

## NBFM WITH THE HW-30

### MODIFICATION TO AVOID TVI

P. J. S. BENDALL (G3NBU)

FOR about three years, since it was bought as the mobile rig for G3NBU/M, the Heathkit HW-30 "Two'er" has also been used as main-station transmitter, for which it was fitted with a wander-plug socket connected to Tx HT, to operate a low-current relay for aerial change-over. The detector voltage is, of course, cut when the rig is used with an external receiver.

#### TVI Problem

During this period it was found that under certain conditions the audio modulation could appear on the sound channel of a television receiver—sometimes on TV sets up to a quarter of a mile away *even when mobile!*

After discussing the problem at the local Club it was decided that narrow-band frequency modulation ought to effect a cure. As it is intended anyway to use NBFM in a 50-watt two-metre Tx under construction, the method was tried on the HW-30. General opinion had it that if a silicon rectifier is loosely coupled to a crystal oscillator through a 15  $\mu\text{F}$  trimmer, with a DC bias of about 10-12v. applied with audio superimposed, the variation

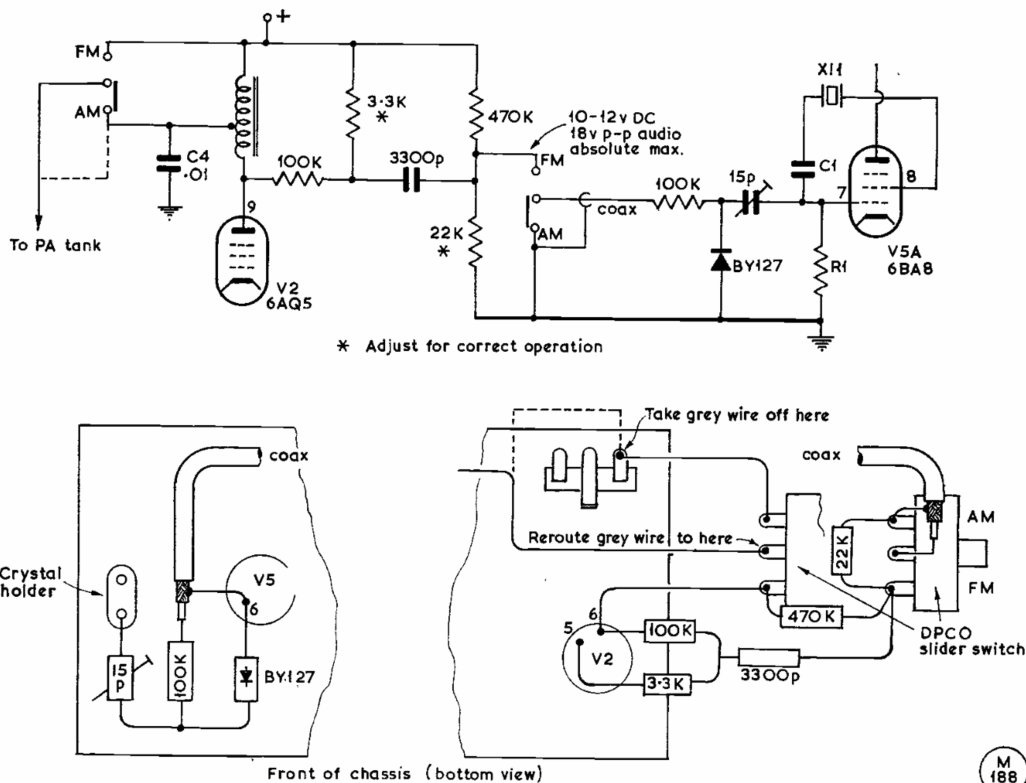
of the apparent capacitance across the crystal would produce frequency modulation.

#### Modification

A BY127 was to hand and, keeping leads to a minimum, its anode was earthed and a 15  $\mu\text{F}$  trimmer connected from the cathode side to the grid of the oscillator. Audio and bias were fed through a 100K resistor. The +10v. bias was obtained by a potentiometer arrangement, consisting of a 470K resistor to HT+ and a selected value of resistor to earth. Similarly, the required level of audio was pott'ed off the modulation transformer. Amplitude modulation was taken off the PA by moving the PA feed direct to the main HT.

Provided that the diode is not run into conduction one cannot get too much audio. The actual deviation is set by adjustment of the trimmer—in the case of G3NBU, on-the-air tests were carried out with a local and the correct setting for the trimmer was found at about the third attempt. The audio break-through on TV was found to have disappeared completely, with a good NBFM signal going out. An unexpected dividend was to find that, with the microphone input shorted, the CW signal went up about two S-points—the reason for this is not immediately apparent!

The modification involved is shown in the accompanying diagrams; it is as well to have the HW-30 manual available when carrying out the work.



Modifying the Heathkit HW-30 for NBFM

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