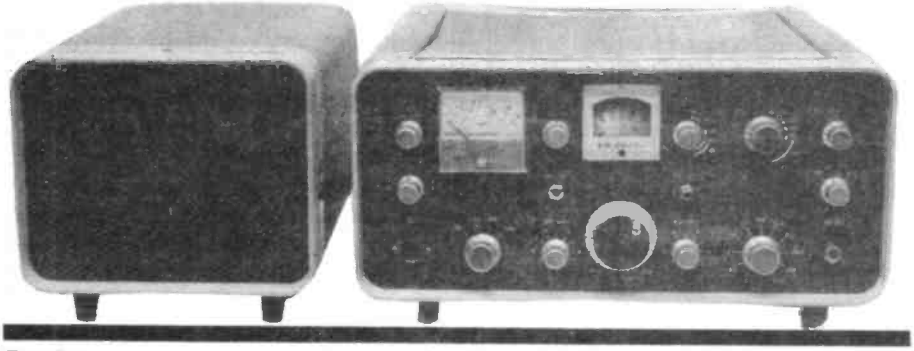
Upgrading the KW2000 series of HF transceivers



Part 5 More Mods

by M.T. Healey, G3TNO and R. Charles

Improving the CW note

The note on most *KW2000s* leaves a little to be desired to the CW purists and the example at G3TNO was no exception. A number of critical reports on the note were obtained from local and more distant stations, including a most useful tape of the transmission from an SWL (needless to say, he received a QSL by return). It became obvious from the tape, various reports and local monitoring that the signal suffered from clicks on 'make', and thumps on 'break', and that the tone had a rather odd 'flutey' sound. Various experiments were tried with the usual key click/thump filter circuits, but none really cured the problem, so thoughts turned to an alternative method of generating the CW signal.

The *KW2000* was tuned up into a dummy load, and another receiver was used to monitor the signal produced. The balanced modulator was then temporarily unbalanced by shorting one side of the balance control RV14 to chassis, and the resultant carrier monitored on the outboard receiver; the note was perfect. So an external power supply was lashed up via a key to the junction of C6 and C7, a CR network being connected across the key contacts. The monitored note was now perfect with no trace of click or thump. This set up performed well on the lower bands, but on 21&28MHz a severe lack of drive was apparent, caused by the fact that the carrier in most SSB rigs is set to a frequency which is about 20dB down one side of the filter passband, as shown in **Fig. 105**. So a crystal in the centre of the passband was plugged into the socket normally occupied by the LSB carrier crystal, and again the note was monitored and the drive level checked; the note was still OK and there was now plenty of drive available on all bands. A few local contacts were made using this lash up, and everyone reported a great improvement in the transmission.

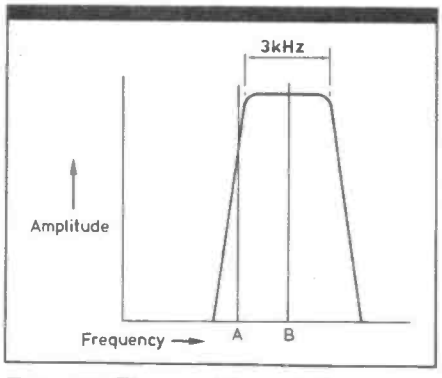


Fig. 105 The position of the carrier with respect to the filter passband. For SSB operation the carrier frequency is normally set to position A, some way down the skirts of the filter response, so that the filter passes the upper sideband and filters out the lower. For CW operation more drive will be obtained if the carrier is moved to position B, in the centre of the passband.

A list was now drawn up of the requirements for a permanent modification:

1) The ability to unbalance the balanced modulator with the key, without using an external power supply.

2) The automatic switching in, in the transmit mode only, of a carrier crystal in the centre of the SSB filter passband, reverting to the normal carrier crystal on receive.

After many trials and errors the circuit of **Fig. 106** was evolved. The advantage of this circuit, apart from an improved CW note, is that, at the flick of a switch (S1*), it is possible to revert to the unmodified state; thus the SSB performance is unchanged, and comparison between the modified and unmodified states is very easy.

The operation of the circuit is as follows. With S1 set to ON, and under key-up conditions, TR4 and TR5 are biased off, so no voltage will appear across R1003 or across the coil of relay C. The sidetone oscillator will be cut off, and with the rig set to VOX the contacts of the VOX relay RL4 will be open; thus the rig will be in receive with the CW filter switched into circuit. At the instant of closing the key contacts, TR5 is biased on, relay C is energised and a carrier crystal in the centre of the SSB filter passband is switched into circuit. The sidetone oscillator in the *KW2000* will at the same time activate the VOX circuit, putting the rig into transmit. This will close contacts RL4/2 and will keep TR5 biased on via D112. This latter feature is very important, as without it relay C will follow the keying, and the

* Note that the switch 'S1' referred to in this article is not the same switch as on the original KW circuit.