MORE ABOUT THE 19 SET

CONVERSION OF MK. III VERSION AS TRANSCEIVER FOR LF BANDS, 80/160M.— MODIFICATION DETAILS AND CIRCUITRY

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Though from many points of view an obsolete piece of equipment, the 19 Set—being well constructed, cheap, widely available and easy to modify—remains very popular in amateur circles where the accent is on the practical as distinct from the ornamental. Moreover, the 19 Set in its various marks seems susceptible of infinite variation—we have done articles about it before, but still the ideas come in. This offering deals with the conversion of the Mk. III as an effective AM/CW transceiver for Top Band and Eighty, and our contributor gives much information that will be of great interest to readers looking for a station rig of this sort, whether as a stand-by or for regular operation.—
Editor.

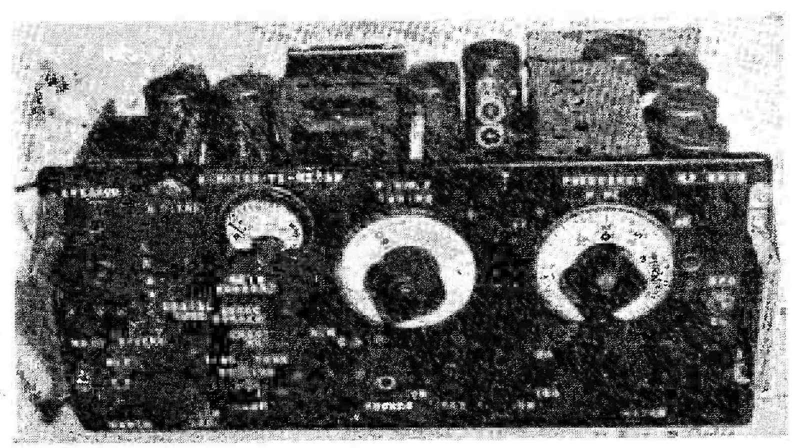
THE Army No. 19 Set is readily available on the surplus market and is known to be widely used for reception by many SWL's, to whom it gives reliable service on the LF bands (40-80m.). However, in its original form as a transceiver, it seems to be much deprecated by the transmitting amateur.

After adapting the receiver portion of a 19 Set for an SWL friend, by incorporation of an internal power supply and output stage, the writer considered the possibility of carrying out a complete modification for transceiver operation on 80 and 160m., for CW and AM.

General Considerations

The No. 19 Set Mk. III covers 2·0 to 8·0 mc, in two switched bands, and the receiver portion is a conventional RF/FC/2IF/Det./Audio with 465 kc IF and a BFO. The principle of transmitter operation is that when switched to "send," the output from the BFO at 465 kc is mixed with the output of the receiver local oscillator to produce a signal at the same frequency as the receiver setting. This is selected and amplified by a tuned buffer stage (EF50) followed by a PA stage (807). Netting is thus automatically achieved, provided that the BFO is working at exactly the IF, and the receiver is accurately tuned. It should be noted that variation of the BFO frequency, either side of zero-beat by means of the heterodyne pitch control on "receive," does not affect the frequency of the BFO on "transmit." (This is because the BFO tuning mechanism is then disconnected, and compensated for, so that the BFO is exactly at the IF.)

The four-gang tuning capacitator is used to tune the grid and anode circuits of the buffer stage, the receiver mixer input and the local oscillator. The RF stage is separately tuned by the PA tank circuit. A major disadvantage is that the frequency coverage



Front view of the completed 19 Set conversion, showing layout of panel controls. The mains transformer at rear of chassis and the heater xformer on the left are visible. The smoothing choke is positioned below the LT transformer, and the smoothing condensers and high-wattage resistors are mounted on group panels above chassis.

