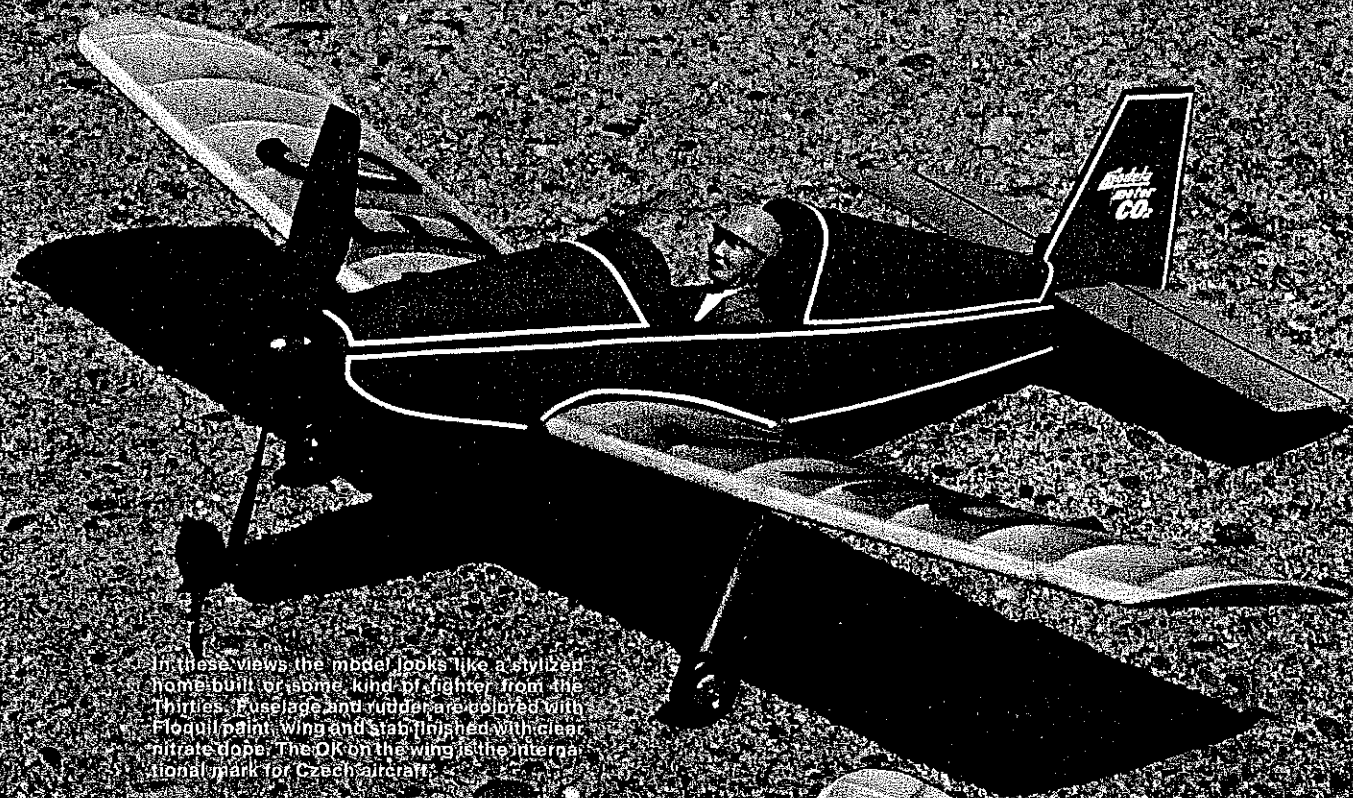


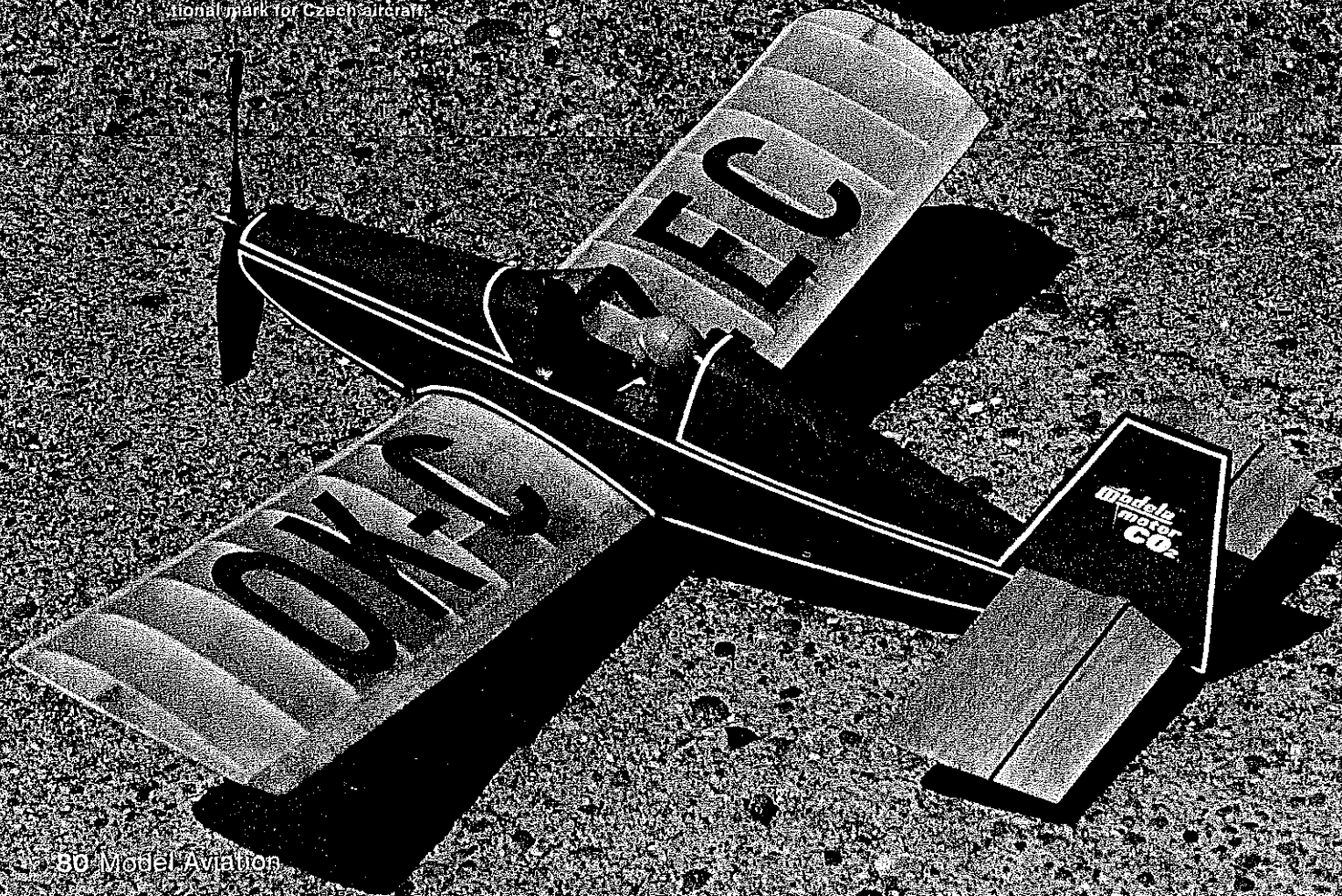
Joe Johnson

# Czechmate

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In these views, the model looks like a stylized home built or some kind of fighter from the thirties. Fuselage and rudder are colored with Floquil paint. Wing and stab finished with clear nitrate dope. The OK on the wing is the international mark for Czech aircraft.



THIS DELIGHTFUL little sport model was named before it was designed! As a matter of fact, it was constructed as the result of discovering a name.

The Czechoslovakian Modella CO-2 engine was no longer being sold in the U.S. when this was written, but it can be ordered from Micro-Mold, Station Road, East Preston, Littlehampton, West Sussex BN16 3AG, England. They will ship via air mail for a total price of 14 Pounds Sterling. (Checks in Pounds Sterling are available at most larger banks. Check the foreign exchange section of a daily paper for the current price; at the time of writing, 14 Pounds Sterling was \$25.90.)

