

Necessary Bandwidth

The necessary bandwidth calculation under 2.202(b) for the H25T2001S transmitter falls under the general FM formula:

$$BW = 2M + 2DK \quad K = 1$$

$$D = 2.5 \text{ kHz}$$

$$M = 3 \text{ kHz}$$

$$\text{Estimated BW} = 11 \text{ kHz}$$

Emissions Designator

The emissions designator based on measurement is 11K2F3E. This emissions designator indicates that this is a NBFM audio channel transmitter with an occupied bandwidth of 11.2 kHz.

Intended Use

This device is intended to be used under the Police Radio Service section of the Public Safety section of Part 90 for short-term undercover surveillance operations.

Description of Circuitry

The active RF circuitry consists of an integrated circuit VCO and buffer device, U7, an intermediate power amplifier U8 and the RF-Mosfet final amplifier stage. The final amplifier is followed with a multi-section harmonic filter. The antenna connection is via a locking coax connector. Quarter wave tuned wire antennas are used with this transmitter. High phase angle mismatches are handled with the final amplifier circuit.

Modulation is via an electret microphone/antenna and a proprietary AGC hybrid integrated circuit. This module provides over-deviation limiting. Deviation is set by RV2. The processed audio directly frequency modulates the VCO via varactor diode, D1.

Frequency generation and stability is achieved by using a 9.6 MHz temperature compensated crystal oscillator (TCXO) in conjunction with U9, the frequency synthesizer IC. Components, R1, C11, R11, C12 and C13 comprise the synthesizer's loop filter.

Factory synthesizer programming and channellization is performed by U10, the microcontroller IC. This device has its own 65.535 kHz reference crystal. Local channel settings are done with BCD switch SW1. Any ten 12.5 kHz channel bandwidth frequencies in the band 150-174 MHz may be factory programmed.

Voltage regulation is performed by U2, an IC micropower low-dropout regulator.

Power up and low battery enable and disable circuits are included in the form of timer/shutdown devices U5 and U6. These devices prevent transient responses and undesired spurious emissions, associated with power up and low battery conditions.

The antenna connector is J101 and the external microphone/ power connector is J102. Emissions are controlled with an on-chassis switch SW101, located on the top of the transmitter.