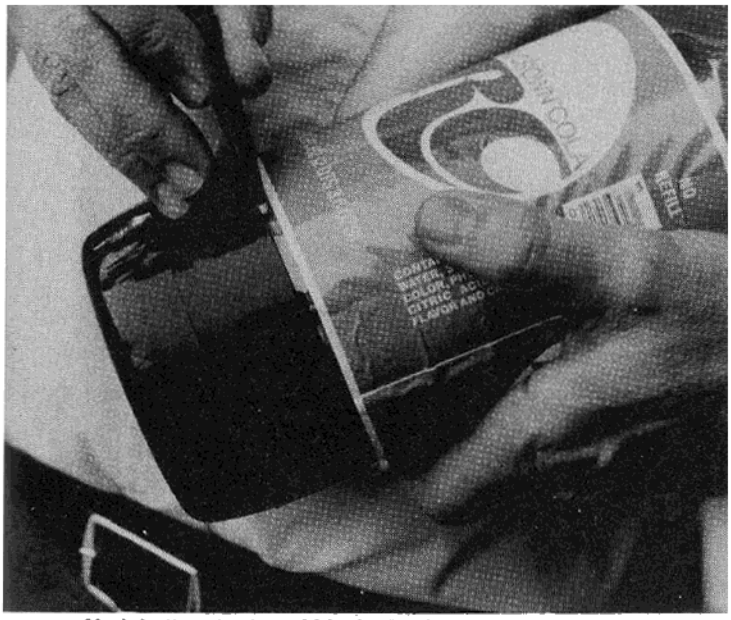
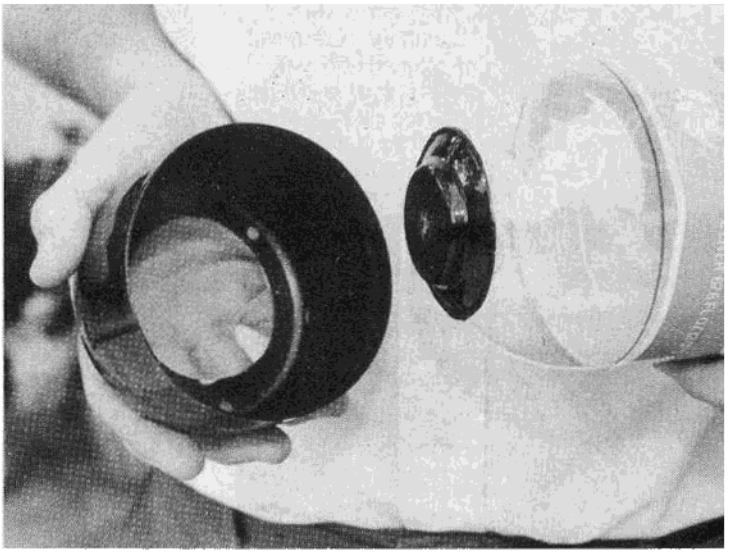
PARA-COLA-SOL

When you finish with your soft drink, try this project. It can be great fun with the attention it causes along with the gentle flying characteristics.
By Robert James Knox

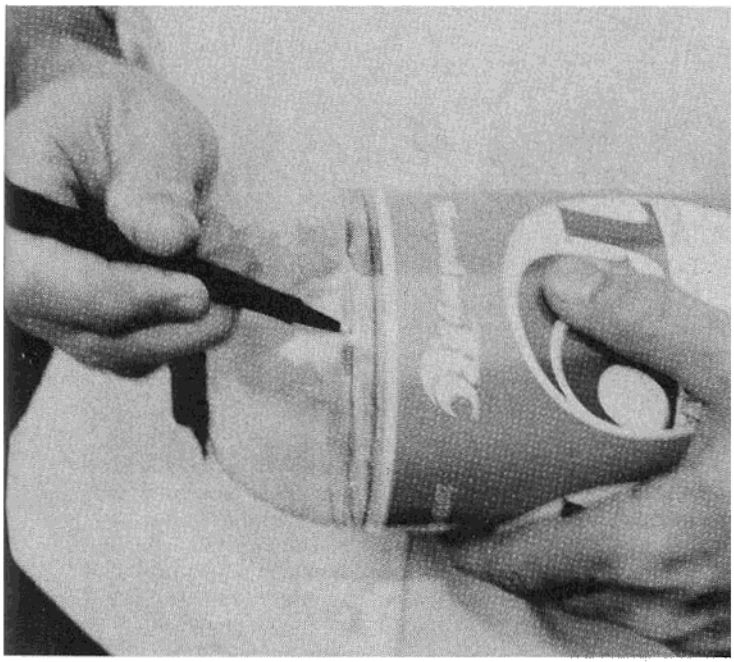
The idea for this R/C project was born a couple of years ago when I read an ad for a kit, suggesting the use of the bottom of a 2 liter soft drink bottle as a cowling. I had just acquired a Futaba radio with mini servos and the thought crossed my mind — "Why not use the whole bottle?" The Futaba flight pack looked like it would fit easily and, after all, there once was a pretty good airplane known as the Flying Jug. From that point on, I began to mentally solve the problems involved. It started with spending more than the ordinary amount of time on the soft drink aisle in the grocery store. I am sure many a shopper thought I was being far too picky in my selection of a soft drink as I turned it over carefully, examining it from all angles, finally holding it parallel to the floor at arm's length (to envision profile). What I discovered is that there is more than one type of bottle. Some have a large neck and some small. Some have rounded,



