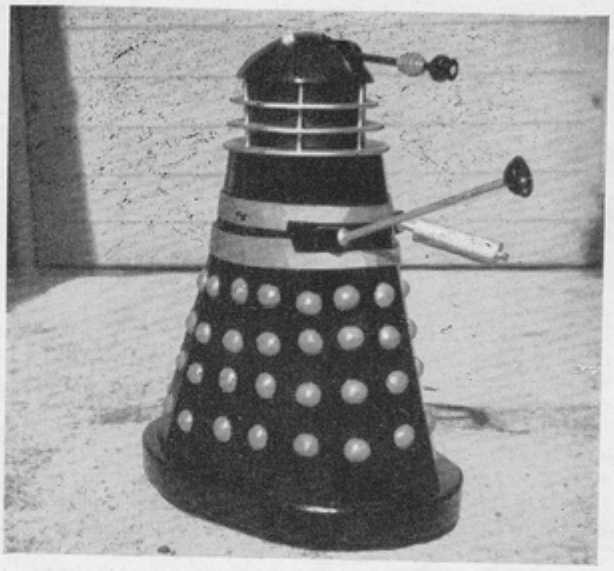


R/C DALEK

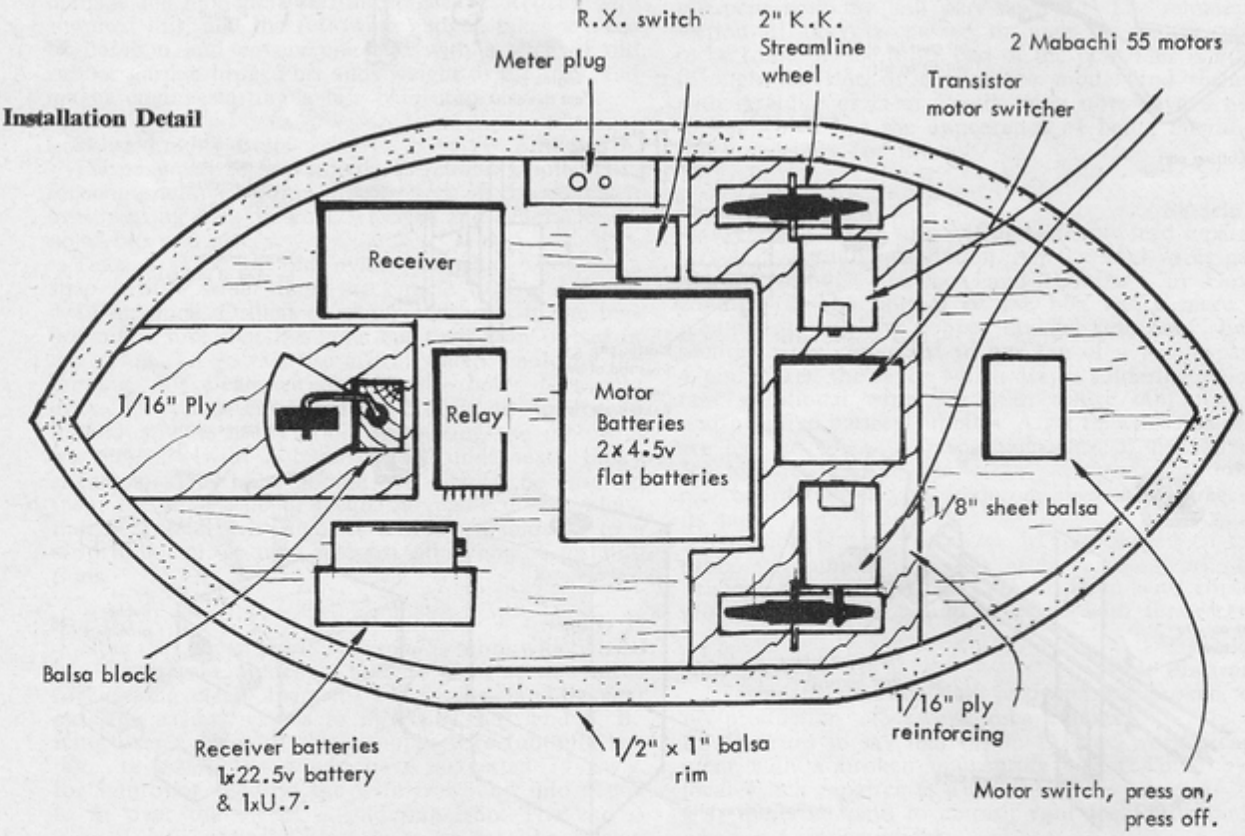
C. ROWLAND BUILT THIS SIMPLE PROPORTIONAL CONTROLLED FUN MODEL.