Testing this new import in our hand quickly revealed our intended model would be much too small to handle the power of this remarkable engine. To our considerable pleasure, the Modella produces torque far in excess of any CO-2 power plant previously experienced.

Consequently, we needed a design to best mate with the potential of this Czech engine. We needed a Czech Mate. With an inspired name like this, who could long postpone developing a model to match the name?

We have long enjoyed designing and building low-wing Free Flight sport and Scale models, primarily to de-bunk the prejudices of many "experts" who maintain they are extremely tricky to trim. One need only follow accepted aeronautical principles for success with a low-wing Free Flight.

In this design a relatively large dihedral angle is used to raise the center of lift into reasonable proximity to the center of mass. The long undercarriage legs also further enhance this relationship by placing the relatively heavy wheels well under the center of lift.

The "proof" of this concept is best illustrated in the fact that the Czech Mate flew beautifully

**The source of the CO-2 engine which powers this attractive FF sport model was the origin of the catchy title. Flights of 30 to 50 seconds are the norm when built lightly and according to instructions, so it should be a great small-field flier.**

the first time it was launched. We have subsequently flown it more than 100 times and have yet to change the original settings. Luck? Certainly. But as Frank Monts once told us, "I seem to get luckier as I learn more about trimming model aircraft."

The standard tank supplied with the Modella provides 30- to 50-second flight dependent on the engine speed selected. A direct relationship exists between engine rpm and run length, as there is a finite volume of fuel. Speed is controlled by screwing the cylinder head clockwise for increased revs. Trimmed for a left power pattern, the Czech Mate climbs in tight circles, then flattens out as the gas is discharged. The prop is usually still barely ticking over as the model lands in a most realistic manner.

Though certainly not a soarer, Czech Mate is

one of those models capable of providing countless hours of low-cost flying from a relatively small field. She's great for running over to the neighborhood playground after work for a few relaxing flights as the sun sets.

**Construction.** We used cyanoacrylate adhesive throughout the construction, except as noted.

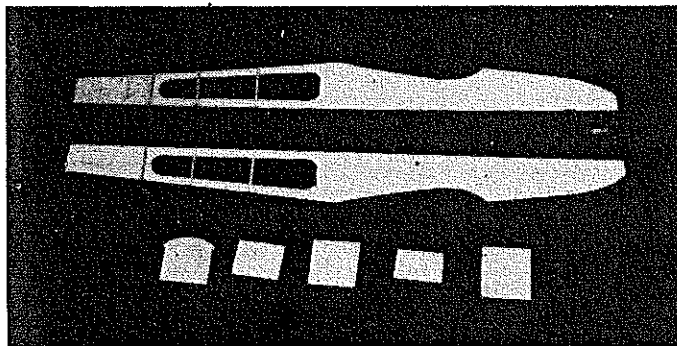
The fuselage is a simple balsa box constructed of two sides and a few bulkheads. Its basic assembly is done with one side pinned flat onto the building surface. Use a 90° triangle to position the bulkheads. Place the second side into position, then pull the tail post together, and add the crosspieces.

Drill all holes before assembly, but do not permanently install the dowels until the fuselage is covered. The motor and tank are installed before closing up the bottom—but after the covering stage. The rudder and stabilizer are not installed until the final stages of assembly.

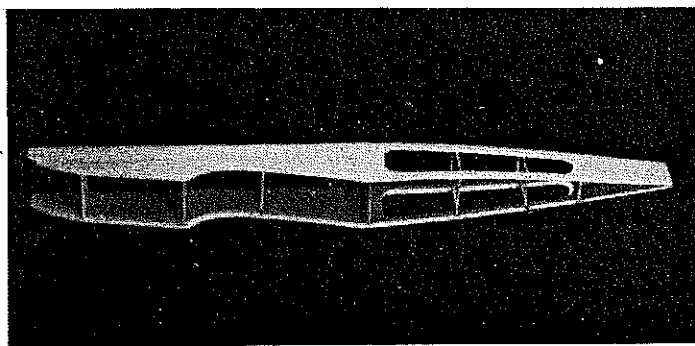
The foam turtledeck is rough-cut to an oversized outline, then spot-glued to the fuselage top with dabs of 5-min. epoxy. Cut the foam with a sharp knife "drawn" in one direction through the material. Most gouging results from pulling previously-cut scraps ahead of the knife.

