



FRANK SCOTT

The night is All Hallows' Eve, and ghostly figures scamper through the darkness to the lighted doorways where they demand their yearly tribute of sweets. There are, however, others who may call this night Lammas, and from overhead we hear the rustling of wind-blown garments as we glimpse a witch in flight on her way to the Witches' Sabbath.

Spooky indeed, but alas impossible. Magic is a flimsy substitute for aerodynamics, and so we have had to overcome the ancient broom's shortcomings with more modern power and balsa.

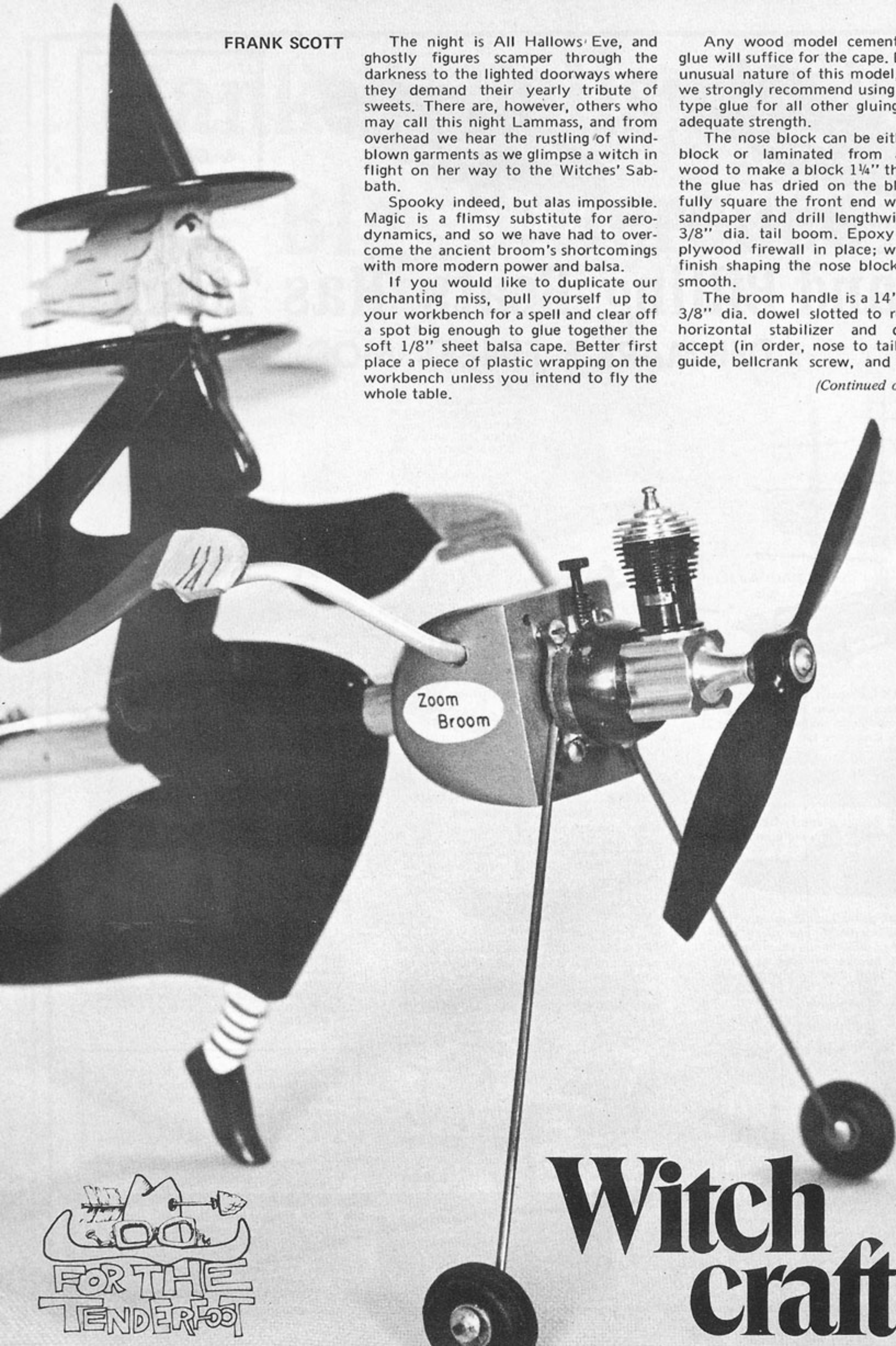
If you would like to duplicate our enchanting miss, pull yourself up to your workbench for a spell and clear off a spot big enough to glue together the soft 1/8" sheet balsa cape. Better first place a piece of plastic wrapping on the workbench unless you intend to fly the whole table.

Any wood model cement or white glue will suffice for the cape. Due to the unusual nature of this model, however, we strongly recommend using an epoxy-type glue for all other gluing to insure adequate strength.

