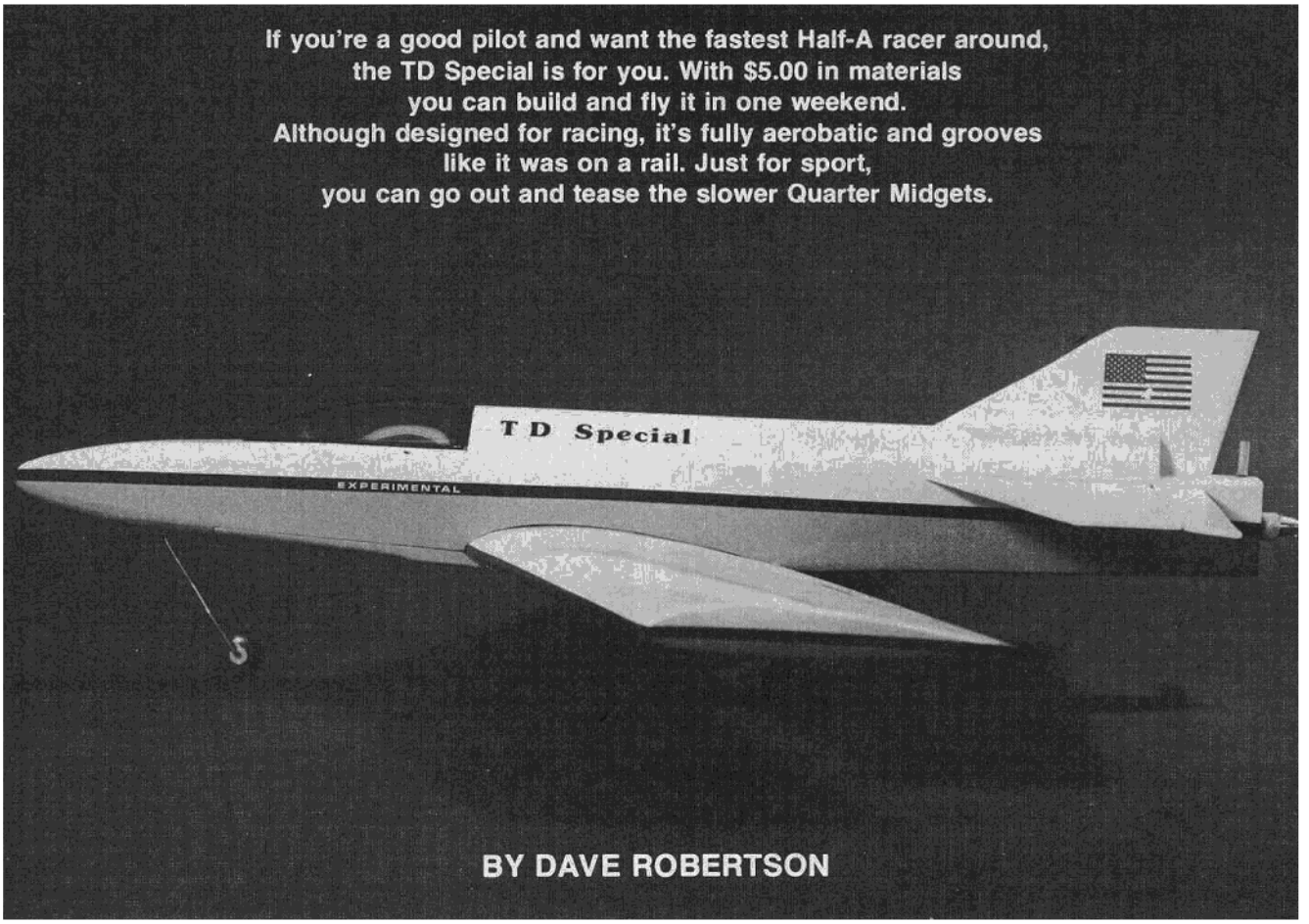
If you're a good pilot and want the fastest Half-A racer around, the TD Special is for you. With $5.00 in materials you can build and fly it in one weekend. Although designed for racing, it's fully aerobatic and grooves like it was on a rail. Just for sport, you can go out and tease the slower Quarter Midgets.



