

LASER SECURITY SYSTEM

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Abstract— This Paper is all about a new security device. After Simulation in the platform of proteus it has been seen that it is very much efficient, reliable, easily maintainable, tiny in size. Where the other devices in the market are not efficient, various hazards are the in maintenance. So interlocution can be made that it is very indispensable for a high security place where nobody are allow to enter.

Index Terms— Light Dependent Resistor, LASER, NE555 Timers.

1 INTRODUCTION

This Laser Security System is very useful in high command security place. In a high secured place where nobody is allowed to enter we can install it. These are easy to install and work at both within as well as outside houses. These are very effective perimeter alarm systems around properties. In indoor systems can utilize the normal power outlets and jacks making them inconspicuous. At outside these can be easily be hidden behind the bushes or plants without causing any damage. They consume less power when compared to the laser system as the whole, which is expensive. These laser systems can be installed in homes either by self or by hiring a technical person. By technological innovations cost of the security systems has been cut to a large extent. So, making laser systems one among affordable security system options can be very safe. It has ability to work continuously; it is not only human but also a small animal or any other movable objects. Its alarming Sound does not stop until anybody stops it after checking. Now we can use this system in a wide range of area.

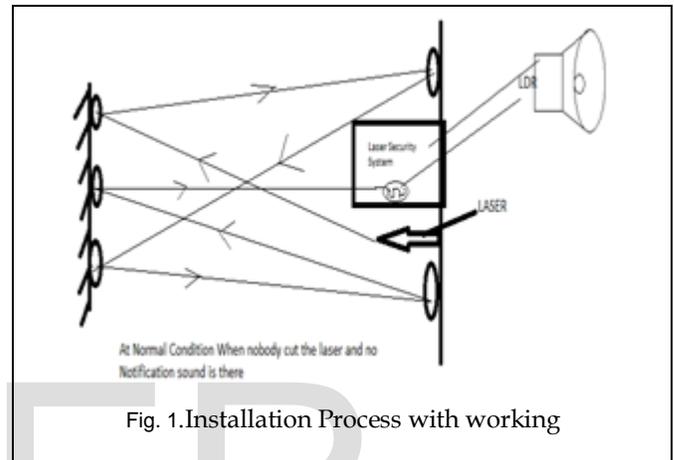
2 WORKING PROCESS

ependent Resistor (LDR) of the circuit which causes low resistance of the LDR. Due to low resistance of the LDR it does not activate the alarming circuit. If anybody try to trespassing inside the secure place or cut the Laser beam, He denied the continuous striking of Laser to LDR. At this condition the alarming circuit becomes activated which lead the circuit to make effective notification in terms of making sound or light.

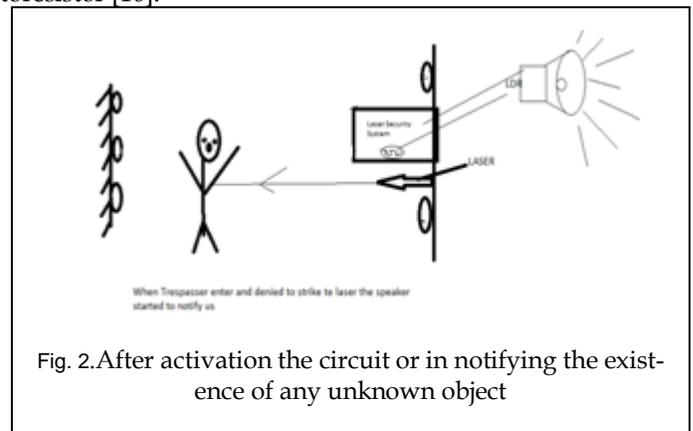
3 SECURITY DEVICES

3.1 Light Dependent resistor

If conduction phenomenon occurs due to photons is known as photo conductivity [11].



And it occurs when sufficient number of electrons shifts into the conduction band after being irradiated by photons changing the conductivity of material. LDR is also that type of photoresistor [10].



