

A Simple but Effective Detector-Pentode Receiver.

It is seldom so clear as it should be why two receivers of different make but basically of similar type should behave quite differently when tested under identical conditions. The simpler the receivers the more likely are they to show these inexplicable divergencies; this is probably because the designers have less scope for real originality, and minor differences in circuit arrangement are generally dismissed as being of no importance by those making a comparative test.

A case in point is that of the Amplion two-valve set under review. There is nothing particularly arresting in its design, and even the exceptional characteristics of the particular valves that are used can hardly be taken as explaining its unusually satisfactory performance. One must assume that results are due to careful attention to details.

With regard to the circuit arrangement, which is shown on the following page, it will be seen that somewhat elaborate precautions have been taken to secure the greatest immunity from interference that is practicable in a receiver of this type. On the medium-wave side there is the option of a direct connection, through a series condenser, or of auto-transformer coupling through a still smaller capacity when maximum selectivity is needed. For long-wave reception direct connection may also be made, and, to avoid the all-too-common trouble of interference from a nearby medium-wave transmitter, there is a separate long-wave primary winding in series with a loading coil which prevents aerial resonances in the medium band.

Separate series-connected reaction windings are provided for each of the tuned inductances, and feed-back is controlled by a small variable condenser. The presence of a detector anode by-pass condenser of relatively large capacity has an important bearing on the general operation of the reaction system. The values of the grid condenser and its leak are rather lower than usual.

Both the valves are heated from the same four-volt output of the power transformer, and the grid circuits are returned to the centre tapping of a low-resistance potentiometer shunted across the L.T. secondary.

Anode current is fed through a combined decoupling and voltage-absorbing resistance to the detector, which is linked to the pentode output valve by a transformer in the conventional way. The loud speaker is directly connected, and the pentode screening grid operates at the maximum H.T. voltage—about 135 volts. A pressure in the order of 85 volts is applied to the detector anode, and nearly 4 milliamps is consumed in this circuit.

High-tension supply is obtained through a metal rectifier connected in the well-known voltage-doubling circuit. Automatic grid bias for both the output valve and for the detector—when it is converted into an L.F. amplifier for gramophone reproduction—is obtained by inserting series resistances in the H.T. negative feed lead and taking the grid return leads, *via* decoupling resistances, to appropriate points.

The set was tested with an Amplion Type A.B.6 loud speaker, which was submitted by the makers as being specially suited for operation with this set; if desired, the loud speaker may be mounted on top of the receiver cabinet. Reproduction afforded by the combination was of a most pleasing character, although

the bass response was not particularly well marked there was no objectionable resonance, and the upper register, thanks largely to the pentode, was particularly strong.

Naturally, the set is not really intended for consistent long-distance reception, but rather for those who expect to get satisfactory signals from two or three nearby stations. For its type, sensitivity is good, and the reception of distant transmissions can be depended upon under fair conditions. Again, the high magnification of the pentode is partly responsible. Reaction control is smooth, reasonably constant, and almost free from backlash, particularly on the medium band.

