CRYSTAL FILTER

Sideband suppression is accomplished with a high frequency crystal filter consisting of two half lattices operating back-to-back. The crystal frequencies are 5173.5 and 5175.5 kc. The passband of the filter, centered at 5174.5 kc. is approximately 3 kc. and the shape of the response is such that the lower sideband, (5173.5 minus audio) is suppressed 40 db below the upper sideband, (5173.5 plus audio). This filter is suitable for operation on the other sideband, provided a crystal oscillator frequency of approximately 5176.5 kc is used. This crystal must be suitably matched to the oscillator circuit, and should be calibrated for a load of 20 picafarads. Commonly available crystals, made to work with 32 picafarads, will not function satisfactorily in this circuit.

BALANCED MODULATOR

V9, the 7360 Balanced Modulator generates the double sideband suppressed carrier signal which is subsequently fed through the crystal lattice filter. This balanced modulator is a beam deflection type, and operates similar to a cathode ray tube in that the electron beam from the cathode is deflected to one output plate or the other by the charge appearing on the deflection plates. RF energy from the crystal oscillator is fed to the input grid of the modulator. In the absence of audio, the deflection plate reference voltages are adjusted by means of the carrier balance potentiometer so that the RF being fed to each output plate is equal. The two output plates feed the carrier to transformer T1 in push-pull, and the two signals cancel each other out in the output of T1. Audio from the Mic. Amplifier, V11, is superimposed upon one deflection plate, unbalancing the modulator, and the two sidebands resulting from sum and difference frequencies of the audio and carrier, appear as a double sideband, suppressed carrier signal in T1, with the carrier suppression being approximately 50 db.

CONTROLS

Functions of the various front panel controls are as follows:

FILAMENT SWITCH	Controls main power to the transceiver, and provides 12 volts ac or dc to the filaments.