THE 19 SET Mk.III Rx BANDSPREAD

FOR 80/160 METRES—SUGGESTING A PRACTICAL MODIFICATION

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THE November 1967 issue of SHORT WAVE MAGAZINE contained various details for using the 19 Set, in particular as a transceiver for the 160 and 80m. bands. The two original tuning ranges of the receiver section were left basically unchanged, except to extend coverage to 1·8 mc. These bands were 1·8-4·5 mc, and 4·5-8 mc. As the transmitter section of the equipment covers 1·8-2·0 mc, and 3·5-3·8 mc (when modified as described) it is a logical step to adjust receiver coverage to band-spread 160 and 80 metres. This gives much more open and easy tuning, and ready identification of frequency. The original circuit has aerial, mixer and oscillator coils for 2·0-4·5 mc and 4·5-8 mc, with a multi-pole two-way rotary switch. The modification consists of removing these coils, fitting new coils, and replacing the large 4-gang capacitor (one section unused) by a 3-gang 20 $\mu\mu$F or similar condenser pack, near value.

Circuit Details

The diagram shows the circuit after modification, other circuits being left unchanged. The new coils are *Denco*, Range 2 for 160m. coverage, and Range 3 for 80m. The aerial coils L1, L2 are *blue*, mixer coils L3, L4 are *yellow* and oscillator coils L5, L6 are *red*, these being the nomenclatures used for the *Denco* range.

VC1/2/3 is the new ganged capacitor, operated by the existing drive. A 3-gang 20 $\mu\mu$F unit gives a little spare rotation. Actual frequency coverage can be modified somewhat by adjusting the cores and trimmers. The existing 50 $\mu\mu$F aerial trimmer (panel mounted) remains. Each mixer and oscillator coil has its own 30 $\mu\mu$F or similar trimmer T.

The 80m. band coils are not modified. However, it is necessary to remove about 32 turns from the 160m. aerial and mixer coils, and 20 turns off L6, the oscillator coil. This is done by unsoldering the winding outer end, taking off turns, and re-soldering.

Modification

If the switch click-plate is unscrewed, the shaft pulls out of the wafers, which are bolted to chassis members. This allows the leads to be reached and gives room to work.

The new coils occupy similar positions to the old ones — aerial coils in the small screened box, mixer coils behind, and oscillator coils in the rear box.

When the old coils are out, screws holding the large ganged capacitor can be seen. One IFT at the rear has to be loosened to get the condenser pack out.

The front plate of the new capacitor was bolted to the drive mechanism, in place of the old one. The click-stop device was also removed.

Adjustments

Coverage can be checked by usual method, or by switching on the transmitter VFO and looking for the VFO beat with the receiver section (aided by the tuning meter).

With a given tuning capacitor value, dial readings are extended by reducing coil inductance and increasing capacity of the parallel trimmer. Extreme maximum and minimum setting positions of VC1/2/3 are not wanted, however.

L5 core and its trimmer may be adjusted for 3·5-3·8 mc (which a little to spare each end of the band). L4

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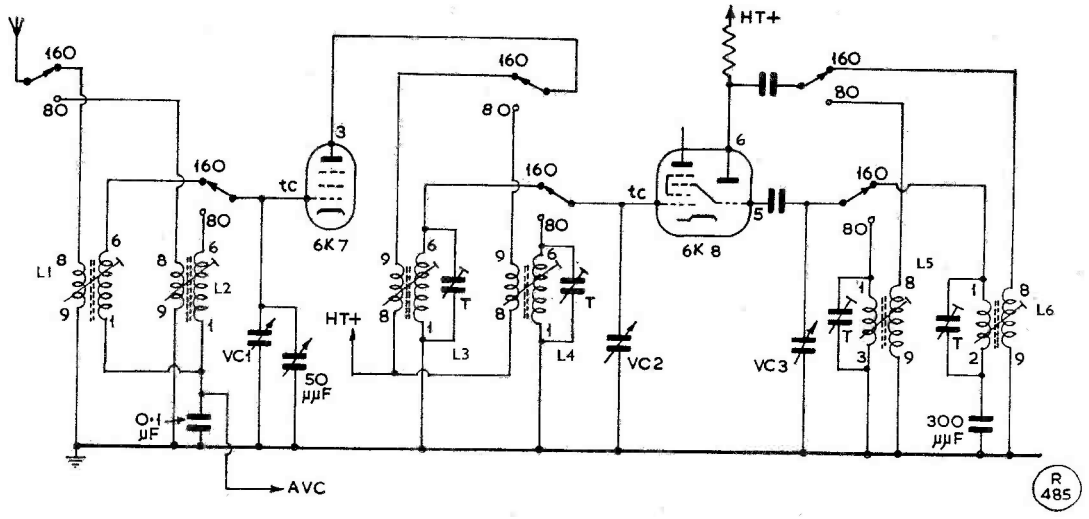

The 19 Set receiver band-spreading circuit for 80/160 metres.

