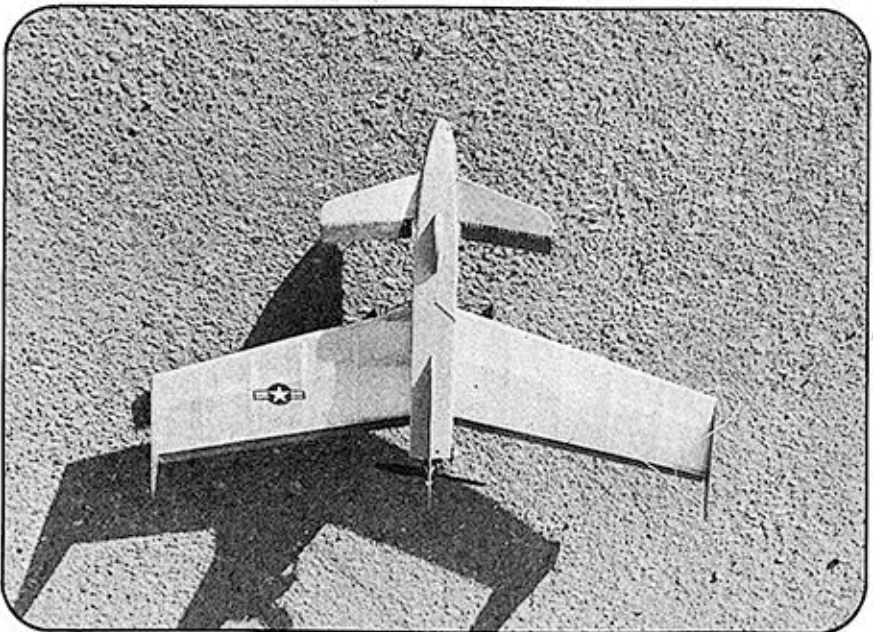
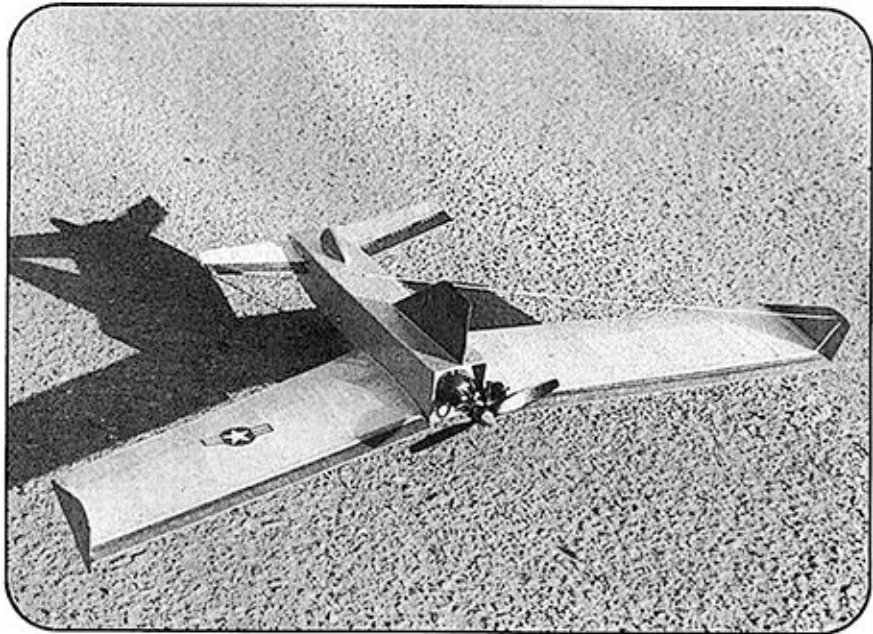
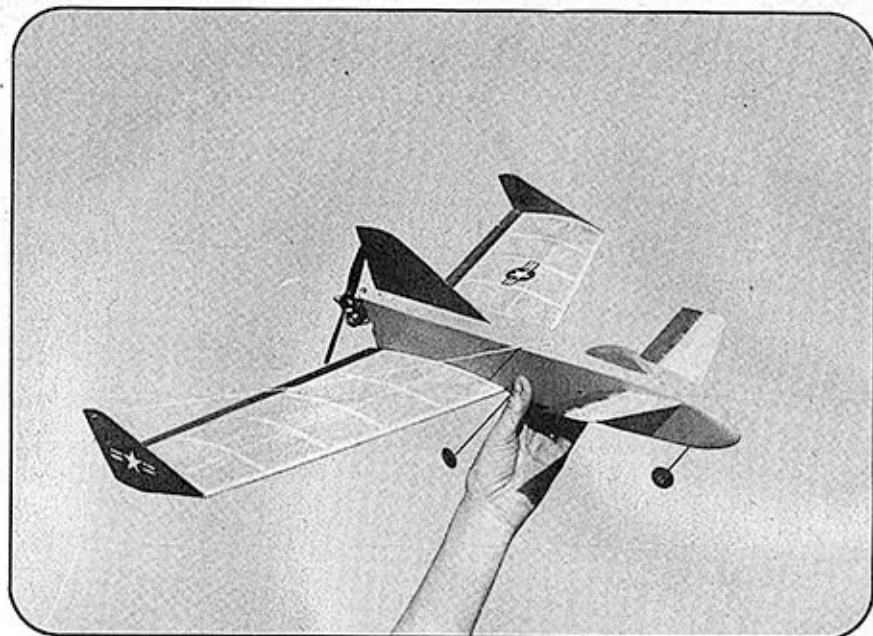


