

A SURE FIRE AUTOGIRO

Autogiros are usually tricky, but this one is a sure fire performer

by ROY L. CLOUGH JR.

A DISTINCTLY rare item—the free flight model autogiro—has the reputation of being an extremely difficult thing to build and fly.

Demonstrating that this reputation is quite undeserved, this model is simple enough to be knocked out in an evening and is no more difficult to fly than a conventional ship. In fact, it is not even necessary to set the rotor in motion before launching. This model climbs at a steep angle and when power is exhausted floats gently back to earth on its spinning rotor, thus eliminating the chief cause of destruction of flying models—a head-on glide into a solid object.

Begin construction with the fuselage which is built up from 1/32" medium sheet balsa. Stiffeners are used at appropriate intervals and the thin covering is backed up with 1/16" sheet at the point where the landing gear is attached.

Nose and tail plug openings are reinforced with strips of 1/16" x 1/8" stock. The bubble canopy is carved from a block of soft balsa.

Tail surfaces are 1/16" sheet and are cemented in place with no offsets of any kind. Carve two end plugs; adapt one as a tail hook and the other as a thrust bearing for the propeller. The prop may be sanded down from a purchased pre-sawed blank or built up as was the original. The prop should be of medium low pitch, and diameter should not exceed 9 inches. Free-wheeling would be of no particular advantage in this model.

Bend the landing gear from 1/20" steel wire and cement it to the reinforced underside of the fuselage. Wheels are 1 1/4" in diameter and must be hardwood.

The rotor and rotor mast, while quite simple, must be made exactly according to plan to obtain optimum performance. The mast is bent from a length of 1/20" steel wire and is anchored to a plate of 3/32" hard balsa which is cemented to the top of the fuselage. A short length of drilled hardwood dowel is slipped over the mast and cemented to the plate for added strength.

The rotor is acted upon by highly complex forces in flight and must be highly flexible to permit these forces to be damped out without upsetting the model. The hub is a piece of dowel which is drilled to permit a loose fit on the mast. The spars are 1/16" x 1/8" hardwood, pushed into slots in the hub at the angle shown on the plan, and cemented. Two short pieces of 1/16" x 1/8" balsa are cemented to the upper sides of the spars next to the hub. Rotor ribs are simply toothpicks. Cover the blade sections with a strip of smooth typing paper, 2 3/8" x 11" for each side. Note that the rotor has 0 degrees incidence and will spin in the proper direction regardless of the direction from which the relative wind comes. *This is very important!*

Drill out two short pieces of dowel; slip one over the rotor mast, then put on the rotor, using the other bit of dowel to hold it in place. The proper height of the rotor above the fuselage is the shortest distance which will give good propeller clearance. The retainers are cemented in place after testing.

To test fly: install an 8 strand motor and balance the model at the rotor axis. Drop it from shoulder level a few times to make sure the rotor works well, then try short powered flights in calm air. The model should climb without deviating right or left and is performing best when it gains a foot of altitude for every foot of forward flight. Whatever minor adjustments may be required can be made by slightly bending the rotor mast.

