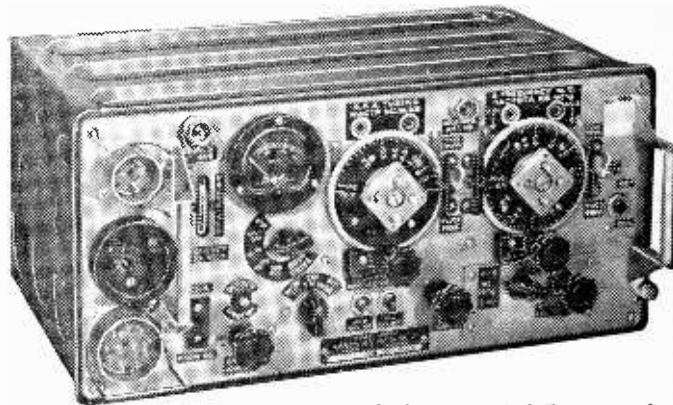


The "No. 19" Set

FURTHER IMPROVEMENTS

By D. W. Dillon

(Continued from page 962 of the March issue)



AFTER the modifications for 6V operation and to the tank coil, etc., have been carried out as described last month, the set is ready for trial.

Intermediate Testing

For testing, a suitable power unit supplying 250-300V and 6.3V is necessary. If only the receiver portion is required, a power unit similar to that shown in Fig. 4 should be constructed or purchased. If, however, the transmitter portion is also required, the circuit of Fig. 5, which includes a relay supply, should be constructed. The smaller power unit could also contain a small speaker, the connections to it being through the chassis and the unused 500V pin on the power socket. The circuit for an output stage will be given later.

The power unit is connected to the set, switched on, and a pair of low impedance headphones plugged into the new jack. The P.A. tuning should be set to approximately the same frequency as the main tuning. A long wire aerial is attached to the feed-through insulator. Rotation of the aerial tuning condenser should show a point where a great increase of signal level, or noise, results. The R.F. gain control is turned down, the AVC off, and the receiver tuned into a signal. No movement of the AVC meter should result. If all works correctly, the next stage of alteration may be commenced.

Selectivity

The most important part of the receiver modifications is the improvement of the selectivity. Although the replacement of the fixed condensers in the I.F.T. cans, removal of damping resistors, and complete realignment does help greatly, and has, in fact, been carried out on the author's set, the need was felt for even more selectivity. In the circuit to be described, this modification need not be carried out, although it is advisable to do so. Until a few years ago, the only solution to this problem would have been in the use of a crystal filter, involving the

entire rebuilding of the second I.F. stage, but recently the idea of the Q-multiplier circuit has been imported from the U.S.A. A circuit suitable for use in the "19" set is shown in Fig. 6.

The 6K7 valveholder beside the aerial tuning unit (Fig. 3, February issue) is removed by filing the tops of the aluminium rivets, and a B9A valveholder mounted on small aluminium strips. Holes are drilled in the chassis to hold an I.F.T. can over the valve, with the valve in one corner of it. A coaxial lead is connected to pin 3 (anode) of the 6K8 frequency changer (V2A). The outer sheath is not connected at this end. Coil L1 is mounted at the bottom of the can in such a position that the core can be adjusted from the side of the set. The coil L2 is mounted directly above L1, and the coil-shaped trimmer at the top of the can. The condensers C3 and C4 should be high stability 2 per cent or 5 per cent types. The 5k wirewound potentiometer is used to vary the sensitivity, and can be substituted for the B set gain control; but if the transmitter modifications are to be carried out, it can be wired in temporarily

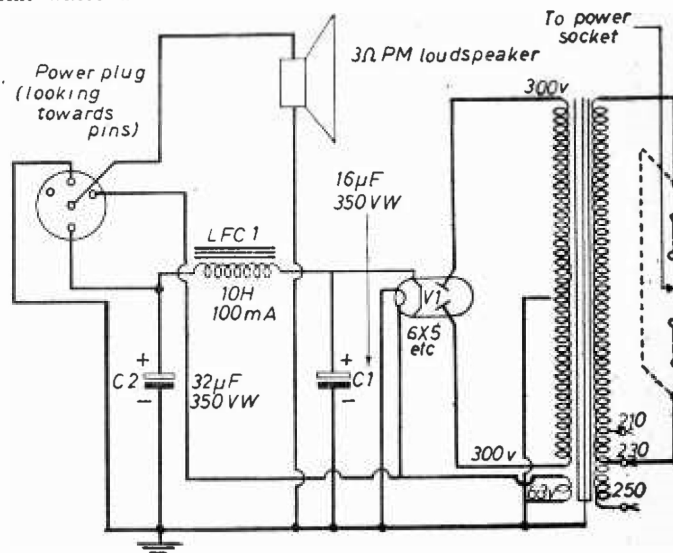


Fig. 4.—Circuit of a power unit.

and the best position on the track found, the resistance determined with an ohm-meter, and the nearest preferred valve resistor substituted for it. The H.T. + connection is joined to pin 6 on VIC (6K7). Pins 4 and 5 are earthed at the valveholder and pin 9 joined to the power socket 6V line.