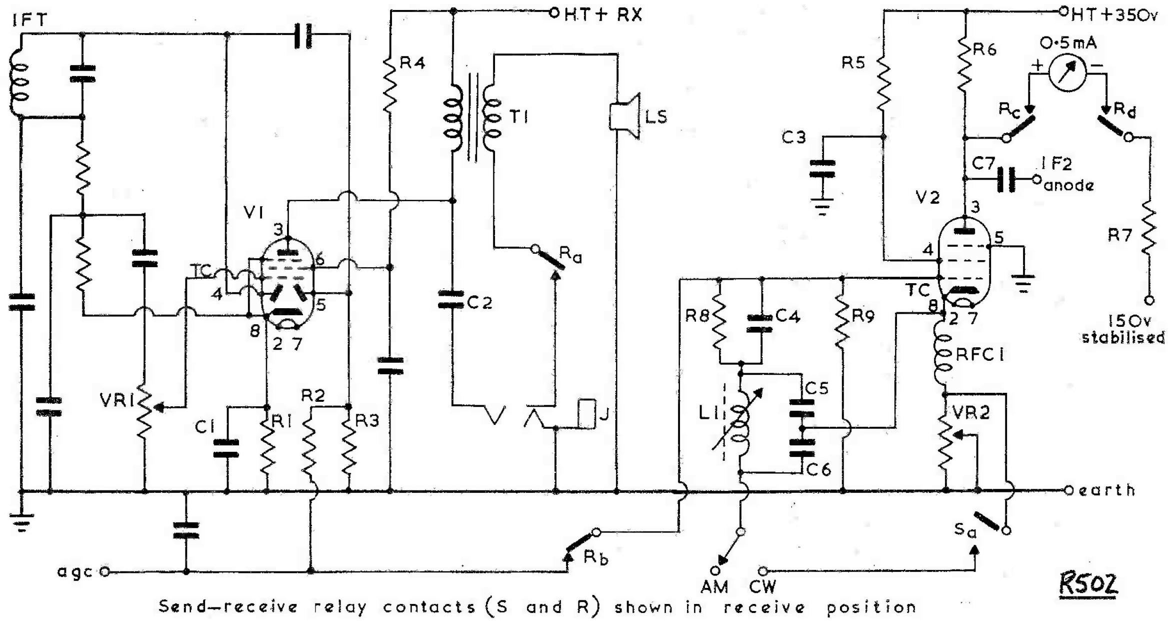


Fig. 1. Circuit of the modified Output Stage and S-Meter /CW Monitor.

is large and does not allow of calibration accuracy to meet amateur-band licence conditions. This difficulty was overcome by reducing the capacity of the tuning condensers. The existing method of modulation was improved by conversion to anode-and-screen control of the PA. A *pi*-type PA circuit and an internal power supply were incorporated, making the unit self-contained while still maintaining the original transceiver facilities. The modifications described will make the equipment very suitable for the newly-licensed amateur or as a self-contained stand-by or /A transceiver.

Removal of Unwanted Circuits

The original set contains a VHF portion (" B Set ") at the front left-hand corner of the chassis, which is completely removed together with the B Set gain control and the input and output sockets. The leads to the 5-way meter switch, the 3-way function switch and the relays are severed and these components temporarily removed, it being thought better to re-wire them completely according to the proposed new circuitry. The three transformers adjacent to the PA are also taken out. One of these is the original output transformer and provides a match to medium-impedance headphones. Three other small transformers, in cube-shaped cans (microphone transformers, etc.) are also removed, and so are most of the components connected to the 807 valveholder and on the adjacent tag-strips.

It is then necessary to locate and identify the various leads which go into the receiver and driver sections. Two red leads issue from near the last IF transformer. These are to provide HT to the receiver

Table of Values

Fig. 1. Receiver Output, S-Meter and CW Monitor

C1	= 12 μF, elect.. 50v.	R6	= *see text*
C2	= ·1 μF, 400v.	R8	= 100,000 ohms, ½w.
C3	= ·02 μF, 350v.	R9	= 2·2 megohms, ½w.
C4	= 100 μμF mica	VR2	= 1,000 ohms, pre-set
C5, C6	= 500 μμF mica		
C7	= *see text*	RFC1	= 2·5 mH, see text
R1	= 1,000 ohms, ½w.	L1	= *see text*
R2, R3	= 1 megohm, ½w.	V1	= 6B8G
R4	= 68,000 ohms, ½w.	V2	= 6K7G
R5, R7	= 150,000 ohms, ½w.		

Note: Values of components present in original circuit not necessarily given.

section, together with a white lead which goes to the tag-strip and hence to pin 1 of the 6B8G and provides screen voltage *via* a 68K resistor to pin 6. A pink lead connected to the anode (pin 3) of the 6B8G is left for connection to a new output transformer of about 45:1, to match a 3-ohm speaker. (Sufficient output is obtained for speaker operation, thus sparing the necessity for an additional output stage.) A brown lead connected to a tag on the last IF transformer and hence to a one megohm resistor from pin 5 of the 6B8G is the AGC line to the RF and first IF stages. It is to be combined with a yellow lead to the second IF transformer which provides AGC to the second IF stage. A brown lead connected to the cathode (pin 8) of the first IF stage is removed. Another brown lead connects to the sender mixer cathode and is for connection to a compensating bias resistor, on "transmit," *via* the send-receive relay. This is to reduce the total cathode resistance of the sender frequency changer on "transmit," in order to compensate for the increased cathode current caused by operation of the hexode section.

The various filter components associated with the 6B8G are taken out leaving the detector and AGC components for use as in Fig. 1, p.19. The 1K cathode bias resistor is returned to chassis.

At the front of the chassis, a mauve lead emerges from the "net" switch and takes HT to the BFO on "transmit" by bypassing the net switch. A white lead, connected to pin 6 of the RF stage, puts HT on the hexode of the sender frequency changer on "transmit" and a yellow lead going to a tag on the buffer anode coil provides HT for the buffer stage. An orange lead connects with the centre of the heterodyne pitch potentiometer and is for connection to earth on "receive." A yellow lead to pin 8 of the 6H6, drive level control valve, connects to the BFO compensating load and is to be earthed on "transmit."

The diode drive level control circuit is removed for direct operation of the PA. To gain access to the 6H6 valveholder, the connections from the buffer anode coil to the compression trimmer and the EF50 screen resistor were temporarily removed, so that the coil former could be unscrewed and lifted up. All components to the 6H6 are removed with the exception of the heater wiring. The leads and components connected to pins 4 and 8, dealing with the BFO compensating load, are taken back to a lead to a condenser clipped to the chassis and this lead is to be earthed on "transmit."