Sanding is best accomplished with #80 or #100 sandpaper on a block. Sand in one direction only, and keep the paper clear of foam scraps and balls. Since no two turtledecks are expected to turn out exactly the same (this provides the builder with a chance to customize), we have not drawn the cockpit bulkheads. Rather, after arriving at a satisfactory shape, place sheet wood against the foam face, and draw formers with a pencil.

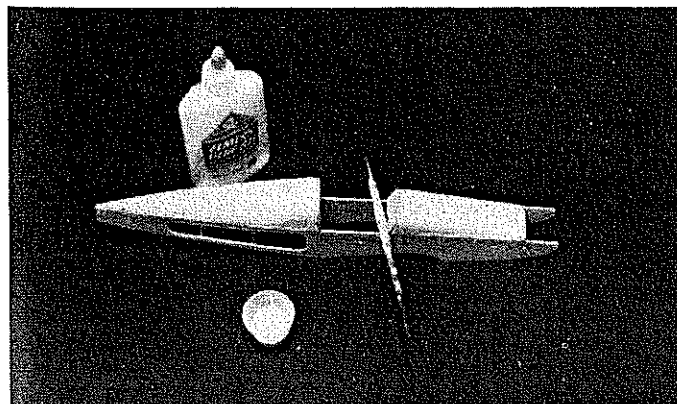
Three or four coats of Elmers white glue, thinned to brushing consistency with water, are enough to provide a hard surface when covered with Japanese tissue. The tissue can be adhered with



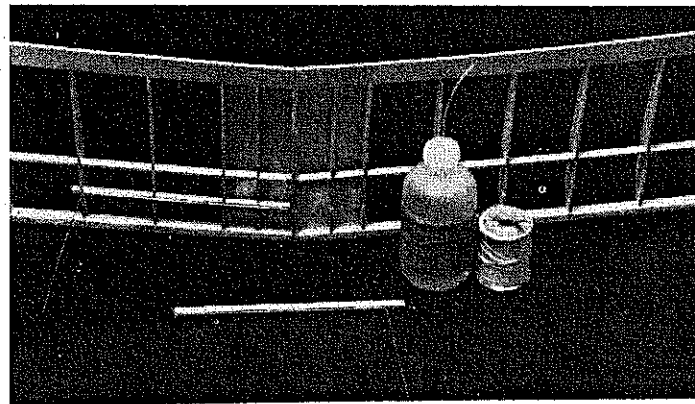
The plane is built mostly of 1/16 sheet balsa. Holes should be made in bulkheads A and B (as well as in the bottom of the tank compartment) to allow warm air to circulate around the tank and feeder lines.