BY DAVE ROBERTSON

Several months ago a fellow flying buddy of mine talked me into building a 1/2A kit for an upcoming race out at the Sepulveda Basin. I built the kit and flew it but, for a racer, it just didn't seem to have the speed I thought a Cox .049 should be able to deliver. Having a wild imagination and being willing to try anything once, I started asking some basic questions and did some thinking about what could be done to produce something that would meet the basic standards for the 1/2A class, yet be as drag free, get the most penetration, and be as fast as possible using a stock engine and convenient building materials.

I talked to Kent Thomas, another fellow flyer, who has been flying a swept wing design of his own for several years. His planes are fast for a sport type model and penetrate extremely well. Kent said he uses a 20 degree sweep back, so I asked if 30 degrees would be too much. He didn't know, and I didn't either, but 30 degrees is what I decided on. As it turned out, it isn't too much.

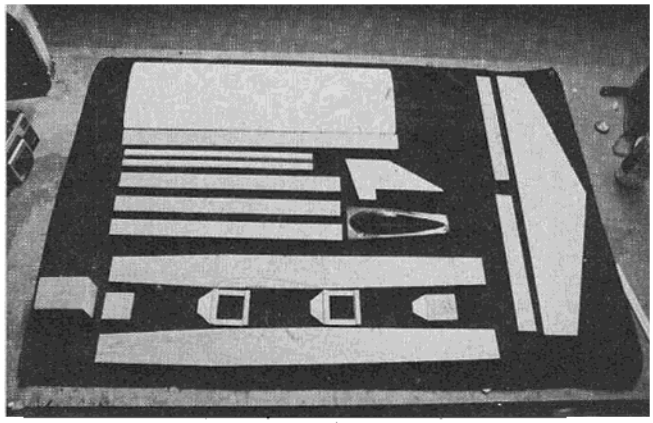
Driving home on the south bound Santa Ana freeway at five in the afternoon, gives you lots of time to think, and on a particular Friday I was stuck in that jam going nowhere. Still trying to come up with some good design, I began thinking about the basic points suggested earlier. Drag: Control surfaces create drag; prop blast over the fuselage has **got** to create alot of drag; the swept wing will increase penetration, thereby less drag. A pusher type aircraft has **got** to produce more thrust because there is nothing in the way of the prop blast. All these things were racing through my mind when I finally pulled into my driveway. I pulled out a piece of shelf paper and started drawing some lines, using basic dimensions from other 1/2A planes I have flown and came up with a basic design. That same evening I started construction and Sunday afternoon I took this new creature out to the flying field. Building time — two days. Cost — about $5.00, less engine and radio which I already had on hand.

I would rather not comment on the first flight! If you have ever flown a tail heavy airplane with too much throw in the control surfaces, you will know why! Every afternoon I went back out to the field after making one adjustment or another. On Wednesday afternoon I fired it up, checked the controls, headed the plane into the wind and let go. The nose wheel lifted off the ground, the main gear lifted off, and I had my hands on 23 ounces of dynamite! The speed was there — the roll rate was slow but positive, and the elevator effective but not overly sensitive.