The connections from pin 5 (anchoring point) to the wave-change *via* a 100 μμF capacitor and to the grid of the 807 are dispensed with and the grid of the 807 connected straight to the wave-change switch *via* the 100 μμF capacitator. A lead to a tag-strip in the buffer grid coil compartment is snipped out and the components on this tag-strip are removed except for a lead to the EF50 grid and a 100 μμF capacitator on one tag. It is then essential to connect this tag to earth *via* a 470K grid leak.

The heater wiring (in black) is rearranged from the original series-parallel arrangement for 12·6v. to parallel operation for 6·3v. At this stage it is possible to test the receiver section by connecting a suitable HT and heater supply and output transformer. Full coverage of the 160m. band is obtained by addition of a ·0022 μF capacitor in parallel with the 2-4·5 mc padder (C3 in Fig. 6, p.25). Application of HT to the sender mixer and BFO gives a strong indication of output on an absorption wavemeter at the 807 valveholder.

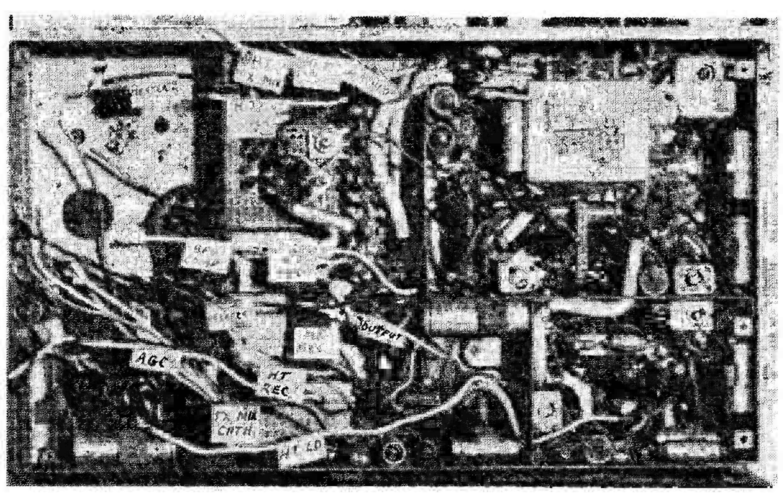
Further stripping, prior to rebuilding, includes removal of the PA tuning coil for conversion to a *pi*-type output. The HT supplies to the BFO (yellow lead to net-switch) and local oscillator (*via* 47K from first IF transformer) are disconnected from the HT line, for operation from a stabilised supply. Some of the components to the two 6V6G and two 6K7G valves in the left rear corner were not disturbed, as these can be used for the speech amplifier and modulator. The other adjacent 6K7G is left for combined use as an S-meter valve and CW monitor.

The BFO

Because of its operation from a lower voltage, the anode feed resistor is reduced from 470K to 100K. For better SSB reception, the amount of injection is increased by removing the coupling to the first IF anode and re-connecting to the receiver mixer anode through a 470K resistor and a 5 μμF capacitor in series.

Receiver Output Stage

A new speaker transformer of about 45:1 ratio is fitted to give a match to a 3-ohm speaker. Headphones are now fed *via* a capacitor, as shown in Fig. 1, and the closed jack is arranged so that the speaker is disconnected on insertion of the headphone jack plug. The speaker, but not the headphone output, is disconnected on "transmit" to prevent audio feedback while allowing headphone monitoring of the transmission.



Under-chassis view of the 19 Set with redundant wiring removed and re-wiring appropriately identified. It is quite easy to do this in the course of the conversion, and could save a lot of bother if later leads have to be traced. In this view, the relays and switching have been temporarily removed.