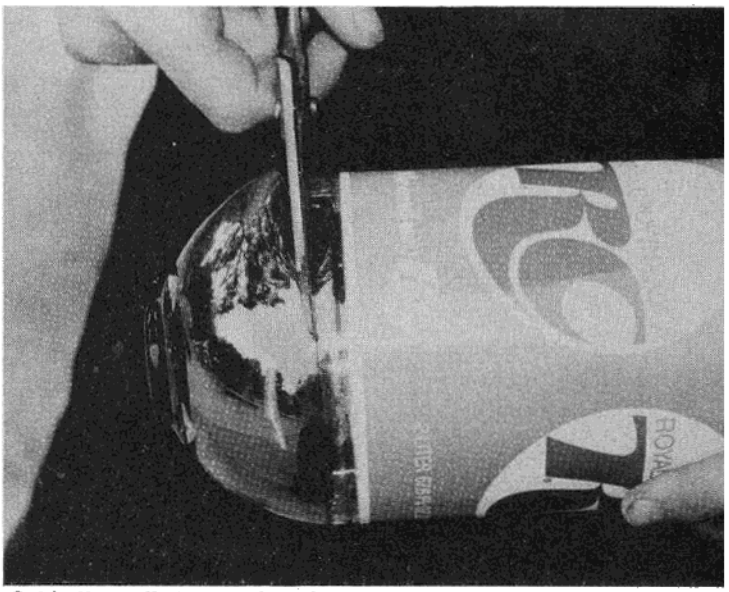
Mark bottle at edge of black plastic bottom.



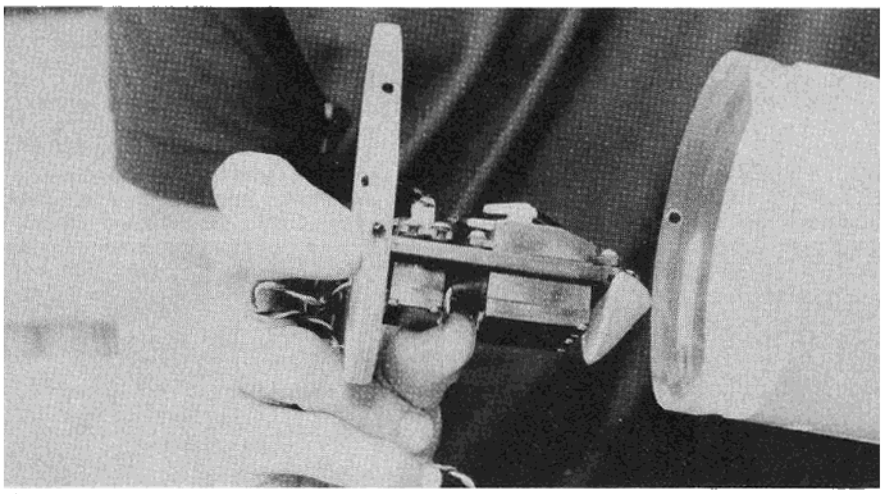
Cut around inset portion of bottom with an X-Acto and the bottom pulls off easily.