THE GREAT ALL AMERICAN BACKYARD CANARD

BY RANDY WRISLEY

THIS SMALL FIELD .020 POWERED, 2 CHANNEL CANARD CAN BE A COMPLETE CHANGE OF PACE FOR THE RC'ER. TRY IT AND WE THINK YOU'LL LIKE IT.



The Great All American Backyard Canard is just what its name implies, a good flying, small field canard. The planform has many advantages. First, it's almost impossible to stall. That means it won't spin either. Second, the Center of Gravity location makes balancing the model easier. The short, fat fuselage gives the builder leeway in radio installation. Third, the entire fuselage forward of the wing is expendable. The impact is absorbed by something other than the engine, firewall, and radio. Fourth, this means if you do crash, being a small model, the cost of repair is low. However, you must manufacture a few fittings you might buy ready-made for a larger model. As this article is intended for builders with some experience, it shouldn't be a problem. Fifth, though stable, the G.A.A.B.Y.C. is aerobatic enough to keep the flyer's interest up. Though it won't soar for hours dead stick, it glides better than some small models I've seen.

If you're looking for something to put your super-mini radio in, that's just a little off-beat, why not try going backwards? You might just like it!

PRE-CONSTRUCTION NOTES

In order to utilize the Cox T.D. .020 as a pusher, you must modify it slightly. Pull off the tank backplate and trim away the fuel pick-up tube inside. You must also use a left hand, or pusher, prop. Cox makes a 4.5d 2"p prop. If you can't find one locally, order from Cox direct.

When building, select the lightest lumber you can find. My lightest model weighed 6.75 oz. ready to fly.

The plans call for 1/20" sheet. If you can't find any, sand 1/16" down some before building. I used tissue for covering and recommend it --- it goes around small curves better for me. Use Sig Lite coat dope and 2 coats will fill the tissue. A built-in retarder prevents warps. Finally, take care to align the structure during assembly --- the straighter it is, the better it flies.