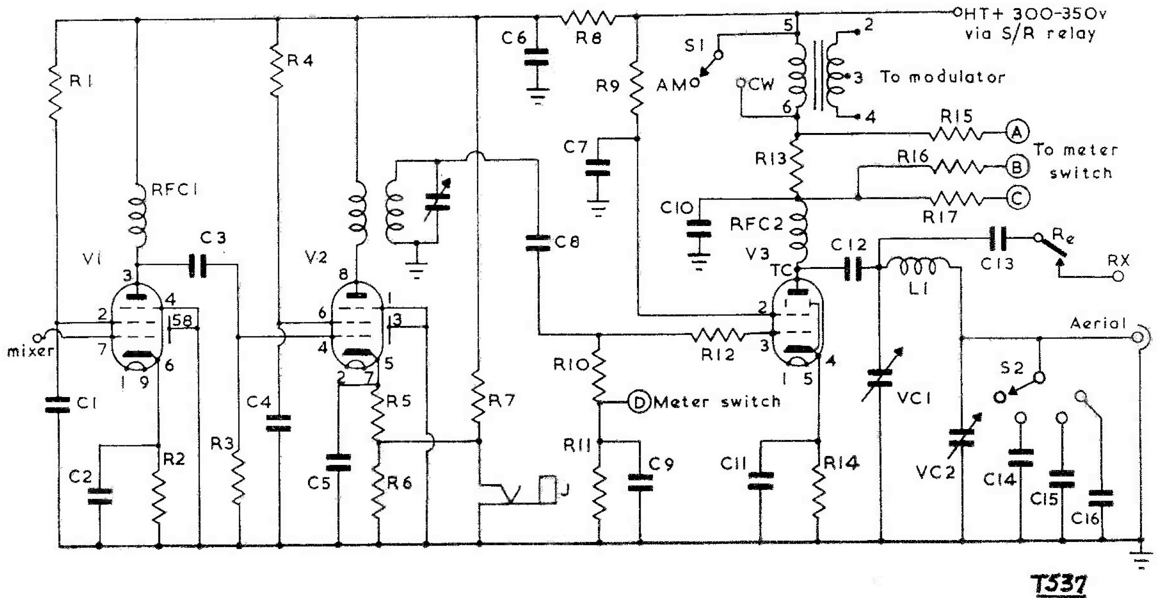


Fig. 2. The modified Buffer and PA Stages for the 19 set.

S-Meter and CW Monitor

The S-meter circuit is one devised by the writer and utilises one of the 6K7G valves, *see* Fig. 1, p.19. AGC is applied to its grid, and the anode voltage, which increases with increasing AGC voltage, is compared with the 150v. stabilised supply line. The sensitivity is very considerable (a 5 mA meter could be used!) and is also fairly linear dB-wise. The anode resistor, R6 in Fig. 1, is chosen such that a zero reading is obtained with the preset cathode potentiometer at about mid-travel, and consists of two 27K, 2w. resistors in series. The resistor R7 controls the S-meter sensitivity and can be altered to suit requirements. The meter is made to operate with the send-receive relay and serves other functions on "transmit."

The same valve operates as a sidetone oscillator at about 465 kc on CW transmissions only, for monitoring the keying, and is in effect a second BFO. It will be realised that the main BFO does not produce a note in the receiver on CW because it is at zero-beat with the IF signal. The oscillator uses a Colpitts circuit, the adjustable coil (L1) being the quench control in the original set and tunes to 465 kc in this circuit merely by removal of 220 turns. The RF choke in the cathode circuit is a wire-ended component found in the original set, but a standard 2·5 mH component would be suitable. The output is fed by screened wire to a tag on the second IF transformer, previously used for the BFO injection, the coupling capacitor C7 being already incorporated in the IF transformer can. The previously described change of main BFO injection ensures its isolation from this second oscillator.

Table of Values

Fig. 2. Modified Buffer and PA Stages

C1, C6	= ·1 μF, 400v.
C2, C9	= ·01 μF
C3	= 100 μμF, mica
C4, C5	= ·001 μF
C7	= 500 μμF, 1000v. mica
C8, C14	= 500 μμF mica
C10	= ·002 μF, 1,000v.
C11	= ·002 μF
C12	= ·004 μF, 1,200v., *see text*
C13	= ·01 μF, 1,200v., *see text*
C15	= ·001 μF mica
C16	= ·0015 μμF mica
VC1	= 500 μμF, *see text*
VC2	= 500 μμF, solid dielectric
R1	= 3,900 ohms, ½w.
R2, R5	= 200 ohms, ½w.
R3	= 100,000 ohms, ½w.
R4	= 27,000 ohms, 2w.
R6	= 47,000 ohms, 1w.
R7	= 100,000 ohms, 2w.
R8	= 2,200 ohms, ½w.
R9	= 10,000 ohms, 2w.
R10	= 22,000 ohms, 1w.
R11	= 47 ohms, ½w.
R12	= 100 ohms, ½w.
R13	= 22 ohms, ½w.
R14	= 470 ohms, w/wound, 5w.
R15, R16	= 1,000 ohms, ½w., *see text*
R17	= 1·2 megohms, 1w. 5%
RFC1	= 2·5 mH
RFC2	= *See text*
S2	= 1-pole, 4-way
L1	= PA coil, *see text*
V1	= EF50
V2	= 6AG7
V3	= 807

Note: For simplicity, only one set of coils is shown in the anode circuit of the 6AG7, and the band-switching and associated trimmers are not shown.

Buffer Amplifiers

It was apparent that insufficient drive was obtained from the original EF50 driver for efficient operation of the PA. To provide more drive power, a second amplifier (6AG7) is added as in Fig. 2 above, using the valveholder previously occupied by the diode drive level control valve. The original anode coils of the EF50 are connected into the anode circuit of this second buffer and replaced by an RF choke. The cathode resistor of the EF50 is increased from 100 ohms to 220 ohms and keying is carried out in the cathode circuit of the 6AG7. The resistor R6