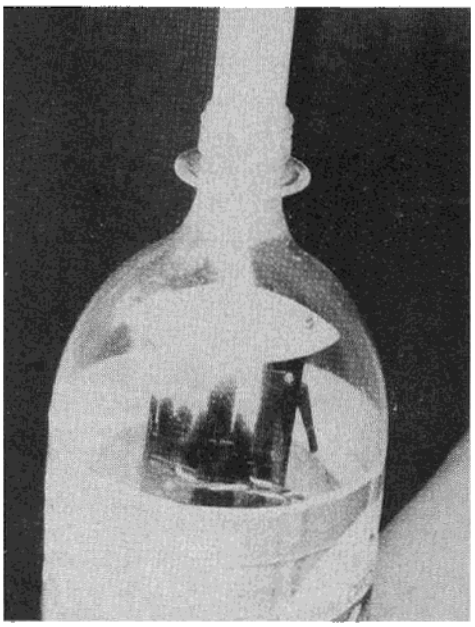
Remark bottle 1/4" lower than first mark.



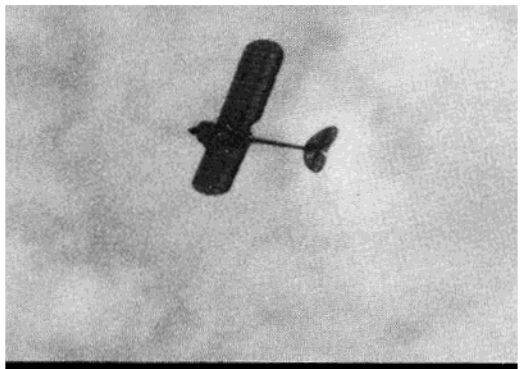
Cut bottom off at second mark.



Servo module being inserted into bottle.



Rear servo mount is screwed to bottle with two wood screws.



PARA-COLA-SOL

Designed By:
R. James Knox

TYPE AIRCRAFT
Unusual Sport

WINGSPAN
47 Inches

WING CHORD
8 Inches

TOTAL WING AREA
345 Sq. In.

WING LOCATION
Parasol

AIRFOIL
Flat Bottom

WING PLANFORM
Constant Chord

DIHEDRAL EACH TIP
1⅜ Inch

O.A. FUSELAGE LENGTH
25 Inches

RADIO COMPARTMENT SIZE
(L) 7½" x (W) 4" x (H) 4"

STABILIZER SPAN
13½ Inches

STABILIZER CHORD (incl. elev.)
4½ Inches (Avg.)

STABILIZER AREA
51 Sq. In.

STAB. AIRFOIL SECTION
Flat

STABILIZER LOCATION
Top of Tail Boom

VERTICAL FIN HEIGHT
4¼ Inches

VERTICAL FIN WIDTH (incl. rud.)
4 Inches (Avg.)

REC. ENGINE SIZE
.10 Cu. In.

FUEL TANK SIZE
4 Oz.