The nose block can be either a solid block or laminated from any sheet wood to make a block 1 1/4" thick. When the glue has dried on the block, carefully square the front end with saw or sandpaper and drill lengthwise for the 3/8" dia. tail boom. Epoxy the 1/8" plywood firewall in place; when cured finish shaping the nose block and sand smooth.

The broom handle is a 14" length of 3/8" dia. dowel slotted to receive the horizontal stabilizer and drilled to accept (in order, nose to tail) the line guide, bellcrank screw, and both the

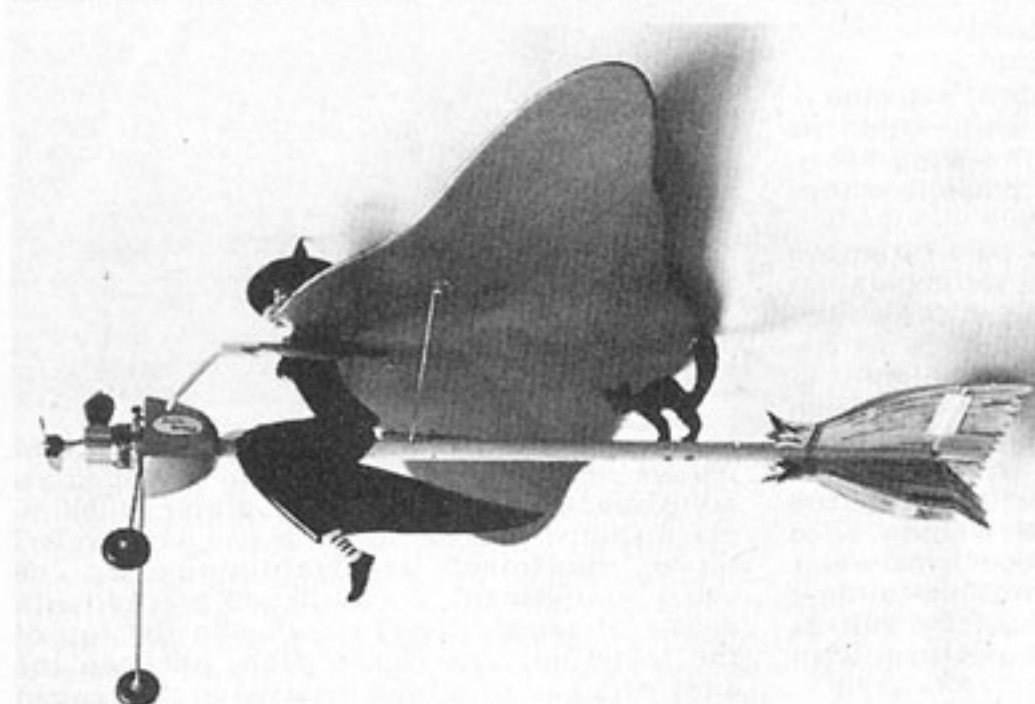
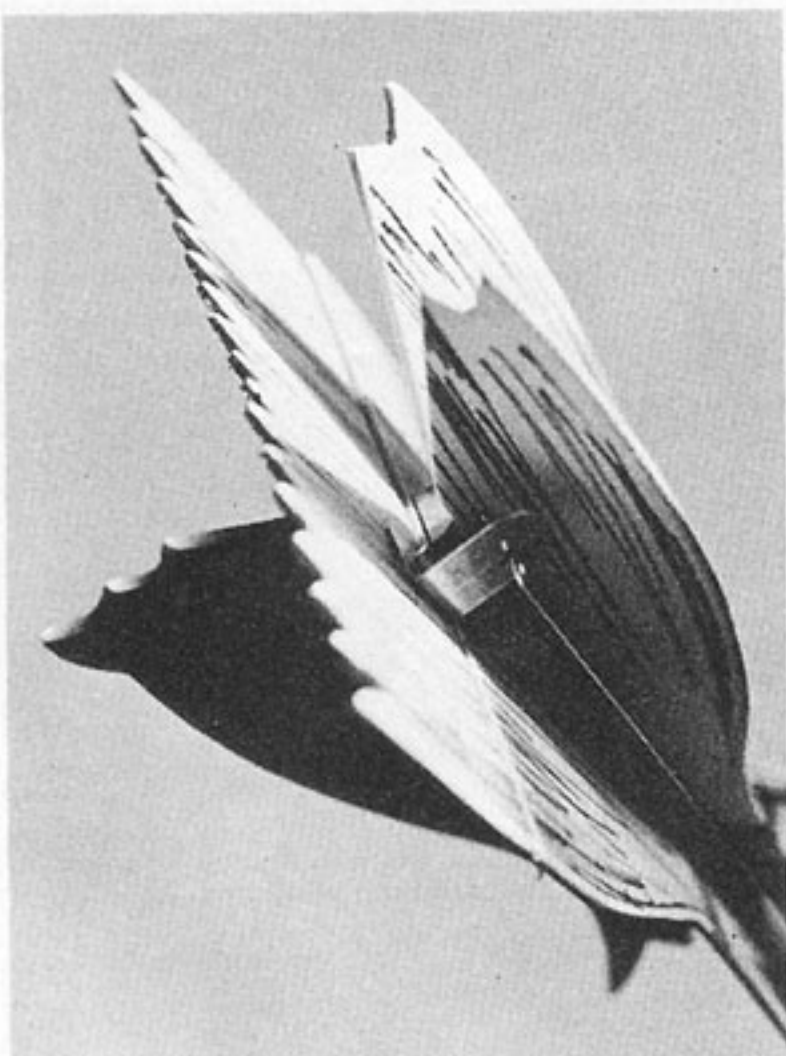
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FOR THE  
TENDERFOOT

