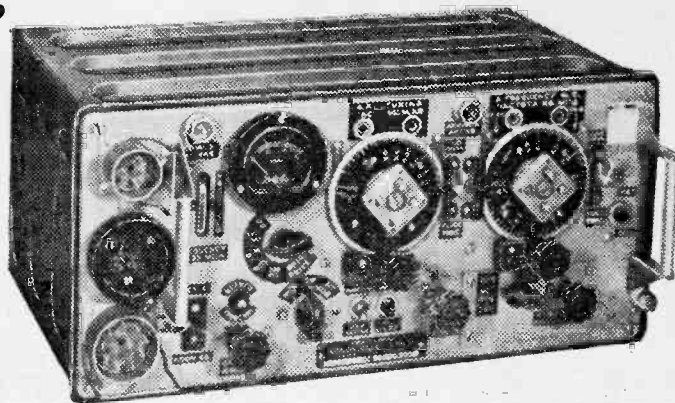


# The "No. 19" Set



FURTHER IMPROVEMENTS

By D. W. Dillon

THE recent release of thousands of ex-army American-built W.S. No. 19 Mk.2's has resulted in almost every enthusiast's shack in the country containing one. While they are generally used in their original condition, several major defects soon become apparent. The first and most important of these is a great lack of selectivity—the subject of a recent PRACTICAL WIRELESS article. The second fault is that too much associated equipment is necessary for the operation of the set: power unit, accumulators, junction box, microphone, headphones and heavy connectors! The AVC action is too heavy and sluggish and the signal to noise ratio is very poor. It is very difficult to transmit good CW because of the lack of sidetone facilities. On telephony the output power is very low, the modulation invariably downward, and the speech quality poor. It is therefore fortunate that by the removal of the "B" set and "I.C." amplifier, much space is available for modifications. Although several amateurs have modified the "B" set for local two-metre use, in the majority of sets, this space simply goes to waste.

### Modifications

The first part of this article should be of interest to all 19 set owners, and the carrying out

of the simple modifications described results in transformation into a highly sensitive, selective and inexpensive mains-operated receiver. The second part of the article concerns the transmitter modifications and is of particular interest to licensed radio amateurs and those who hope to obtain a licence shortly. It should, however, be noted that, as with any radio transmitter, no matter how low the power, a Post Office licence is necessary before any attempt is made to transmit into an aerial.

The transmitter modifications will allow fully automatic sidetone monitoring on CW. The original circuit allowed only 12W input at about 30 per cent. efficiency on telephony, which does not usually result in flattering signal reports! This article will describe the addition of a 15W modulator stage requiring few extra components and which will allow 30W of good quality 100 per cent. modulated phone output to be run to the 807 P.A. Alternatively series-gate modulation is also described which gives carrier controlled output. The advantage of this method are the small space and few components required, but the disadvantages are lower efficiency and the necessity for 67½-90V negative bias on the modulator.

### Testing

Having received the set, it is strongly recommended that it be tested in its original form, by obtaining the loan of the associated equipment. After it has been proved to be working satisfactorily, the B set and I.C. amplifier are stripped out. All the components to the left of the above-chassis screen (when looking at the front panel) should be removed, as should also those to the left of the below-chassis relays, with the exception of the key jack leads, the leads to pin 4 (green) on the 12-way plug and those to pins 4 (red) and 6 (speckled red) on the six-way plug. The B set gain control also remains. The six- and 12-way plugs are removed, the 12-way one being discarded and replaced by a British five-pin socket. The inside "plug" part of the five-way plug is discarded, the outside casing being once again bolted on to the panel, with a Mazda octal valveholder bolted behind the panel to receive the speaker and remote control plug. The braided earth lead is connected to tag 3 on the holder.

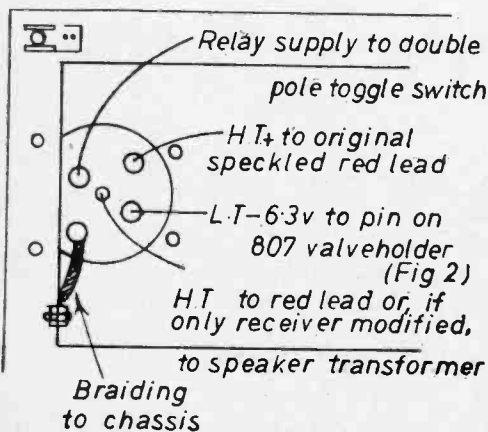


Fig. 1.—Wiring of the five-pin holder.

while the original red (H.T.) leads are re-routed under the chassis, being connected to the five-pin socket as shown in Fig. 1. A closed circuit jack is substituted for the "quench control" grommet.

