

3. "PRIVATE-LINE" TONE GENERATOR

a. Description

The "PL" tone generator consists of a transistorized two-stage oscillator and "reverse-burst" switching circuitry. The frequency determining element of the oscillator is a Motorola "Vibrasender" resonant reed (an electro-mechanical equivalent of a parallel-tuned high-Q tank circuit). The oscillator operates continuously when the radio set is turned on. It is located on the bottom side of the chassis as shown in Figure 3.

b. Circuit Theory

The oscillator circuit is made up of Q704, Q705, the "Vibrasender" resonant reed and the bias circuitry. The tone output is taken from the collector of Q705 or from resistor R724 in the emitter circuit of Q705. The selection of these two paths is determined by diodes CR710 and CR711. When the transmitter is keyed, the push-to-talk lead is connected to ground. The diode bridge (comprised of CR701, CR702, CR703 and CR704) causes Q701 to turn on. When this happens, CR710 becomes reverse biased and CR709 is forward biased through R728, R730 and R731. The tone oscillator output is now taken from R724. When the push-to-talk button is released, Q701 is turned off and CR710 is now forward biased through R725, and R729. Diode CR709 becomes reverse biased and the tone output is now taken from the collector of Q705. The 180° phase shift between the two tone paths gives a "reverse-burst" of tone just after the push-to-talk button is released. This tone prevents "squelch tail" from occurring in the receiver by quickly damping the "Vibrasponder" resonant reed. Even though the push-to-talk button is released, the transmitter remains "on" for approximately 150 milliseconds so that the "reverse-burst" of tone may be transmitted. This delay is accomplished by Q702 and Q703 which comprise the "reverse-burst" switching circuitry. When the transmitter is keyed, Q701 and Q703 are immediately turned on. Q703 supplies current to the transmit-receive relay which turns on the power supply. When the push-to-talk button is released, Q701 and Q702 are turned off but Q702 turns on again after capacitor C701 is discharged through R704 and R705. It should be noted that during the discharge time (approximately 150 milliseconds) Q702 is off and Q703 is on. Finally, as Q702 is turned on, Q703 is turned off. This action removes the voltage from the relay which turns off the power supply and the transmitter.

4. CONTROL PANEL

a. Description

The control panel provides all controls required for operation of local and extended local control base stations.

A basic panel consists of the following controls:

Volume Control/On-Off Switch
Squelch Control
Power On-Off Indicator
Transmit Indicator
Frequency Select Switch (Multiple-Frequency Models Only)
"Private-Line" Disable Switch ("Private-Line" Models Only)

A number of optional "add-to" items are available for these control units. Refer to the DESCRIPTION section of this manual for a listing of these items.

b. Circuit Theory

(1) Power On-Off

When switch S503 (part of the volume control) is turned on, 117 volts ac is applied to the power supply. At the same time, the power on indicator lights.

The receiver is placed in operation immediately upon application of primary voltage to the power supply. The transmitter remains off until the microphone push-to-talk switch is pressed.

(2) Volume and Squelch Controls

These controls perform the functions standard to communications receivers, that is, controlling receiver volume and noise level.

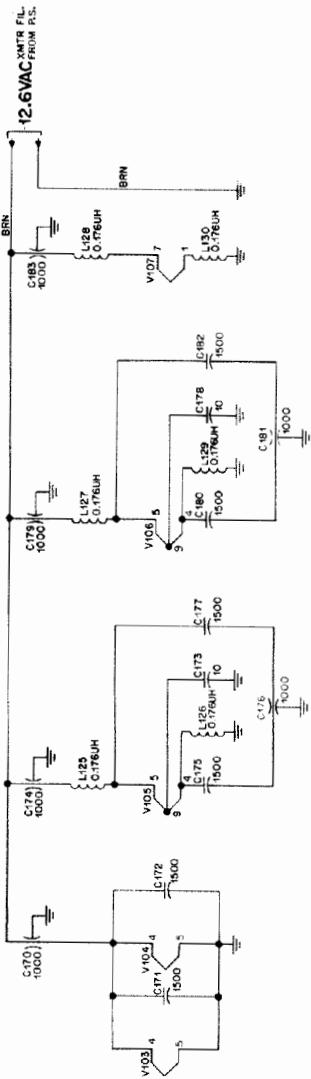
(3) Push-To-Talk Operation

When the P-T-T switch on the microphone is pressed, a ground is applied to the transmit/receive relay K201. This action causes K201 to energize to the transmit condition.

(4) Transmitter Turn-Off

When the microphone P-T-T switch is released, the ground is removed from transmit/receive relay K201, the relay de-energizes and all

TRANSMITTER FILAMENTS



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(“PRIVATE-LINE” MODELS ONLY)

NOTE 5

