

### **Operational Description**

The transmitter unit come in two varieties:

1. A 'standard' unit which gets its power externally from the system (9V-30V) and can accommodate up to 4 auxiliary inputs to turn the alarm on and off automatically bypassing the Alarm switch
2. A portable 'battery' unit which is powered from a 9V battery and does not have any auxiliary inputs (the alarm must be turned on and off manually).

Each transmitter unit can be broken up into four main blocks or functions:

1. Microcontroller
2. Data encoder
3. RF transmitter
4. Power regulator

The microcontroller is the brains of the unit and determines the appropriate action to take based on various input conditions. The microcontroller uses a 3.58 MHz ceramic resonator for its clock. A user can select using the Mode button three possible alarm settings for the receiver (flashing lights, buzzer, or both). Using the Alarm button or external switch the user can turn the alarm on and off. (as mentioned above the standard unit also has 4 auxiliary inputs to turn the alarm on and off). Based on these inputs and conditions the microcontroller transmits one nibble ( $\frac{1}{2}$  byte) of information to the encoder (the data is transmitted in parallel from the microcontroller to the encoder, no serial transmission occurs here).

The encoder takes the data from the microcontroller and encodes it into several packets or bytes of information which is then sent to the RF transmitter module at a serial rate of 500 KHz. The encoder adds address information and start and stop bytes to the data to help prevent data corruption.

The RF transmitter module transmits the encoded data to the receiver unit at a constant frequency of 916.48 MHz. No frequency hopping or spread spectrum techniques are used. The standard unit (the unit which is powered externally and has auxiliary inputs) uses a  $\frac{1}{2}$ -wave whip antenna for its transmission while the portable battery unit (powered by a 9V battery, no auxiliary inputs) uses a  $\frac{1}{4}$ -wave whip antenna. The receiver unit also uses a  $\frac{1}{4}$ -wave whip antenna.

The system is powered using a DC source which is then regulated to +5V (standard unit) or +3.3V (battery unit) using a linear regulator.