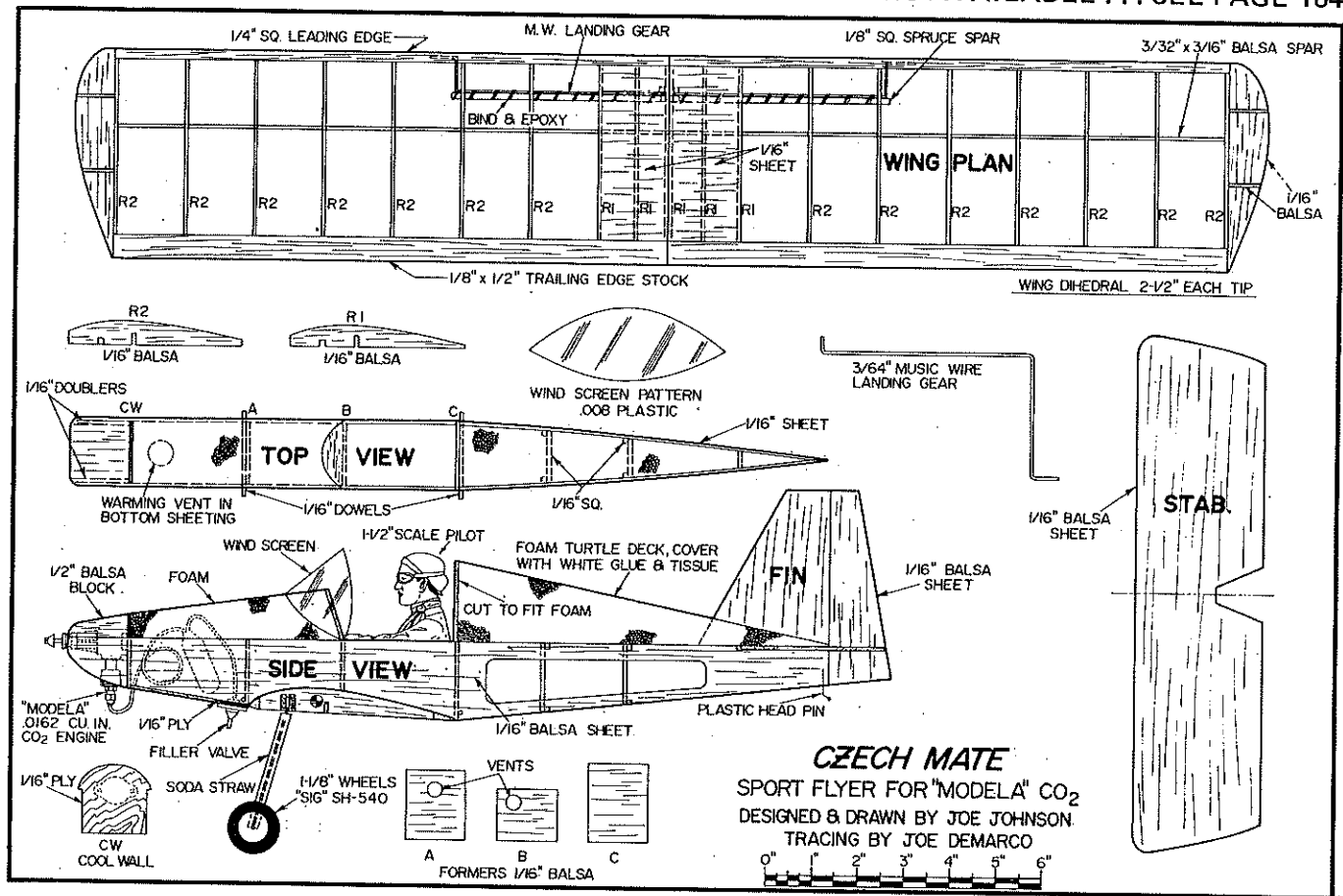
Assemble the fuselage with one side flat on the building surface (back to former C), pull the tail end together, and add the 1/16 sq. crosspieces. Simple sheet box fuselage goes together quickly.



Styrofoam nose and turtledeck are carved and sanded to any shape the builder finds attractive. Balsa formers around cockpit are marked and cut to fit. Foam then is given three coats of thinned Elmers white glue and covered with Japanese tissue. Remember, foam and dope don't mix.



Landing gear wire is bent to shape, then attached to 1/8 sq. spruce by carpet thread wrappings. Small vertical section of the wire is boxed in by the wing center rib and held tight so that the horizontal section of wire, free to rotate, acts as a torsion bar.



white glue, shrunk with water, then sealed with more white glue.

*Do not use dope on the fuselage of this model.* Any areas of foam unprotected with white glue will dissolve completely.

We discovered that warm air needs to pass around the tank to prevent reduced runs from "frosting over." Cut a 1/2-in. hole in the fuselage bottom in front of the tank, and small holes in the bulkheads, for air passage. Notice that these are really "warming" vents, and the engine is actually mounted onto a "cool" wall. One of Newton's Laws of Physics is at work here.

The wings are ultrasimple to fabricate. All wood sizes are strictly stock. Tilt the center ribs slightly for the dihedral angle, then sand in a butt-jointed center section with the classic table edge and sanding block technique.