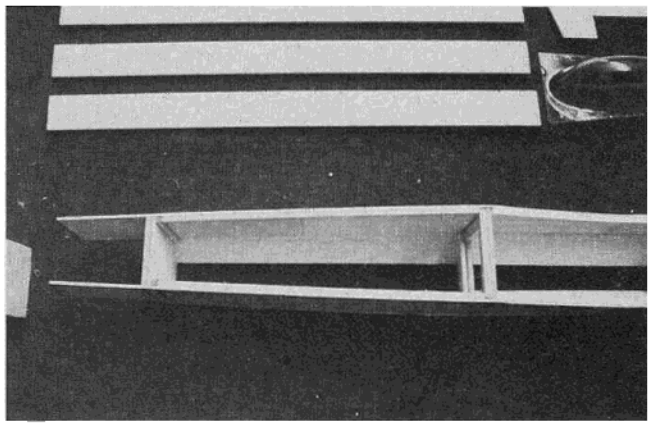
On the second flight that afternoon I tried loops and rolls and all that fun stuff you do on weekends with an airplane. With the T.D. Special, loops are instantaneous, climbing speed the best of any ship in its class I have flown, inverted flight good with some down elevator, even outside loops are possible with enough airspace. The one maneuver that was slow was the roll — very slow. For racing, which is what this plane is all about anyway, the roll is plenty as you will see when you turn this plane into pylon #1.

The construction of the T.D. Special is basic and very much like many kits currently on the market. Attention must be paid to the wing hold-down, as it is unique. The design is sound, and adding wood that isn't on the plan may make the model stronger, but it will also make it heavier. To keep it fast is to keep it light.

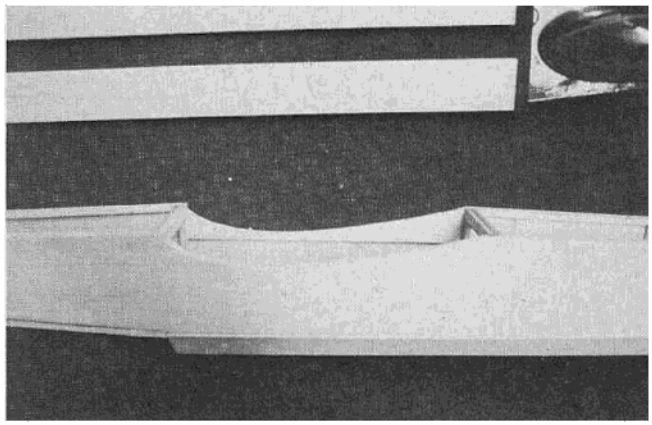
TD SPECIAL



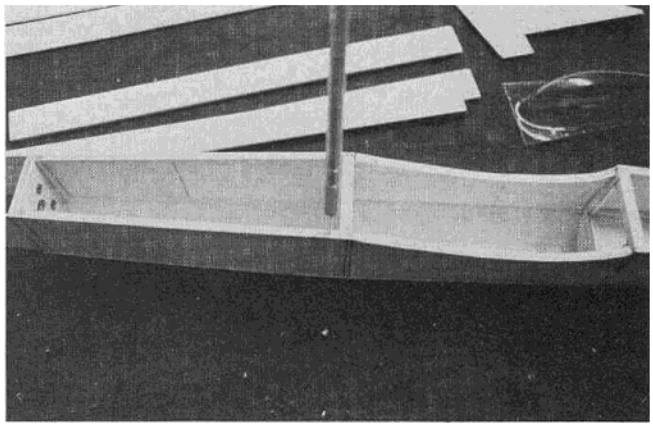
All wood parts for the TD Special are cut out first.



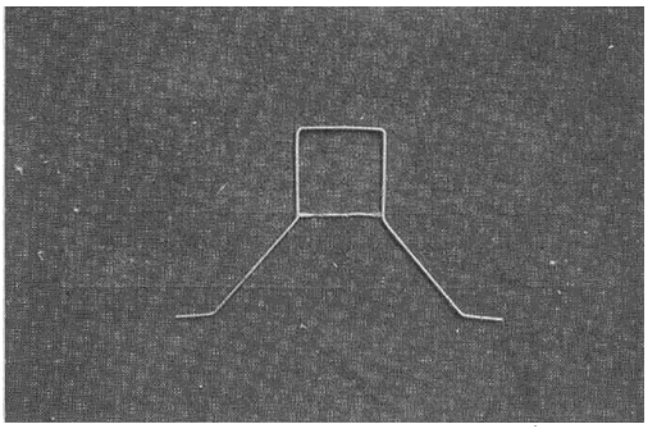
Fuselage sides being joined by the bulkheads.



