of F-3, matching up T-2 slots and with T-2 assembly glued in F-3. Let dry.



(5) Shape F-5 pieces to match the inside of the front F-2 coupler and glue in flush with the front edge and centered on the reference screw lines and bottom line.

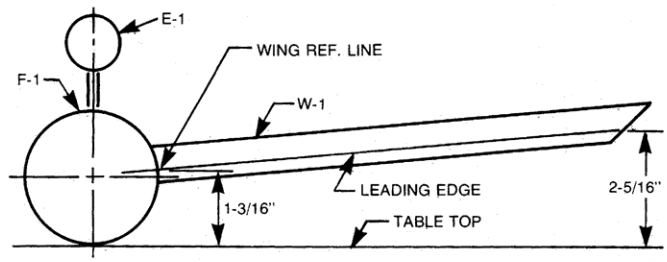
(6) Glue the engine tube and fin assembly in place using E-4 as the guide so it fits against the bottom of F-1. The engine and body tubes F-1 and E-1 must be parallel, and the support E-4 and fin T-1 must be set so the body and tail T-2 are at right angles. Let dry.



(7) Sand F-1 at the wing root. The wing is glued on by either of these two ways:

(a) Pour epoxy in the wing spar hole and coat the root. With the root up, slip the spar with the ends plugged into the hole and line the wing and fuselage up with the reference line and dihedral dimensions. After setting, add the other wing the same way.

(b) Use epoxy on the root, but fill the wing hole with Epoxylite. Slip the wings on and align as in (a).



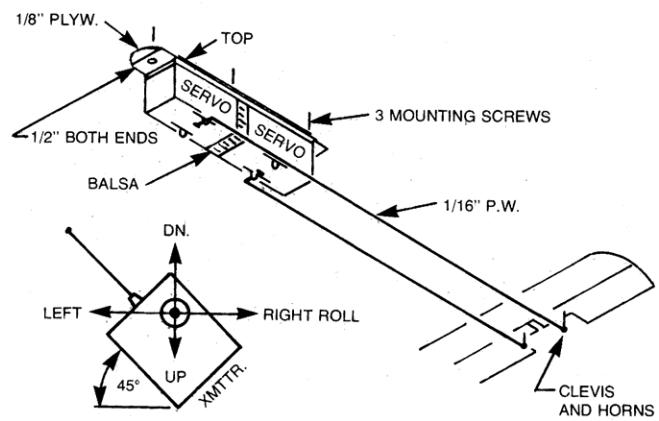
(8) Check the fit of the nose cone and lower tail cone on F-1. Now it looks like an airplane! If T-3 has 45° free movement, you are ready to finish covering the plane with Solarfilm. Use black Aerogloss inside the ends of the engine tube and openings on the tail cone. The pattern shows the size and placement for the insignias cut from white Solarfilm, MonoKote, or tape. Put the skid along the bottom.

(9) Take your pictures now and show it off before adding the screws, switches, and engine. Make them guess how it flies!

CONTROL SYSTEMS

Two-Channel "Rollavators"

(1) An extremely simple two-servo digital system built both for the V-1 and forthcoming Baka Bomb, it also fits well into conventional systems. Both servos are attached with servo tape and strapping tape to a 1/8" plywood strip. The MRC equipment used in the original worked as shown:



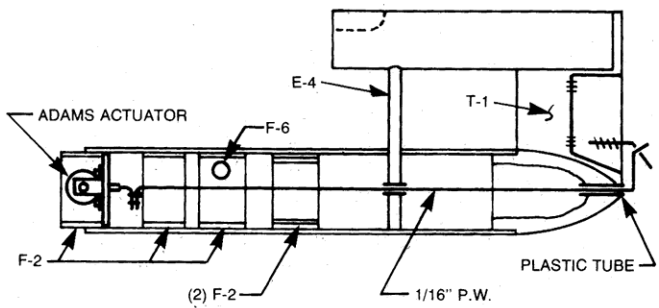
(2) The plywood strip overhangs 1/2" on each end for screwing to the body as close to the wing spar in the forward fuselage as possible.

