

EXHIBIT B
TECHNICAL DESCRIPTION

A. Product Description:

The Model E13653 Remote Control Transmitter Unit has been designed for use in an industrial environment as part of a Telemotive radio remote control system. The preliminary application is the remote control of industrial cranes and other material handling equipment.

The transmitter operates over the frequency range of 436 MHz to 439.8 MHz.

A 7.5 VDC battery is used to power the transmitter.

The antenna is an integral antenna which is installed inside the plastic case and connects directly to the circuit board.

The transmitter operates with its companion receiver FCC ID: GXZE13151.

B. Block Diagram:

The block diagram of the transmitter is shown in Figure B-1.

C. Schematics:

The schematic for the transmitter is presented in Figure B-2

D. RF Module circuit Description:

The purpose of the RF module is to provide an RF output carrier frequency which is direct frequency modulated. This carrier is keyed-on in short bursts of data to provide Time Multiplex Sharing (TMS) systems operation.

The regulated voltage at 5 VDC is maintained by means of U1, which also provides the on-off power control.

Oscillator circuit Q1 is crystal controlled by Y1 which operates near 16.2 MHz and depends on the channel frequency trimmer capacitor C1 used to set the oscillator center frequency. The data input level of 0 to +5 peak volts is applied across the varicap diode CR1, which pulls the crystal controlled oscillator above and below the center frequency. This results in a slight FM deviation which is multiplied (along with the oscillator center frequency) to provide a total 80 kHz deviation bandwidth.

Transistor Q2 acts as a tuned frequency tripler resulting in an output near 49 MHz. This circuit is keyed-on by switching transistor Q5 which provides the TMS data operation. Components C11 through C16, L3 and L4 provide a 49 MHz bandpass filter.

Transistor Q3 is a second tripler and output amplifier at a frequency of 438 MHz. The harmonic generated by the amplifier are attenuated by the filter made of C24 through C28, L7, L8, and L9. The output to the antenna is matched to approximately 50 ohms by the coil tap at the end of L9.