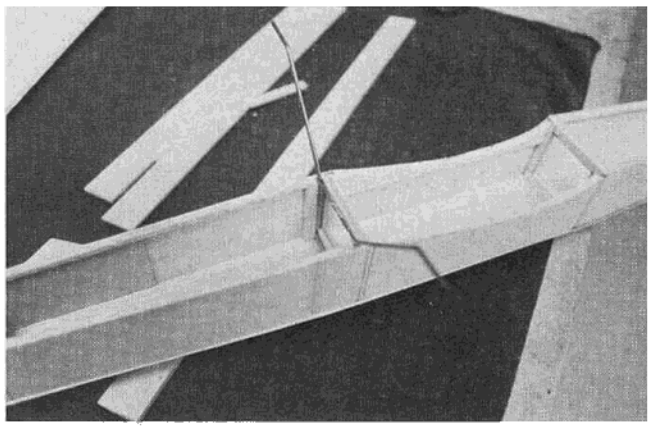
Wing saddle doublers in place. Accuracy important here.



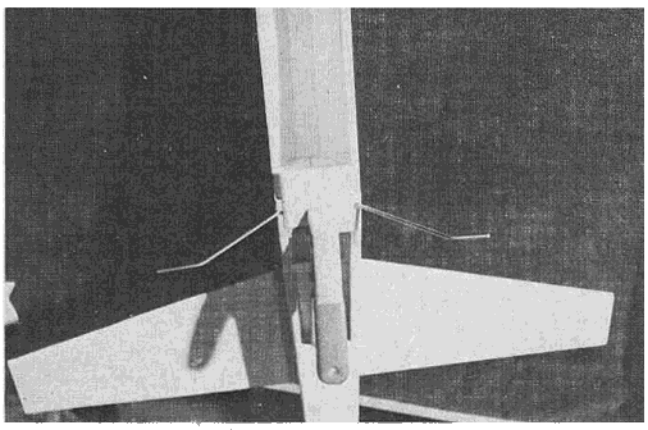
Notching the sides for main landing gear clearance.



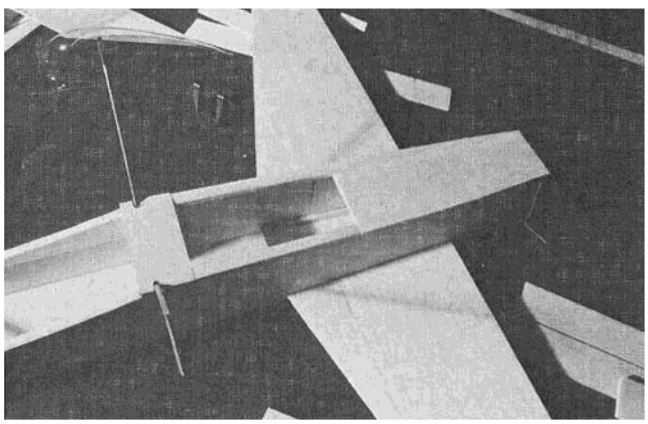
The formed wire main gear held in tension.



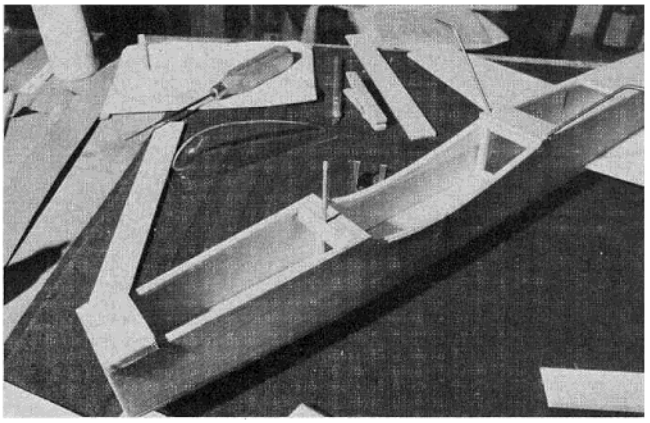
The main gear installed between fuselage braces.



