

The Ultimate —Absolute Command

THOUGHTS ON
SOLIDTRONICS
BY
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IVES

Zell Ritchie flew this Zell Sabre, Solidtronics equipped in U.N. Nats. at Dallas. He completely shattered it with a series of loops that ended too near the ground. R/C equipment survived undamaged!



EIGHT-CHANNEL fully proportionate control, all simultaneous. Completely sealed in one unit to include servos and batteries (which can be charged "in situ").

All that is necessary is to slip in the batteries, connect the push rods, etc. and away you go. And this for an all up weight of 26 ozs.

No this is not a pipe dream but a solid fact. In fact it is a "Solidtronics" fact.

We were intrigued when we received a leaflet issued by the Solidtronics Corporation of Van Nuys, California, dealing with what is called a "Telemetering Duplexer". It sounded complicated but on the front cover was a picture of a powered model aircraft.

Naturally we investigated and found that it was a system for providing additional channels by means of switching two sub carriers on a proportional basis. This was reminiscent of Dr. Walt Good but we found that it went even further than his system.

The frequencies lie in the band from the low audio section to the low radio frequency spectrum.

In the system described two sub carriers are transmitted and the Frequency Modulation system is used in the Transmitter. The frequency of each sub carrier is varied about a mean value and this provides two commands (or the equivalent of four channels). At the same time a separate multivibrator switches the two sub carriers at a pre-

