HOT CANARY

by BOB SEIGELKOFF

A pair of unique and well-designed racers for Formula I and Formula II/FAI NMPRA racing. These are just as competitive as the usual planes.

THE HOT CANARY is a really different airplane. A biplane racer is unusual enough, but designer-builder and flier Bill Warwick wanted to see the pylons as he banked into the turns so he put the upper wing behind the pilot!

After seeing the Hot Canary at the 1970 Reno races, we felt the urge to build a miniature pylon racing version. The design fits both the FAI International racing rules and the AMA Formula II event. Total surface area is 705 sq. in. (698 required for FAI). It is an excellent flyer, but control surface movements must be minimized. An eighth of an inch up and down on both the elevators and ailerons should be more than sufficient for trial flights. Movements can then be adjusted after trimming and altitude adjusting flights.

The bane of any fast pylon racer is that too much elevator will induce a snap roll, and at racing altitudes this is an immediate disaster—a characteristic of any model turning pylons at over 100 mph. Consider the wing loading of a five-lb. plane at six or eight g's with 600 sq. in. wing area. That's asking the wings to support a 40-lb. weight (or 154 oz./sq. ft. wing loading)! Flying on the safe side of the elevator travel is essential.

It's hard to believe, but the first prototype, with a plain wood finish, had its wings an inch and a half farther aft than shown on the plans. What a goofball-looking thing that was, but it flew, and fast. In several match races against a competitive Formula I Ballerina, the Hot Canary held its own.

Because of too much elevator travel, the first prototype ended in a snap roll at about a ten-ft. altitude in the No. 2 pylon turn. The second prototype, with its wings moved forward, appears far less sensitive in this respect, but it is still important to keep all

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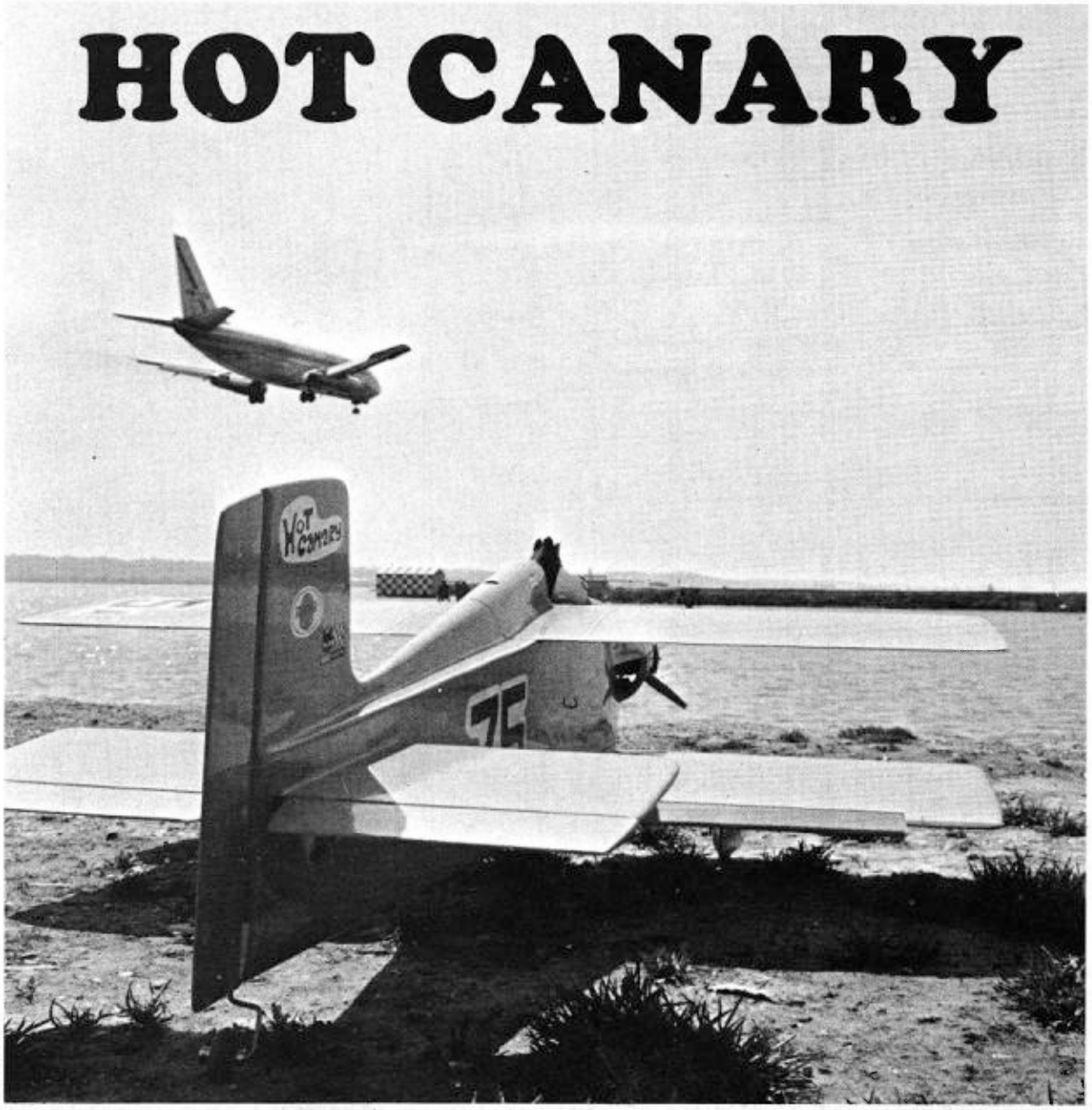