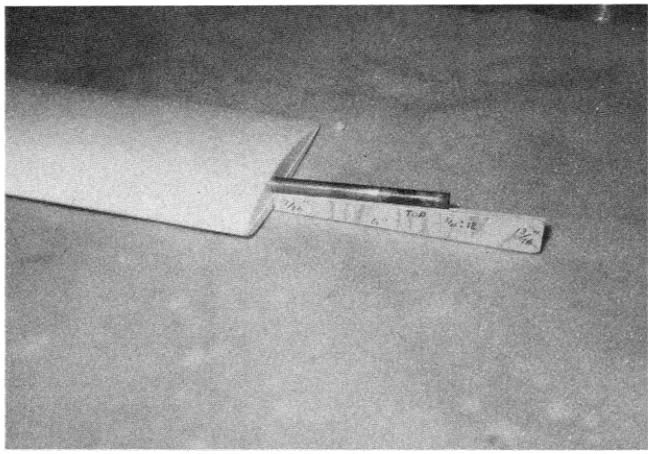
(3) The receiver, batteries and switch are located in the warhead. It is held on with three screws into the three blocks F-5. Slip the lower tail cone in place and secure with a small screw at the point.

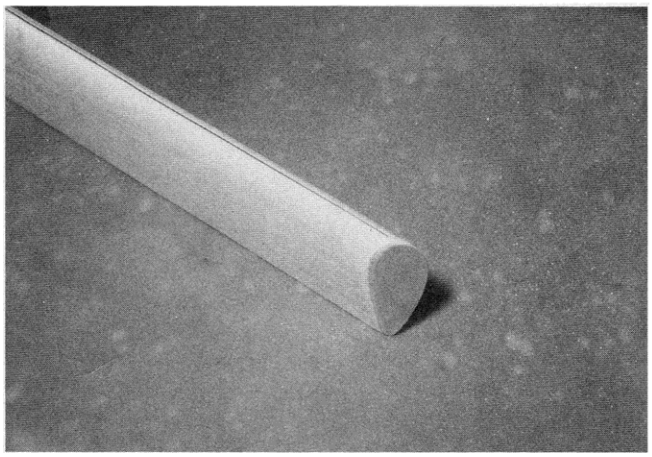
(4) Any of the mechanical mixer devices that have been illustrated in this publication can be used if you can fit them in. Then people won't wonder why you're flying your transmitter at a tilt!

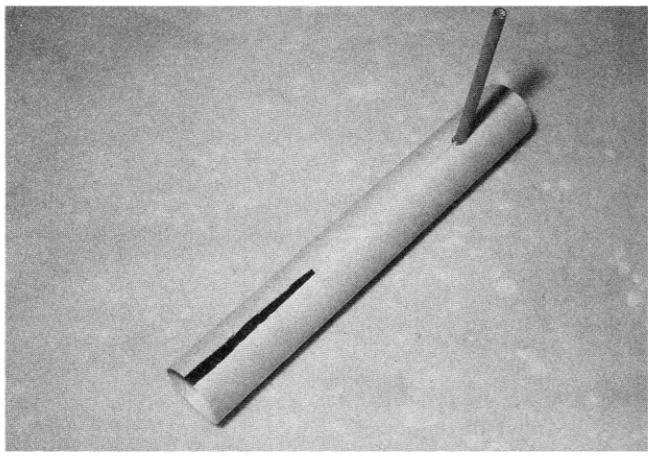
Pulse Rudder

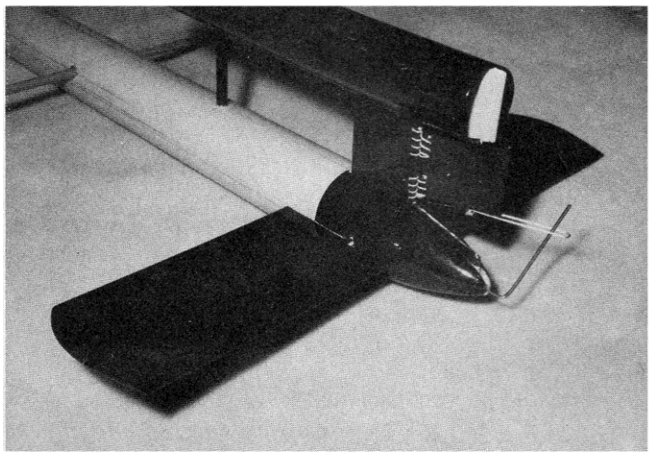
(1) Locate the actuator close to the front end of the fuselage. Cut and hinge the vertical fin with the control hook-up as shown, or as you please.