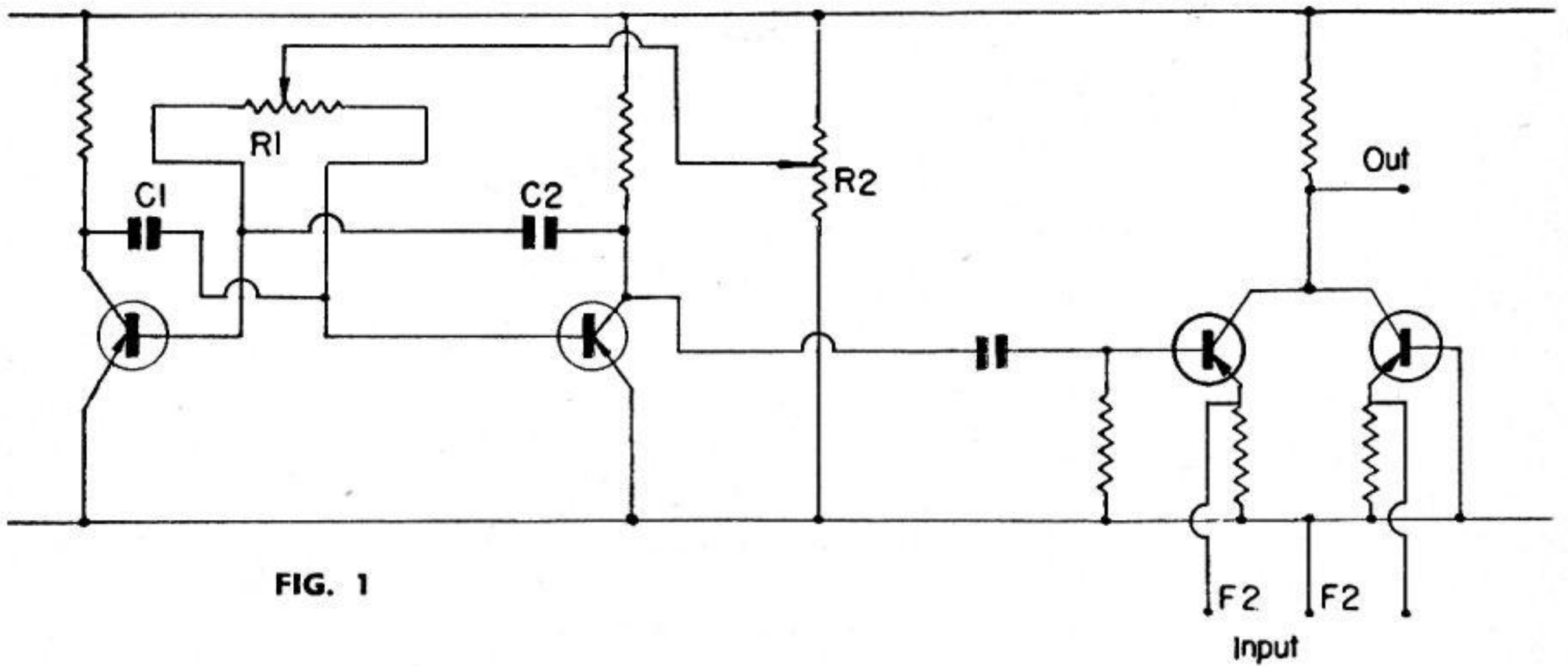


FIG. 1

determined frequency (described as the repetition rate) and also a mark space (called the symmetry ratio). Each provides a separate command (or two channels). The repetition rate is also varied as in the Galloping Ghost system and the result is four commands all fully proportional and simultaneous.

What are the snags? Firstly, of course, the cost is not the smallest item and is in fact around 500 dollars. Range is not exceptional (ground range 1,000 ft.) but is adequate for all purposes and if the model goes out of range a fail safe system operates. To quote "when the model begins to get out of range all controls will show a reduction in travel. When it is completely out of range all surfaces will return to neutral and the throttle will return to the cut off position".

The system incorporates fully propor-

tional servo systems and they will not be self-centring. What happens if the batteries fail when a control is on?

Later we received full details issued by the makers with the units and it is clear that as foolproof a system as could be devised is available for those who have the "lolly" and in fact when compared with some of the expensive reed systems and considering what it gives is not so expensive at that.

Referring to the drawings Fig. 1 gives details of the electronic switch which gives the mark/space and repetition rate and it will be seen that the first half is our old friend the multivibrator as used in the G/G systems. As, however, it is necessary to switch the two sub carriers the output stage is different from the normal. The two sub carrier frequencies are fed to the emitters of the output transistors whose collectors

