ZEPHYR

Building the 'Zephyr' is a breeze!

Although not suitable for a first indoor model (I would suggest if you have no indoor f/f experience, you try a 'Hangar Rat' first) the 'Zephyr' is a simple little rubber-powered canard that is a real eye catcher, and quite a performer to boot. Canards are fun and are capable of surprisingly good flights. Being a stick model, the 'Zephyr' is very quick to build. Indoors or out, its consistent performance will make you wonder why this type of layout isn't explored further. (It's interesting to note that, according to Webster, a canard is "an obsolete kind of airplane with the rudder and elevator in front". Somebody better tell Burt Rutan about this, so he won't design any more "obsolete" aircraft like the Vari Viggen, Vari Eze, or Quickie!)

MOTOR STICK

Cut the motor stick to length using the motor stick provided -3mm x 6mm ($\frac{1}{8}$" x $\frac{1}{4}$") balsa. Glue on the thrust bearing and incidence blocks for wing and canard. Next, cement the thrust bearing tube and front motor hook in place. Wrap these with thread and cement well. Sand the motor stick to an oval section, leaving the tops of the incidence blocks flat.

WING

Cut wing template (harden edge with superglue or substitute ply if you prefer). Slice 14 ribs from the $\frac{1}{4}$ grain 1.5mm ($\frac{1}{16}$") sheet provided, and set them aside.

Centre section: Pin down leading and trailing edges from medium hard 1.5mm ($\frac{1}{16}$") strips (the long ones) provided. Cement three ribs in place - note **all** trimming to length of ribs is done by cutting the excess from the aft end of the rib. The wing tips are made in similar fashion.

Wing assembly: When all three components are properly dry, pack up the trailing edge of the centre section 3mm ($\frac{1}{8}$") off your building board, and glue on wing tips with 57mm ($2\frac{1}{4}$") dihedral at the rear outer end of each wing tip.

CANARD

The canard is built just like the wing. Using the leftover wing ribs, when dry, raise each tip 34mm ($1\frac{3}{8}$") for the proper dihedral. (It is easier to pin one wing flat on board, and raise opposite tip 68mm ($2\frac{3}{4}$").

PROPELLOR

Cut two prop blades from 0.8mm ($\frac{1}{32}$") $\frac{1}{4}$ grain balsa sheet provided. Prepare the 34mm ($1\frac{1}{4}$") long 3mm x 5mm ($\frac{1}{8}$" x $\frac{1}{16}$") pine prop hub. Accurately drill a .025" hole vertically through the exact centre (a clipped pin can be used as a drill bit!) then slant each end of the hub 10mm ($\frac{3}{8}$") deep on opposing angles. 60 degrees is effective. See scrap view on plan.

Assembly: Fit the blades onto the hub and glue, checking the blade angles are even and consistent with side view on the plan. Coating the back of each blade with dope (or very thin glue) whilst slightly damping front face, will give a nice camber to the blade.

The hub may now be sanded to a pleasing section and the propellor sanded and balanced. Finally slip the propellor drive shaft with hook through the thrust bearing tube, add two teflon washers and bend over the end of wire shaft to engage the prop hub.

COVERING

The wing and canard are covered on the top surface only with tissue. Don't shrink the tissue with water or dope, or you'll have to build a whole new wing and canard! The larger sheet of tissue provided is for the centre section and the canard foreplane. The smaller piece is for both wing tips.

ASSEMBLY AND FLYING

Glue the wing to the motor stick. Spot-glue the canard in place. The motor is a single loop of the rubber provided. Balance the model where indicated with the motor in place. Hand glide the model to get the final trim, adding small bits of clay to the nose or tail as required. When you're satisfied with the glide, try a few hand-wound power flights. The 'Zephyr' should fly in left circles, spiralling up under power. Tilting the canard toward the direction you want the model to fly will control the turn. Use a winder for maximum duration.

You can experiment with propeller pitch and curvature and motor width and length for extra duration. Indoors you need a long cruise, and outdoors a more 'zippy' climb, however, be warned! We have lost O.O.S. every single 'Zephyr' we have flown outdoors!