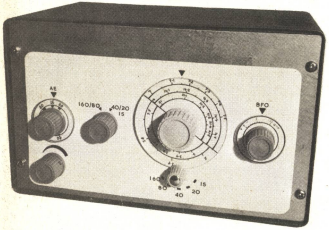
all band short wave converter

Part 2

F. RAYER G3OGR



Tuning Adjustments

L1, L2 and L3 and the trimmers can be set before adding the BFO and 5·5MHz FET stage. L3 and the trimmers determine the bands covered, so they must be adjusted correctly. Either of the following methods can be used:

1. If the associated receiver covers at least some of the correct oscillator frequencies, and if its calibration is reasonably accurate, the oscillator frequency can be checked by placing its aerial lead (preferably screened except near the end) near L3. It will then be possible to pick up the oscillator carrier. As the converter output is to be 5·5MHz, there will be 5·5MHz difference between the required band frequencies and the oscillator. For example, for 1·8 to 2·0MHz the oscillator will tune to 7·3 to 7·5MHz. TC1 and L3 are adjusted until this is achieved. All the required oscillator frequencies were listed earlier. If a required band cannot be reached with some of the trimmers, the core of L3 is slightly moved to correct this, until adjustment of the five trimmers alone allows all five bands to be covered.

2. An alternative method is to use a signal generator, or to find amateur band signals, working the converter into the receiver in the usual way. The core of L3 is sealed after adjustment.

Subsequently adjust the core of L1 so that 7MHz signals are peaked with VC1 fully closed, and 21MHz is reached with VC1 nearly completely open. L2 has more than adequate coverage for 160 and 80m and the core is set so that VC1 gives resonance with both bands. VC1 will allow tuning of signals 11MHz away from the required bands, in the way explained, so the five resonant points for the wanted bands should be marked on the dial of this control. The core of L4 is simply adjusted for best volume or sensitivity.

IF Unit

The IF stage is assembled on a metal chassis about 75 x 50 x 40mm (3 x 2 x 1½in) high, as in **Fig. 7**, made from scrap metal. Coil L5 is wound on a 7mm diameter former. Begin at point 1 and wind on thirty-three turns to 32SWG enamelled wire, finishing at point 2. C18 is across this winding, its leads projecting under the chassis. Winding 3-4 is ten turns, close to the main winding.

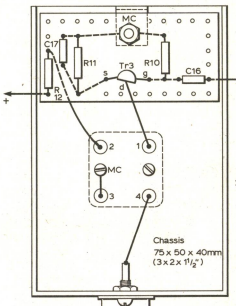


Fig. 7: Layout and wiring for the optional IF amplifier stage.

The small board in Fig. 7 is mounted by a bracket, which is the chassis and negative return. Output from 4 goes to a co-axial socket on the unit. The coil core is set to peak signals, as for L4.

BFO Unit

Fig. 3 is the circuit, and **Fig. 8** the layout of this stage. L6 is wound on a 7mm diameter former, with core, and has thirty turns of 32SWG wire, close wound, centre-tapped for the chassis connection. R14 and R15 allow the shorting of VC3, to put the stage out of use, thus avoiding a separate switch. The extreme corner of one moving plate is bent outwards, so that it firmly contacts a fixed plate when the capacitor is closed.

A satisfactory level of BFO coupling was obtained by running an insulated lead from VC3 (marked IF) and looping this round the centre pin of the output socket in Fig. 7. When this stage is fitted, set VC3

half open, tune in an AM or CW signal and adjust the core of L6 for the usual zero beat position. Rotating VC3 either way should then cause a heterodyne, rising in pitch.

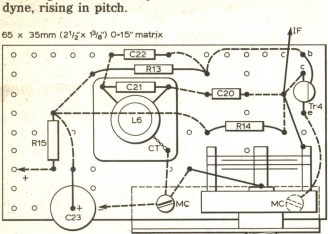
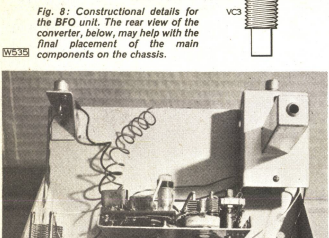


Fig. 8: Constructional details for the BFO unit. The rear view of the converter, below, may help with the final placement of the main components on the chassis.

W535



The converter is ideal for use with the general coverage type of communications receiver, but can of course be used with other receivers. A screened aerial lead from receiver to converter is necessary, and should not be longer than necessary. This can provide an earth connection from converter to receiver, which is essential.

The likelihood of 5·5MHz breakthrough depends on the screening and other factors. A very small adjustment of receiver tuning above or below 5·5MHz will have little important effect on calibration, but if the shift away from 5·5MHz is substantial the converter ought to be re-aligned to suit the actual IF output to be used. Chances of 5·5MHz breakthrough will be very much reduced by using an aerial tuner, which will also allow best results with very weak signals. It is also possible to fit a 5·5MHz trap in the aerial lead at the converter. It is essential to turn back VR1 with strong signals to avoid overloading the receiver.