only drawback to large changes in frequency is found not in the transceiver itself but in the whip aerial which, being itself sharply resonant, has to be re-resonated. The impedance of a base-loaded whip such as the 3FIF is very low, of the order of 25-30 ohms. The use of 75-ohm coax to connect the whip to the transceiver does not really provide a good match and so the author uses *two* lengths of low-loss TV coax connected in parallel. Three parallel lengths would be even better but the author achieves excellent results using two 14ft. parallel lengths.

Modulation level can initially be adjusted by on-the-air reports. In the writer's case, the microphone gain control is up to about 50%, which is adequate for all conditions except motorway speeds. Then the supply voltage builds up and over-modulation occurs if the gain is not backed off.

The HSO-460 also provides BFO facilities and the author was at first dismayed to find that the injection was so strong that AGC voltage was developed. However, this turned out to be a blessing in disguise because the strong injection makes possible excellent SSB copy.

Conclusion

The equipment has been in use for over two years and consistently good reports are received. If acknowledgements are due, then these must surely go to the original designer of the 19 Set!

Editorial Note: We have recently been informed that the Electroniques coils mentioned for this article—Table of Values, p.541, November—have been discontinued and that only small stocks remain. It has been suggested that the *Denco* BFO.2/465 will substitute for the HS-460, and the possibility of other substitutes is being investigated. Some further points to note are that "R3" in the right-hand column of the Table should read T3; that T1 is 60:1; and in the list of 5w. resistors, include R17. In the circuits on pp.542-543, November, switches marked "S3" are separate, for obvious reasons.

THE KW VICEROY ON TOP BAND

MODIFICATION FOR 160-METRE OPERATION — USING SEPATATE MIXER/OSCILLATOR

D. W. POWER (G3SCJ)

THIS modification is quite simple and consists basically of extending the *pi*-tank coil by a few turns to cover 160 metres, adding an extra coil for this band to the driver section, and building an ECF80 mixer/oscillator unit. This work can easily be done in one evening—and is just as easily removed should this ever become necessary.

The K.W. Viceroy was in production for several years and is probably one of the best known SSB transmitters in the U.K. It normally covers 10 to 80 metres with a power input of 180 watts peak, and is quite as good as many more modern transmitters—the only drawback, as far as the writer is concerned, being the lack of Top Band coverage. This was at first overcome by the use of an external translater unit driven from the Viceroy operating on 7 mc—a method which although effective was thought to be rather crude, as it entails the use of a dummy load, separate relays, power supplies, plus the translater unit itself. Because of this the possibilities of operating the Viceroy itself on 160 metres were investigated.

Circuitry

Various arrangements were considered, such as switching the VFO heterodyning from 80 metres, and so forth. But none of these was practical. This left the original system of mixing from 7 mc, this being to a crystal oscillator on 5 mc (or 9 mc if the Viceroy is an older model with USB on 7 mc) the difference of 2 mc being taken to give 160 metres, with an ECF80 triode-pentode as a mixer/oscillator.

The first step is to construct the mixer/oscillator unit on a small piece of aluminium, about 4in. x 1½in., around the ECF80. The triode section is used as the

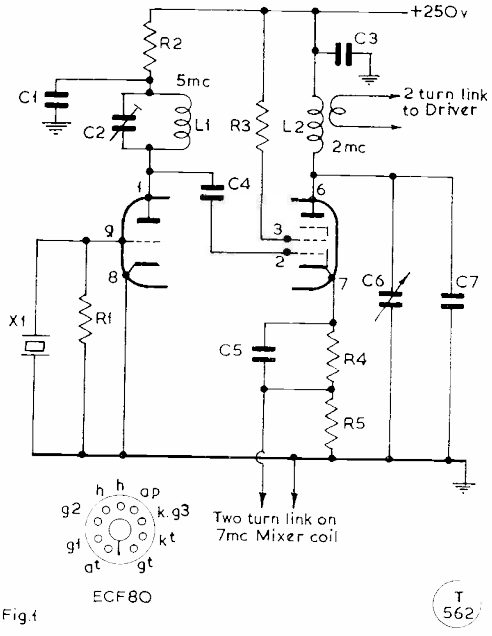

Fig. 1. Circuit of the ECF80 mixer-oscillator, to enable the K.W. Viceroy Mk. II to be operated on the 160-metre band. C6 is mounted on the front panel—see text.