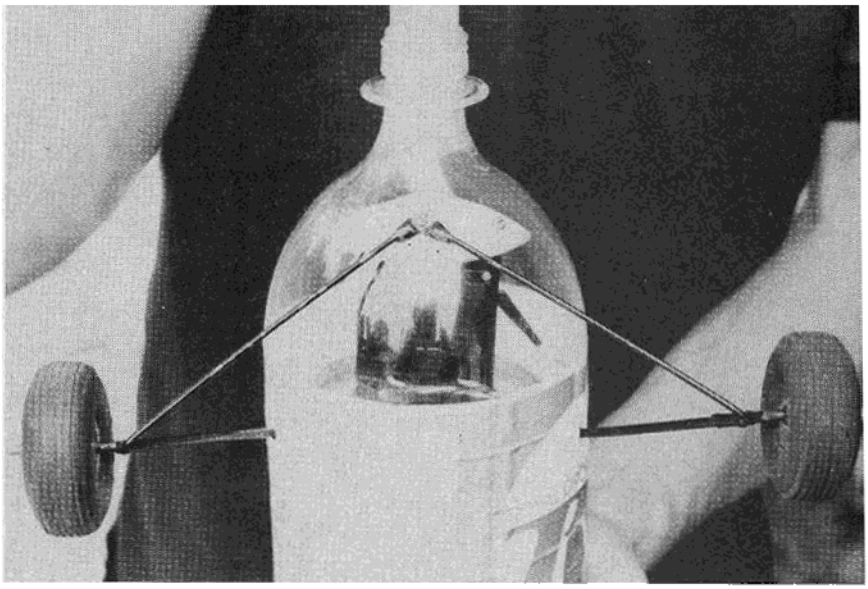
LANDING GEAR
Tricycle

REC. NO. OF CHANNELS
3

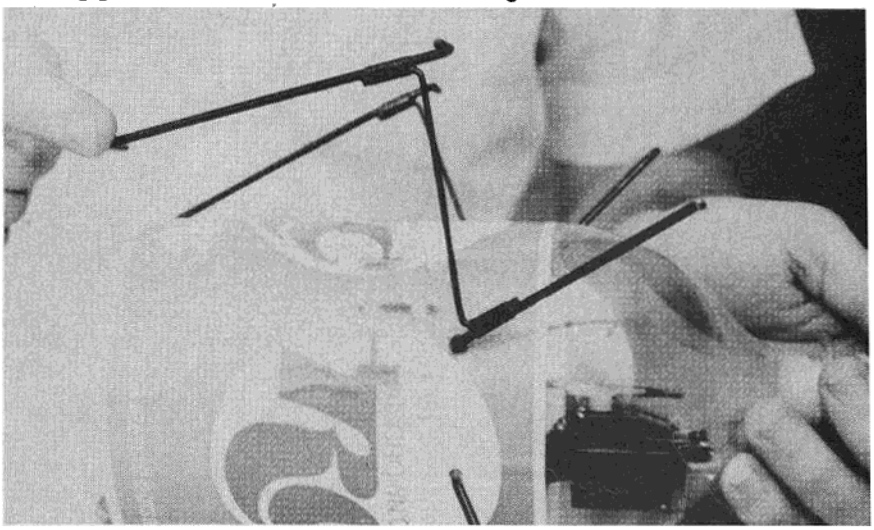
CONTROL FUNCTIONS
Rud., Elev., Throt.

BASIC MATERIALS USED IN CONSTRUCTION

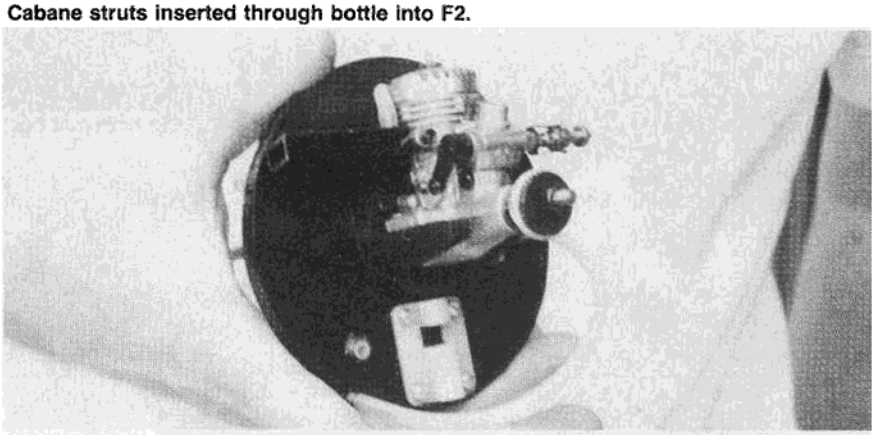
Fuselage ..... Plastic Soft Drink Bottle
Wing ..... Balsa and Ply
Empennage ..... Balsa
Wt. Ready To Fly ..... 34 Oz. (2 Lbs. 2 Oz.)
Wing Loading ..... 14 Oz./Sq. Ft.



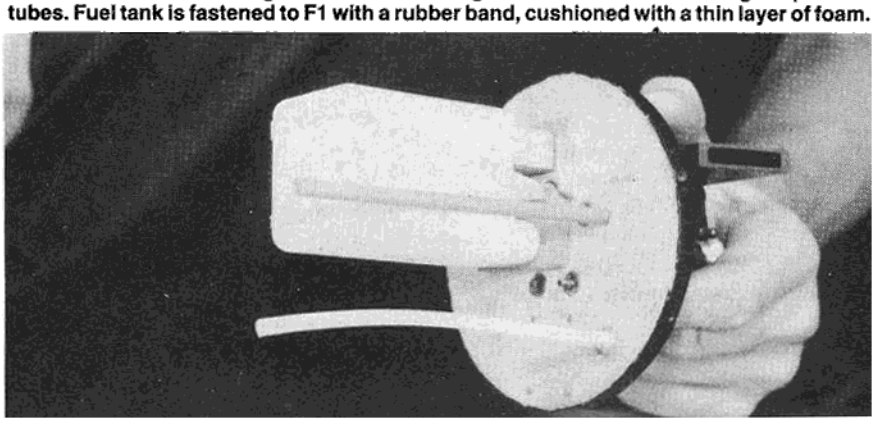
Landing gear inserted into F2 and screwed through bottle to rear servo mount.