# Witch craft





Above left: The tail straws. With a bit of up-broom it will fly like magic. Dowel broom handle was carefully notched for the stabilizer and rudders.

Above right: Note the use of wire leadout guide. Don't guide the flying wires by the wing, you'll bank the model inward too much and not have enough line tension.

Left: Cape is lots of wing area. Model flies fairly slowly so choose calm weather for safety of the Witch.

#### Materials

- 1 - 1/8 x 3 x 36 balsa
- 1 - 1/4 x 3 x 18 hard balsa
- 1 - 3/32 balsa scrap sheet
- 1 - 3/8 dia. birch dowel
- 1 - 1/8 plywood
- 1 - 1/16 plywood
- 1 - 1/32 plywood
- .045, 1/16" dia. music wire
- Pair 1" dia. wheels
- 1/2 A bellcrank and horn
- 1/8" dia. aluminum tube
- No. 2 sheet metal screws
- Glue
- Fuelproof dope: clear, red and black

## WITCH CRAFT

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cat's feet. With the stabilizer slot cut and holes drilled, this boom may be glued into the nose block.

Our bewitching aviatrix is cut from the hardest piece of 1/4" balsa available. After she has been shaped and sanded, saw her in two to allow for the broomstick. Wrap rough sandpaper around the broomstick, rough side out, and slide the witch halves back and forth in order to relieve them for a good fit with the boom. When you're satisfied with this fit, the witch may be epoxied to the broom handle.

The cape, which sustains our craft as a wing, needs only to be cut to shape and the edges sanded round. The wing is attached to the body with the 1/8" plywood "T" which passes through the witch's body, and reinforced by the 1/32" plywood plate at the under side of the leading edge. At the trailing edge, the wing is secured in place with the 1/8" plywood "Familiar" cat. The attachment of the cat is facilitated by the pegs left on the bottom of his feet which are glued into holes in the broomstick.

The 1/16" plywood fins are a bit

stiff for broom bristles, but being plywood, they are strong and help balance the machine. Of course balsa may be substituted, but then ballast may be required. Note that the horizontal stabilizer is made in one piece, is substantially larger than the other fins, and passes through the fuselage slot. The other fins are simply glued onto the broomstick. The lower vertical fin also serves as a rudder with its trailing edge bent 3/8" to the outside of the circle.

Incidentally, the rudder offset is the only line-tensioning device needed. The position of the line guide makes any wing tip weight or engine offset unnecessary.

In keeping with our modernization of the ancient vehicle, handlebars are provided for improved rider comfort. These are bent from 1/8" aluminum tube, and the witch's 3/32" sheet balsa arms are epoxied in place.

So much for the airframe. To give this project real color, it's time to decorate. A felt tip pen can be used to handily sketch in broom bristles and bindings and, after achieving some confidence with the broom, the witch's face. Give the entire model two coats of clear fuelproof dope, lightly sanding be-

tween coats. No fashion discerning witch would be caught in a drab cape, so a bright red lining is appropriate. The top of her cape, dress, hat and shoes are black. Stockings are the traditional red and white stripe. The engine pod can be any color that turns you on. The remainder—face, hands and broom—are clear finished.

Bend landing gear wire to shape and attach wheels. The landing gear is sandwiched between the firewall and engine when the engine is mounted with No. 2 sheet metal screws.

Mount the bellcrank and hook up pushrod. Finish the control system with the line guide, bent from .045 wire, epoxied in place.

Now for the final inspection. Check the model's balance and add ballast as necessary. If built according to plans, balance ought to be right with a Cox Pee Wee .020. Check for control freedom, warps, and anything which may put a hex on your witch.

At the flying field, try your flying sorceress on short lines (15 ft., for example). Fill the tank with the appropriate elixir, mutter the usual incantations, and with a bit of up broom it should fly like magic!