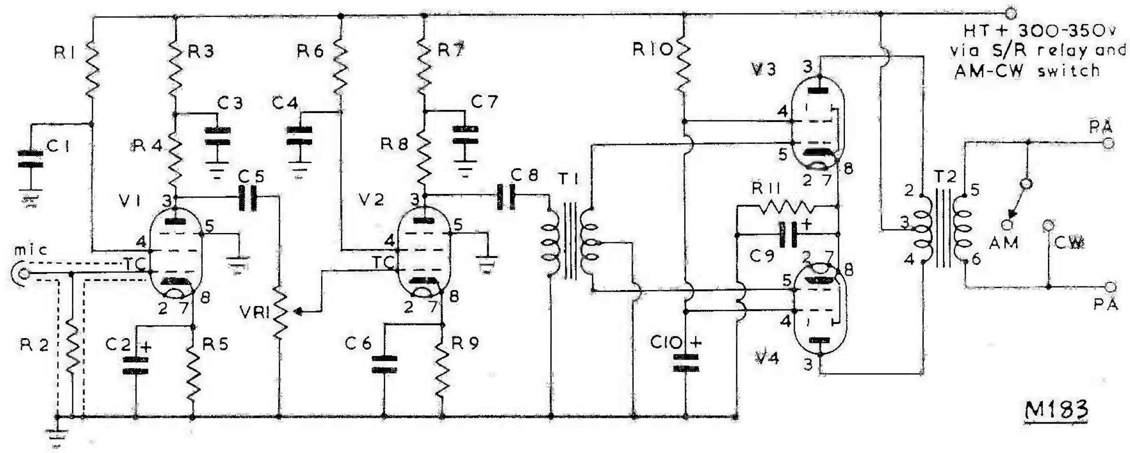


Fig. 3. Circuit for the Modulator side of the 19 Set LF-Band Transceiver.

ensures that the heater-cathode voltage does not float to too high a value with key open, and at the same time R7 increases the bias and so ensures that the valve is completely cut off.

The PA Stage

The circuit of the modified PA is also shown in Fig. 2, p.21. The *pi*-tank coil is rewound with 54 turns of 20g. enamelled wire, 2½in. long, using the original former. C12 and C13 are the high voltage capacitors found bolted to the frame of VC1, which is originally the PA and receiver RF tuning capacitor. Because of lack of room, a solid-dielectric tuning capacitor is used for VC2 (conveniently mounted in the position of the original UHF tuner) and the total loading capacity can be increased in 500 μμF switched steps. The RF choke RFC2 is an air-cored component, of single-screw mounting, taken from under the UHF section of the original set and which has a suitably large inductance.

The Modulator

The circuit is shown in Fig. 3, above. Two 6K7 and two 6V6 valves are used in their original positions. The anode, screen and cathode resistors of the 6K7 valves are the original. The electrolytic decoupling capacitors found on the chassis showed excessive leakage on test and were replaced by the component values shown. The value of cathode decoupling condenser for V2 was chosen to give a measure of negative feedback at low frequencies and thereby restrict the low-frequency response. The modulation transformer T2 used is one commonly advertised as suitable for push-pull 6AQ5 to QQV03-10, and the numbers in Fig. 3 refer to this component.

An insulated jack is used for the microphone input, enclosed in one of the previously mentioned cube-shaped cans. Insulated screened cable extends from this to the valve top cap, the screening being exposed and earthed only at a point near the valveholder. The grid resistor R2 is incorporated close to the top

Table of Values

Fig. 3. Modulator Section for the Transceiver

C1, C4	= ·1 μF, 400v.	R5, R9	= 1,000 ohms, ½w.
C2	= 25 μF, 25v.	R10	= 10,000 ohms, 2w.
C3, C7	= 4 μF, 500v.	R11	= 270 ohms, w/wound, 3w.
C5	= ·005 μF, 1,000v.	VR1	= 500,000 ohms
C6	= ·5 μF, 250v.	T1	= Standard LF transformer, *Radiospares*
C8	= ·01 μF, 1,000v.	T2	= Modulation transformer, *see text*
C9	= 100 μF, 50v.	V1, V2	= 6K7G
C10	= 16 μF, 500v.	V3, V4	= 6V6G
R1, R6	= 470,000 ohms, ½w.		
R2	= 2·2 megohms, ½w.		
R3, R7	= 22,000 ohms, ½w.		
R4, R8	= 100,000 ohms, ½w.		

cap. The result is an output surprisingly free from hum in spite of the proximity of mains transformers.

Power Supplies

The largest transformer which could be fitted gives 300-0-300v. at 120 mA. Using silicon rectifiers of the BY100 type, an HT line of about 350v. is obtained on full load. The total HT current taken on full load is in the region of 200 mA, but as maximum

Table of Values

Fig. 4. Power Supply and Receiver Muting *(see p.24)*

C1	= ·01 μF, 1,000v.	R11	= 300 ohms, w/wound, 10w.
C2, C3, C4, C5	= 16 μF, 500v.	R12	= 1,500 ohms, w/wound, 10w.
C6	= ·01 μF, 400v.	VR1	= 10,000 ohms, w/wound
C7	= 100 μF, 25v.	VR2	= 50,000 ohms, pre-set
R1	= 4,700 ohms, 2w.	D1-D4	= BY-100
R2, R3	= 22 ohms, w/wound, 3w.	MR1	= Rectifier 12v. 1A
R4, R5, R6, R7	= 2·2 megohms, 1w.	Ch.1	= Smoothing choke
R8	= 220,000 ohms, 1w.	F1, F2	= 2A fuse
R9	= 3,000 ohms, w/wound, 10w.	V1	= VR 150/30
R10	= 10,000 ohms, w/wound, 10w.	T2	= Heater transformer, *Radiospares* "Hygrade"
T1	= Mains transformer, *Radiospares* "Hygrade"		

Note: The value of R11 will depend on the resistance of Ch.1, which should be low. Choice of Ch.1 is also determined by space limitations and the item used came from an old TV set.