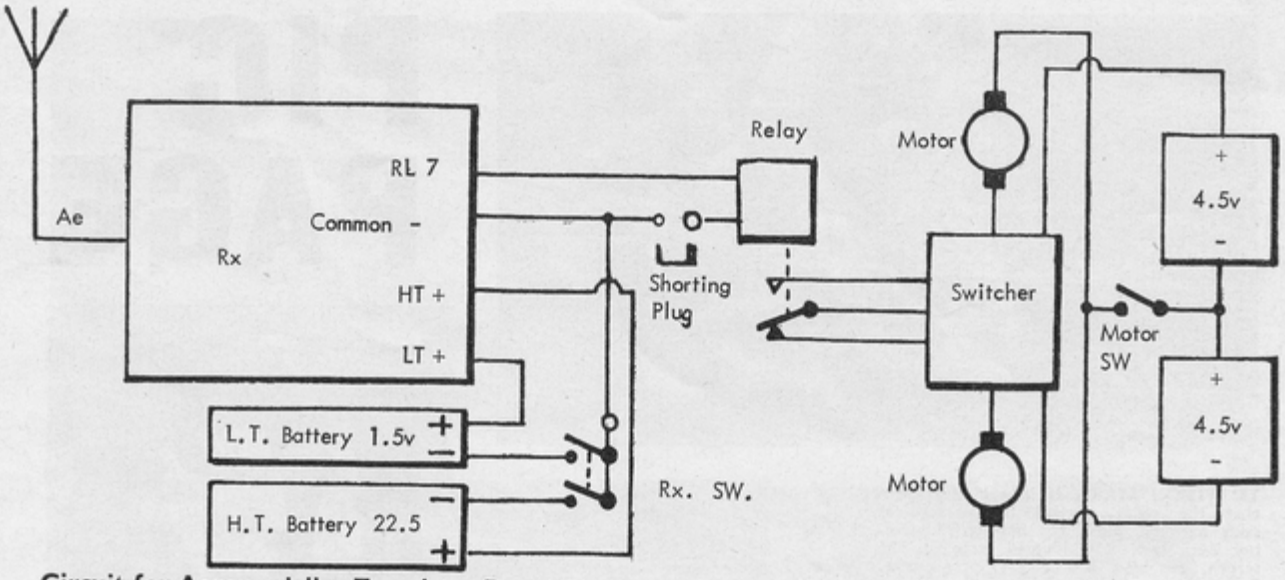
YOU are still in time for Christmas if you start building a Dalek now . . . This model is easily constructed from card and balsa plus a few junkbox oddments. Two Mabuchi 55 motors provide the power and drive a pair of main wheels by friction. The wheels on the original model are Keil Kraft spong rubber streamline types 2 in. diameter and the motors are fixed so that their armature shafts exert light pressure on the tyres. A castoring tail wheel 1 in. diameter is mounted on a piano wire leg pivotted in a block of wood. ☆ in. plywood is used to reinforce the balsa "floor" and the whole superstructure lifts off for access.

Power for the drive motors is supplied by two separate 4.5 v. flat batteries with negatives common to the motors via an on/off switch.

The radio link may be chosen to suit existing outfits, the only requirement being that the receiver has

Installation Detail





Circuit for Aeromodeller Transistor Rx. show

a single pole changeover relay or is capable of operating a low resistance relay (50 to 100 ohms) if the particular receiver used is a relayless type . . . A simple pulser keys the transmitter . . . The pulser may be mechanical or transistorised, the only requirement being that fairly low rate of mark/space be used. The original system employs a MacGregor carrier transmitter keyed via a 2,000 ohm Siemens relay in a two transistor multivibrator circuit.

