

This particular model started life as a Jumbo Scale (Over 48 inch span, rubber power) and was converted to "R/C Free Flight" for this article.

F/F-R/C D.H. HUMMING BIRD

We wanted to prove a point. ... that pulse rudder was the ideal system to control a free-flight model. With Walt Mooney's help ... mission accomplished. The Humming Bird was a free-flight first and an R/C model second. The transition was painless, in fact, it became a perfect combination.

By Walt Mooney

#This was the first light plane designed by the De Havilland firm. It was built for the Daily Mail's light plane trials at Lympe in October 1923. A three-view of the Humming Bird and several pictures of the various versions (mostly with differing engines), are presented in Volume I of British Civil Aircraft 1919-59, by A.J. Jackson. On page 296 is the photo that inspired this model. It

shows G-EBRW taking part in the comic event at the Woodley Flying Meeting on 5 April 1930 piloted by a gentleman wearing a Roman helmet.

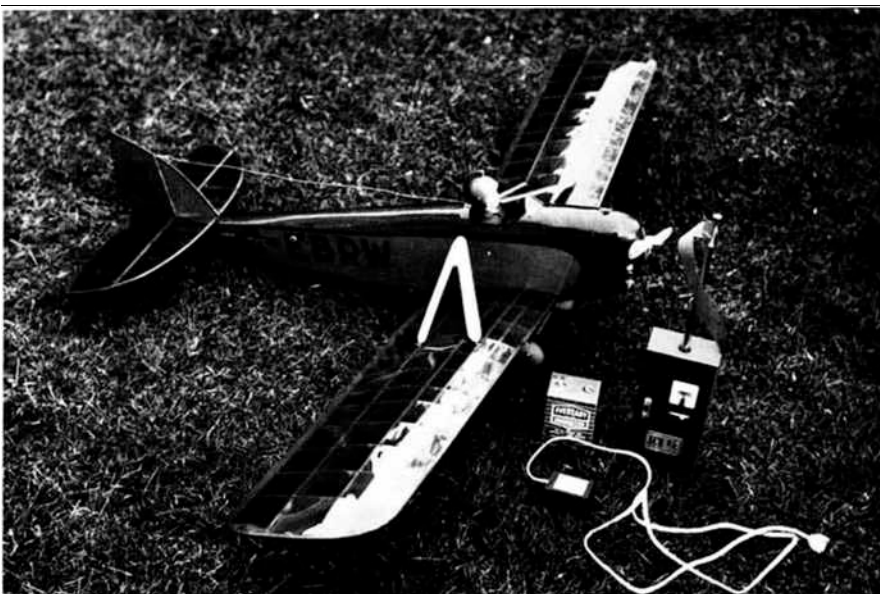
The model actually started out as a Jumbo (over 48" span) rubber scale model for the Flight masters annual Jumbo Scale meet. One of their rules requires a pilot, so I modeled the happy Roman warrior as well as the G-EBRW.

As a rubber model it flew but did not place, mostly because it was finished just the night before the contest. (*Of course nobody ever does that! Ed.*)

However, Bill Northrop thought it would fit in with a concept of his which he calls Radio Controlled Free Flight. So, with the advent of Ace's Commander 72 radio control system, a conversion project was born. The Perelli rubber and the propeller with a wire hook was replaced with a Cox .049 and the Ace 72 system.

Now the Ace 72 system is the answer to a beginner's prayer for an easy way to start out in the R.C. business. The connections between the various components are color coded and everything is extremely neatly done. We used the Stomper actuator in this model with a scale rudder (*Big!*). Even so, the R.C. version turned out to weigh the same as the rubber version, because a 48 inch span rubber job uses quite a bit of Perelli and the Ace 72 system is quite light.