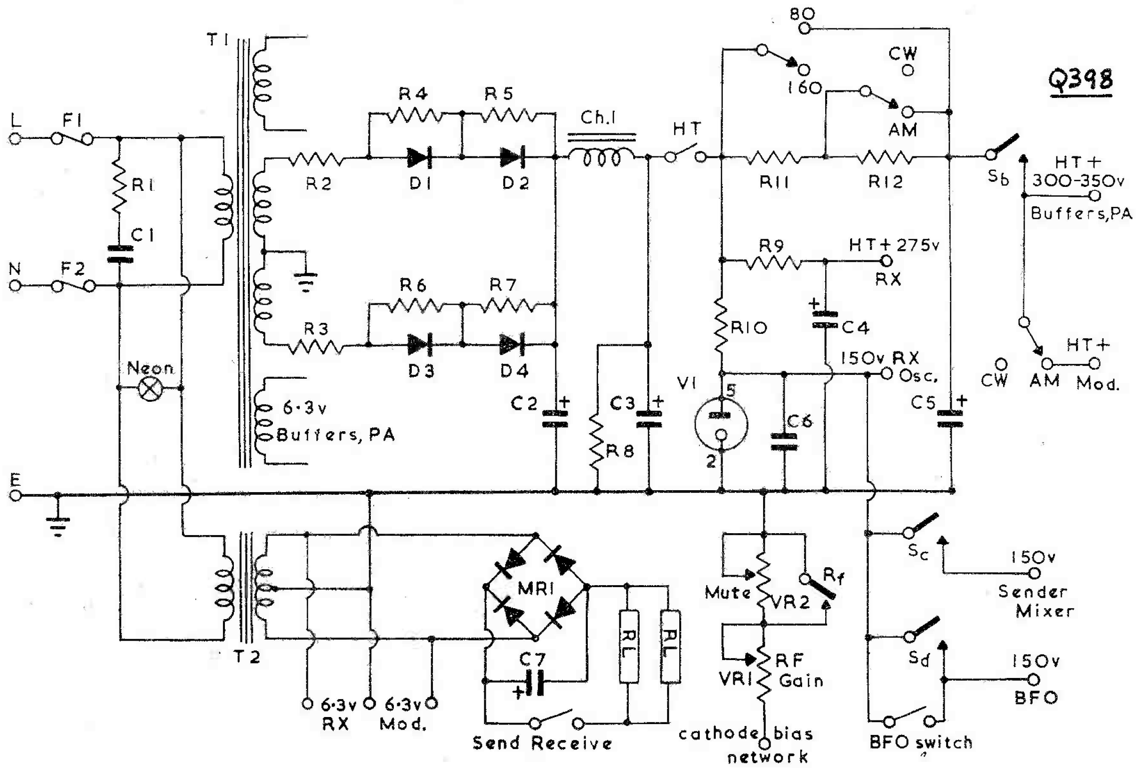


Fig. 4. Power Supply circuity and connections for Receiver muting.

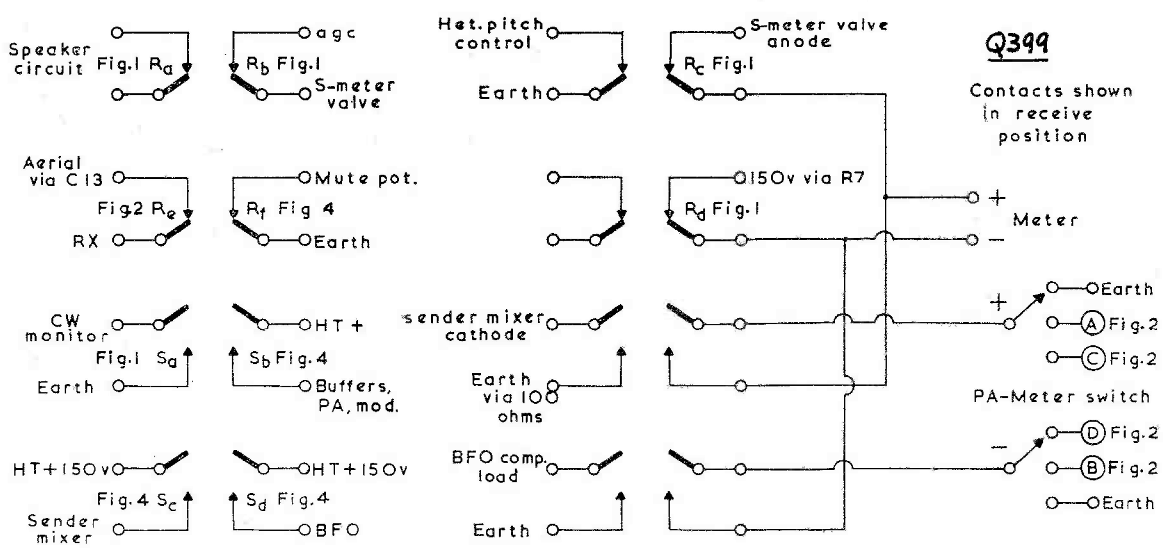


Fig. 5. Circuit arrangement for the Send-Receive relays and PA-meter switch in the 19 Set modification.

