Operational Description For LT2200 Wireless Signal Processing Unit (SPU)

Block Diagram Description

The LT2200 Signal Processing unit (SPU) is comprised of the following circuit blocks:

10 Hz oscillator
Correlator (multiplier and integrator
Variable audio oscillator driving a speaker
Input signal amplifier
916.5 MHz OOK modulated transmitter

A 10 Hz square wave oscillator simultaneously drives a multiplier and modulates the RF transmitter. This oscillator On-Off modulates a 916.5 MHz (On OFF Keyeing, OOK) carrier. The multiplier along with a f ollowing integrator stage forms a correlator which correlates the the 10 Hz square wave to the amplified input signal. A DC voltage results from correlating the 10 Hz square wave from the amplified input signal. The amplifier has a bandwidth of 300 Hz. The higher the correlation, the higher the voltage. This voltage is used to control a variable frequency audio oscillator. The frequency of the oscillator rises with increasing correlation. The frequency will diminish with decreasing correlation and oscillator will turn off with negative correlation. The audio oscillator frequency can range from "OFF" to about 1 KHz.

916.5 MHz Transmitter Description

The 916.5 MHz transmitter is based on a Colpitts type, single transistor oscillator. The frequency is controlled by a 916.5 MHz +/- 100KHz, single port SAW resonator. A 10 Hz square wave,.with a maximum duty cycle of 50%, signal is presented to the base of the transistor. The oscillator will turn off when the transistor's base voltage falls below the cut-off voltage and turns on when rising above the cut-off voltage. A 3.3 volt regulator stabilizes the transistor's operation. The oscillator was design for a maximum output power of 0 dBm yielding a 50mV/meter field strength at 3 meters.

The transmitter's antenna is incorporated into the printed circuit board. It is a quarter wavelength monopole.

No tuning is required for this transmitter.