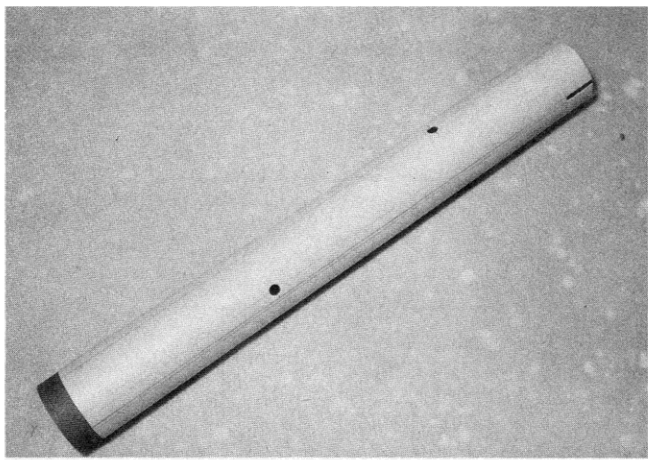


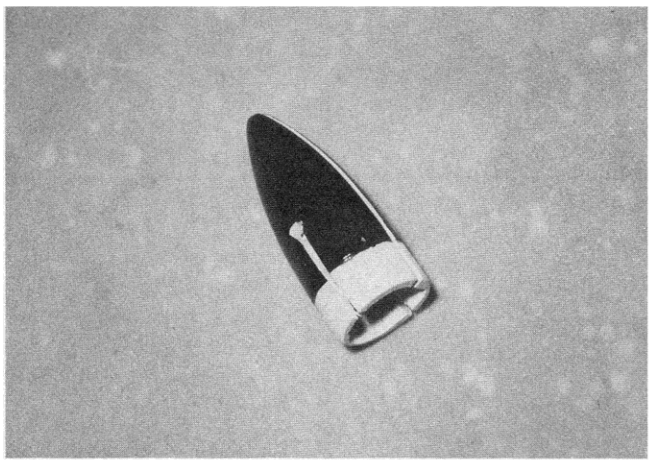


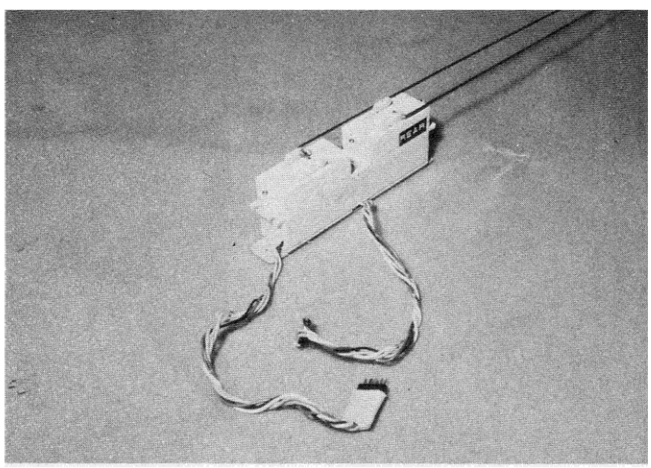












TOP ROW, LEFT: Photo of the wing root and brass coring tube. Core spar hole with jig as shown.
RIGHT: Close-up view of wing tip and music wire leading edge.
SECOND ROW, LEFT: Bottom view of E-1 engine tube. RIGHT: View of body tube with engine tube and empennage. Ace pulse proportional used in this prototype.
THIRD ROW, LEFT: Completed F-1 body tube (front and left).
RIGHT: Completed F-3 tail cone.
LEFT: Assembled twin servos with pushrods for two channel digital system.

