

399C-1 EXTERNAL VFO UNIT

1.1 DESCRIPTION.

The 399C-1 External VFO Unit includes a 70K-2 Oscillator and a permanent magnet speaker. It operates with the KWM-2 Transceiver to provide separate receive and transmit frequencies within the same 200-
kc band when desired. A switch on the front panel provides selection of either oscillator as single frequency control for the station in transceiver service, or selection of one oscillator to control the receiver frequency and the other to control the transmitter frequency. This allows tuning the receiver into the foreign DX bands to listen for DX stations while keeping the transmitter within the legal amateur band. The vfo in the 399C-1 is a 70K-2 Oscillator and is identical to the 70K-2 Oscillator included in the KWM-2.

2.1 INSTALLATION.

- a. Remove the jumper plug P17 from J17 on the KWM-2 chassis and plug P17 of the 399C-1 power cable into J17. Plug the other end of the cable (P401) into J401 of the 399C-1.
- b. Plug P403 (the phono plug attached to the speaker lead) into J10 on the rear of the KWM-2. This jack is marked $4\ \Omega$.
- c. Connect J402 of the 399C-1 to J18 on the KWM-2 with the shielded coaxial cable furnished with the 399C-1. This is the 399C-1 vfo output connection to the KWM-2.

3.1 OPERATION.

In the following operation procedures, the KWM-2 vfo is described as number 1 and the 399C-1 vfo, as number 2.

- a. With the VFO selector switch in the REC 1 - XMIT 2 position, the receiver frequency is controlled by the dial setting of KWM-2 and the transmitter frequency is controlled by the dial setting of 399C-1.
- b. With the VFO selector switch in the REC 1 - XMIT 1 position, both the receiver and transmitter frequencies are the same and are controlled by the VFO in KWM-2.
- c. With the VFO selector switch in the REC 2 - XMIT 2 position, both the receiver and transmitter frequencies are the same and are controlled by the VFO in 399C-1.

4.1 CIRCUIT DESCRIPTION.

The oscillator tube of the 399C-1 is a type 6AU6 pentode connected in a high-C electron-coupled oscillator circuit. The tuned circuit consists of C301, C302, C303, C305, L301, L302, and L303. Variable inductor L303 is the front panel frequency control and L302 is an inductive trimmer adjustment. The value of capacitor C301 is factory-selected for oscillator temperature compensation. The vfo frequency shifting circuit, consisting of L304, C108, and diode switch CR301, shifts the oscillator frequency as part of the sideband selection circuits. This allows sideband selection without changing the vfo dial indication. For example, when the KWM-2 is switched from LSB to USB, a positive voltage is applied through R303 to the anode of CR301, causing it to conduct. Forward conduction of the diode lowers its impedance and effectively connects C308 to ground across the cathode choke L304. The added capacitance across L304 lowers the oscillator frequency by the amount of the KWM-2 mechanical filter pass band. When the KWM-2 is operated on lower sideband, the d-c voltage applied across R303 is negative, cutting off conduction of CR301 and raising its impedance to such a high value that C308 is switched out of the oscillator cathode circuit.

Vfo output is taken from an autotransformer in the plate circuit of V301 through coupling capacitor C307.

5.1 MAINTENANCE AND ADJUSTMENT.

5.1.1 TUBE REPLACEMENT.

Tube V301 can be replaced without upsetting the calibration accuracy of the unit.

5.1.2 VFO SIDEBAND FREQUENCY SHIFT ADJUSTMENT.



Do not make this adjustment unless switching from one sideband to the other makes readjustment of the tuning dial necessary to keep the output signal from shifting.