current is not needed from the heater windings and operation is intermittent (HT current is less than 50 mA on receive) some increase in the VA loading of the HT secondary is permissible and the transformer does not overheat in practice. *See* Fig. 4, p.23.

The HT to the receiver section is dropped to about 275v. The voltage to the PA is reduced when operating on 160m. (to limit the input to 10 watts) the value of dropping resistor being increased on CW when the modulator is not drawing current. It was found quite easy to fit an extra wafer to the front of the wave-change switch and this is used to short out the voltage-dropping resistors when 80m. is selected.

A 150v. stabilised supply produces HT for the receiver local oscillator, the BFO and the sender mixer. An additional heater transformer is used to give a supply, after rectification, for operation of the relays.

A manual HT switch is incorporated to avoid application of high no-load HT voltage to the set before the cathodes of the valves reach operating temperature.

Receiver Muting

A preset potentiometer is inserted at the earthy end of the RF gain control, operative on "send," to increase the bias to the RF and first IF stages. It is necessary to replace the original RF gain control, the slider of which is in contact with the earthed spindle and would render muting action ineffective.

Relays and Switching

Both relays in the original set are re-wired and used as in Fig. 5, p.23. The change over to "transmit" is by a SPST switch which energises the relays. On "receive," the S-meter circuit operates, but for transmission the instrument is connected to the PA-meter switch which can be selected to read PA anode current, anode voltage or grid current. The switch is the original 2-pole 6-way item with alternate positions left blank to prevent any make-before-break. The values of resistors R15 or R16 in Fig. 2 (p.21) will probably need adjustment to give an accurate reading of PA anode current.

For AM/CW, four poles of the original 9-pole 3-way mode switch are used. An 8BA nut and bolt is inserted to stop down to two positions. The functions of the switch can be seen by reference to the circuit diagrams, but to summarise, the four poles operate as follows :—

(1) Connects HT to the modulator on AM, Fig. 4, p.23.

(2) Shorts across PA side of modulation transformer on CW, Fig. 2, p.21.

(3) Connects side-tone oscillator on CW, Fig. 1, p.19.

(4) Brings in a resistor in the PA HT supply on CW to reduce voltage to that obtained with modulator running. This latter works in conjunction with an extra wafer on the wave-change switch so that it is only operative on 160m., *see* Fig. 4.

Metalwork

The accompanying photographs show the locations of most of the new components and panel layout. Use is made of existing holes where possible. A strip of aluminium sheet covers the holes left in the panel by removal of the large sockets, and this contains the speaker jack, loading capacitor switch, S-meter and muting presets, microphone jack and earth terminal. A bracket is fixed to the left side of the chassis to hold the additional smoothing choke and heater transformer.

The flick-mechanism on the two tuning condensers is removed. The original calibrated plates, rivetted to the tuning dials, are replaced by white card fixed with adhesive.

Numerous ½in. diameter holes, about sixty in all, are made in the top and rear of the outer metal case for ventilation.

Tuning Modifications and Alignment

The transceiver is now capable of operation, but as mentioned previously, it is desirable to reduce the tuning range. This proved to be much easier than expected and put a final touch to the modification. Ten of the moving vanes are removed from each section of the 4-gang tuning capacitor, leaving three vanes (one of which is an outer one) on each. After sawing through the brass spacing strip between each of the plates to be removed, they are then extracted by slight twisting and pulling with fine-nosed pliers, with the vanes out of mesh. Care must be taken to avoid damage to the remaining vanes. The tuning is then reset on each of the two switched ranges to the appropriate bands, 3·5-3·8 mc and 1·8-2·0 mc, by wiring fixed capacitors across the coils. Fortunately, the required connections are to the three outermost tags of the wave-change wafers and are easily found. The condensers required, for the 80m. and 160m. bands respectively, are 330 $\mu\mu$F and 470 $\mu\mu$F for the receiver mixer, and 300 $\mu\mu$F and 470 $\mu\mu$F for both of the buffer stages. The oscillator stage is a little more difficult because the circuit employs a single coil which is partly shorted for the higher frequency range. However, this was overcome as shown in Fig. 6 (p.25) by addition of C1 and C2 for 80m. and 160m. respectively. Capacitors are 1% silver-mica.

With these modifications, the tuning ranges are 3·45-3·85 mc and 1·80-2·00 mc, and a final alignment is possible using the existing trimmers. To maintain good oscillation, particularly on the higher range, the two damping resistors shown across the grid coil windings are removed.

