RF FINAL AMPLIFIERS

RF final amplifiers V6 and V7 are connected in parallel. High voltage plate connections are under the chassis. The grids are connected by a long foil strip on the circuit board. This strip is bypassed at its ends by capacitor C61 and C71 to suppress VHF oscillations. Cathode resistor R71 is a meter shunt for measuring cathode current when the meter switch is in the BIAS SET position.

Tubes V6 and V7 are operated as linear amplifiers, with high power sensitivity. Grid load resistor R72 is connected to the Final Bias control through R73, to allow adjustment of the grid voltage for proper operation. The Final Bias control is grounded through resistor R75 when transmitting. When receiving, this control is grounded through resistors R76 and R77 to increase the grid bias to cut off the final tubes.

AUTOMATIC LEVEL CONTROL

No grid current is drawn by tubes V6 and V7 in normal linear operation; however, when higher than normal grid drive is applied, grid current will flow and change the bias voltage. This higher-than-normal grid drive, caused by too much audio signal, makes the bias voltage change at an audio rate. This varying bias voltage is coupled through capacitor C75 to diode D70, which rectifies the signal to develop the DC negative ALC voltage, which is applied to V2A, V4, and V5. Resistors R78 and R79, along with capacitor C74, filter this voltage and provide the proper time delay for ALC action. The entire ALC circuit is biased above ground by resistors R76 and R77 to cut off the transmitter section when receiving.

TRANSMITTER OUTPUT CIRCUIT

The plates of the RF amplifier tubes are connected to the supply voltage by choke RFC61. Their signal is coupled to the pi-section output circuit through capacitor C67. Output coil L4 is tuned by Final Tune capacitor C65. Antenna loading is fixed by capacitor C77. With the Function switch in the Tune position, a sampling of the output voltage from resistors R61 and R62, and diode CR60, gives a meter indication to indicate proper adjustment of the Final Tune capacitor.

RELAY TRANSMIT-RECEIVE SWITCHING

Switching between transmitting and receiving is done by the relay. Section A of the relay switches the antenna, and section C switches the bias voltages.

Section B of the relay is connected to the Ext Relay socket on the rear of the Transceiver, and can be used to control external equipment, such as a linear amplifier or antenna relay. Because one side of the Ext Relay socket is grounded to the Transceiver chassis, the socket must not be used to switch any voltage in a circuit that operates above ground, as the chassis would become "hot," causing a possible shock hazard.

VOX AMPLIFIER V10 AND RELAY AMPLIFIER V2B

The Transceiver can be switched from receive to transmit by either the push-to-talk or the VOX method. VOX Amplifier V10 is normally operated in a saturated condition, that is, with very low plate voltage and maximum plate current. Positive half cycles of the voice signals from V1A have no effect on V10, however, the negative half cycles cause the plate current to drop, thus increasing plate voltage. This increased plate voltage fires neon lamp NE2, providing a positive switching action. The voltage from the neon lamp is then amplified by relay amplifier V2B, which operates the relay. Capacitor C105 and resistor R107 form a delay network that establishes the time the relay stays closed after being tripped. The length of time is determined by the setting of the VOX Delay control.

ANTI-TRIP CIRCUIT

Because the VOX stages operate on both transmit and receive, the speaker signals during receive must be kept from tripping the relay when receiving. This is done by taking a portion of the audio signal from AF output stage V12A, rectifying it with diode D100 to produce a positive voltage, and feeding this voltage to the grid of V10 from the VOX control. This voltage tends to increase the plate current of V10; signals from the microphone (picked up from the speaker) tend to decrease the plate current. Therefore