GENERAL CIRCUIT DESCRIPTION

This brief circuit description is intended only to familiarize you with the Transceiver. We suggest that you read this information before proceeding with assembly. A more detailed circuit description can be found on Page 57. You may want to study the detailed circuit description as time allows after assembly is completed.

When reading this circuit description, it may be helpful to follow the circuit on the Block Diagram. In the Block Diagram, the receiver stages are located across the top, the transmitter stages across the bottom, and stages common to both the receiver and transmitter are located through the center.

TRANSMITTER OPERATION

There are two ways to actuate the Transceiver relay to change from receive to transmit operation; first, by the PTT (push-to-talk) method where a pushbutton switch in the microphone is used to close the relay circuit; or second, by the VOX (voice operated transmitter) method.

In VOX operation, the voice sounds which are transformed into electrical impulses by the microphone are amplified by microphone amplifier stage V1A. These signals go to VOX amplifier V10 and to AF (audio frequency) cathode follower V1B. These electrical impulses are amplified by the VOX amplifier and then by relay amplifier V2B to a level that will operate the relay. When the relay is switched to the transmit position, it turns off certain tubes in the receiver sections and turns on certain tubes in the transmitter sections, as indicated by the dashed lines on the Block Diagram. The tubes in both sections that are not switched by the relay remain in operation for both transmitting and receiving.

With the transmitter switched on by either the PTT or VOX method, the amplified voice voltage from V1A is sent to AF cathode follower V1B, which properly matches the low impedance of the diode type balanced modulator. The balanced modulator mixes the voice frequencies with a signal from carrier oscillator stage V11B. The modulator uses these two signals to develop two new signals; one is the sum of these two signals, and the other is the difference between these two signals. With the modulator balanced, the carrier signal is cancelled out and the resulting output of the modulator is a "double sideband, suppressed carrier" signal at the carrier frequency (IF).

The output of the modulator is fed through transformer T1, which is tuned to aid in balancing the modulator. From T1, the signals are amplified by transmitter IF amplifier V2A. From V2A, the amplified signals go to the crystal filter, which passes only the lower sideband signal and rejects the upper sideband signal. The lower sideband signal from the crystal filter is amplified by IF amplifier V3. This signal then passes through IF transformer T2 to transmitter mixer stage V4. In the mixer, the signal is combined with a signal from VFO (variable frequency oscillator) cathode follower stage V14. This mixing results in a single sideband signal at the correct transmitter output frequency.

The VFO signal is produced by tunable oscillator stage V13. The VFO signal from V13 goes to VFO cathode follower V14 for isolation. This signal is used in the mixer stages of both the receiver and transmitter, thus locking the transmitter and receiver to the same operating frequency.

The signal from transmitter mixer stage V4 is fed through receiver-transmitter bandpass coil L2, and then is amplified by RF driver V5. Output signal from the driver is applied through bandpass coil L3 to RF power amplifier tubes V6 and V7. Here the power level is greatly increased and then is fed to the antenna through a section of the relay.

To obtain maximum transmitter output without overloading, a portion of the driver output signal is fed back to preceding stages to adjust their gain automatically as needed. This is called ALC (automatic level control).

RECEIVER OPERATION

For receiving, the antenna is connected through the relay to receive-transmit bandpass coil L3. From coil L3, the signal is applied to RF amplifier stage V8A. From V8A, the signal passes