

AMPLION

'SIX'

WHEN the Amplion Six was first announced, just before this year's Olympia Exhibition, it seemed almost too good to be true. This self-contained A.C. receiver, with six British valves, albeit with only four stages (two of the valves are in the push-pull output circuit and another is a rectifier), with refinements such as a band-pass filter, ganged tuning, and wavelength calibration, to say nothing of a built-in moving-coil loud speaker, set quite a new standard of value.

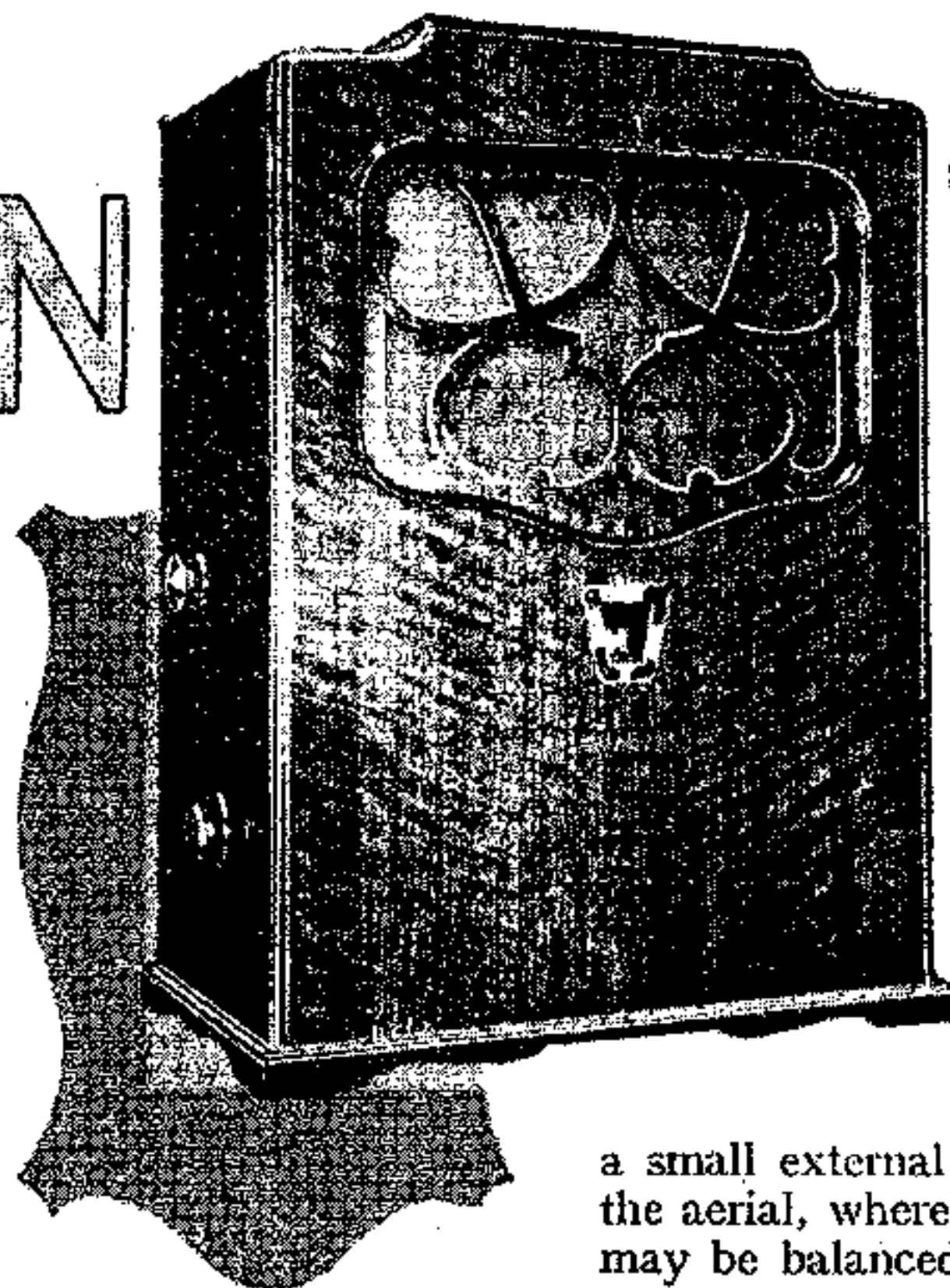
After having had an opportunity of carrying out an extensive test, the opinion has been formed that the receiver lives up to its early promise in every respect, and, indeed, in the matter of selectivity, is rather better than might reasonably be anticipated. A set produced under commercial conditions is naturally subject to limitations in various directions, but almost every difficulty seems to have been overcome in a very satisfactory way.