Wing:

Building the wing is a simple affair. First, Hot Stuff a piece of 1/16" square balsa down the center of the leading and trailing edges. Lay the L.E., T.E., and spar, down on the plan. With a razor saw, cut all three to the proper sweep back angle, and epoxy. While these cure, cut out the 1/16" plywood sweep back braces. Attach them to the L.E. and the spar. When dry, block the L.E. and T.E. up 1/8" over the plan. The spar is pinned in position flat on the board. Cut the 1/16" x 3/16" top capstrips to approximate size. With the blade removed from an X-Acto knife, roll it over one side of each strip until a curve results. Trim the front of the capstrip to fit. Hot Stuff it into position. Now bend, don't break, the strip over the spar and Hot Stuff it to the trailing edge. Ideally, the strip should rest on the 1/16" center

GREAT ALL AMERICAN BACKYARD CANARD

Designed By: Randy Wisley

TYPE AIRCRAFT

Small Field Canard

WINGSPAN

21.75 Inches

WING CHORD

4.8" (Avg.)

TOTAL WING AREA

105.4 Square Inches

WING LOCATION

Bottom Aft Fuselage

AIRFOIL

Symmetrical

WING PLANFORM

Swept Tapered

DIHEDRAL, EACH TIP

.75" (Nose Wing)

O.A. FUSELAGE LENGTH

14 Inches

RADIO COMPARTMENT AREA

(L) 7" X (W) 1.5" X (H) 2"

NOSE WING SPAN

8 Inches

NOSE WING CHORD

1.96" (Avg.)

NOSE WING AREA

15.7 sq. in.

NOSE WING AIRFOIL SECTION

Flat

NOSE WING LOCATION

Front of Fuselage

VERTICAL FIN HEIGHT

2.5 Inches

VERTICAL FIN WIDTH (Avg.)

2.5"

REC. ENGINE SIZE

Cox T.D. .020

FUEL TANK SIZE

Std. Tank Mount

LANDING GEAR

Tricycle

REC. NO. OF CHANNELS

2

CONTROL FUNCTIONS

Elevator & Ailerons

BASIC MATERIALS USED IN CONSTRUCTION

Fuselage Balsa, & Ply

Wing Balsa & Ply

Empennage Balsa

Wt. Ready-To-Fly 7 Oz.

Wing Loading 3.02 Oz/Sq. Ft.

G.A.A.B.Y.C. BILL OF MATERIALS

Fuselage:

(1) 1/20" x 3" x 36" - sides, top, bottom.

(1) 1/16" x 1 1/2" x 12" ply - formers.

(1) 1/8" x 5/16" x 2" spruce - hold-downs

(1) 3/64" dia. x 36" wire - landing gear.

(3) 3/4" dia. wheels.

(1) 1/8" x 1/8" x 3" - landing gear retaining blocks.

Wing:

(2) 3/16" sq. x 36" - L.E. & T.E.

(2) 1/16" sq. x 36" - L.E. & T.E. center strips.

(1) 1/8" x 1/2" x 36" - spar.

(3) 3/16" x 1/16" x 36" - capstrips.

(1) 1/2" x 36" trailing edge stock - ailerons.

Rudders, Nose Wing & Elevators:

(1) 1/16" x 3" x 24"

Misc.:

(1) 1/32" dia. x 36" music wire - pushrods, ele. linkages.

(1) 1" 1/16" brass tubing - aileron linkages.

(3) small wood screws.

(1) 1/16" dia. x 1" dowel.

strip and be flush with the top of the L.E. and T.E. Install the rest of the top capstrips in the same manner. The 1/16" x 2" center section planking is installed last. Dampen the top of the planking with water and dry it with a heat gun or hair dryer. This sets the curve and helps maintain alignment.

When all is dry, flip the wing over. Block it up again, adding 1/16" to your blocks. Build the bottom of the wing exactly as you did the top. Once dry, remove from the board and sand the L.E. and T.E. to shape. Cut a slot in the top planking and epoxy the 1/16" hold-down dowel in place. It should rest on top of the front sweep back brace. Ailerons are cut from 1/2" tapered trailing edge stock. The horns are bent from 3/64" wire. Solder a flattened piece of 1/16" brass tubing to the top of each horn --- these should be pre-drilled to accept the pushrods. Install the completed horns on the ailerons.

