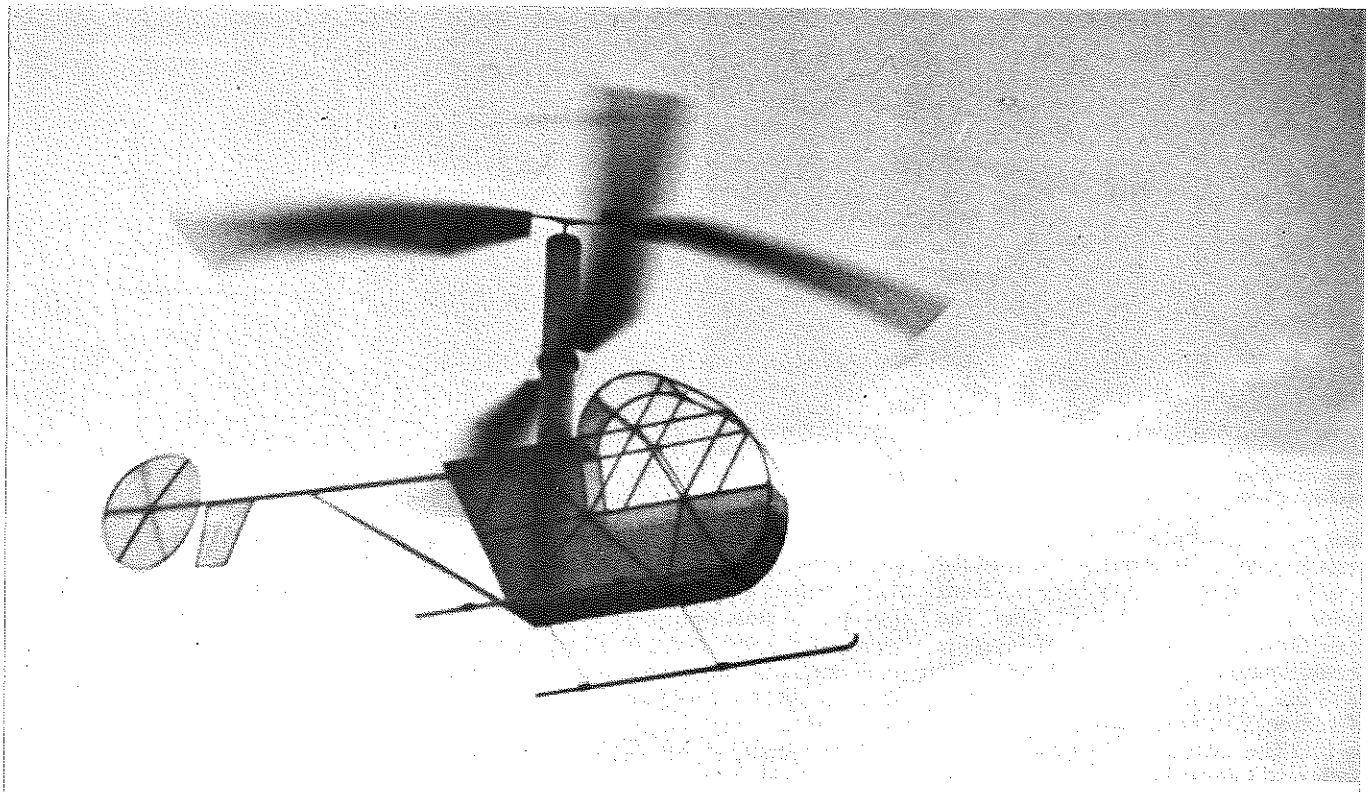

HUGHES '300' HELICOPTER

This large, but lightweight rubber powered helicopter is one you can truly fly in the living room on cold winter evenings. Great subject for a club one-design contest at the local gym. By ROY FOOTE

● This little, easy-to-build helicopter is a very stable and predictable flyer. It has an inherently stable contra-rotating rotor system which I copied from a sketch from Roy Clough Jr. in the October issue of Air Trails, 1953.

It can be trimmed to go straight up and down, or fly forward by adding nose weight.

Start by building the rotor system, as you need the finished tube to determine the hole size in the top of the fuselage. The tube is 1/16x3 soft balsa about 10¼ inches long. Wet thoroughly and wrap it around a 3/4 inch diameter dowel. Hold with elastic bands. After drying, cut off overlap and butt glue edges together; wrap Saran Wrap around the dowel to prevent glue from sticking to same. Wrap glued tube tightly with masking tape (sticky side out) to ensure a true round tube. Trim to 10 inches long. Reinforce top of tube with a few wraps of thread and glue.

All 4 rotor blades are the same size; 1/16 medium balsa is about right. Top rotor rotates counterclockwise and bottom rotor clockwise. The ½ inch long brass tubing at the top of the rotor tube is a piece of 1/16 O.D. tube soldered inside a piece of 3/32 O.D. tube. The little ferrule in the removeable top plug should have an ID large enough to let the 1/32 dia. wire tilt about 10° each side of center. This is to allow the top rotor to tilt. The bottom rotor does not tilt. Both rotors must be free to feather. All 4 blades have 15° of incidence. The bearing in the bottom of the fuselage is a 3/16 long piece of 1/16 O.D. brass tube. Align bearing and 1/32 wire carefully to avoid binding.

Slide some 1/16 O.D. nylon tube (or similar) on the 1/32 wire loop at top of tube. This is to prevent the wire from cutting the rubber motor.

The fuselage is straightforward, with the possible exception of how to form the curved portions. I cut 1/32x1/16 soft balsa strips of suitable length, soaked them in water, and wrapped them around a 3¼ inch dia. glass jar to dry. Next, glue two strips together to form a 1/16 sq. strip and leave on the same jar until the glue is dry. Do this 3 times; two for the canopy and one for the tail rotor disc.

Place plastic wrap over plans and make two side panels per plan. Cut top and bottom sheet pieces. Cut rotor tube hole in top piece. Do not drill lower bearing hole at this time. Drill after fuselage is complete. Locate lower hole directly under top piece hole. Cut 15 cross pieces from 1/16 sq. medium balsa. Join fuse sides together, first with top and bottom sheets, then add cross pieces. Install small balsa sheet in front for adding thumbtack weights. Cover with light tissue and thin mylar per plans.

Bend the landing skids and wires to shape and install. Attach tailboom and braces. One last thing . . . using 5-minute epoxy, put a layer of glue on the inner edge of the tube hole in top sheeting and around tube at hole height, then sand it smooth. This acts as a tube bearing and is very important. A little oil at all metal bearing points will help also.

To balance the helicopter, pick it up by the upper rotor in the center. The rotor tube should hang straight down, or tilt slightly back (nose down). C.G. location is not critical.

The Hughes 300 flies best indoors (no wind). It is so predictable, that by counting the turns in the 4 strands of 3/16" rubber, it can take off and go up to 6 ft. and land back on the same spot. For indoor flying, start with about 80 turns and work up. Don't forget the rubber lube.

Many happy ups and downs! ●

#11742