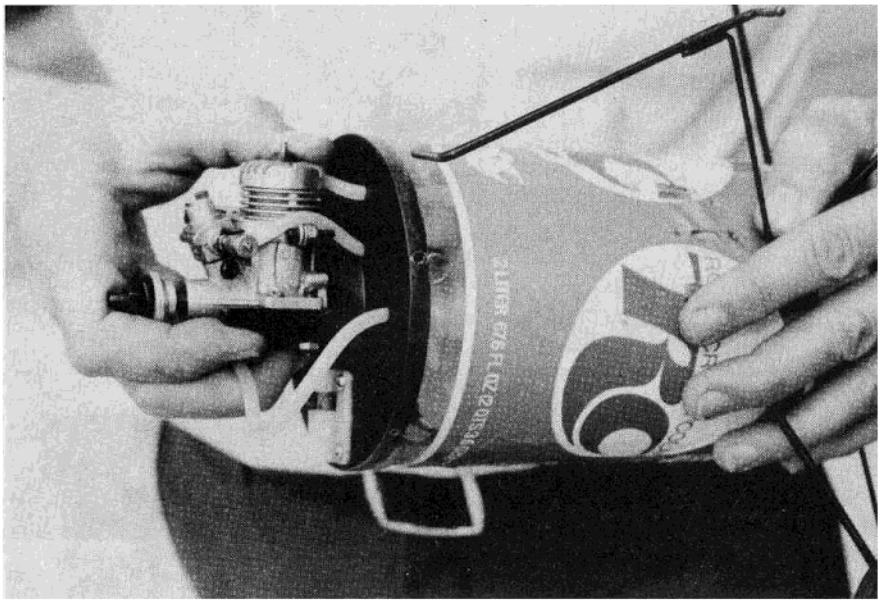


Cabane struts inserted through bottle into F2.



ABOVE: Front view of engine module. Long fuel filler line stores neatly inside cowling
BELOW: Rear view of engine module showing outer throttle and nose gear pushroc tubes. Fuel tank is fastened to F1 with a rubber band, cushioned with a thin layer of foam.





Engine module being inserted into bottle.

almost dome-like tops, while others slope rapidly away from the neck.

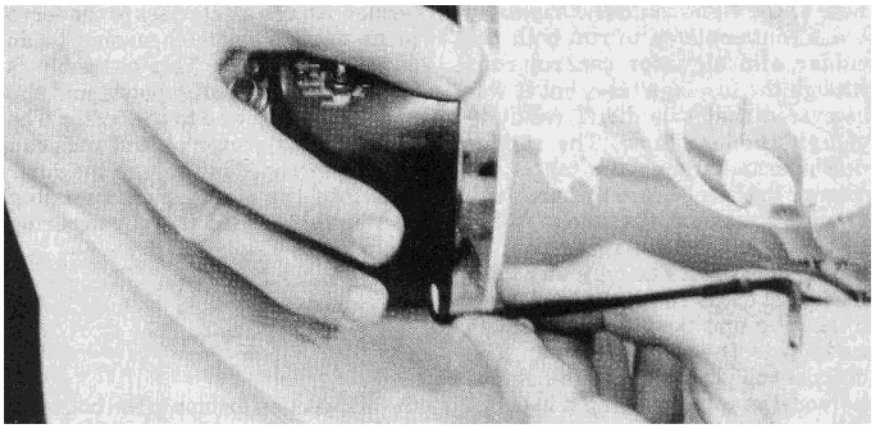
I already had my power picked. I had been wanting an O.S. 10 FSR and this was the perfect excuse. The biggest remaining problem was how to connect the bottle to the tail group. My first thought was the plastic aerator tubes used in aquariums but I couldn't find any long enough. I experimented with the cardboard tubes that music wire is stored in but found them too heavy. I was beginning to think I was going to have to fabricate my own out of fiberglass when I discovered plastic shower rod covers. They were light, came in several colors and, best of all, the diameter was adjustable. I was now ready to start.