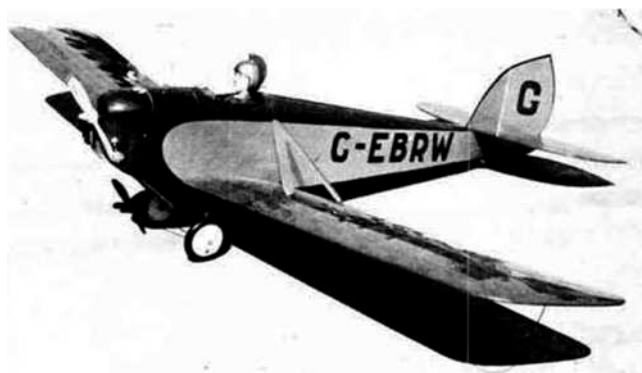
Only the actuator need be installed in the model in a rigid fashion. The radio and the battery/switch combination can be encased in some rubber foam and dropped into a hatch in the



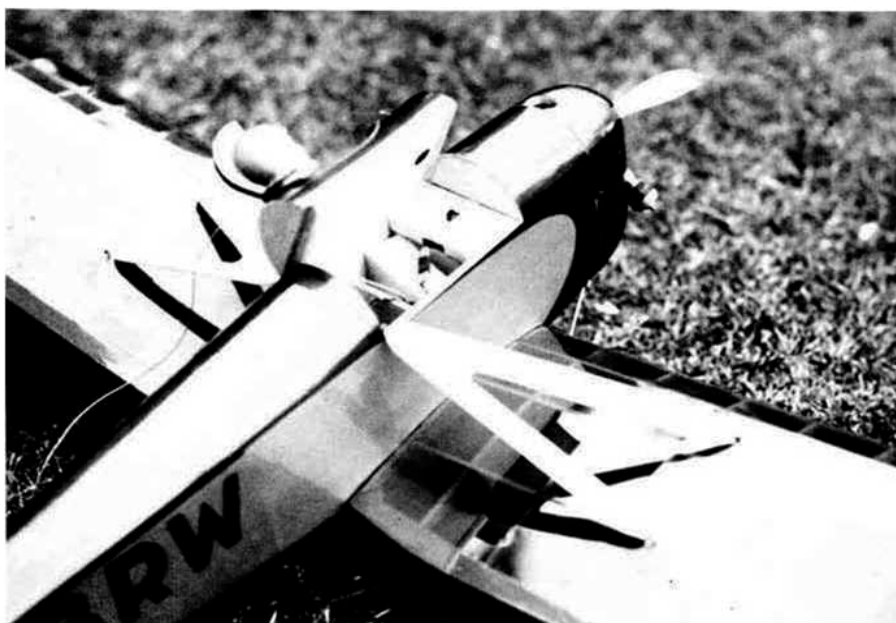
What better way to keep your F/F scale job from wandering into the next county ... or that nearby tree? Ace Commander unit has given terrific boost to pulse rudder activity.



Here's the "Hummin Boid" doing its thing the first time around, as a Jumbo Scale at the 1971 NAR Flight masters contest. Berrara times.



See that dowel head between the "B" and the "R" ? For old times sake, Wait left the rear rubber holder in place. RC version no heavier.



Access to the Stomper actuator. Commander receiver, and switch/battery pack comes with a flip of the hatch. Switch can be operated through the cockpit without disturbing the Roman pilot.

model, making convenient to use single radio in several models so long as each model has its own actuator.

Ace sells a charger, size matched to each of the available airborne battery pack sizes, so you don't even have to think about the charging rate but just plug it in. You do have to remember to put the switch in the "On" position, but then most of us can learn to do that.

An owner's manual comes with the Ace '72 system and it is really worth reading. It also saves this author from writing a lot of flying instructions. What the Manual says goes for this model, although I'll have to admit I made all of my test flights R.O.G., partly because a poorly adjusted power pattern won't even get it off the ground and thus can't hurt the model much, and second, because I find low wing models a little awkward to hand launch because they can't be held near the CG.

G-EBRW took off perfectly every time. On the first flight, the ship pulled to the left, but this turning tendency was easily controlled by the radio. It turned out that the left wing had more washout than the right wing.

The model was covered with Mono-kole. We used silver for the fuselage and for the wing numbers, and transparent red for the rest of the airplane. It sure turns out pretty this way, although the finish wouldn't be expected to garner too many points in scale judging.

The model was constructed as far as possible in the same manner as the real G-EBRW. The built up Monokote wings and tail simulate the fabric covered originals, and the sheet balsa fuselage construction simulates the plywood covering of the real fuselage. The model basically follows the traditional construction methods and should require little more than the plans for the construction effort.