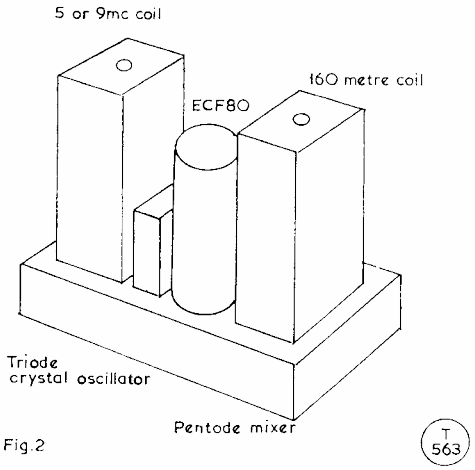

Fig. 2. Sketch to show general appearance of the completed mixer/oscillator unit, as designed by G3SCJ for his K.W. Viceroy modification for Top Band.

crystal oscillator and the pentode as the mixer.

The anti-trip control to the left of the VFO knob is then removed and mounted at the rear of the transmitter between the two other Vox controls, and the variable capacitor of the mixer/oscillator unit fitted in its place on the front panel.

The 6CL6 driver stage must now be adapted for 160 metre operation. This is easily done by bolting a suitable coil, trimmed and adjusted by GDO, to the side of the driver compartment, disconnecting the 7 mc coil and connecting that for 160 metres in its place.

The 7 mc drive to the mixer/oscillator unit is obtained by taking a two-turn link from the 7 mc second mixer coil—the existing link to the driver being disconnected. The output from the mixer/oscillator unit then goes *via* a two-turn link from around the 160-metre coil of the mixer/oscillator to the 6CL6 driver—using the connections originally going to the 7 mc coil of the second mixer.

The final step is to extend the coverage of the *pi*-tank coil to operate on Top Band. This is accomplished by the addition of an extra self-supporting winding between the end of the original coil and the unused position on the PA band-switch. If some models do not have

Table of Values

Fig. 1. Circuit of the Mixer/Oscillator

C1, C3, C5	= ·01 μF	R4	= 680 ohms
C2	= 5-30 μμF trimmer	R5	= 75 ohms
C4	= 10 μμF	L1	= To resonate on 5 mc with C2
C6	= 75 μμF var.	L2	= To resonate on 1·9 mc with C6, C7
C7	= 100 μμF	Xtal	= For 5·0 mc
R1, R3	= 47,000 ohms	V	= ECF80
R2	= 10,000 ohms		

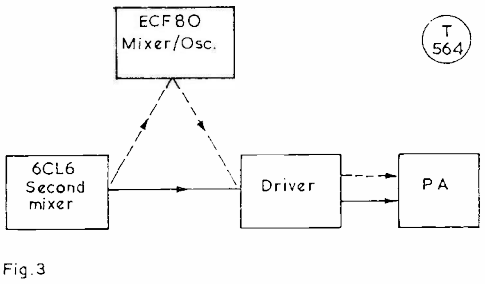

Fig. 3. Block diagram to show the electrical position of the mixer/oscillator unit relative to the Viceroy. The solid line is the normal signal path, and that dotted is the signal path when the transmitter is used on 160 metres.

this extra switch position then a separate switch could easily be used.

The mixer/oscillator unit can be mounted vertically, *i.e.*, with the valve and coils horizontal and pointing towards the front panel, fitting between the VFO flywheel and the old anti-trip control position. HT and heater volts can be obtained from the transmitter itself.

Setting Up

The Viceroy should now be tested for 160-metre operation: With the VFO switch set to 40m. and the PA switched to the new 160-metre position, the transmitter should now function correctly on 160 metres—the only difference being an extra peaking control for this band. It should be noted, however, that the transmitter must under no circumstances be allowed to deliver more than the legal limit of 26¾ watts peak output; on the Mk. II this is easily achieved by dropping the PA anode volts from 750v. to the 250-volt position.

As described, the modification means, of course,that the transmitter can no longer be used on 40 metres as it stands. However, if the 7 mc band is wanted, then the spare switch positions on the band-change switch can be arranged to make this possible.

Although the modification is designed specifically for the Viceroy Mk. II it can easily be adapted for use with the Mk. III, and probably other makes of transmitter as well.

Editorial Note: A great many of these well designed and soundly engineered amateur-band transmitters are still in use all over the world—they remain among the attractive items occasionally offered in our Readers' Small Advertisement columns. The K.W. Viceroy transmitters have always been noteworthy for the quality of the CW/SSB signals they radiate. They are widely used as driver units by those who have translaters for CW/SSB on VHF. The foregoing is an interesting built-in modification to enable the K.W. Viceroy to be operated as a CW/SSB transmitters on the 160-metre band.