**6V Operation**

The 12V line is earthed at the 807 valveholder (Fig. 2), and a lead taken from the other heater tag to the five-way socket. This allows 6V operation of the heater chain. The green lead (ex-pin 4 is attached to the headphone jack socket. The

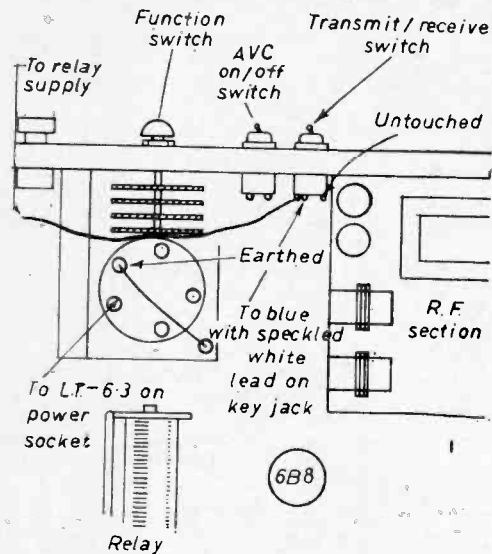


Fig. 2.—L.T. circuit rewiring.

leads to the single-pole toggle switch on the front panel are removed, as are also the left-hand section leads on the double-pole toggle switch.

The green and blue leads on the other section should not be disturbed. The large 0.1 $\mu$ F paper condenser fixed to the chassis beside the P.A. tuning condenser is replaced by a 750VW, 0.0005 $\mu$ F type. The 10 $\Omega$  variable resistor (het tone) is removed and the leads insulated. In its place is mounted a 10k wire-wound potentiometer. The resistor between the cathode (pin 8) of V1A (6K7) and earth is disconnected from the chassis tag, and joined to the potentiometer slider. The left-hand tag of the potentiometer is earthed. This is the new R.F. gain control. The single-pole toggle switch on the front panel is used as the AVC on/off switch, being connected between chassis and the AVC line (white) on the tagboard near the 6B8 valveholder.

The bracket which originally

supported the B set tuning condenser is modified to support a miniature air-spaced 0.0005 $\mu$ F variable condenser. This bracket is replaced in its original position, together with the calibrated knob. A 1 $\frac{1}{2}$ in. diameter 3in. coil former 3in. long is wound with 18 turns 22s.w.g. tinned-copper wire, evenly spaced over 2 $\frac{1}{2}$ in., is mounted directly on the old E1148 valveholder. One end is joined to a soldering tag on the tuning condenser frame, and the other to the fixed vanes. The B set aerial socket is removed and replaced by a small ceramic feed-through insulation. This is joined to the fixed vanes. A four turn insulated link is fixed around the earthed end of the coil, and connected to a short piece of 80 $\Omega$  coaxial cable, which passes directly under the condenser spindle and meter to the tank coil. The original screened box is replaced over the aerial tuning components.

**Diode**

A crystal diode is connected, with the black end to the fixed vanes and the red end to the small tagboard in the screened box. A wire is taken from this in the direction of the tank coil and marked for later described modifications. The lid of the box is fixed in position. The lead to the A set aerial socket is removed, together with the connection to C1A and the R.F. C12B.

The tank coil L3A is removed, the connections being noted. The tapping point is ignored, and about three turns removed from the upper end. A four-turn insulated link is wound on the lower end and connected to the coaxial cable. The coil is replaced, the coaxial cable outer sheath being earthed to chassis at its base and all the original leads, with the exception of that to the tapped point, being reconnected to the coil. The set is now ready for testing.

(To be continued)

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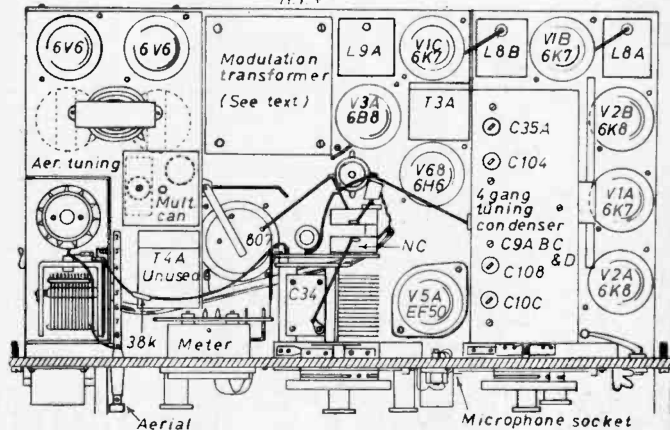


Fig. 3.—Top view of modified 19 set.