A final alignment can then be made of the receiver and transmitter circuits. It should be noted that the trimmers on the higher frequency range, being always in circuit, affect the other band so the 80m. trimmers located on the 4-gang capacitor should be adjusted first. The buffer circuits are aligned for maximum PA grid current with the PA anode and screen supplies disconnected. Grid current of 4-5 mA

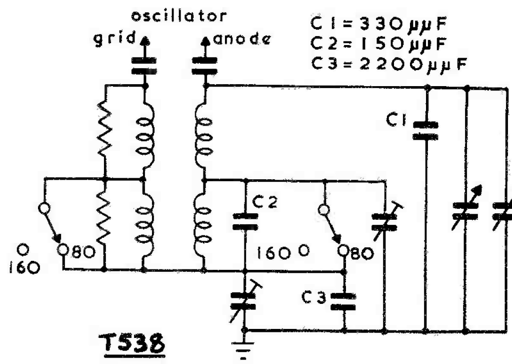


Fig. 6. The modified oscillator tuning, values as shown.

on 160m. and 3-4 mA on 80m. was obtained. It is important to check with an absorption wavemeter that the correct frequency has been selected from the sender mixer.

With the heterodyne pitch control in the central position, the BFO is adjusted by means of the dust-iron core to zero-beat with an accurately tuned signal. It is then checked that the frequency of the BFO remains unchanged on "transmit," and adjusted by the value of the sender mixer compensating cathode bias resistor. A value of 100 ohms was found to be exact and a plan to use a variable preset was dropped.

Calibration

This was carried out using a crystal calibrator giving pips at 1000, 100 and 10 kc, and harmonics. Calibration marks were made at 10 kc intervals on both bands, drawn in black ink on white and protected by a clear lacquer spray. An additional scale was made for the S-meter and fixed higher than the existing calibration so that the latter is still readable.

Testing and Results

Preliminary tests of PA output and modulation were carried out using a dummy load consisting of carbon resistors (three 220-ohm, 2w. in parallel) or a suitable 12v. bulb. With the specified HT, an input of up to 20w. could be run efficiently on 80m. in the CW mode and slightly less on AM.

Results on the air, using AM and CW, were well above expectations and no adverse reports have been encountered. The transceiver has proved to be very simple to operate when compared with the more orthodox station equipment.

Finally, the writer wishes to thank G3TFF for his critical comments during the progress of the work and for assistance in testing the completed transceiver.

GOING QRO FROM TEN WATTS

ADDING A LINEAR AMPLIFIER

D. O'GARA (G3UQF)

THERE are many amateurs who operate small low-power transmitters on the LF bands, 80/160m. The circuit described here is a simple method of increasing the power output of such a transmitter without going to the trouble and expense of a complete rebuild. Most of us are familiar with the linear amplifier, as commonly used with single-sideband transmitters. But there is no reason why a medium-power linear cannot be added to an AM or CW rig.

The circuit is as shown in the diagram. The 807's were chosen, because they are cheap, readily available to most amateurs and, with suitable HT, will handle about 100 watts.

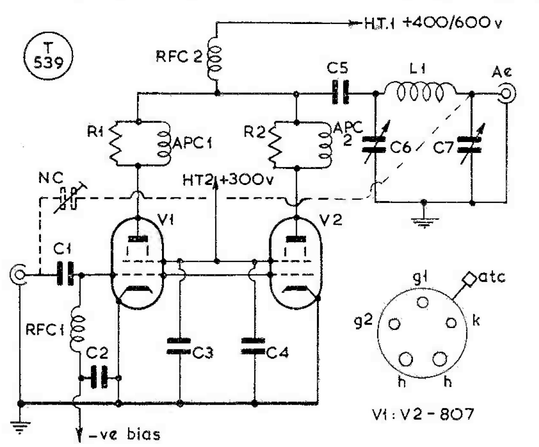
It would be advisable to stabilize the screen supply of the 807's, and though not done on the original, there have never been any complaints of distortion when using it on the air.

The grids of the 807's were left untuned for the sake of simplicity, since a ten-watt transmitter will fully drive the valves with ease. The grid bias is derived from a separate supply and should be in the region of —30v. to —40v.

If it is intended to use this set-up on 80 metres it should not be necessary to neutralise the valves. If instability should occur it can easily be remedied by inserting a small capacitor, NC in the diagram, of about 10 μμF, between the anode out-of-phase voltage and the grids of the valves, as shown in the sketch.

When setting up this RF amplifier, the negative bias is adjusted to give about 25 mA of standing anode current with no drive applied to the grids. Then all that remains is to feed the output from the existing transmitter to the grid of the linear and tune for maximum output.

Values for the circuit as shown can be: C1, C5, 100 μμF; C2, ·001 μF; C3, C4 ·01 μF; C6, 100 μμF, variable; C7, ·0015 μF variable (can be 3-gang 500 μμF,



Circuit of the 807-linear for the LF bands, using a pair of 807's —see text for values. Drive from almost any low-power Tx capable of giving about 5 mA of grid current is applied to the coax socket across C1, RFC1, the grid of the amplifier being untuned.