



**By HARRY BARR** ... A cute little rubber job that is easy to build and fly. Full-size plans on next two pages.

"Hangar Rat" owes its existence to the "Sig Parasol," a simple, easy-to-fly, tissue-covered profile model. Having built one of these with a cambered wing, I proceeded to fly it every lunch hour in the hangar, where I worked, until it was so tattered it was retired to a place of honor above my bench. Needing another fun machine that could be built in a hurry, "Hangar Rat" evolved, using the same airfoil I had used on the Parasol.

It has been a success right from the first flight, with average flight times under a 20 - foot ceiling of 50 sec., with a best flight to date of 1:08 and many flights over a minute. It is easy to adjust and build and will bring pleasure to both the beginner and the jaded R/C nut (like me). It brings back memories of simpler times when modeling was less complex and expensive.

If you are a beginner, follow the plans closely and you will be rewarded with a fun flying machine. If you're an old hand at the game you probably have your own ideas about a lighter airframe, better prop, etc. Regardless, have fun!

## CONSTRUCTION

Let's start with the wing and get that miserable so-and-so out of the way. Using the side view of the fuselage, cut a template from 1/32

plywood of the rib profile. Reinforce the edges of this template with a Cyanoacrylate type glue to toughen them against knife knicks. Using this template, slice out ten ribs 3/32 deep from 1/20 sheet and two full depth ribs from 1/16 sheet. Protect your drawings with Saran Wrap or something similar and pin the wing frame to your building board. Use the dihedral jig to set the root rib angle accurately and glue the root rib (the full-depth rib) in place. Add the gussets at the root and allow to dry thoroughly. Since the wing is bilaterally symmetrical, the same wing drawing can be used to build the second panel merely by moving the root rib to the opposite end.

Once both panels are framed up, gently sand the leading edge to a rounded contour and re-glue all joints. Do not join the wing panels at this time! Set them aside for now.

The tail surfaces and cabane structure are built flat over the drawings using the time-honored method of pinning and gluing. The only point worth noting here is the method of joining the stabilizer leading edges. This is stronger than a butt joint. The 1/32 trim tab is cut out now, sanded, and set aside. Do not glue to the fin at this time. Lightly sand surfaces and check all glue joints.

The motor stick is a firm piece of 1/8 x 3/8 balsa. Pick a good straight piece and after cutting to length, taper the bottom (from front to rear) to 1/4 x 1/8. Sand to suit your personal tastes.

The wire parts are bent up from .025 music wire. Note that the tail skid and rear hook have a tang that pierces the motor stick approximately 1/8 of an inch. Bind the hook and skid neatly with cotton thread and cement securely. The landing gear is pressed over the motor stick in the proper position and it is also bound and glued in place. Slip a pair of 1-inch wheels in place over the axles and bend the axles upward to retain the wheels.

The wings and tail surfaces should now be covered. Use the lightest possible grade of tissue available, iron it flat, and attach with water-thinned white glue. Cover only the top of the wings and stabilizer and one side of the fin. Do not use any dope and do not shrink the tissue.

Now that the wings are covered, cement both butt ribs lightly and join, using clothespins as clamps until the glue dries. At this point, glue the cabane to the wing in its correct position. Ensure that it is perpendicular when the wing is level (equal dihedral under each tip). If such is not the case, apply your sanding block to the surfaces that contact the wing ribs until corrected. (Note: the cabane glues to the side of the root rib.)

Accurately assemble the tail group to the fuselage. It may be necessary to remove a small sliver of tissue from the stabilizer center rib in order to get a good bond between the fin and stabilizer. Add the trim tab at this time, with about 3/8 inch right offset, Tack-glue lightly to allow for

adjustment. Cut "Mr. Rat" from foam or balsa, decorate, and glue in place.

I used a 7-inch plastic prop, and the prop hanger was the one supplied with the Sig Parasol. This simply slides onto the stick. If you wish, a metal strap or aluminum tube type can be used instead, as long as it's securely bound and glued. Make sure that 3° to 4° of down thrust is built into the hanger, no matter what type you use. Use a drop of rubber lube on the prop shaft.

At this point, pin the cabane to the fuselage and by trial and error move it fore or aft until the "Rat" balance at the point shown. Because of the large stabilizer, the CG, is

further aft than might be expected. Once balanced, mark the correct position of the cabane and glue it in place. Ensure that the wing is properly levelled and the incidence angle is correct. Adjust to suit. You can now add the 1/16 x 1/8 lift struts. The small "X" on the wing drawing gives its location on the wing, and the side view of the fuselage indicates the struts' position. Although the struts' forward position is unorthodox, I placed it there for a reason. If the "Rat" contacts an obstruction, the strut takes the brunt of the collision and protects the leading edge of the wing. It's much easier to repair the strut than the wing.

If desired, initial glides can be done with the rubber motor left off. It has very little if any effect on the C.G. Adjust the glide for a flat right turn of about 20 feet in diameter. My "Rat" flies best on a 17 inch single loop of flat 1/8-inch rubber. This is for the aforementioned 20 - foot ceiling. No doubt you'll want to experiment to find the best prop/rubber combination for your own site. The wheels can be bent forward or back for final trim adjustments.

So now you can pack in the winds and have at 'er. I hope you enjoy the "Hangar Rat" . . . I still do!

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