Operational Description

The Transmitter contains a microcontroller, an Amplifier Sequenced Hybrid (ASH) transmitter, a permanently mounted stub antenna, passive components for tuning/ antenna match, an LED transmit indicator, a 3 volt lithium coin cell and holder, and a case incorporating a five button elastomeric keypad.

User input via the function keys is interpreted by the MCU, which controls the SLEEP and DATA signals to the ASH transmitter.

With no user input, the SLEEP signal is held low and the ASH transmitter "sleeps" with no RF output. When user input is detected, the SLEEP signal is held high, the ASH transmitter becomes active. The time required to go from "sleep" state to the transmit state is 20uS nominal.

The DATA signal is a 9600 Baud data stream with a bit time of 104uS. To preserve the DC balance of the DATA signal (important for proper decoding by the Receiver), data is encoded with 8 – to – 12 modulation (ETM), similar to Manchester encoding but with less "overhead". ETM breaks 8 bit bytes into 4 bit nibbles, which are translated into 6 bit STM nibbles, then combined to produce 12 bit STM "symbols" with a digital swum value of zero.

Data packets are 48 bits in length. Each data packet is composed of one sync symbol (000111111110), one address symbol, and one command signal, and one carriage return symbol (signifying "end of command"). Each packet takes approximately 5 mS to transmit, and at the end of each packet, the ASH transmitter returns to "zero emission" mode. If function key remains pressed, a delay (currently 60 mS) is inserted between packets. The ASH transmitter uses Amplitude Shift Key to modulate the RF output.

The Transmitter consists of a SAW delay line oscillator operating at the fundamental frequency of 916.5 MHz, followed by a modulated buffer amplifier.
TXA1 is biased by the SLEEP input. TXA2 controls the transmitter RF output power. This is modulated by the input current provided by the DATA signal. Resistor (R2) is in line with the DATA signal, limiting the TXMOD current and thus the peak transmitter output power.
The SAW output filter suppresses transmitter harmonics to the antenna.

Rated RF Power in Watts:	.001 Watt
Operating Frequency Range	916.5 MHz. – 916.5 MHz.
Modulation Technique:	Amplitude Shift Key (ASK)