Fuselage:

Cut the formers from 1/16" plywood. Make all cut-outs and drill all holes before installation. Cut the sides from 1/20" balsa. Make sure the nose wing slots line up. With the former locations drawn on the sides; install F-5 and F-3. Use a triangle to square things up. Install F-4 next. Pinch in the nose and cement F-1 in. Plank the fuselage top with 1/20" sheet applied crossgrain. Bend the main and nose gear from 3/64" music wire. Install the nose gear using F-2 as a back-up plate. Epoxy the main gear in place in front of F-4. Use 1/8" square balsa slotted down one corner to hold it in place. Make the hatch hold-down from 1/8" x 5/16" spruce; install in front of F-3. The wing hold-down is spruce likewise --- 1/8" x 5/16" epoxied to F-5. Plank the bottom and build the hatch. Cement the nose block on. When dry, shape and finish sand the fuselage. Fit the wing at this time and make any necessary adjustments.

Rudders, Nose Wing & Elevators:

Cut these from hard 1/16" sheet. Round the edges and sand smooth. Cut the nose wing down the centerline and add dihedral. Elevator linkages are bent from 1/32" music wire and installed.

Covering:

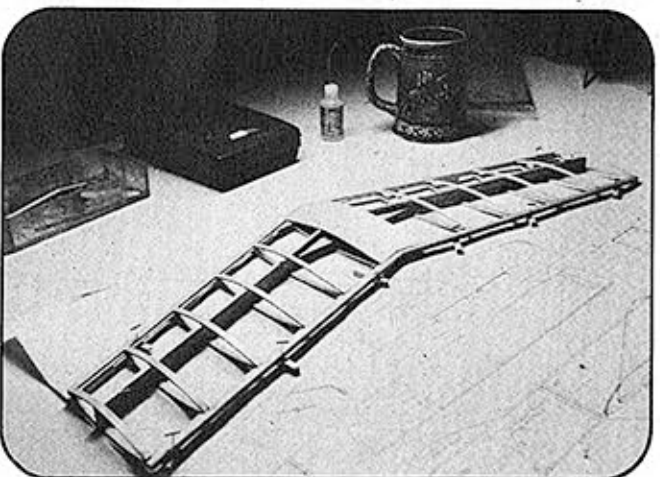
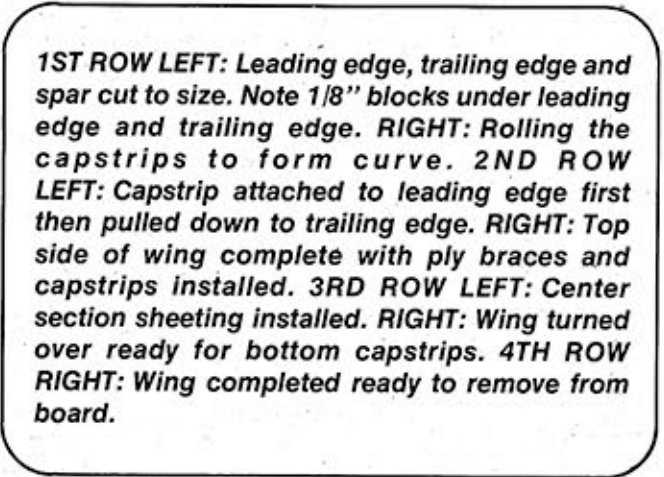
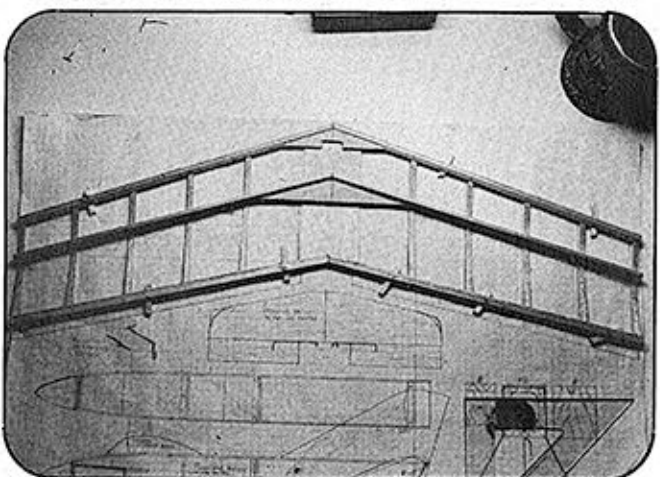
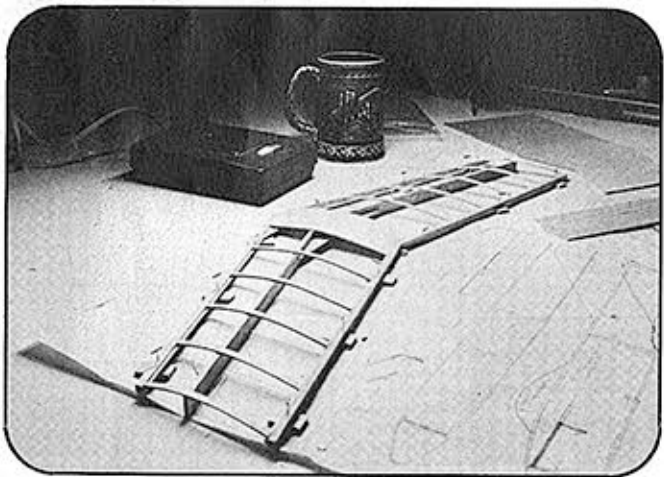
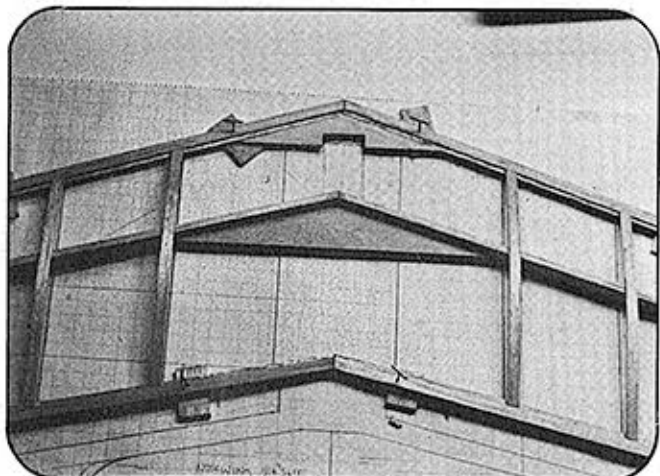
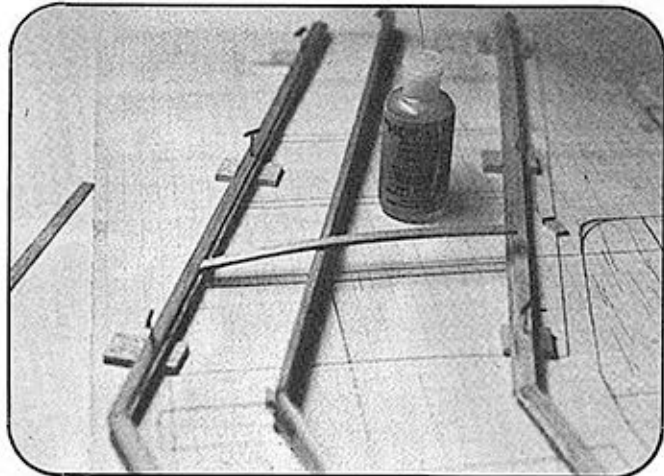
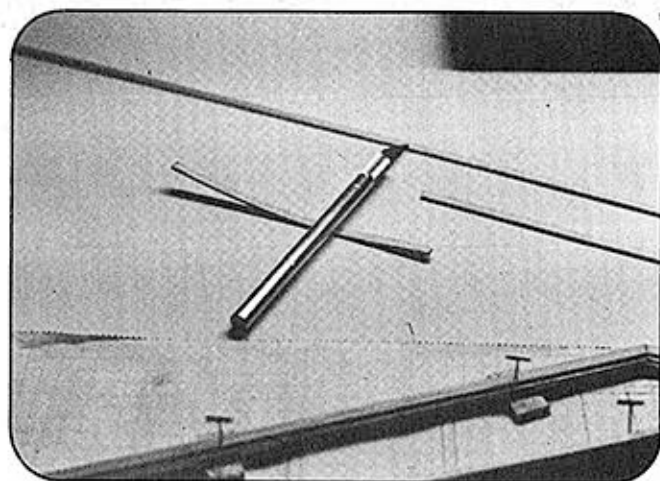
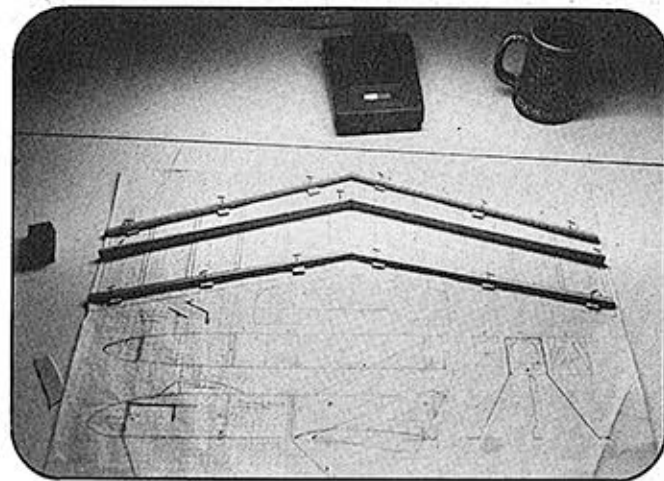
Use tissue if you know how (thanks, Dad). If you must use a plastic film, select one of the lighter brands. Take care not to warp the structure by applying too much heat to one side. Whatever the choice, cover all parts before assembly.

