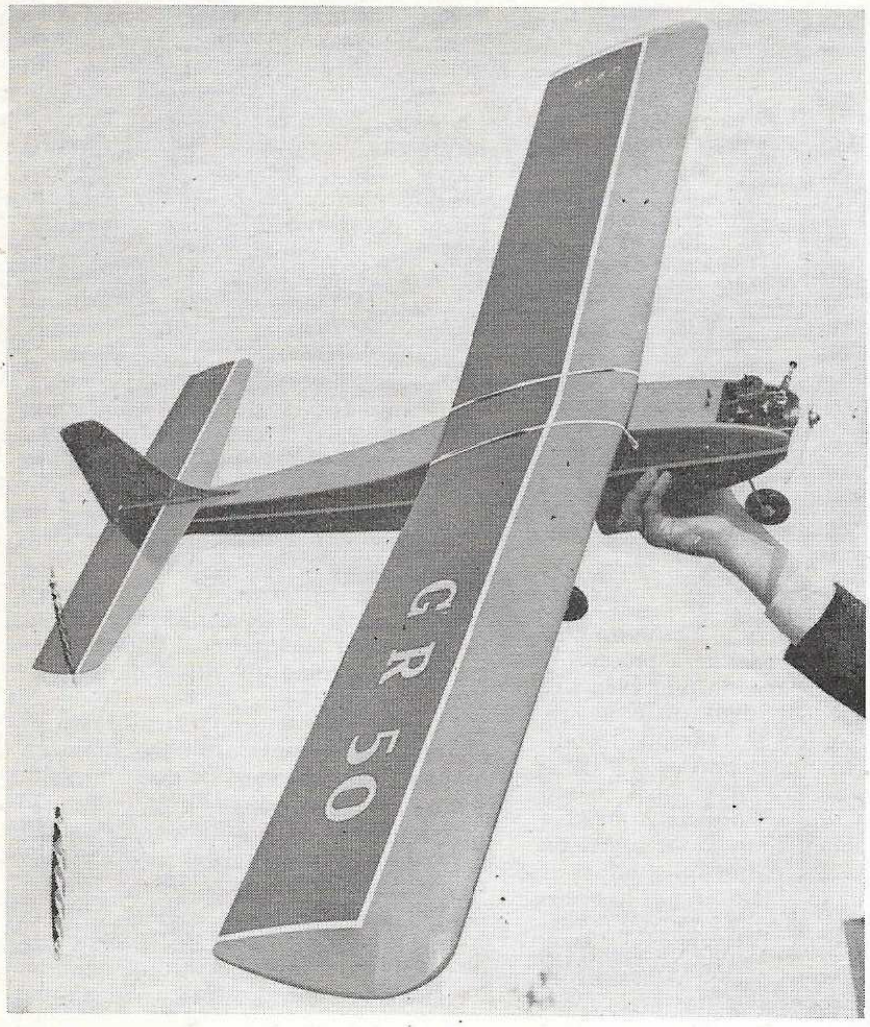

GHOST RIDER 50 R.E.M.

(Rudder-Elevator-Motor)

By David Boddington

For 'YOU HAVE CONTROL' series readers looking for a follow-on from the TYRO MAJOR without the need to buy a bigger motor,— here's the answer!

Introduction

Although the original Ghost Rider 50 was designed for 'Galloping Ghost' pulse proportional equipment, it has now been modified for the more sophisticated proportional control systems. This design has been developed over a number of models with the aim of producing a model that is reasonably easy to fly, aerobatic, simple to build and with pleasing appearance.

It is, of course, impossible to 'guarantee' successful flying for a builder of this or any other model. Providing, however, the Ghost Rider 50 is built precisely to the plan and instructions and the radio equipment functions correctly, success will only be limited by the ability of the flyer. The Ghost Rider 50 is not recommended as a first radio model, it flies a little too fast for that, but can be considered as an intermediate training model for Radio Control flyers. It is certainly not a difficult aircraft to fly and very easy to build, but there are more stable and slower flying radio models such as the *Tyro Major* for the true beginner to 'cut his teeth on'.

CONSTRUCTION

Some of the methods of construction may not entirely agree with your own, but please think twice before amending the form of construction. This is particularly important if 'improvements' result in a heavier structure and most alterations seem to have this effect. Any increase in weight of a model of this type can only result in a deterioration of flight characteristics and, although the total weight of the model is not critical, additional airframe weight is wasteful.

Before commencing construction, familiarise yourself with the drawing and the instructions and ensure that all stages of the construction of the model are thoroughly understood. Mark accurately on the plan the position of the radio equipment, this will make installation more simple at a later stage. P.V.A. glue is recommended for all construction with the exception of engine bearer joints to the plywood former, where an epoxy adhesive should be used.