Although designed primarily to operate with an external aerial-earth system, the Amplion Six is fitted with a built-in capacity aerial, which is, very modestly, stated to be mainly for short-distance reception. In point of fact, this miniature aerial, which consists

merely of a metal plate measuring about 7in. by 12in., mounted under the top of the cabinet, provides about as much signal pick-up as is needed by a large number of listeners; as an example of what it will do—and also as an index to the high sensitivity of the set—it may be stated that Radio Paris is receivable at full strength with its help under fair average conditions.

The basic circuit is a 2-V-I combination, with band-pass input filter, two H.F. stages, power

grid detector, and push-pull output. Plain inductive coupling is employed between the filter circuits, but it is stated that a certain amount of capacitive coupling is intentionally introduced through the capacity of the wiring. Trimming of the primary circuit is done by



An Inexpensive
Long-range
Self-contained
A.C. Receiver
of Ambitious
Design.

a small external condenser in series with the aerial, whereby differences in capacity may be balanced out; this control, when once set, does not need subsequent adjustment. Simple tuned-anode

couplings, controlled by ganged condensers with segmented end vanes and earthed rotors, are employed for linking together both the H.F. stages and the detector. The tuned oscillatory circuits are completed through large condensers, and also act as by-pass capacities in conjunction with anode decoupling resistances.

A pre-detection volume control of the double-acting type is fitted; this operates both by over-biasing the H.F. grids and by partially short-circuiting the aerial input circuit at the same time. These operations are carried out in a very simple manner by means of a single potentiometer; as the sliding contact is moved progressively from "maximum" to "minimum," negative bias is increased, and the resistance shunted across the aerial circuit is simultaneously reduced.

After the H.F. amplifier comes a power grid detector, operating with some 150 volts on its plate. This valve is convertible into an anode-bend detector by the simple expedient of open-circuiting a bias resistance included in its cathode circuit by means of an external switch. It is intended that anode rectification should be used mainly to improve selectivity where necessary, and also for short-distance work.

In the anode circuit of the detector there is a complete H.F. filter, of which the choke coil is entirely screened. Coupling between this valve and the push-pull output stage is by means of a transformer with the usual centre-tapped secondary; another transformer is used to link the output valves to a moving-coil loud speaker.

The power supply circuits are fairly conventional, the process of rectification being carried out by a standard B-type rectifier, of which there is a sufficient margin of voltage output to allow for adequate anode decoupling throughout the set. That part of the rectified output which feeds the push-pull stage is smoothed by a choke,

GENERAL: Self-contained A.C. mains receiver for operation with external aerial or built-in capacity aerial. Moving-coil loud speaker.