CONSTRUCTION

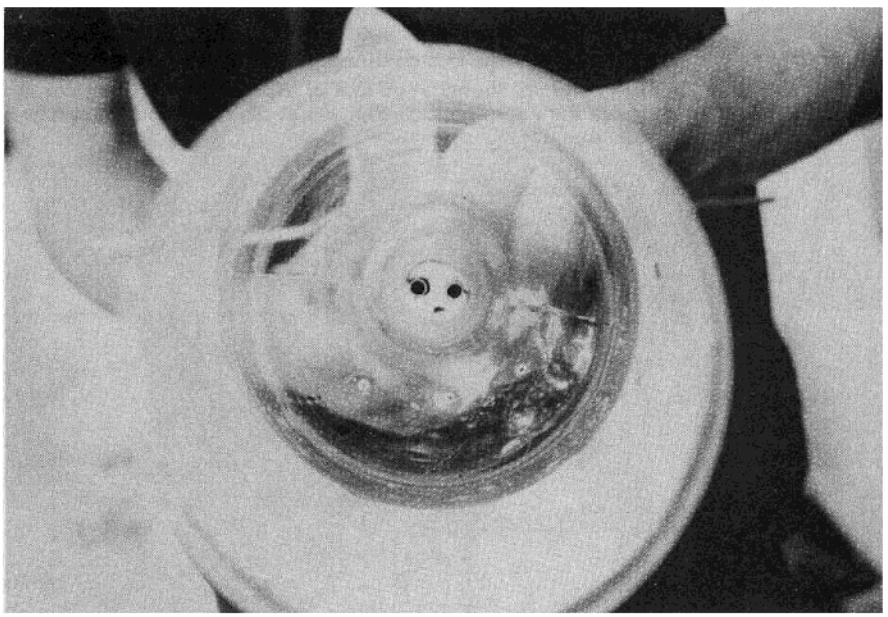
Fuselage:

This is the obvious challenge in this model and little time was spent on the wing or tail group. As a matter of fact, the wing is from a Flyline Fairchild 22 which I was in the process of repairing. The tail group is straight Gypsy Moth because it seemed to fit the model.

The first step is to mark the bottle right where it meets the plastic bottom. The bottom is then removed by cutting around the inset portion with an X-Acto knife. Since this is the only portion of the bottom glued to the bottle, the remainder will fall off in your hand. Set it aside for use later and re-mark the bottle 1/4" lower than the first mark. This is to allow for the 1/4" firewall. The bottom of the bottle is then cut off with an ordinary pair of scissors. The bottle will appear very flimsy at this point but the 1/4" plywood firewall and mid-section former will take care of this. The diameter of these is critical as they must fit snuggly in order to offer proper support. The best practice is to cut them slightly large and sand to fit.



Front cabanes being inserted through cowling and bottle into F1.



Empty bottle showing pushrod tubes. Lower hole is for antenna.

The holes for the cabanes and landing gear wire are predrilled. Once aligned properly inside the bottle, an ordinary ice pick was used to punch through the bottle into these holes. The rear servo tray support offered a special challenge in order to make it conform to the dome shape. This was solved by first cutting the neck off a bottle right where this piece fits. Plaster patching compound was then used to form a plaster dummy of this part. After drying, it was removed and used as a model for shaping one out of spruce with an X-Acto and sandpaper. These wood parts all serve dual purposes. The rear servo support also provides the rear anchorage for the landing gear. In addition to supporting the bottle, the firewall and mid-section former also provide anchorage for the wire cabanes. The mid-section former also serves as a servo rail and the front support for the landing gear.

Note that although the firewall and rear servo supports are fastened to the bottle with screws, the mid-section former is held in place only by the cabanes and landing gear wire which

pass through the bottle into the former. The rear cabanes are secured by wheel collars after they pass through the mid-section former. This was not found necessary on the landing gear.

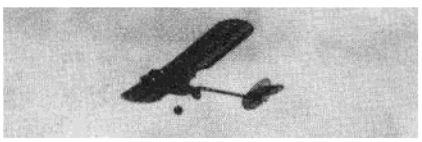
For ease of assembly, the fuel tank is fastened to the back of the firewall by rubber bands. This makes a nice "module" which slides into the bottle after the flight pack is installed. After roughing up the contact surfaces on the plastic shower rod, it is epoxied and then held to the right diameter by slipping a number of bottle necks over it. (An amazing number of soft drink bottles are accumulated in building one of these.) A judicious use of alcohol will insure getting them off.

