TRANSMITTER

The transmitter circuitry consists of a crystal oscillator/driver stage, final amplifiers, and a pi-network output circuit for impedance matching and harmonic suppression. Transistor Q5 is the crystal oscillator and/or driver, depending on whether or not the transmitter is VFO or crystal controlled. If VFO control is used, the stage is only a driver which is resonance-tuned by the appropriate driver capacitor, C35 and C36, C37, and C38 with coil L2. When the crystal transmit button is pressed, the stage is a combination Pierce oscillator and driver. The transmitter output frequency is then the same as the external crystal, regardless of the VFO frequency.

Coil L2 couples the driver signal to the final stage that consists of transistors Q6 and Q7 operating in parallel. The RF output signal is switched through the appropriate pi-network which acts as a low-pass filter and provides the necessary impedance matching. Capacitor C42 is the Tuning control which should be adjusted for maximum power output on the relative power meter. Capacitor C43 acts as the loading capacitor across the output to the antenna. Capacitor C44 couples the RF output through relay RL1 to antenna jack J4. The meter circuit couples off a small portion of the RF output, which is then detected by diode D1. Meter M1 indicates the RF output as relative power.

Keying

Transistor Q12 provides a keying function when the key is depressed. This transistor provides the keying for the transmitter driver stage, the sidetone oscillator, the break-in delay switching, and the receiver muting. When the key is depressed, the keying transistor places a B+ voltage on the collector of crystal oscillator/driver transistor Q5 and switches it on. The transmitter is then keyed and provides an RF output signal. The B+ voltage is simultaneously applied to the sidetone oscillator circuit which couples its tone to audio amplifier IC1.

Depressing the key also places a ground on the emitter of break-in delay transistor Q8 and the input of audio amplifier IC1. The break-in delay circuit switches relay RL1 and connects the antenna to the transmitter. Since the ground is placed at the input to the audio amplifier, and the antenna is switched to the transmitter, no receiver signal is heard. The sidetone is coupled to the second cascaded amplifier of IC1 so the tone can then be heard in the headphones. When the key is released, keying transistor Q12 allows the Transceiver circuitry to return to the normal receive mode.

BREAK-IN DELAY

Transistors Q8 and Q9 provide an adjustable delay circuit for antenna switching. The emitter of break-in delay transistor Q8 is placed at ground when the key is depressed. This pulls the collector to ground which causes relay driver transistor Q9 to energize relay RL1 and switch the antenna from receive to transmit. Relay RL1 will remain energized until the base voltage of relay driver transistor increases to the B+ voltage. When the key is released, the emitter and collector voltages of Q8 try to increase toward B+. Capacitor C19 simultaneously tries to discharge through delay control R8 which determines the break-in delay time. The collector voltage of Q8 will gradually increase until it reaches B+ which causes the base voltage of relay driver transistor Q9 to increase toward B+. This causes relay RL1 to de-energize and switch the antenna from transmit to receive.