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Brief operational description of the SALIO wireless switched light.

The SALIO wireless light system consists of a handheld wireless transmitter and a low cost receiver located in the base of a portable light. Desired operational range was to be greater than 450 feet line of sight. Antennas are to be self contained in both the receiver and transmitter. Operation was to be under Article 47, part 15.XXX

Transmitter;

The RF portion of the transmitter consists of a SAW (F1) stabilized Pierce oscillator (Q1) directly coupled to a tuned antenna etched on the transmitter PC board. The frequency of operation is 315 MHz.

The oscillator is on/off keyed via the base of the oscillator transistor.

The on/off keying signal is derived from a PTC remote control encoder (U1). The "data" rate is approx. 500 symbols(bits)/sec. The bit period is approx. 2 mSec and data is encoded as 0.5 mSec hi (xmitter on) or 1.5 mSec hi (xmitter on) the balance of the bit period low (xmitter off).

The length of a data packet (all information needed for address codes and data to be sent [i.e.. light on/off or blinking]) is approx. 45 mSec and repeats (as long as the transmitter button is held down) approx. every 60 mSec. Release of the button stops the transmission.

Power for the whole transmitter section runs off a raw +12 volt battery (BATT1).

Address selection is accomplished via jumpers (J1 through J8)

Receiver;

The receiver is a single conversion super heterodyne with a first IF of 1.8 MHz. The LO for the receiver is (as in the transmitter) a SAW (F1) stabilized Pierce oscillator (Q1) operating at a frequency of 316.8 MHz.

The antenna for the receiver is a tuned design utilizing the top and bottom reflectors of the light. The bottom reflector is ground ant the top is tuned with a series L and connected to the receiver input matching stage (C11, L1, C12, & C10).

The detector responds to On/Off keying and the data is derived from the detector stage of the receiver. A single pole of post detection filtering is used (C8).

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Engineering

The majority of the RF portion of the receiver is built around an economical HiMark UHF receiver "chip" (U1). This unit contains RF amplifier, First (and only) mixer, IF filter (such as it is), successive detection "limiter", and a comparator.

Data from the receiver is then sent to a PTC decoder chip which matches up the address and, if the addresses match, sends out the appropriate commands to the light.

The command breakdown is as follows;

- 1) Light on
- 2) Light on (blinking)
- 3) Light off

The light is switched on and off by way of a N channel enhancement mode IGFET (U5). The IGFET is driven with two bipolar transistors (Q3 & Q5). The input to the bipolar transistors is a two input diode OR gate. The light on/off input comes from the decoder chip (U3). The flashing light input comes from a simple 555 timer (U2). The power to the 555 is switched with the other output from the decoder chip via Q2 & Q4.

The receiver, LO, and decoder runs off a +5 volt regulator (U4). The 555 timer, FET driver, and the light itself (LAMP1) runs off the raw +12 volts.

Address selection is accomplished via jumpers (J1 through J8).