The receiver is an old Aeromodeller Transistor Rx operating another 2,000 ohm Siemens relay. More recent circuits could easily be employed, but that which the author used was available for this "fun" model at the time.

Steering

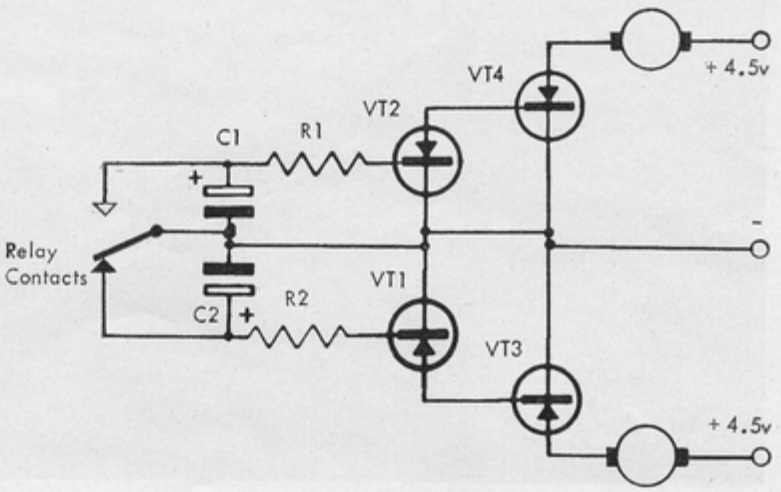
The relay in the receiver feeds negative bias alternately to a transistorised switcher. The switcher is in two parts each half feeding one of the drive motors. Capacitors C1 and C2 remain charged when pulsing at 50/50 mark/space so that both halves of the switcher pass current to their appropriate motors continuously. R1 and R2 values are adjusted so that when the mark/space signal is varied such that the relay contacts dwell longer on one side than the other, the capacitor on the contact which has the shortest dwell discharges completely, cutting off the appropriate transistor and hence the supply to that drive motor.

Thus, both drive motors run at full speed for straight running, a turn is accomplished by blipping one or other of the motors off due to unbalance of the mark/space signal. The switcher also protects the relay contacts, as there is only a small bias current passing through them.

Control is thus fully proportional and slight discrepancies in speed of the two drive motors, either due to varying efficiency, or varying battery voltages, can be compensated for by varying the mark/space signal so that it is not exactly 50/50. For best results; either the pulse rate, or the resistors R1 and R2 should be adjusted so that the capacitors C1 and C2 only just hold their charge long enough to keep the motors running continuously. If the charge is held for too long, the neutral will be too wide, but

(Continued on page 44)

Steering Circuit



R1 : 2.2K
R2 : 2.2K
C1 : 4μF electrolytic
C2 : 4μF electrolytic
VT1 : OC71
VT2 : OC71
VT3 : GET535
VT4 : GET 535

R/C DALEK (*Continued from page 19*)

control can be effected by giving solid signal or no signal as required. Such a method of control is less flexible however, so little time spent in adjusting the system for proportional response is well worth while.

This control system might work in a model delta using flyball actuators, one for each elevon. It would certainly be suitable for track vehicles, paddle boats or indeed any other device which is controlled by varying the speed of two drive motors. One could even build a wide beam boat with twin screws, each mounted well forward and as near the sides as possible.

D.F. MONITOR CORRECTION

In the November issue, lands 1 and 2 are seen to be joined with the result that the aerial wire is shorted to the junction of R1, R3 and C2. In this condition the R.F. amp will not work. The P.C. board could readily be ammended as shown.

With some R.F. transistors used at VT2 the value of C6, the feedback condenser, may have to be reduced or even increased. A value of 20 pf is not uncommon.

If a very high gain transistor is used for VT3 (the original had a gain of only 15) R9 may have to be increased up to 3.3K. Alternatively an extra resistor of 15K can be placed from the junction of R8 and C8 to the positive rail. The symptoms necessitating this modification would be lack of volume due to VT3 bottoming due to its high gain.