The center section ribs can be developed separately—or use the standard ribs, lower the master pattern 1/16 in. from the top and cut accordingly. We assembled the halves with five-minute epoxy. No gussets are required. Set dihedral at 2 1/2 in. at each wing tip.

The torque bar undercarriage is bent to shape, omitting the axle bend. Carpet thread and CA glue are used to attach the wire onto 1/8 sq. spruce. This assembly is then epoxied into the rib slots, and a spruce "box" is built up around the vertical wire section in the wing. The wire "rolls" inside the thread, and the box takes the force that is distributed in the long axis of the wire—exactly like the undercarriage of most low-wing RC models.

Cover the wing with Japanese tissue and nitrate dope.

Sections of plastic soda straw are cut to length, capped top and bottom with small balsa plugs, then pushed down over the wire legs. The wheel axles are then bent, and the wheels are held on with right-angle wire bends, or small nuts from the model railroad department.

**Finish.** The fuselage was colored with Floquil model railroad paints. This was brushed over the sealed tissue. It is highly pigmented, and it spreads extremely well.

The wing and stabilizer were sealed with thin nitrate dope to avoid warping problems. Butyrate dope could be substituted if used carefully.

The letters are EZ-Stik vinyl die-cuts which were purchased at an office supply store. Sig decals would also be most satisfactory. The trim lines are 1/16-in. Sig Trim Rite Tape.

The soda straws and the wheel hubs were painted silver with paint for plastics. Needless to say, this model does not require fuel-proofing.

**Flight trimming.** The Czech Mate must be flown to the left! Turn radius is controlled with engine rpm and right thrust. A small amount of washout of the right wing tip (leading edge low

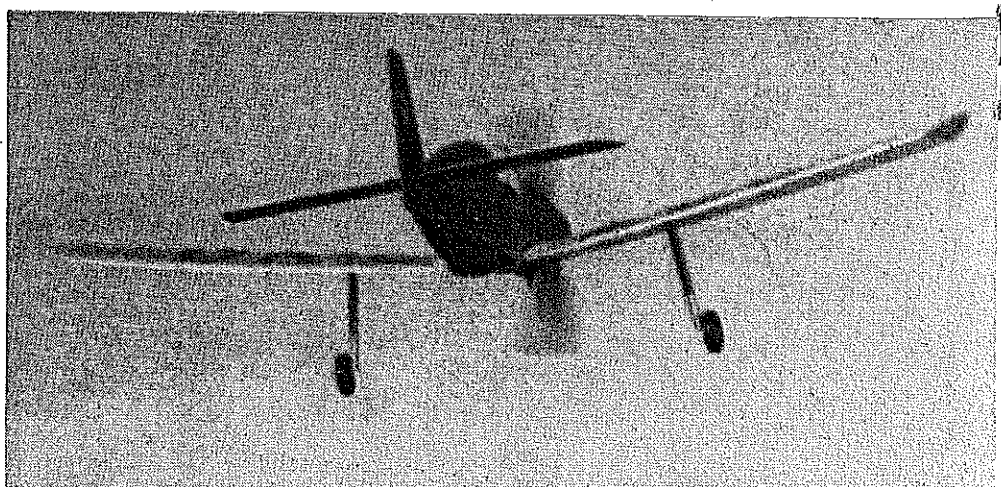
relative to the training edge) may be needed to encourage the right tip to not angle upward too much.

Essentially, right thrust controls turn, down-thrust controls nose attitude and climb angle. The rudder and elevator are adjusted only to compensate for any building errors.

Initial flights at low power settings should exhibit a straight-ahead shallow powered glide from a hand launch. As the power is increased, the model will turn left and climb. The higher the engine rpm, the tighter the left turn becomes and the steeper the climb.

It is nearly impossible for the model to spiral-in when trimmed in this manner.

The Modella engine coupled with its "mate" will provide hours and hours of fun for only a few dollars.



Up, up and away! A sight like this makes the building of a model seem more than worthwhile. Long landing gear needed to clear Modella's large prop—adds to plane's stability, too.