

EXHIBIT 6

CIRCUIT DESCRIPTION

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FCC ID: ELG THERMOTX

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ws/pt15/dests.t

## Wireless Thermometer Transmitter

### DESCRIPTION OF PRODUCT

The wireless thermometer consists of two modules:

- (1) a sensor and transmitter module that may be placed outdoors in a greenhouse, etc; and
- (2) a sensor, receiver, and display module (base unit) that displays both indoor and outdoor temperature.

This document deals only with item (1) above.

### PRINCIPLE OF OPERATION

The sensor module contains a microprocessor controlled by 32.768 kHz watch crystal. At regular intervals it powers up and transmits thermal data. The thermal data are derived by measuring the resistance of a thermistor and dividing it by the resistance of a fixed reference resistor. The quotient is then multiplied by a calibration constant and transmitted.

At the base unit the received number is used to interpolate the temperature from a lookup table, and the number is displayed on a liquid crystal display. The base unit generates similar data from a self contained thermistor and also displays that temperature.

The base unit is battery-operated, and to save energy the receiver is powered down most of the time. Transmitter and receiver are turned on and off synchronously at sparse intervals to maintain radio contact.

### RADIO AND TRANSMISSION DETAILS

The thermal data (11 bits) are merged with transmitter ID code (8 bits) and 5 bits of administrative data to form a total message length of 24 bits. There are two more pulse than the number of bits; there are 26 pulses in each data group.

Two data groups are concatenated to make a transmission. There is a constant interval of 64 milliseconds of no output between the end of the first data group and the start of the second.

The transmit frequency is nominally 433.8 MHz, controlled by a surface acoustic wave resonator. To maximize efficiency and minimize spurious emissions, the transmitter tank/antenna is tuned to exact resonance by a trimmer capacitor. Data coding is on-off-keyed, pulse position modulation.

Normally the transmitter makes one transmission every minute, but immediately after a battery is installed, it transmits every 11 seconds in order to establish contact with the receiver as soon as possible. Short-spaced transmissions continue for 8.5 minutes after power up before the rate reverts to normal.