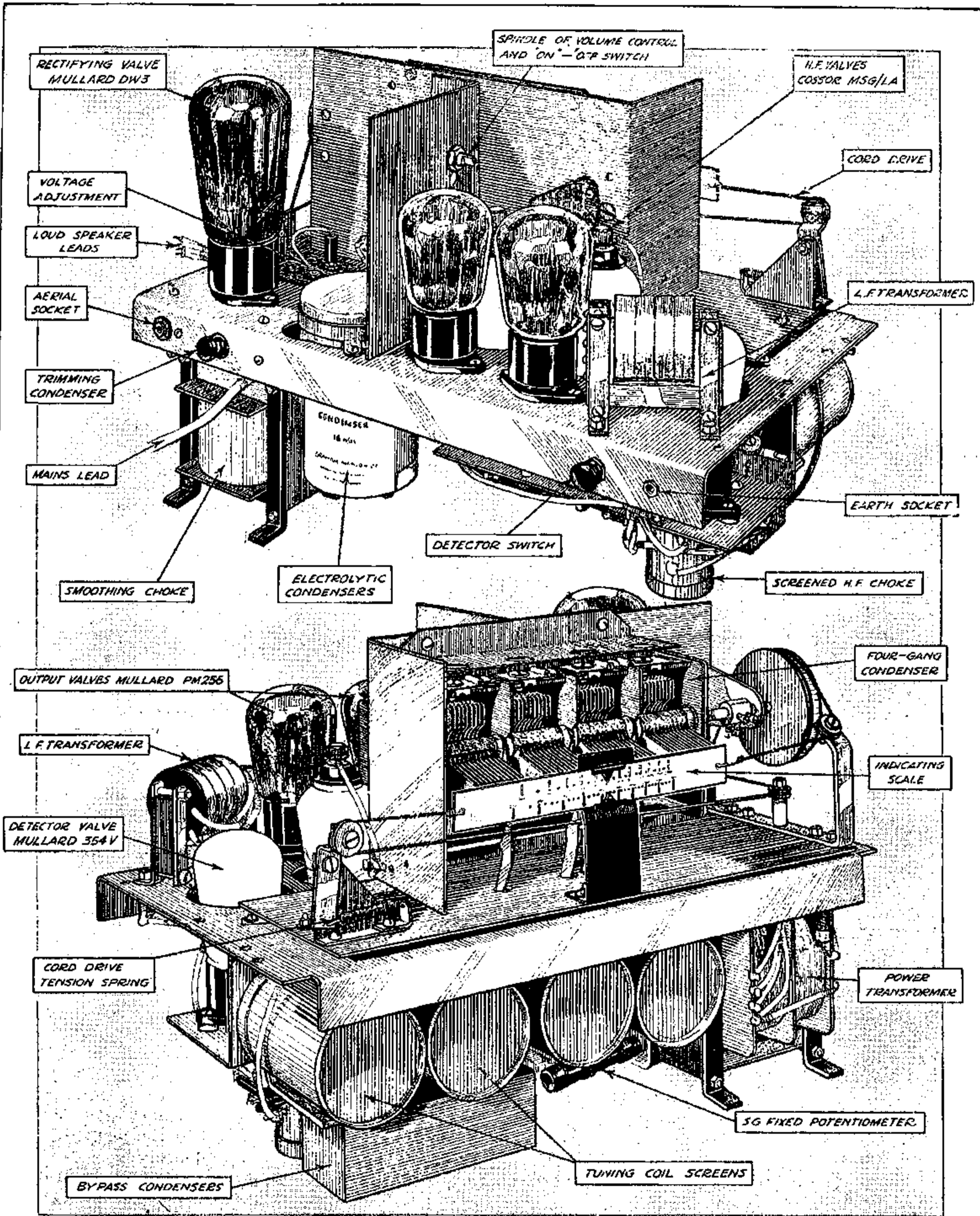
CIRCUIT: Band-pass input filter; two tuned-anode H.F. stages; optional power grid or anode bend detector; transformer-coupled push-pull output stage. Full-wave valve rectifier.

CONTROLS: (1) Ganged tuning. (2) Wave-range switch. (3) Combined volume control and on-off switch.

PRICE: 20 guineas complete.

MAKERS: Graham Amplion, Ltd., St. Andrew's Works, Slough, Bucks.

THE AMPLION SIX: DETAILS OF THE RECEIVER UNIT.



HIND

The chassis, as seen from both front and rear. All apparatus except the loud speaker is included in this unit.

