EON/CALPT Programmable Transmitter Principle of Operation

The Transmitter consists of a micro-controller, a LCD driver, RF oscillator and a temperature sensor The micro-controller sends data to the LCD driver when necessary and the LCD driver will then display information on LCD. The micro-controller controls an EL backlight circuit. When a button on the keypad is pressed the micro-controller will turn on the EL backlight circuit to illuminate the LCD for two seconds.

The micro-controller on the Remote Transmitter reads the resistance of the temperature sensor (thermistor) every 16 second. It then converts the resistance reading into temperature reading and display the temperature on the LCD.

The micro-controller reads and compares the preset temperature with the room temperature. If the room temperature is above/below the preset temperature, it will send a series of on/off code words to turn on/off the RF oscillator which in turn will transmit an ASK RF signal to the Remote Receiver.

When the user press the flame or fan buttons on the Remote Transmitter, the micro-controller will send series of code words correspond to the flame and fan control commands to the RF oscillator. The RF oscillator will in turn transmit the ASK RF signal to the Remote Receiver.

The super-regenerative circuit on the Remote Receiver receives the RF signal from the Remote Transmitter, converts it into code words (CMOS logic level) and feed the received code words to MCU1. If the received code words match the setting stored in the EEPROM, it will acts according to the received code word.

When MCU1 receives a on or off code word, it will turn on or off the relay output. When the micro-controller receives fan speed setting code word, it will send a signal to MCU2. MCU2 will then control the firing angle of the trigger pulse of the triac hence controls the fan speed. When MCU1 receives flame height setting code word it will send signal to MCU2. MCU2 will then alters its digital output which converted by R-2R network to analog signal for adjusting the flame height of the gas valve.

All timing on the Remote Transmitter is derived from a 32768 Hz Crystal-Oscillator and a 4.19MHz Ceramic Resonator Oscillator. All timing on the Remote Receiver is derived from a 32768Hz Crystal Oscillator and a 455kHz Ceramic Resonator Oscillator.

Timing and Signal Format of the Transmission

The Transmission signal composed of a train of code words separated by 12.1ms and last for 1.5 seconds. The timing of the transmission signal is shown in Figure 1.

Each code word consists of 13 bits. It always start with a start bit and follow by 12 bits (A_{11} to A_0) as shown in figure 2. A_{11} to A_0 are a combination of '0' and '1'. The timing of the start bit, '0' and '1' are shown in Figure 3, 4 and 5 respectively.

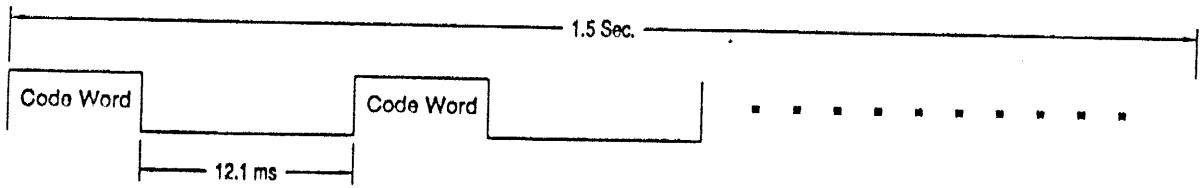

Figure 1 : Timing of Transmission

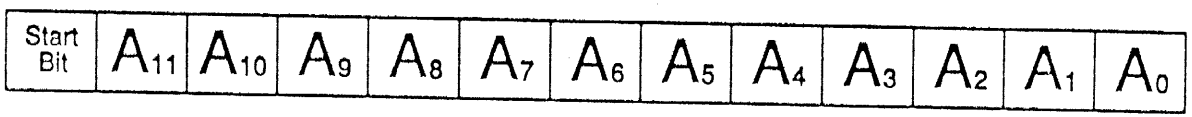

Figure 2 : Code Word Format

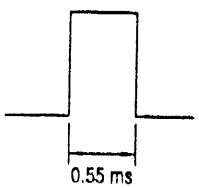

Figure 3 : Timing of Start Bit

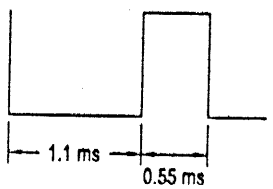

Figure 4 : Timing of '1'

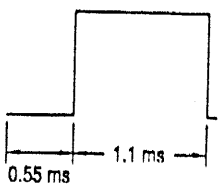

Figure 5 : Timing of '0'