

CB 25LTD Theory of Operation

The COBRA models CB25LTD is the Citizen band AM radio transceivers operated in the frequency range of 26.965 to 27.405 MHz (40 channels).

1. CB mode of operation

1.1 CB Transmitter section

When in transmit mode, TR15 and the crystal oscillator generate a fundamental frequency 10.24 MHz and send it to the Phase-Locked-Loop IC3 25LTD to produce the reference frequencies of 16.725 to 17.165 MHz. The fundamental frequency and the reference frequencies are then mixed up in IC2 TA7310P to produce the RF signal of 26.695 to 27.405 MHz. This signal, after magnified by the RF amplifiers TR8 and TR7, is fed to the antenna for transmitting.

In the mean time, the speech signal picked up by the microphone is amplified by TR13 and IC1 TA7222AP, and then applied to the collectors of TR8 and TR7 for RF amplitude modulation. Thus completes the speech signal modulation and transmitting.

1.2 CB Receiver section

When in receive mode, TR15 and the crystal oscillator generate a fundamental frequency 10.24 MHz and send it to the Phase-Locked-Loop IC3 25LTD to produce the first local oscillator frequencies 16.270 to 16.710 MHz.

In the mean time, the AM RF signal (26.695 to 27.405 MHz) picked up by the antenna is magnified by TR1 and fed to the first mixer FET1. This signal is then mixed with the first local oscillator frequencies 16.270 to 16.710 MHz. That produces the first IF frequency 10.695 MHz. The first IF signal, after passing through the ceramic filter, is fed to the second mixer FET2 for mixing with the second local oscillator frequency 10.24 MHz. That produces the second IF frequency 455 kHz. The second IF signal, after filtered by the ceramic filter and magnified by TR2, TR3, TR4, is demodulated by D6 for speech signal recovery. The recovered speech signal is then magnified by the TA7222 and fed to the speaker. Thus completes the speech signal receiving.

2. PA mode of operation

With the CB-PA switch set at PA position, the speech signal picked up by the microphone is fed to TR13 and TA7222 for magnification to a level of about 4 watts, and then via the PA terminal sent to the speaker for speech sound reproduction.