Table of Values

Fig. 2. Marker Unit for Two Metres

C1	= 22 $\mu\mu$F	L1	= 200 turns, 40 SWG, on slugged polystyrene former
C2	= 100 $\mu\mu$F, variable	L2	= 3 turns, 24 SWG, on slugged polystyrene former
C3, C7, C8, C9	= 500 $\mu\mu$F	L3	= 2 turns coupled to L2
C4, C5	= ·003 μF	Valves	= 6AK5, 9001, 9003 (*see text*)
C6	= 80 $\mu\mu$F	Xtal	= 500 kc bar—*see text*
R1	= 500,000 ohms		
R2, R3, R6	= 10,000 ohms		
R4	= 100,000 ohms		
R5	= 220 ohms		

express purpose of giving 500 kc marker points in the 2-metre band. Most converters and receivers acquire a certain amount of frequency error due to drifting or voltage changes, so a suitable frequency standard to check this point from time to time adds up to better operating efficiency.

With a 500 kc crystal, five marker points are provided in the 2-metre band; these are useful for making a suitable calibration chart. When the calibration is completed and can be relied upon, stations not already listed can be measured and their actual operating frequencies filed. The unit was designed to be really accurate all the way from 500 kc to 150 mc. Power consumpton is so small that it could probably be bled off the HT/LT supplies to any existing receiver. With 100v. or so HT and using 6AK5 valves, harmonics in the 144-146 mc band are strong enough to be picked up with only a few inches of wire connected to the calibrator output terminal. The physical size can be kept small for the convenience of tucking the unit out of the way in some corner, to be switched on as required.

The circuit is not at all critical and once it has been well constructed with good components (the most important being the crystal) no further adjustment is required other than to zero the crystal beat-note with one of the WWV transmissions, or MSF on 2500 kc. The particular components specified are correct for a QCC Q5/500 bar. Should some other make of crystal be used it may be necessary to change the values of the 22 $\mu\mu$F and 500 $\mu\mu$F condensers (C1, C3) slightly in order to have an equal amount of frequency correction either side of zero beat. The frequency correction is adjusted

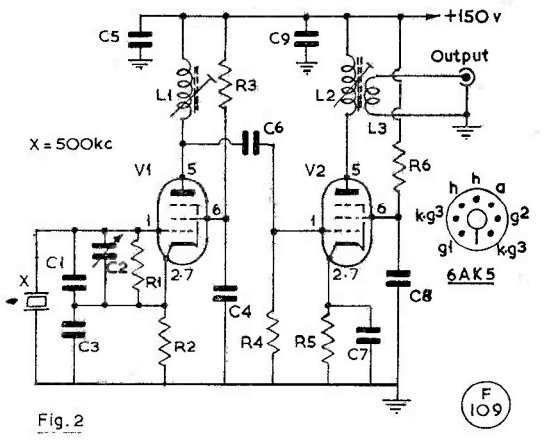

Fig. 2. For accurate marker points through the two-metre band, this circuit is suggested, with a 500 kc bar as the primary oscillator. Variable capacity C2 enables the oscillator side to be brought to zero-beat with a standard-frequency signal, such as WWV or MSF. In most cases, a calibrator unit of this sort can be run off the Rx power supply.

by the variable 100 $\mu\mu$F condenser, C2. Several crystals were tried in this circuit, including a 1000 kc bar, and all worked very well.

The valve complement can be quite varied—types 9001, 9003 (EF91, EF92 with wiring modification) and 6AK5 are all suitable. The 6AK5 gives the strongest harmonics, but the 9001 is good enough.

There are no particular tuning adjustments other than to peak the oscillator plate circuit on either 3 or 4 mc. This can be checked by listening for maximum signal on the regular communication receiver adjusted to 3 or 4 mc. The three-turn plate coil L2 is peaked for the strongest signal by listening on 145 mc. The coil formers are small polystyrene type. The 200-turn coil L1 can be either wave- or scramble-wound and doped to keep the turns in place. The output coil L3 is three turns of 24g. enamel.

The chassis size of this unit is 4in. long by 3in. high and 3in. wide. Actual size is not important so long as grid and plate leads are kept to one or two inches. Once constructed, it will be found essential for its purpose, and it is cheap and easy to build.

INTERNATIONAL I.E.A. EXHIBITION

Described as the " greatest technical show in the world," this year's International Instruments, Electronics and Automation Exhibition will be held at Olympia, London, during the week May 13-18. More than 800 exhibitors will occupy the whole of the building, and the value of their exhibits, from all over the world, is put at " scores of millions of pounds."

GONSET TAKEN OVER BY AEROTRON

We are informed that the American Gonset concern —manufacturers of amateur-band equipment—has been absorbed by Aerotron, Inc., of which one of the directors is Stuart Meyer, W2GHK—*see* p.54, March issue. It seems that the products now being offered to U.S. amateurs from the Aerotron, Ameco and Gonset stables will henceforth be marketed under the name of Ameco.

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core is then peaked around 3·6 mc, and L4 trimmer around 3·75 mc. L2 is set for minimum adjustment of the panel aerial trimmer, across the band.

The Top Band cores and trimmers are set up in a similar way. After peaking up all adjustments, the tuning scale can be calibrated and marked.

These *Denco* coils could no doubt be employed in the same way for a home-constructed 160/80m. receiver, or when modifying a surplus or other old receiver. To use the coils specified, the receiver IF should be around 465-470 kc.