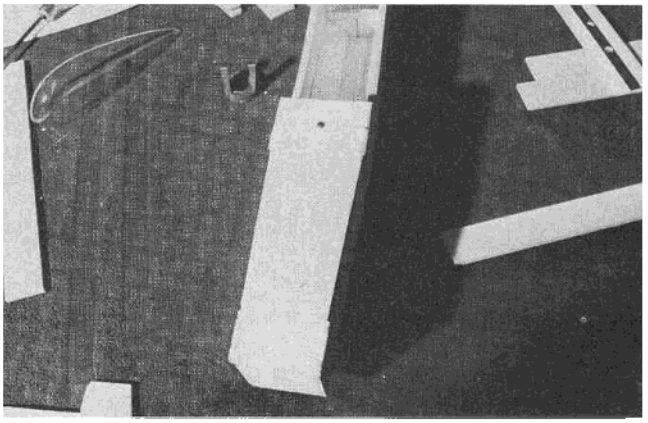
A clamp used to hold ply gear cover in place.



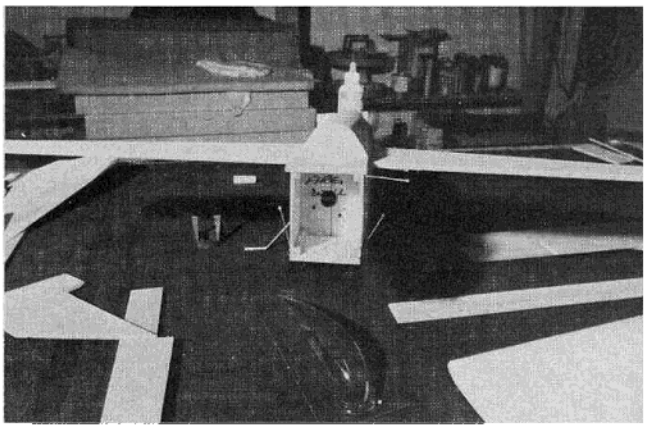
Fuselage with sheeting in place. Mixer installs in open area.



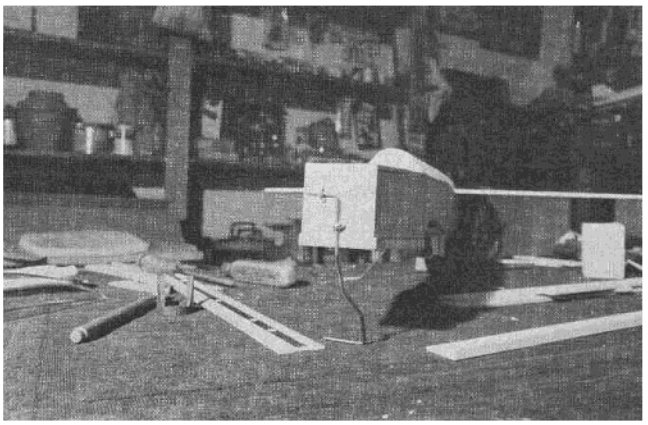
A center punch is used to locate bolt for ply wing plate.