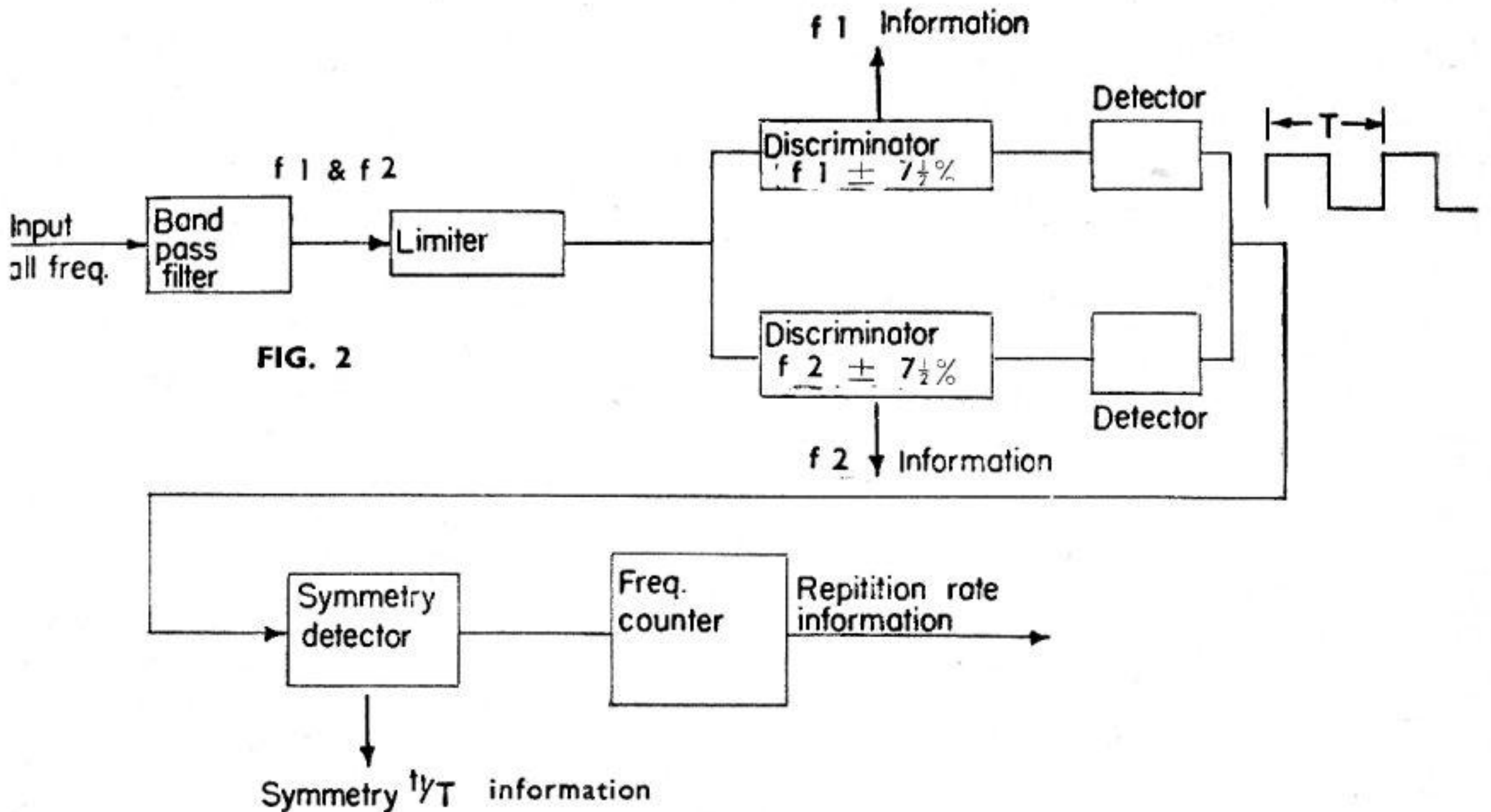


FIG. 2

are in parallel. When one transistor is on the other is off so that the multi-vibrator switches the two and the output is two alternate frequencies switched at a frequency determined by the multi-vib. From the transmitter, therefore, you have an output which includes two sub-carriers each providing a proportional command and these in turn are switched at a varying frequency and varying symmetry thus providing four independent commands all simultaneous with complete freedom from interaction.

The transmitter is crystal controlled.

Figure 2 shows the decoding arrangements. The receiver is a super-heterodyne (presumably crystal controlled) and is tuned at the factory before despatch. From the Super-het output there is a band pass filter and a limiter. This feeds into two separate frequency discriminators whose output is a DC component plus or minus depending upon the frequency transmitted. The DC output f_i and f_{ii} provides control for the servos which operate on the true servo principle. Although not stated each servo will have its associated servo amplifier. The output from the discriminators is also fed to separate detectors whose function is to provide a square wave output which is present as a result of the switching at the Tx.