A few special details are noted as follows. **(Did you notice? He didn't say, "Construction is straight forward." Ed.)**

The outlines for the horizontal and vertical tails, and for the wing tip bows, are laminated out of four pieces of one sixteenth by one eighth balsa. Cut the forms out of balsa or box wood and wax the edge so the lamination won't stick to it. I use a color crayon for waxing because it's easy to see where the form needs more wax. Use white glue, thinned about half and half with water, to cement the laminations together. Put glue on each stick and lay the next one on it until there are four in the stack. Wet the outside of the last stick with water and bend the stack around the form, using masking tape to hold it in place while it dries. The secret to bending the stack of sticks around the form without having them break is to attach one end to the form securely and then keep some tension on the stack as you "pull" them around the form. Laminated tips are stronger and lighter than tips cut out of several pieces of sheet. **[See ".Scale F/F", this issue. Ed.]**

The most common structural failure on a model is a broken wing leading edge. To avoid this as far as possible the Humming Bird uses a piece of three- sixteenths diameter birch dowel for the wing leading edge.

The second most easily damaged part of a model is the landing gear, and on G-EBRW the landing gear is made so that the forward struts are held by rubber bands and the main legs pivot in a cross tube in the fuselage. The landing gear can thus flex in the aft direction if it hits an obstruction.

Continued on next page

Because of the size of the model, the wings are made removable. Tubes are installed in the fuselage to accept the one eighth diameter music wire spars that stick out of the wing root ribs. These wires can be bent to give the desired dihedral angle. The dihedral shown on the plans was designed for a free flight rubber model and has worked well in R.C., but as an R.C., less dihedral might be acceptable.

The struts are more for show than for strength on the model and merely fit into two small loops of wire let into the wing and into a tube in the fuselage. Because of this slip fit and the wire wing root attaching method, the wing and struts will flex and even come off in the event of a collision, absorbing some energy in the process and reducing the damage.

Access to the radio and the battery and the Stomper actuator is thru the top of the airplane at the cockpit area. A hatch is made that includes about four inches of the top, extending forward from about a half inch behind the pilot. The On/Off switch is accessible inside the cockpit opening. Three compartments are provided under the hatch, separated by balsa bulkheads. The forward compartment is for the battery and has a snug fitting cover in which is installed the switch. The next compartment is for the radio, and the most aft compartment is for the actuator. The Stomper actuator is attached to a piece of one sixteenth birch plywood by its own mounting screw, and the plywood is cemented permanently in place on the fuselage bulkhead at the back of the compartment. The model uses pushrod actuation as described in the Ace 72 manual, with a rudder horn on the right side of the rudder below the horizontal tail.

The radio and the battery are simply wrapped in foam rubber and pushed into their compartments, just a light snug fit will keep them in place. The antenna is threaded through the top of the hatch behind the pilot and extends back to the top of the vertical fin where it is held by a small rubber band.

Scale details can be added to the model to the limit of your impatience to get out and start flying. Look at the photos in "British Civil Aircraft 1919- 59," vol I to get as many as you want.

On this model we didn't try for too many, but we did add the tail struts and a couple of old Cox cylinders to the cowl to indicate the real engine. Williams Brothers wheels were used. The tailskid was fabricated out of ply and uses a length of "bobby pin" for the iron shoe. Wing tip skids are bent up out of music wire and installed in holes let into the wing spars out near the wing tips. The narrow track landing gear required them on the real plane and they keep the wing tips from getting scuffed on the model too.

I'm no expert on R.C. but the model seems to have plenty of control, and is a real joy to fly. All of our flights have been from unassisted takeoffs and it's easy to get it to land nearby at the end of the glide. Bill Northrop's idea for R.C. Free Flight makes a lot of sense. For a modest investment you can install the Ace 72 and with the rudder control you can eliminate that bad turn on the first flight of your new scale ship, you can keep it from flying into that tree, and even possibly save a few steps in retrieving it.

Of course, you also have the opportunity of learning about pilot error, and the effects of showing off in front of your friends at low altitude, but these lessons are good for your personal growth too.