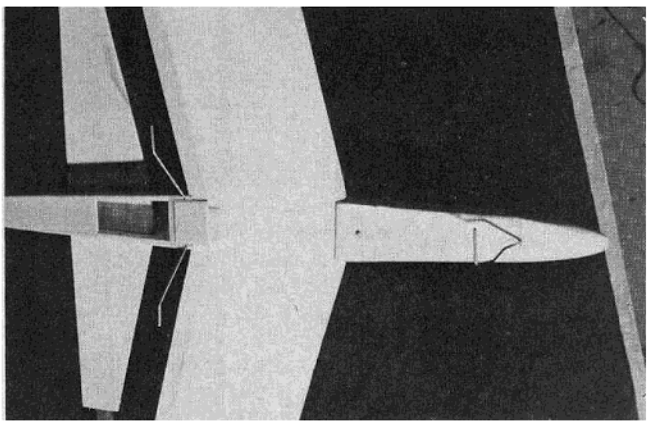
Plywood wing hold-down installed on fuselage.



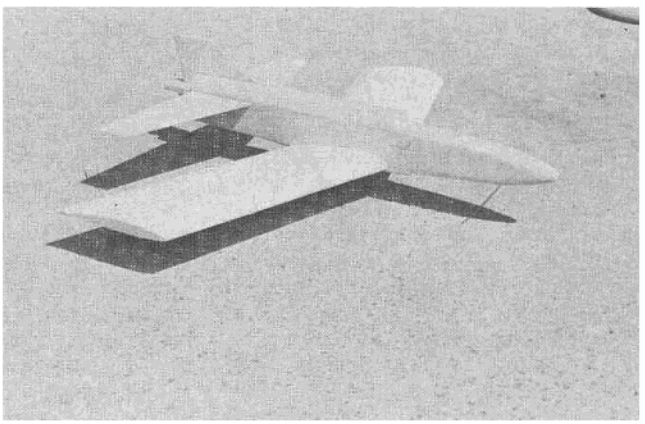
View of firewall. Note hole for fuel lines.



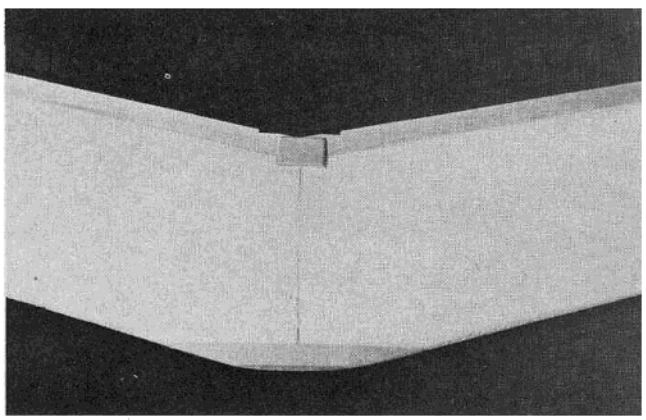
Nosegear installed with J-bolts.



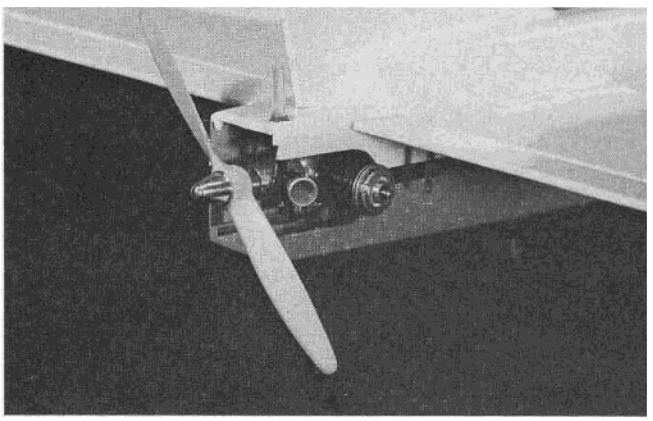
Bottom view of completed aircraft, prior to covering.



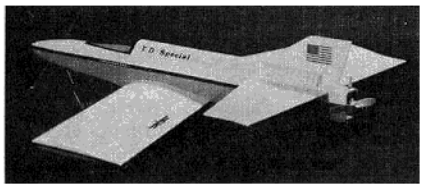
Overall view of TD Special prior to covering.



