K.W. ELECTRONICS LTD.
Dartford

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TUNING

The KW VANGUARD Transmitter

Operating & Tuning Procedure

Adjust the three mains voltage selectors at rear of chassis to appropriate voltage. Connect mains lead to A.C. supply (Green is earth). Plug in Antenna or Dummy load to ANTENNA socket (situated at rear of P.A. screening box - remove cabinet back panel).

To put the Transmitter into operation, the following procedure should be carried out:-

1. Turn the TRANSMIT/RECEIVE switch to RECEIVE
2. Switch the NORMAL-TUNE switch to NORMAL.
   This ensures that no H.T. is applied to the Rectifier valves.
3. Switch MAINS switch to ON. This applies mains to the heater Transformer and should cause all valve heaters to light.
4. Switch the PHONE-CW switch to PHONE; adjust the VFO BAND-SWITCH and final R.f. amplifier band switch to the band of operation.
5. Adjust the oscillator (VFO) to the desired frequency, as indicated on the frequency calibrated dial.
   Set VFO switch to required band, also P.A. Bandswitch.
   Note: On the 10-80 m. model there are two 80 metre positions on the P.A. Bandswitch. Both positions should be tried for best antenna loading on this band. The 10-160 m. model has one 80 m. position only and this is fixed to provide a suitable match into a 50-80 ohm load or Antenna Tuning Unit.
6. Turn the drive control (R10) half-way up.
7. Turn the modulator gain control to minimum.
8. Turn the meter switch to read P.A. PLATE M/A
9. Turn the antenna coupling condenser to maximum capacity corresponding to a dial setting of '10' for loose antenna coupling.
10. During the procedure listed above, the valve heaters will have warmed up sufficiently and plate voltage may now be applied. Turn the TRANSMIT/RECEIVE switch to TRANSMIT. Watch the meter and rapidly adjust the final R.f. amplifier tuning condenser for lowest possible plate current.
11. Switch the meter to read GRID M/A and adjust the P.A. grid condenser (C20A) for maximum reading on meter. Then adjust the DRIVE control (R10) for reading on the meter, 2.8 to 3 m/a.
12. Return the meter switch to P.A. plate m/a position and adjust antenna coupling control for an increase in P.A. plate current. Rapidly re-adjust P.A. TUNING for minimum plate current. Repeat this operation until plate current dip occurs at approximately 110 m/a - the normal loading of the final R.f. amplifier. It should be realised that low plate current indicates loose antenna coupling and therefore low R.f. output. On the 80 metre band it may be possible to obtain a dip in plate current at two different settings of the P.A. tuning control; one near a dial reading of 7-10 and the other near the reading 0-2. In the latter position the final is doubling to 40 metres and this position should be avoided.
13. Re-check the grid current as indicated under para. 11. Now re-adjust the P.A. tuning control for minimum dip coincides with 110 m/a indicated on the meter. The P.A. tuning control should be operated rapidly to keep the 6146 from drawing excessive plate current for a long period of time; a condition which might damage the tube. After the adjustments for tuning the final R.f. amplifier and antenna coupling have been completed, modulation may be applied.
14. Turn the meter switch to % MOD. position and speaking into the microphone in a normal voice level at a distance of 3" to 6" gradually increase MOD. GAIN control until the meter reads 80-100% modulation on voice peaks. After modulation adjustments have been completed the Transmitter is ready for

The final R.f. amplifier tuning and antenna coupling procedure for C.W. is identical to the one just outlined for PHONE operation but the modulator gain control should be kept at zero. The PHONE-C.W. switch should be brought into the C.W. position. Plug into appropriate socket at rear of chassis - transmission may then be started by pressing the key. When standing by, the TRANSMIT/RECEIVE switch should be turned to RECEIVE. For C.W. operation the meter may be switched to read P.A. plate current offering a check of the tuning condition of the final R.f. amplifier, or it may be switched to read GRID current to avoid excessive stress on the meter itself.

Reception

The change-over from transmit to receive is accomplished by operating the TRANSMIT/RECEIVE switch. The co-ax socket adjacent to the antenna socket should be connected to the Receiver antenna terminal.

Rx Mute

This socket at the rear of chassis may be used for muting a receiver (e.g. by breaking H.T. to R.f. or I.F. stages in the Receiver). In the transmitter, the "Rx Mute" socket is connected with the Send/Receive switch, which, when in the "Receive" position, provides a shorting line across the two "Rx Mute" terminals.

Zero Beat Frequency Adjustment

In order to adjust the transmit frequency exactly to a frequency of another station, the NORMAL-TUNE switch should be set to the TUNE position. The oscillator of the Transmitter may now be adjusted to 'zero beat' with the signal being received. After tuning has been accomplished the switch is returned to the NORMAL position. After a minor change of frequency, perfect tuning of the final R.f. amplifier may be obtained by re-adjusting the P.A. tuning condenser.

Note

Should it not be possible to obtain sufficient drive on 14, 21 or 28 mc/s after adjustment to P.A. GRID and DRIVE control has been made, it may be necessary to adjust the dust iron cores in L.5 & 6, as indicated in the Signal Shifter leaflet. L.5 should be adjusted for maximum P.A. grid current on 21 mc/s and L.6 for maximum grid current on 28 mc/s. Should it be necessary to adjust the Signal Shifter to correct calibration, instructions should be followed as indicated in the VFO leaflet.

Harmonic Filter

When the Transmitter has been aligned according to the above instructions, the harmonic filter may now be adjusted. This filter is tuneable over the 40-70 mc/s range and is suitable only when feeding a low impedance 50-100 ohms. If it is required to use an aerial with a high impedance feed, e.g. long wire or windom, it is advisable to employ an Aerial Tuning Unit coupled to the Transmitter with a short length of co-axial cable. The harmonic filter should be adjusted for minimum radiated power at the frequency of the Television Transmitter (40-70 mc/s band) received locally. This can best be checked by a receiver at the television frequency connected to an aerial a few yards from the transmitting aerial.