Amplion 'Six.'—

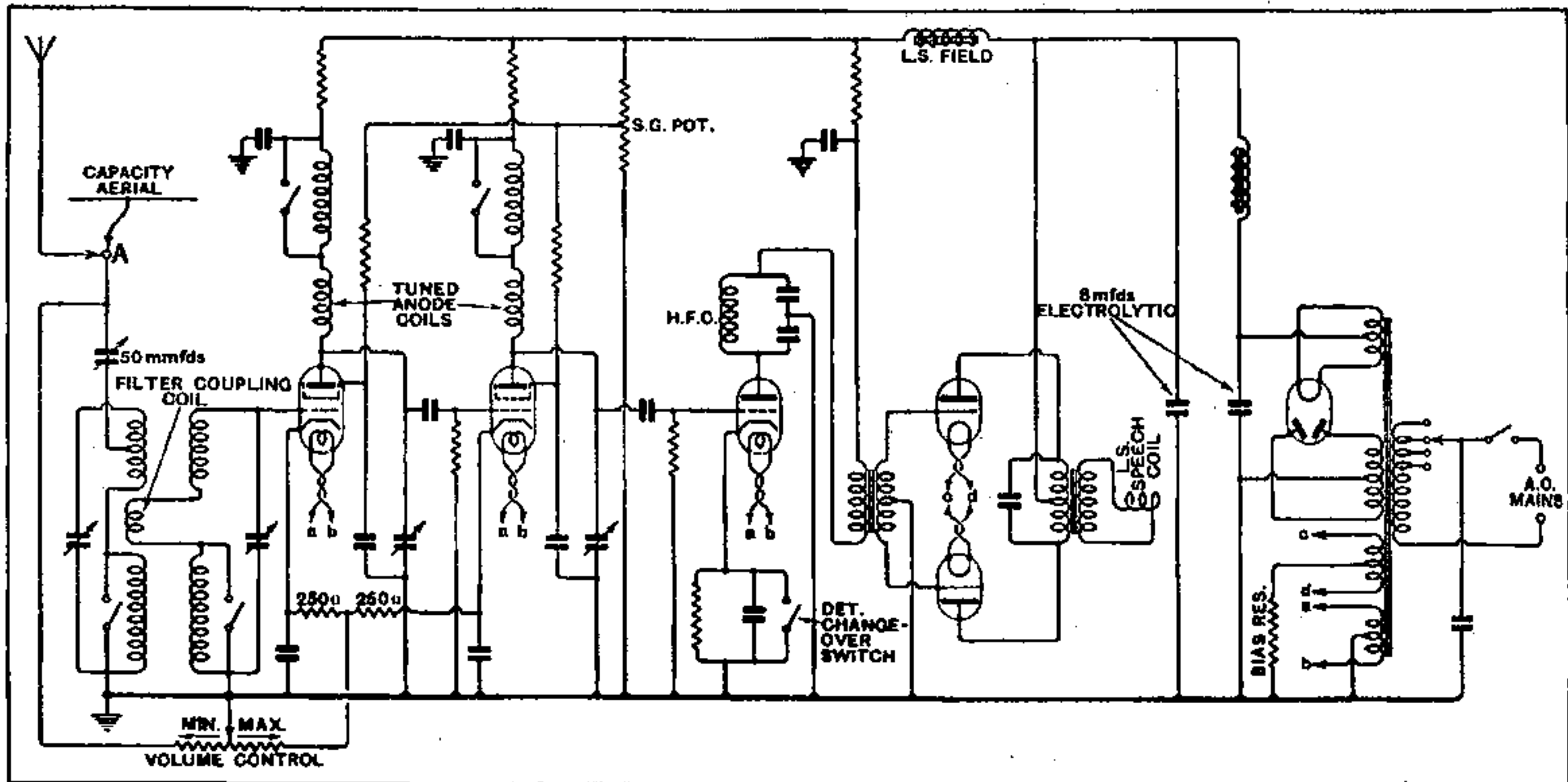
in conjunction with a pair of high-capacity electrolytic condensers, which, incidentally, are built into a single case; feed current for all other valves is smoothed in addition by the loud speaker field winding; current for the screening grid potentiometer, which is of unusually low resistance, and thus provides good voltage regulation, is also passed through this winding, so there is an adequate magnetising current.

Operation of the receiver is simplified by combining the volume potentiometer control with that of the on-off switch, which is operated by a trip-action mechanism. Among other mechanical features are an ingenious spring-tensioned cord drive for the tuning condensers, combined with a horizontal wavelength scale, and also sponge-rubber suspension for the H.F. and detector valve-holders. All components, except

and as no reaction control is fitted, it is obvious that regeneration plays an insignificant part.

With regard to selectivity, it is hardly necessary to say more than that the tuning control "chops off the stations" in the real band-pass fashion. Interference from a local station at ten miles distance is confined to a much narrower band than usual, even for a four-circuit set of comparable type, while the other kind of interference—between two more-distant stations operating on adjacent frequency channels—is hardly ever encountered. When it is, recourse to anode bend detection will generally dispose satisfactorily of the interference, but will cause a reduction in signal strength, as this system of rectification is much less sensitive than the power grid method.

Loud speaker output is well maintained from about 100 cycles to nearly 2,500 cycles, after which there is



Complete circuit diagram, showing clearly the operation of the double-acting volume control. A 250-ohm resistor is permanently in series with each H.F. valve cathode.

the loud speaker and its transformer, are mounted on an easily removable metal chassis, which is fitted into the lower part of the cabinet. The lay-out is quite neat, and accessibility for purposes of test or replacement is much better than is usual nowadays. The wave-range switches, which are always examined critically, as troubles are so often caused by faulty contacts, are of extremely simple but robust design, and seem likely to stand up to their work indefinitely.

A receiver with two H.F. stages is expected to be in the long-range class, and in the matter of sensitivity the Amplion Six is fully up to expectations. It is not a set that depends on exceptionally favourable conditions or on skilful adjustment; many Continental stations on both medium and long wavebands are receivable in broad daylight, and as for operation, there is literally nothing to do but to set the volume control at maximum and then to turn the condenser knob. There is no sign of incipient self-oscillation,

distinct falling-off. This limitation of high-note output is not enough to prejudice the intelligibility of speech, and has the very practical advantage nowadays that it prevents a great deal of heterodyne interference. There is a noticeable resonance at about 200 cycles, which gives an effect that is pleasing rather than otherwise; also another, much less evident, in the upper middle register. The push-pull output stage provides volume to spare, even for a large room.

No unfavourable criticism can be directed against the design or general finish of the cabinet, which is of walnut, and compares well with many of those supplied with much less ambitious sets at about the same price. An unusually good instruction book, giving almost all the information that the average user is likely to need, is supplied with the set.