laser based communication system essay sample

Laser Based Communication System.

Introduction:-

An optical communication system for inter and intra building communications can be built using the following three basic component. A light emitting element. 1. A light emitting element, which could be a laser diode or light emitting diode. 2. Transmission media such as optical fiber cable or free space. 3. A light receiving element, which could employ avalanche photo-diode, PIN photo-diode or any other light sensors like LDR. Since the communications performance of the system depends on the overall characteristics of the above elements, the characteristics of the individual element should match. Here we present a one way optical communication system using a short wave-length visible laser diode as the light emitter source, free space as the transmission media and a light dependent resistor as the light receiving element. The system is ideal for speech communication between two adjacent offices or between homes on opposite sides of a road.

Buzzer

It comprises transmitter, receiver and a common DC power supply. The power supply, at one end of the, provides 6V to the transmitter section.
In the transmitter section, the intensity of the laser beam is modulated by the out put of an always on code oscillator, using a push to on switch; the tone oscillator is momentary activated to alert the person at the receiver end before starting a voice communication using the micro-phone.

The receiver receives the intensity modulated light signals through a light sensor and it puts the code and 1 KHz tone/voice.

The ckt. For detecting the code signals is built around a phase locked loop. The absence of the code signal indicates intercepting of the laser beam and activates an audio- visual warning at the remote receiver for detecting the 1 KHz signal; another phase locked loop is used. The call detection is indicated by a buzzer sound and LED.

For such a communication, the person at the transmitter end speaks into mike while call switch S1 is open. The modulated light beam contains the 10-15 KHz code freq. and voice components. After demodulation at the receiver, the 10-15 code component is largely are passed by capacitor C28 at the input of LM386, while the voice component is attached insignificantly. Thus, speech is reproduced at the out put LM368 via loud speaker LS-1. The code component is detected by PLL-5 signifying un-interrupted light path which indicated by LED-2 as explained earlier.