Assembly:

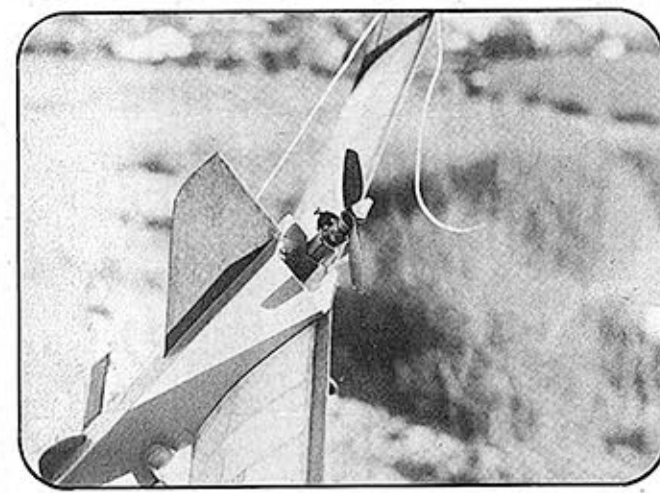
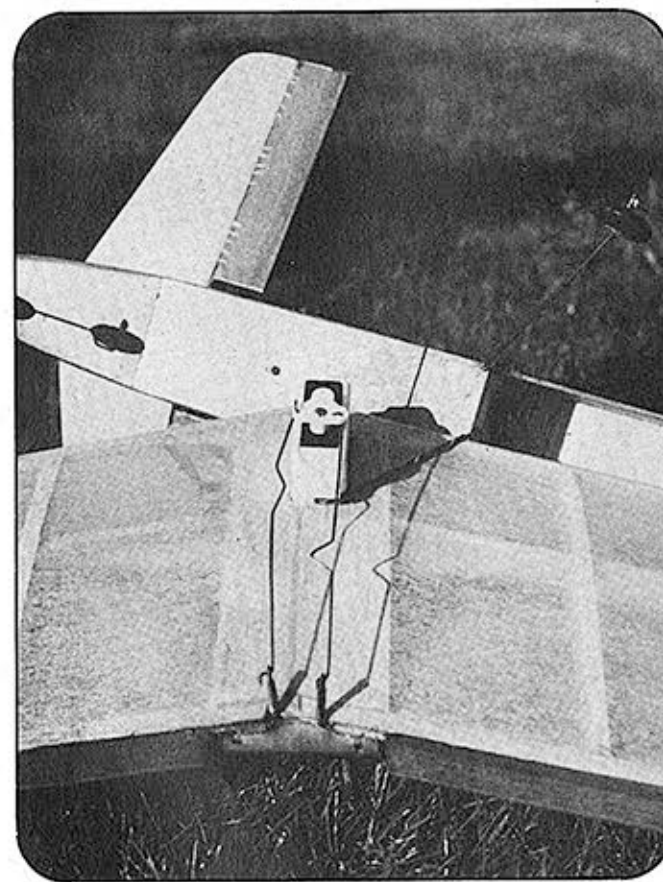
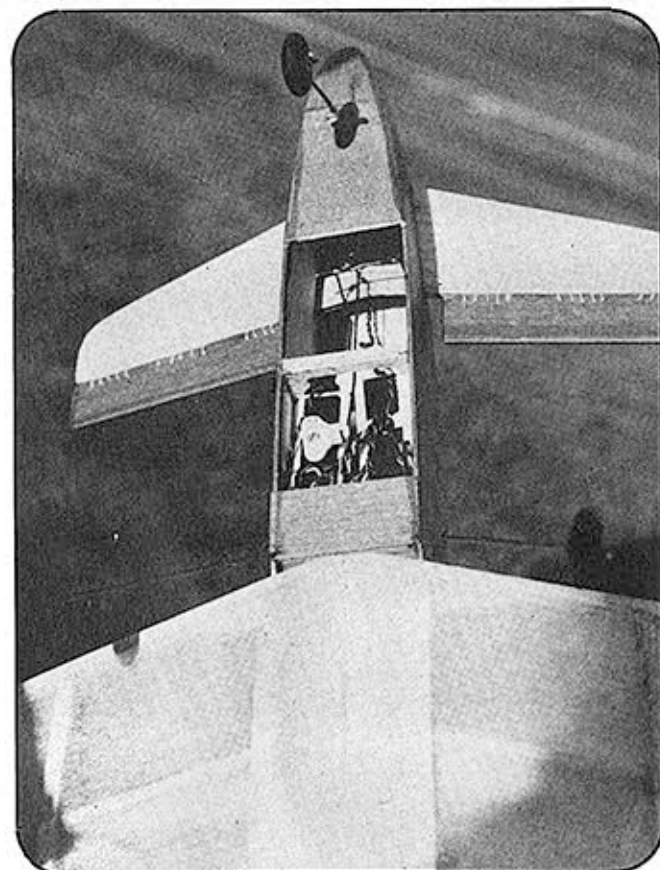
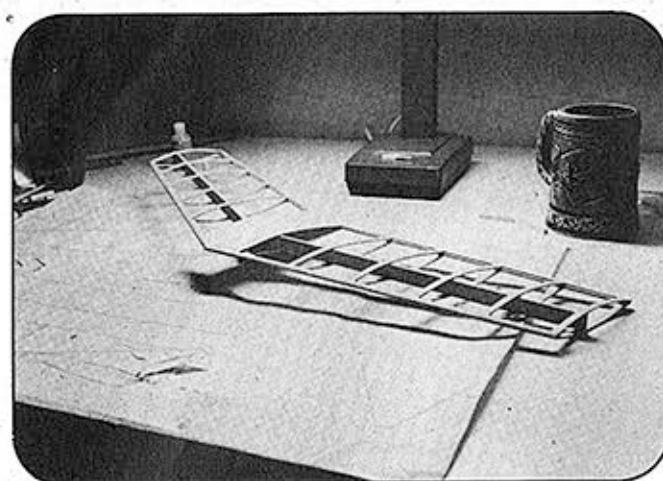
Cement the rudders in position. Slide the nose wing in place, and epoxy. Poke the elevator linkages through the fuselage. Secure the elevators to the nose wing with figure 8 thread stitching.