Two triangular blocks epoxied to the shower rod cover provide a platform for the tail group. A piece of sandpaper wrapped around the fuselage rod works great in shaping these to the right contour. Originally it was contemplated to run both the rudder and elevator control rods through the fuselage tube, but it was discovered that this didn't result in enough rudder throw. The rudder control exits through the top of the elevator in order to cure this problem. A plug of styrofoam was used to stiffen the control rods at about mid point of the fuselage tube. The only way to do this is first epoxy the control rod tubes to the plug and then slide the entire works into the fuselage tube. The fuselage tube can be used to balance the model simply by sliding it in or out of the neck of the bottle until the right balance point is reached. It is then epoxied in place.

The stock muffler would not clear the fuselage so a Du-Bro was substituted and fits perfectly.

Assembly:

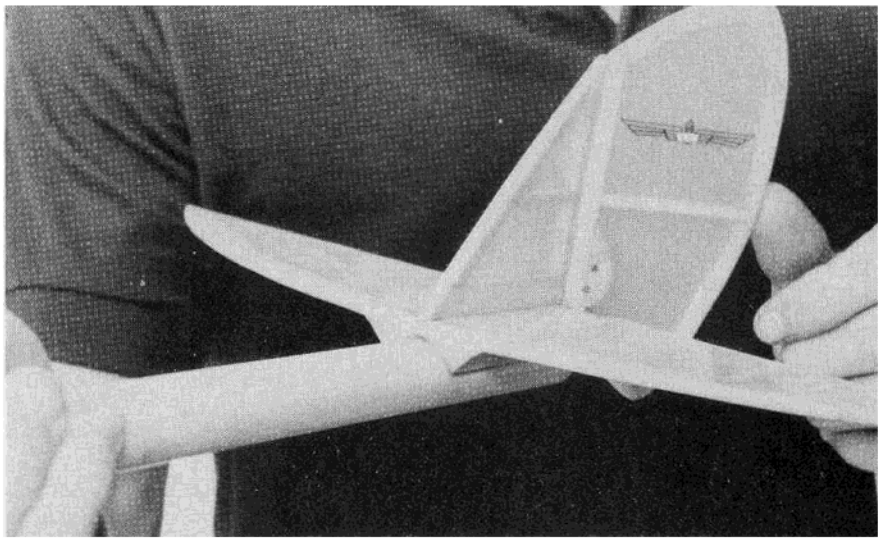
There is a certain procedure for assemblying the model which must be followed. The servo tray is fastened to the rear mount and the mid-section former. Attach all clevises to the servo arms as this is much easier to do outside the bottle. This assembly is then inserted into the bottle and the rear mount screwed to the bottle. The rudder and elevator control rods can then be threaded in through the outer rods into the clevises. The landing gear is then added thereby securing



the mid-section former to the bottle on the bottom. The mid-section former is then completely secured by inserting the rear cabanes and attaching the wheel collars. The throttle control rod and nose gear cable are then screwed into the clevises previously attached to the servo arms. Note that the outer rods are permanently attached to the firewall module. The receiver and battery pack are connected and positioned and the throttle and nose gear rods threaded into the outer rods. The entire firewall module is then worked into the bottle and the black plastic bottom (cowling) is added. The front cabanes can then be inserted passing through first the cowling, then the plastic bottle and finally into the firewall.

The firewall is then further secured with small wood screws. The nose gear and throttle can then be attached and finally the wing. Landing gear blocks are used for wing attachment. Complicated as it sounds, a dead battery pack was replaced at the field in fifteen minutes. The key is not to get in a hurry and remember you have to do Step A before you do Step B.

The plane weighs in at 2 lbs. 2 oz. with a 400 mA battery pack and displays no unusual flying characteristics. If you want to try something a little different, you should find this an interesting R/C challenge. □



Mounting of tail group on fuselage tube.

Elevator pushrod exiting fuselage tube. Note that platform is notched to allow for full throw.

Bill Hereford, former President of the Sarasota R/C Squadron, holds the Para-Cola-Sol. Bill was at the controls for the flight shots.

From RCModeler Apr. 1986