Alignment

To align the unit, the set is switched on, allowed to warm up, the audio gain turned up half way, the AVC off, the netting control depressed, and a station tuned in normally to zero-beat. The core of L1 is adjusted for greatest signal strength. The 5k resistor is moved up about half way and the 100pF trimmer moved to half capacity. The core of L2 is then moved with a plastic screwdriver to peak the signal. At the peak, the high frequency audio sidebands should be greatly attenuated, giving a bassy output. The tuning will be extremely critical, and signals may not even be readable. The 5k resistor is varied to give best selectivity consistent with good readability. The cores can be sealed with a little hot wax. No adjustment of the original I.F.T.s is necessary, since L1 cancels out the reactive impedance and capacity of the coaxial cable.

Output Stage

The final receiver modification concerns the addition of an output stage. This is very simple, and uses the existing 6V6 and I.C. amplifier output transformer. The circuit will be given next month. The H.T.+ is obtained from the H.T.+ lead to the Q multiplier. The connections to the output transformer were given in Fig. 3, last month. The input signal for the amplifier is obtained from pin 3 (anode) of the 6B8. Insertion of the headphone jack turns off this stage. The speaker output

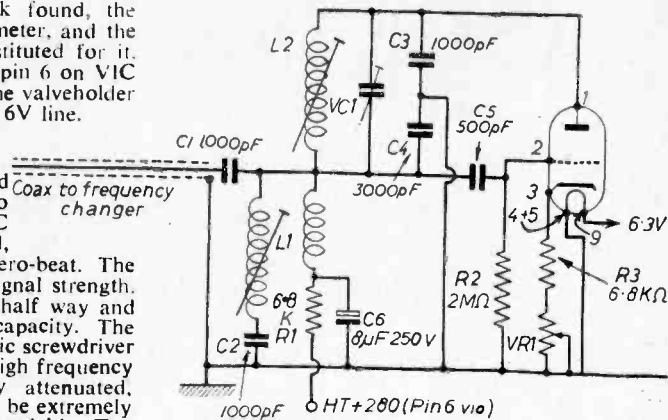


Fig. 6.—Circuit of a Q-multiplier (VR1 is 5k).

passes either through the centre pin of the 5-way socket on pin 6 of the control socket.

This will conclude the receiver modifications, and result in a small, highly sensitive, and selective receiver. If being used for CW reception, the set should be switched on to CW, tuned to zero-beat with a stable signal; and the core of L5AB moved until a beat note of about 1,000c/s is obtained. True single signal CW reception will then be possible. The AVC should be kept off, and the audio gain well up for best results.

(To be continued)

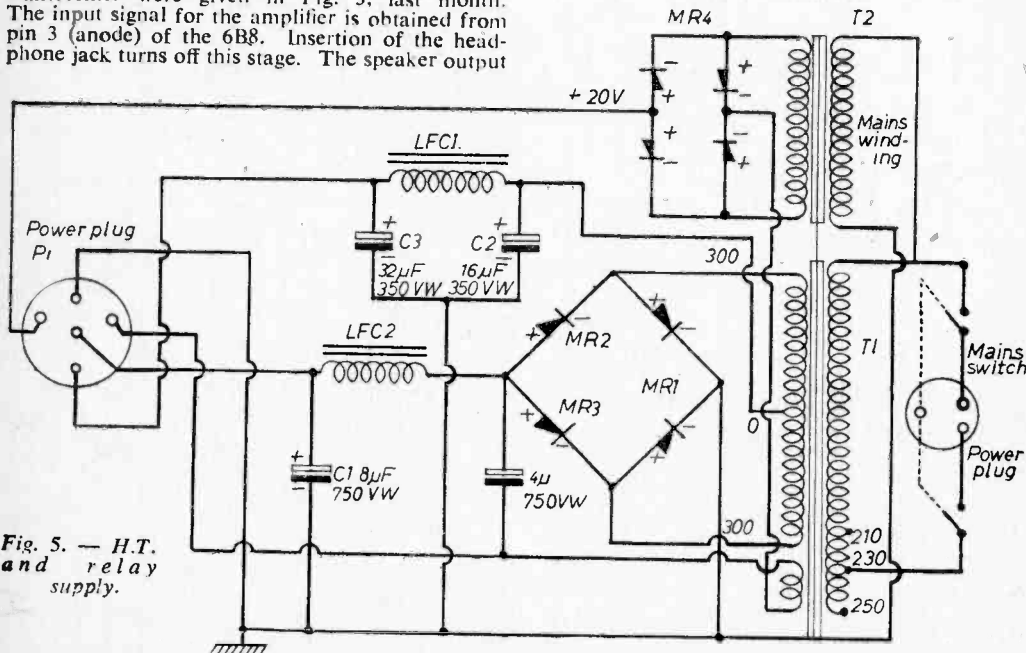


Fig. 5. — H.T. and relay supply.

(LFC1 and LFC2 are 10H 100mA; MR1, MR2 and MR3 is a bridge rectifier giving about 400V at 100mA; MR4 is a bridge rectifier giving about 20V at 1A.)