

CIRCUIT DESCRIPTION

Refer to the Schematic Diagram and the Block Diagram in the Illustration Booklet while you read the following description.

The Transceiver operates in the CW portion of the 15, 20, 40, and 80 meter amateur bands. The frequencies are generated by the combined efforts of the VFO and the heterodyne oscillator for both transmit and receive operation. In the following paragraphs, each part of the Transceiver circuitry will be discussed in detail.

VFO

FET (field effect transistor) Q2 and its associated circuitry forms a Hartley oscillator. Part of coil L9, tuning capacitor C302, and temperature compensating capacitors C44, C45, C46, C47, C48, C49, and C51 determine the frequency of the oscillator. The other part of L9 is a feedback circuit that couples part of the generated signal back to the gate of FET Q2 to help sustain oscillation. The VFO generates frequencies from 8.645 MHz to 8.895 MHz.

Diode D9 clamps the positive-going half of the signal to prevent FET Q2 from reaching high peak operating currents. This helps to keep the VFO from generating harmonic frequencies.

The signal from the VFO is coupled through capacitor C54 and C56 to emitter follower transistor Q3. This transistor provides isolation for the VFO. The output from the emitter of transistor Q3 is coupled to the balanced mixer.

When the Transmitter is keyed, diode D11 effectively adds capacitor C55 to the circuit which causes a shift in the VFO frequency. This produces a fixed offset during transmit. Zener diode ZD1 provides voltage regulation for the drain of FET Q2.

HFO

The HFO operates at any of four crystal-controlled frequencies, depending on which band switch is depressed. These frequencies, when mixed with the VFO frequency, establish the four bands of operation.

When the 3.5 MHz pushbutton switch on the front panel is depressed, crystal Y1 and its associated circuitry are electrically connected to transistor Q6 to form the HFO. At this time power is supplied to the circuit through resistor R78 and crystal Y1 oscillates at a frequency of 12.395 MHz, which is coupled through diode D22 to transistor Q6. A part of the signal from the collector of transistor Q6 is coupled back through diode D23 and through the tuned circuit composed of coil L17 and capacitor C116 to sustain oscillation. Diodes D22 and D23 prevent DC from activating this crystal circuit when a different crystal circuit is being used. The HFO operates similarly on the other bands.

The HFO signal is coupled through capacitor C127 to emitter follower transistor Q7. This transistor provides isolation for the oscillator circuit to prevent loading. From the emitter of transistor Q7, the signal is coupled to the balanced mixer.