Cut a hole in the center section planking to receive the aileron servo. Ailerons are installed next with cut down

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1ST ROW LEFT: Leading edge, trailing edge and spar cut to size. Note 1/8" blocks under leading edge and trailing edge. **RIGHT:** Rolling the capstrips to form curve. **2ND ROW LEFT:** Capstrip attached to leading edge first then pulled down to trailing edge. **RIGHT:** Top side of wing complete with ply braces and capstrips installed. **3RD ROW LEFT:** Center section sheeting installed. **RIGHT:** Wing turned over ready for bottom capstrips. **4TH ROW RIGHT:** Wing completed ready to remove from board.



small plastic hinges. Pushrods bent from 1/32" music wire are fitted between the servo and the horns. A "Z" bend in each will assist in making things line up. Fit the wing to the fuselage and install the 1/16" ply hold-down plate. Use small wood screws to hold the wing on. Bolt the engine in place. Check aileron control. No binding allowed. Solder the wheels in place.

Now is the time to dry fit the components in the fuselage. When the proper C.G. is reached, install parts permanently. Use 1/16" servo tape for servos and pad the rest with as much 1/8" foam as space allows. Connect the pushrod to the elevator servo. Remember, the elevators must move down to raise the nose. With the switch mounted and the hatch screwed on, you're ready to fly.

Flying:

My first flight with the prototype was interesting, to say the least. The fuel tank I was using refused to allow the engine to run. Picture one rather large modeler trying to start one tiny canard. Minutes ticked into hours. Interested bystanders offered the usual helpful suggestions, whiling away the time, awaiting the crash. Frustration mounted and in desperation, I installed the tank mount. The engine fired on the first flip. Not wasting any time, I stood up, switched on, and heaved this mini-monster into the ozone. Aggravation gave the launch the extra 10 feet of altitude needed. G.A.A.B.Y.C. recovered in time and proceeded to fly exactly as it has ever since --- better than I expected. Though this technique

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TOP LEFT: Final sanded wing. **TOP RIGHT:** Hatch removed showing servo linkage to elevators on nosewing. **ABOVE LEFT:** Aileron servo and linkage. **ABOVE:** Tail mounted Cox T.D. .020. This pusher configuration makes easy clean up after flying.

BACKYARD CANARD

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worked for me, I'd suggest a more sane approach. Adjust the engine to max. rpm while holding the model's nose up about 40 degrees. Set it down, pointed into the wind and release without pushing. Add a touch of up if she's not airborne in about 25 feet. Grab some altitude and check things out. Ideally, the model should climb slightly under power and glide without adding up trim. Use downthrust in small amounts to achieve this pattern. Once trimmed out, you'll find the performance exciting, to say the least! Now you, too, can fly a full tank out, do wild aerobatics, amaze your friends, and still not use much more space than your living room. Not bad for a \$5.00 airplane that flies backwards! Have fun, that's what it's all about. □