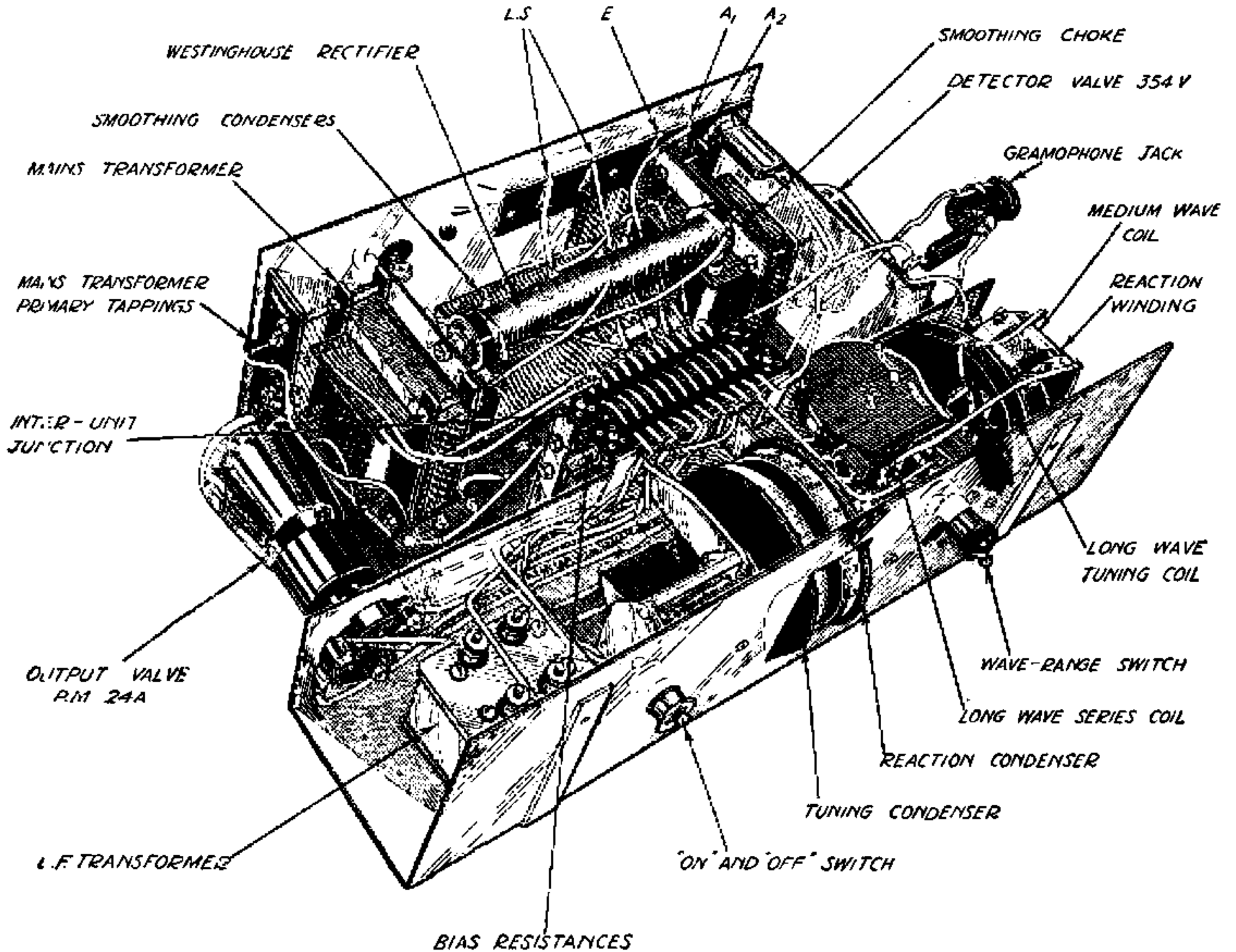
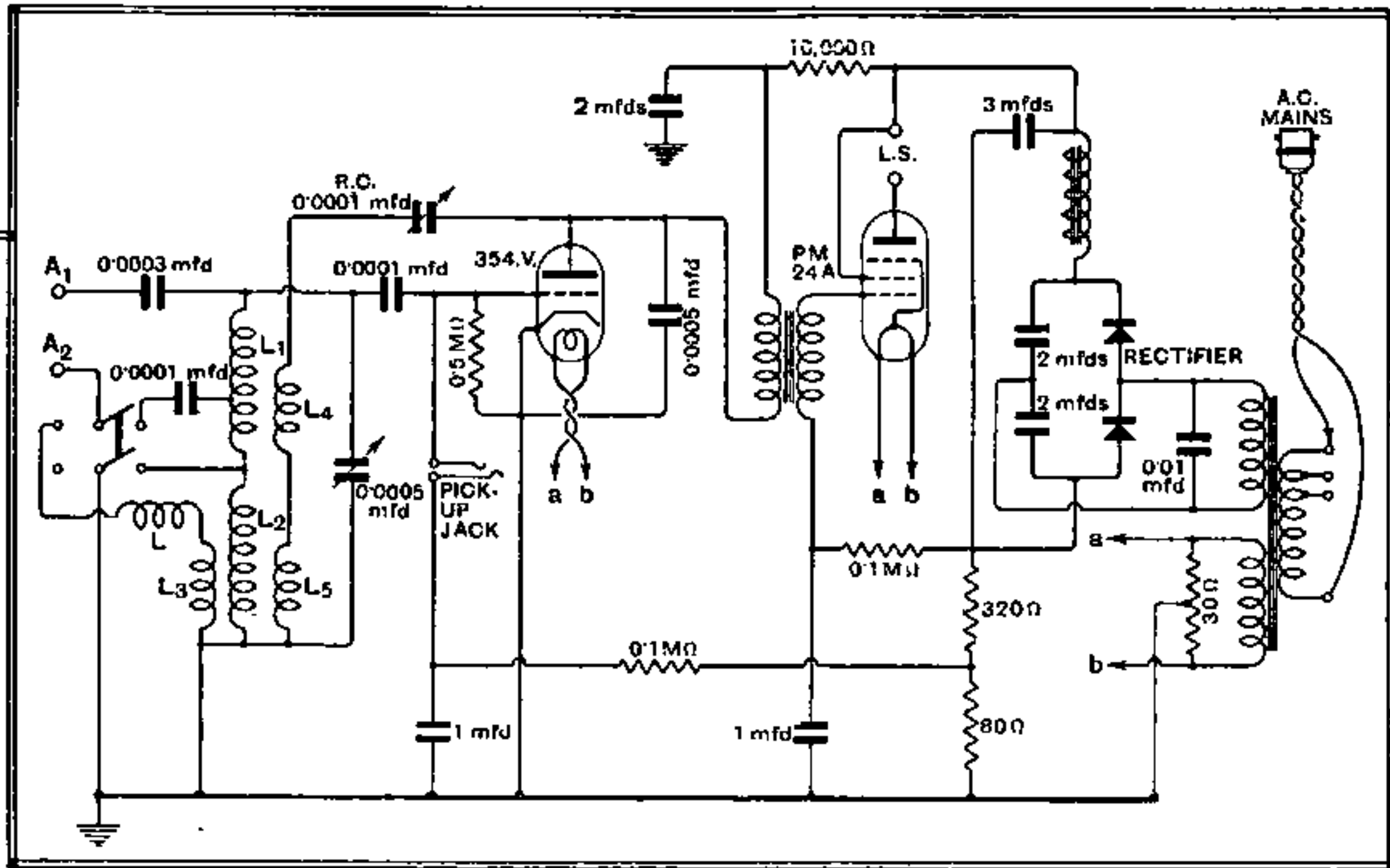
One must not expect the impossible as regards the selectivity of a detector-L.F. set, but in this respect the receiver works surprisingly well. As overall sensitivity is good it is possible to work with a very loose aerial coupling—or with a very short aerial. The receiver costs 15 guineas complete, and is manufactured by Graham Amplion, Ltd., 26, Savile Row, London, W.1.

SPECIFICATION.

CIRCUIT: Indirectly-heated grid detector, transformer coupled to a directly-heated pentode output valve. Capacity-controlled reaction. A.C. mains-feed through Westinghouse metal rectifier.

CONTROLS: (1) Tuning. (2) Reaction. (3) Wave-range switch. (4) Mains switch.

GENERAL: Jack for gramophone pick-up. Price: 15 guineas.



Amplion two-valve receiver removed from cabinet, showing two-unit chassis construction. Inset: complete circuit diagram; L, long-wave series coil; L₁, medium-wave grid coil; L₂, long-wave grid coil; L₃, L₄, reaction coils.