This weird-looking bipe is a tough and winning plane in full-scale racing. Silvester pilot does not race but cockpit is open with long narrow windshield.

Hot Canary

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control throws down. Do not fly with a CG aft of that shown on the plans.

Construction

Building the Hot Canary poses no problem. The fuselage is a square box with no "fancies." Begin with the fuselage side assemblies, adding the ply doubler to the balsa sides with contact cement. Then add the 1/4" sq. longerons and 1/8" x 1/4" uprights with Titebond, making right- and left-hand panels. Lightly score the ply doublers at the bend points (shown in the plan view) and, with a straightedge over the scored line, gently crack the side assemblies so that a sharp bend point results.

Begin fuselage assembly by gluing the sides to the intermediate cabin area bulkheads. Add several temporary diagonal braces top and bottom to keep things square, then add the firewall, top and bottom sheeting, landing gear mount, etc.

The 1/8" wing doublers should have the wing hold-down block cutouts cut right through, serving as doublers for the anchor blocks.

The wing and tail construction is straightforward. Both the upper and lower wings are made from the same foam cores, but are finished a little differently. Notch out the cores and add the vertical grain blocks where the hold-down screws go through. Add the trailing edge spar to each core and then the 1/16" lower skin. The top wing should have enough lower skin to reach the trailing edge; the lower wing stops at the spar.

On the top wing, fill in the trailing edge area with foam or soft balsa. Then sand this down to the wing contour, leaving a feather edge at the trailing edge. Add on the upper wing), the balsa tips and finally the leading edges.

Finish the basic undercoat on the fuselage and tail before the tail surfaces are installed in the fuselage. At this point, it is a lot easier to put on the two coats of surfacing resin and sand them.

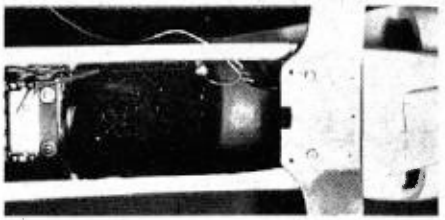
Lots of room in the engine compartment for easy, quick servicing. Needle is quite handy.

When this is done, place the elevator horn assembly, with its pushrod hooked up, in the fuselage, then slide the stabilizer in place and cement securely. Install the elevator onto the horn and hinges. Then cement the vertical fin in position and install the rudder. This method provides a neat tail end with only a rudder pushrod hanging out in the wind.

"Surfacing" resin is suggested as a basic undercoat for Hobbypoxy finish colors. We prefer this system of finishing primarily because we are lazy and like to get flying sooner. It involves one quickly brushed-on coat of resin, lightly sanded after drying about two hours. A second coat is flowed on carefully so that runs do not develop. After this has set up in about two hours, it is ready to accept a color coat. For a superb muscle-power finish, a third coat of DuPont gray lacquer primer can be sprayed on. This is sanded off as completely as possible.

The K&B rear-rotor engine with its new fuel shut-off racing venturi installed for NMPRA racing is shown, rather than the barrel throttle required for FAI. However, there is room for the throttle for FAI.

We flew the first ship with an inverted engine and fixed cheek cowls; the second,



Bottom wing leading edge notched to fit under aluminum landing gear blank.

side-mounted as shown with a removable cheek cowl. We prefer the clear-running side mount, but the inverted mount requires less work. Before any pylon turns are tried, take the ship up quite high and, after everything is trimmed for level flight, try a vertical full elevator turn. If the elevator throw is correct, a smooth tight turn will result with no sign of snapping. If it does snap, level out, land the ship and cut down the throw. Conversely, if the turn is too wide, increase the throw until full stick deflection gets the plane around quickly.