Requirement 4E: Theory of Operation

The Guardian G25AMK003 is a 50W vehicular transceiver operating in the 136-174 MHz frequency band. The internal transceiver is the same unit used in the Datron portable unit, with a 50W power amplifier and two audio amplifiers for vehicular use.

Receive signal from the antenna enters the motherboard which contains a T/R switch. It is then routed to the transceiver, where it is filtered and converted to 45 MHz, filtered again and converted to 455 kHz. It is then converted to data, and all demodulation and decryption is done in a DSP. The audio output is fed to the motherboard again and amplified to drive an internal 5W speaker and/or an external 10W speaker, selectable from the front panel.

The transmit audio enters at the front panel microphone jack and is routed to the transceiver, where is it converted to data and enters the DSP. The transmit VCO runs at transmit frequency and is directly modulated by a DAC which is driven from a signal generated by the DSP. Again, all modulation and encryption is generated in the DSP and is present on the reference signal to the transmit VCO. The VCO output is amplified and filtered, and passes out of the transceiver to the mobile unit motherboard. There it is amplified up to the desired output power level, filtered and passed to the antenna.