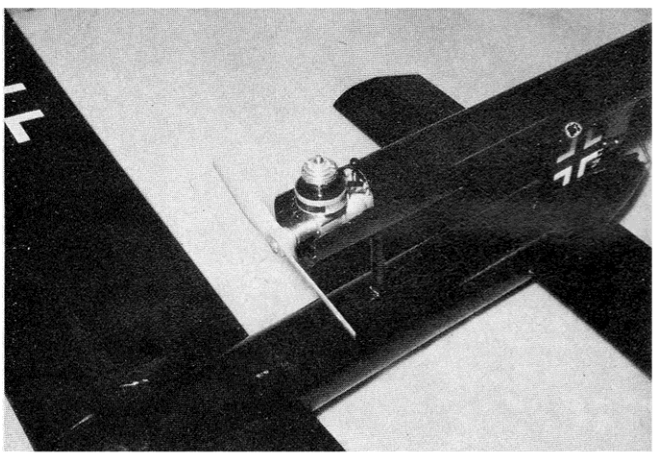
FLIGHT

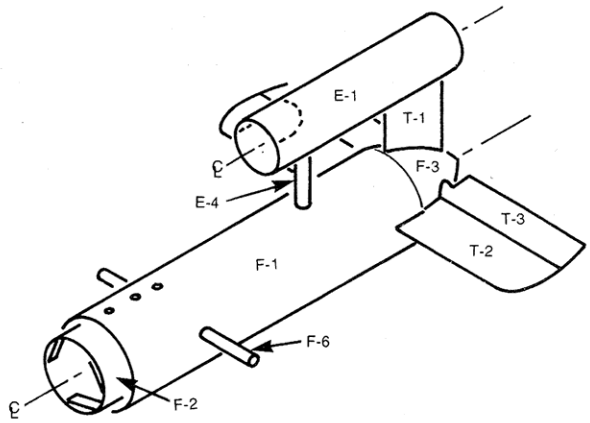
(1) The balance point should be 1⅝'' back from the wing leading edge.

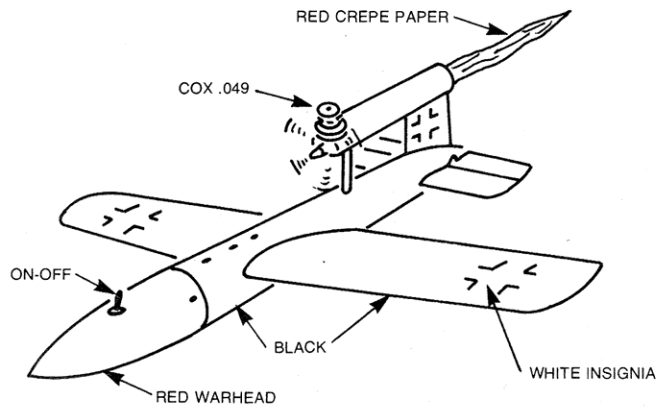
(2) With this new control system, it is advisable to find a hill and become familiar with the tilted transmitter by gliding. Throw hard and level — it will fly fast and flat. Trim and re-balance as needed. You will note more pitch action than roll response in gliding, but with power both will be equal and good. The original glides equally well with or without the engine, and there is almost no trim change either way.

(3) I prefer the Cox QZ .049 because it is quiet and keeps dirt out better. The starter spring doesn't fit in the tube, so cut it off; some is needed as a spacer between the muffler and crankcase. Run it full bore!

(4) Start the engine; turn on the switches; throw as in the glide test; and away it scoots. The nose will rise slightly as speed increases and starts it climbing. If you don't have enough power, belly it on the grass, now! Remember, this is roll and pitch combination for turns. Keep the nose down for a fast descent when the engine quits to give better roll control. Set the approach and it will come in ''hands-off''. Yes, you get maximum scale points for warhead first landings, because that's how the real one worked, but remember it was good for only one flight! □







The photo at the left shows the Cox QZ .049 engine installed on the nacelle mount. Starter spring has been removed for proper clearance. Shown in the sketch below are the sizes and placement of the German insignia.