



# The "Tucker Special"

## best stunt design of the year

■ For a note of realism, reminiscent of the Schneider Cup racers, the control-line aerobatic "Tucker Special" was designed with the Macchi MC-72 Italian plane in mind.

Since fall 1958 when I began flight testing it, the stunter has always received much attention from flyer and spectator. It has even appeared on television here in St. Louis. The "Tucker Special" has won or placed in every contest entered. There are lots more who fly the design than pictured here, but even so just count the trophies. From left to right, 22 belong to Gary Zeller, 1961 AYSC Missouri winner; (author in center); 26 won by Ron O'Toole who was 1959 and 1960 Air Youth camp. Ron also placed 6th with his "Tucker Special" at the 1959 California Nationals.

At the 1960 Nationals in Dallas, Texas, the design and its flyers did an outstanding job in the aerobatic circles. There were 130 contestants in Junior, Senior or Open class stunt. By Friday evening when the finalists were known, 3 of the 10 had flown a "Tucker Special" airplane. This is a rare impressive point because these represented each age class:

Ron O'Toole in Senior, Art Schaefer in Open, Gary Zeller in Junior—3rd, 6th, and 8th place respectively.

During the winter following the '60 Nationals, I tried to improve the plane's landing characteristics. So the next models sported l.g. gear in the wing. Other changes included varying moment arms, greater wing area and chord thickness—but the one tremendous advantage over the original was the new Special's ability to land smoothly without a bounce. It still looked like a "Tucker Special" and still continued to win.

Presented here is that final version. The size is ideal for a 35-powered stunter with a weight of 40 ounces. Although 46 ounces and over will go through the pattern, it definitely is not to your advantage. So pick light balsa; 4 to 8 pound contest wood. Of course, all the winning copies were beautifully finished to gain maximum appearance points. However, I caution that too much paint can really pile on the ounces.

This latest airfoil will groove better and give reliable performance under all weather conditions. It has a chord thickness of 18.5 per cent at the wing root,

**This vast display of trophy awards was taken by two outstanding Missouri flyers who have had remarkable success with their Tucker Specials. From far left: Gary Zeller, author-designer Robert J. Tucker, and Ron O'Toole.**

tapering to 16¼ per cent at the tip. Maximum camber occurs at a point 32 per cent back from leading edge.

Study plans carefully to familiarize yourself with the construction. Cut and file the two wing rib templates from thin sheet aluminum. Try to be exact. With two 3/16" x 1¼" long bolts, sandwich twelve pieces of 1/16" x 2" x 10" balsa and one piece of ½" x 2" x 10" balsa between the templates. The ½" sheet is the root rib. Rough cut, then finish sanding down to the template. This is the number required for inboard half of wing. The outboard half is shorter so one 1/16" sheet section should be omitted when forming the opposite set of ribs.

Pin lower half of trailing edge over plans. Mark rib positions on all spars and leading edge. Slip ribs onto lower and upper spars, then cement and pin firmly to trailing edge. Attach 3/16" leading edge to ribs, cement all spar joiners and braces, check wing for alignment. Put on trailing edge upper half, install plywood bellcrank floor. While wing is drying, make landing gear and attach to 3/16" plywood mounts with "J" bolts. Lift wing from plan, cut out front half of rib number 4 to rear of spar, cement plywood with gear in place. Add vertical braces to rear side of spars at

ribs 3 and 5. Replace front of rib 4, cement over this entire area once more for added strength.

Install lead-out wires with bellcrank, fit and cement 1/16" sheet to spars with grain running vertical. Be sure front lead-out wire has adequate clearance as it passes through this vertical sheeting toward tip. Put on leading edge sheeting and center section, and trailing edge strip. Add wing tips with ½ ounce weight in outboard side; install capstrips. To make flap control horn, use 3/32" music wire and 1/16" brass sheet, slide ⅛" inside diameter brass tubing on each end just before bending wire. This makes a long-lasting hinge. Assemble flaps to horn and affix to wing, using fiberglass or epoxy to attach tube hinged horn. Remaining hinges may be cloth or your choice. Install push-rod and wing is complete.

Cement hard balsa doublers, and top longerons only, to fuselage sides; cement motor mounts to the doublers. Install plywood formers #1 and #2, check alignment. Cut out remaining formers and other parts until this assembly dries. Pull sides together at rear, cement in the 3/16 square balsa strip. Add formers #3 and #4, temporarily insert former #5 so that sides have correct shape, then cement wing to fuselage. Remove former #5 to allow FW-2 plywood doublers to be installed, then cement #5 in place. Add FW-1 doublers, formers 3a and 4a; install lower longerons; cement lower fuselage sections to splice area. Shape stabilizer and elevator, install control horn, attach push-rod. Thread formers #6 and #7 on push-rod and feed through

hole in former #5. Insert end in flap horn, cement stabilizer and formers in place. Drill motor mounts with 2° right thrust, solder nuts to tin plate, cement in place. Install tank and box in with 3/16" sheet balsa.

Put ¼" sheet floor in place and fuselage is ready for hollowed top and bottom blocks. Cement on 1" cowl block, add ½" block. Carve and hollow nose so engine can be installed and removed through opening. Add plywood nose ring, make exhaust and needle valve cutouts, finish-sand cowl to final shape. Carve headrest, fin, rudder and sub rudder—install in that order. Add two 1/16 plywood pieces in rudder for tail wheel. With wheel in place, drill and install wire axle, then solder washer on each end. For added strength, fiberglass this area. Add windshield and fuselage is complete.

After installing pants and strut fairings, sand entire model with 400 sandpaper. Brush on two coats of clear to seal wood pores, sanding between coats. Cover wing with silk; paper covering on fuselage and tail is optional. Give wing four or five coats of thinned clear dope, sanding after each. Brush two coats of fillercoat on fuselage, tail and wheel pants, sanding lightly between coats.

Now is the time to decide on a color scheme. Here are some seen on "Tucker Specials" flying around St. Louis: Orange and Light Cream, Curtiss Blue and Taylorcraft Cream, Black and White, Chocolate and White, Red and Taylorcraft Cream, Red and Corsair Blue, Pale Orange and Corsair Blue. Five coats of colors are brushed on, sanded after each coat, then hand-rubbed to a good finish.