View of Ace foam wing with balsa T.E. and L.E. Note sweep.



Cox T.D. .051 installed in rear of aircraft.



TD SPECIAL

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T.D. SPECIAL

Designed By: Dave Robertson

TYPE AIRCRAFT
1/2A Pylon
WINGSPAN
32½ Inches
WING CHORD
6 Inches
TOTAL WING AREA
200 Square Inches
WING LOCATION
Low Wing
AIRFOIL
Semi-Symmetrical
WING PLANFORM
Constant Chord (15° sw. back)
O.A. FUSELAGE LENGTH
24½ Inches
RADIO COMPARTMENT AREA
(L) 11" X (W) 1¾" X (H) 2"
STABILIZER SPAN
19 Inches
STABILIZER CHORD (incl. elev.)
4½ Inches (Avg.)
STABILIZER AREA
74 Square Inches
STAB AIRFOIL SECTION
Flat
STABILIZER LOCATION
Mid-Fuselage
VERTICAL FIN HEIGHT
2¼ Inches
VERTICAL FIN WIDTH
4" (Avg.)
REC. ENGINE SIZE
Cox T.D. .049-.051
FUEL TANK SIZE
1-2 Ounce
LANDING GEAR
Tricycle
REC. NO. OF CHANNELS
Two
CONTROL FUNCTIONS
Elevons (Elevator and Ailerons)

BASIC MATERIALS USED IN CONSTRUCTION

Fuselage ..... Balsa and Ply
Wing ..... Balsa, Foam
Empennage ..... Balsa
Weight Ready-To-Fly ..... 22-25 Oz.
Wing Loading ..... 15.9-18.1 Oz./Sq. Ft.

Start construction by gluing the formers and the firewall to the 1/16" balsa sides. Add decking formers C1, C2, C3. Glue all 1/8" square stringers in place and cut out the slot for the stabilizer. Put the doublers in the wing well and in front of the firewall. Add the top decking and sheet forward and aft. Make and install the nose and main gear. Pay close attention to the main gear detail as it will keep you from tearing up your plane on those hard landings. Install 1/4" x 3/8" maple for the hatch cover supports. Make the hatch cover and sheet the bottom of the fuselage, leaving an open space to slip in a gas tank and to get to the mixer. This opening can be covered with plastic covering for a race to reduce drag. Add the nose block and sand the entire fuselage to shape. Insert the stabilizer and glue on the fin.

The wing is simple. Follow the directions that come with the Ace foam cores for adding the trailing edge. Make 15 degree cuts as shown on the plan on each wing panel. Be sure to make a right and a left side. Epoxy the panels together with the bottom sides down and with the trailing edge flat on the table. Epoxy the 1/16" ply pressure plate as shown on the bottom trailing edge.

Sand the entire wing with fine sandpaper and add the balsa leading edge wedge. Put three strips of 1/2" strapping tape on the bottom and two strips on the top to keep the wing from flexing.

Cover the entire model with Solarfilm, or other low heat shrink covering. Resin the engine area to fuel-proof the balsa.

Cut the front off a 6" Sig canopy and shape to fit the long rear portion. Use Hot Stuff or Zap to hold the canopy in place, then add a good quality pinstriping tape to finish it off.

If the tank is installed as shown on the plan, a clunk cannot be used. The fuel pickup tube goes into the tank and straight down. The vent tube goes into the tank and straight up. If the tank is turned around with the front of the tank facing the front of the model, a conventional clunk fuel pickup can be used.

The original model was done in orange and white with a dark blue stripe separating the two colors. Orange seems to be the best color to use for visibility. This is a small plane and you don't want to lose it because you can't see it!

Now that you have the construction finished, go out and tease the slower Quarter Midgets as I have had occasion to do.

I wish to recognize Kent Thomas and Ken Holden for helping me with some of the ideas for this plane, and Paul Strengell, without whose help this article would not have been possible. □

From RCModeler Jan. 1976