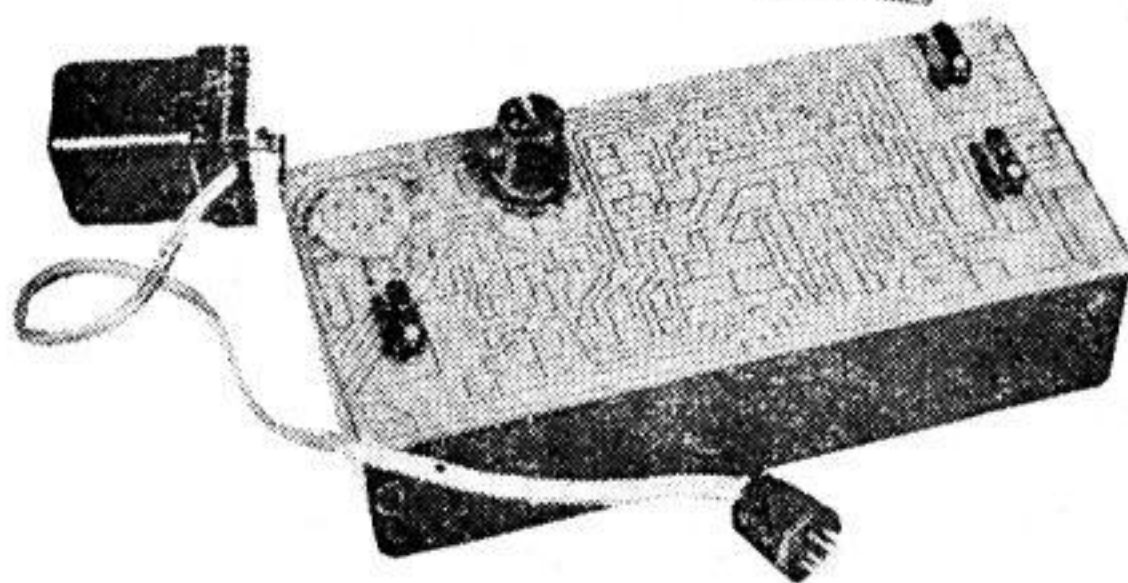
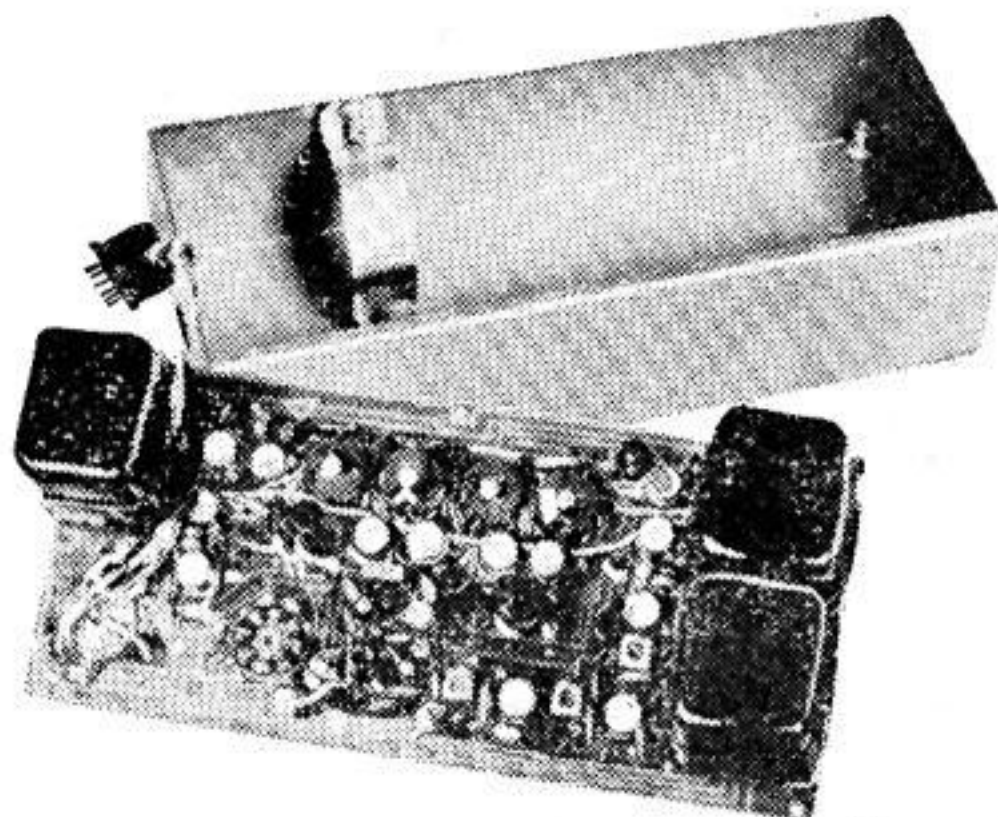
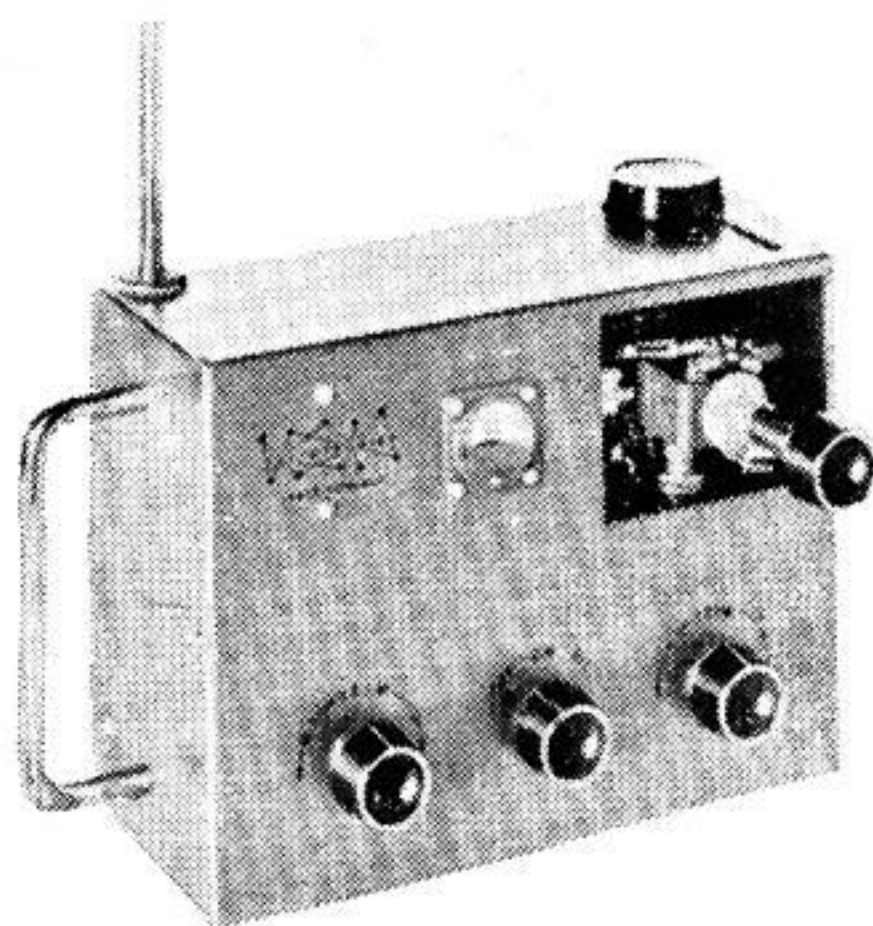
The square wave is fed into a symmetry detector with a DC output for the next servo followed by a frequency counter which provides a DC output for the fourth servo.

Proportional trim controls for rudder and elevator are provided and these can be operated "in flight".

The receiver is completely transistorised (35 transistors) and is fully temperature stabilised. It is claimed that operation can be obtained at minus 10 to plus 140°F.

ARE YOU LICENCED?

Just in case newcomers to Radio Control are not aware of it — you need a licence for operating remote control equipment. No tests, just fill in a form and pay £1 for five years cover. Application form and full particulars from Radio Branch, Radio & Accommodation Dept., G.P.O. Headquarters, London, E.C.1.



What you get for the money! Rudder, ailerons and elevator are controlled by large knob upper right front. Centre lower is on/off and outside knobs for trim. P.C. receiver, stuffed with transistors is below.

It is a solid block and in the event of a mishap due to a piloting error, etc. cannot be damaged on impact.

Altogether an attractive system for those who can afford it. It is understood that Ed. Johnson (Radio Control), The Stores, Larkhill, Wilts., is able to supply to order. Any enquiries should be addressed to him.