Fuselage

Mark with a ball point pen, on the fuselage sides the position of all doublers, formers, etc. When marking the positions on the left-hand fuselage side, first transfer the fuselage outline and doublers, etc., to the back of the plan by using carbon paper (face up) under the plan and marking through. Glue the doublers and uprights in position, note that formers F2 and F3 fit between doublers and these should be temporarily positioned when gluing the doublers. Mark the position of the engine bearers on the 3/16 in. nose doublers and, after cutting the bearers to shape and drilling holes for the nose wheel leg and engine mounting plate screws, glue to the doublers.

Before former F1 can be fitted it must be drilled to receive the nose wheel saddles and throttle cable tube. The position of these latter will depend on the particular engine you propose using and the sides on which the throttle arm is situated.

When the fuselage sides are completely dry, formers F1, 2 and 3 can be added to both sides, making sure that the fuselage is true and square. Temporarily hold the stern posts of the fuselage together with clothes pegs to ensure accuracy at the tail end. Check from time to time whilst the glue is drying that the fuselage sides have not 'sprung' apart; a good way of avoiding this is by wrapping around the fuselage, at former positions, with masking or drafting tape.

Taper the stern posts to mate accurately and glue permanently, pinning together until dry. The fuel tank compartment should be given at least two good coats of fuel-proofer before the fuel tank is fixed, as should the underside of the top nose sheeting. Complete the fuselage construction by adding the top and bottom sheeting including the $\frac{1}{8}$ in. plywood for the main undercarriage and $\frac{1}{8}$ in. U/C positioners. Sandpaper thoroughly, rounding off the corners of the rear fuselage slightly and rather more around the nose area where the doublers increase the thickness of the fuselage. Fuelproof thoroughly around the engine bay both before and after painting. Close attention to fuel-proofing to all parts where fuel seepage might occur (including the inside of the fuselage at the wing seating position) can increase the life of the model considerably.

Wings

The full depth main spar, together with top and bottom leading and trailing edge sheeting plus capping strips to ribs results in a light but strong wing panel. A big advantage with this form of wing is its rigidity, so important when covering with materials such as Kwikcote or Solarfilm or nylon. Pin the port wing main spar vertically in position over the plan (dry soaping the plan first to avoid sticking) and pin the scrap $\frac{1}{2}$ in. sheet leading edge packing in position as shown on the drawing. Cut seven trailing edge packing pieces from scrap and pin them in position between wing ribs. To these packing pieces pin the bottom 1/16 in. trailing edge and check that the wing ribs fit correctly onto the main spar and trailing edge, glue all ribs into position noting that the root rib is angled for dihedral.

Mark the position of the wing ribs onto the leading edge by holding the leading edge temporarily in position and marking with a ball point pen. Glue on the leading edge, making sure the height of all the wing ribs is identical. Add the trailing edge and leading edge to sheeting top capping strips and centre section top sheeting. Capping strips should be cut from scrap 1/16 in. sheet. When dry, remove the wing panel and pin and glue in position the bottom leading edge sheeting, centre section sheeting and rib capping strips. Complete assembly by adding the wing tips and stiffeners. Trim the leading edge to shape, using a razor plane and finally sand the whole of the wing smooth including the root rib which should be sanded onto a flat surface to ensure a true surface.

Repeat the operation for the starboard wing. Glue the two wing panels together, checking for true alignment, and leave pinned together until completely dry. Note: P.V.A. glue can take a long time to dry where there is little air present. Cut slots for the dihedral brace and glue in position. Add micro-ply reinforcement to the leading and trailing edges, at the points shown on the plan, where the wing retaining rubber bands cross. Ailerons and aileron servo box can be constructed to the modeller's requirements.

Tail Surfaces

The construction of the tail surfaces is straightforward and should be obvious from the plan. Sandpaper all tail surfaces smooth, rounding off the hinged edges. Whatever form of hinge is used, it is essential that the control surfaces are absolutely free-moving. No excessive stiffness in hinges can be tolerated. The hinges should be made *after* the surfaces have been covered and fuel-proofed.

Check for true alignment of fin and tailplane on fuselage before finally gluing in position with $\frac{3}{8}$ in. triangular supports on either side.

Finishes

With so many alternative covering materials, paints and synthetic finishes available, no comprehensive instructions are given here on applying coverings and finishes. It should be remembered, however, that the two important considerations in applying finishes are strength and lightness. Tissue paper, even the heavyweight ones, are not recommended because of their poor resistance to tearing and if nylon is used, do not overdo the paint decoration, otherwise the weight will be too great. The other important consideration as mentioned before, is to ensure that the model is well fuel-proofed.

Radio Installation

Again, there are so many alternative radio control systems that it is impossible to cover the installation of all types. Needless to say, it is essential that the radio equipment works 100 per cent both on bench tests and under operating conditions on the flying field. A word here about single-channel rudder only of rudder and engine installations. Although the model was not specifically designed for this form of control, the Ghost Rider 50 makes an attractive advanced single-channel model with the increased wing dihedral. Escapements, motorised servos or magnetic actuators can be used, although the latter are recommended for maximum control effect. What-

Ghost Rider R.E.M.

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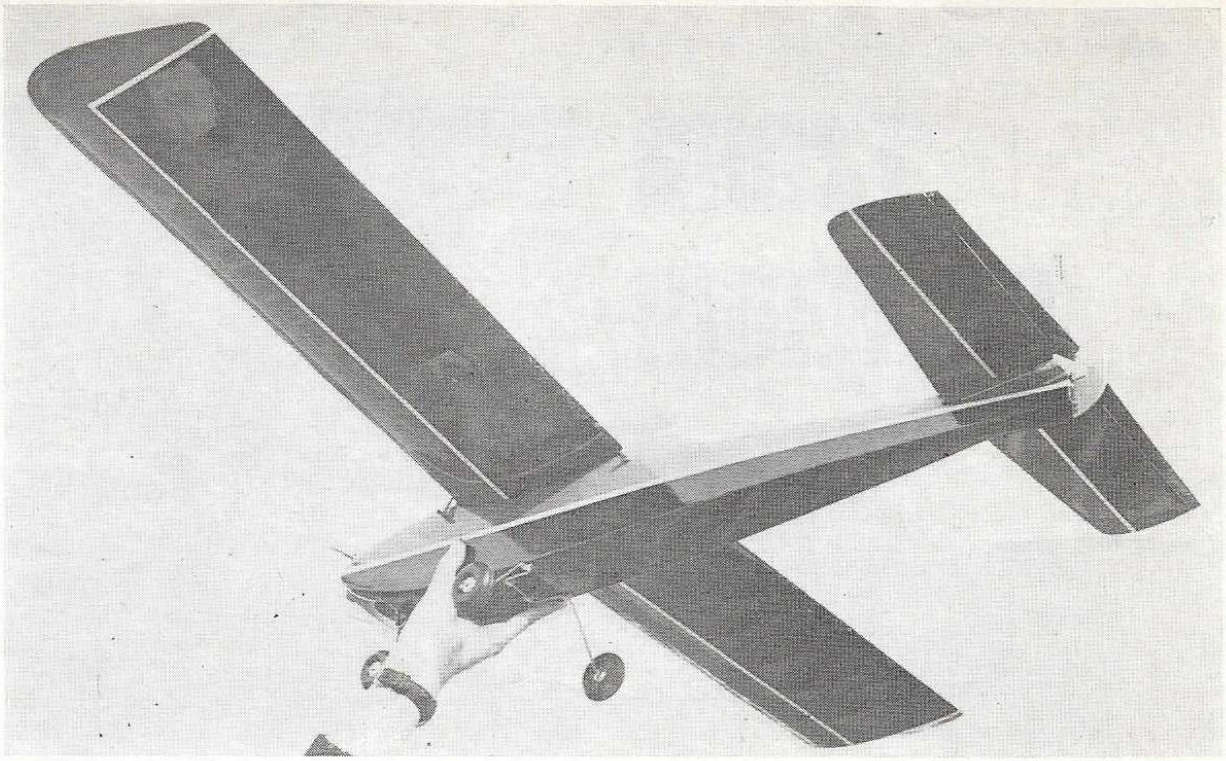

ever the type of radio then, make sure it is installed neatly, with no loose wires hanging about, the receiver and batteries well protected and the actuator and pushrods all smooth and easy in operation.

Flying

Before you get on to the flying field, make sure the Ghost Rider 50 balances at the correct point and that all surfaces are free from warps or twists. With a tarmac area, commence tests with take-offs at about ⅔rds power (power reduced by throttling back on the transmitter); over grass, the model should be in hand launched by a helper at the same power setting. Content yourself on the first part of the initial flight with progressing upwind, gaining height steadily. Should the Ghost Rider 50 deviate from a natural straight and level flight path, corrections to the model's attitude can be made with the trims on the transmitter. Make a note of the trim changes made and correct accordingly on the control surfaces of the model at the end of the flight. Rudder and elevator trims on the Tx. are most useful during these early test flights but they should not be permanently used to counteract poor model trimming.

With the model trimmed out and confidence increasing with every flight, it is time to try a few more advanced manoeuvres. The Ghost Rider 50 will perform most of the scheduled aerobatic manoeuvres when ailerons and one of the larger capacity engines are fitted. Without ailerons the model is still very aerobatic but rolls are less axial.

That leaves me little to say except to remind you again to double-check on all equipment before flying – are those DEACs well charged, is the range good enough, are the linkages really free, etc., etc.? If you only have a limited amount of R/C flying experience – swallow your pride and ask a *really* experienced pilot to take the first few trimming flights.