A photoresistor is an electronic component whose resistance varies as a function of light. The value of electrical resistance of a LDR is low when there is light shining on it (can drop to 50 ohms) and high when it is dark (several Meg ohms). Its operation is based on the photoelectric effect. A photoresistor is made of a high resistance semiconductor such as cadmium sulfide, CdS [10] [11]. If the light falling on the device is high-frequency photons are absorbed by the semiconductor elasticity giving the electrons enough energy to jump the conduction band. The resulting free electron and its associated gap, conduct electricity, so that the resistance decreases. Typical values

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range from 1 MW or more in the dark and 100 Ω in bright light. The cadmium sulphide cells are based on the ability to vary its resistance cadmium according to the amount of light striking the cell. More light is incident, the lower the resistance.

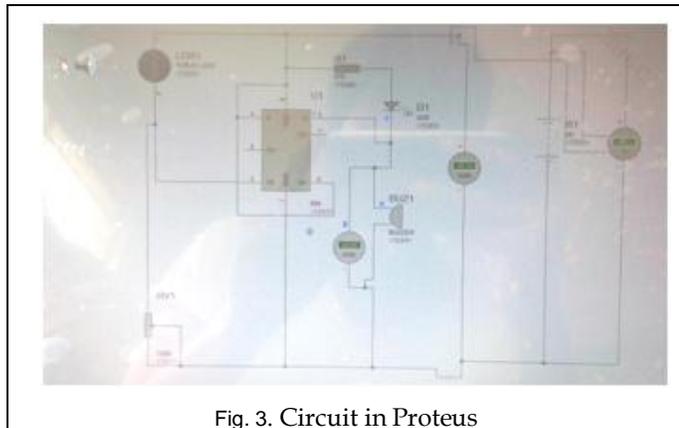


Fig. 3. Circuit in Proteus

The cells are also capable of reacting to a broad range of frequencies, including infrared (IR), visible light, and ultraviolet (UV). The variation of the resistance value has some delay, different if you go from dark to bright to dark or lit. This limits use LDR not in applications where the light signal varies rapidly.

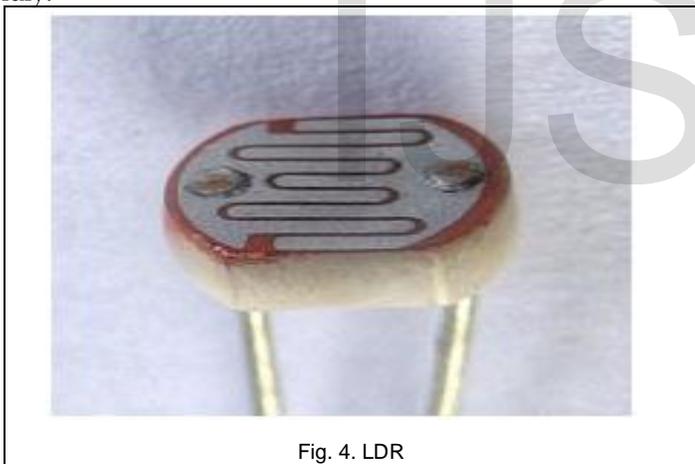


Fig. 4. LDR

The typical response time of a LDR is on the order of a tenth of a second. This slowness gives advantage in some applications because rapid changes in lighting that could cause an unstable sensor (eg fluorescent tube powered by AC) are filtered. In other applications (whether it is day or night) slow detection is not important. Operating within the lower range "infrared radiation" photoconductors (Cu Ge) is also produced. When the PH⁺⁺ energy is sufficient to shift the electrons does implying that only below a certain wave length it is possible and a sharp cut off likes to be observed. When the photonic energy is equal to semiconductor energy gap. Now if we observe the chases of resistance of a photo conductor change with incident photo radiation intensity, We can draw the graph from the relation.

$$r = \left(\frac{1}{rd} + \frac{I^{\beta-1}}{\alpha} \right)^{-1}$$

Where ,

R = resistance of the sensor

Rd =dark resistance

I =intensity of the light

α, β =these are constants which are material depend-

ent.

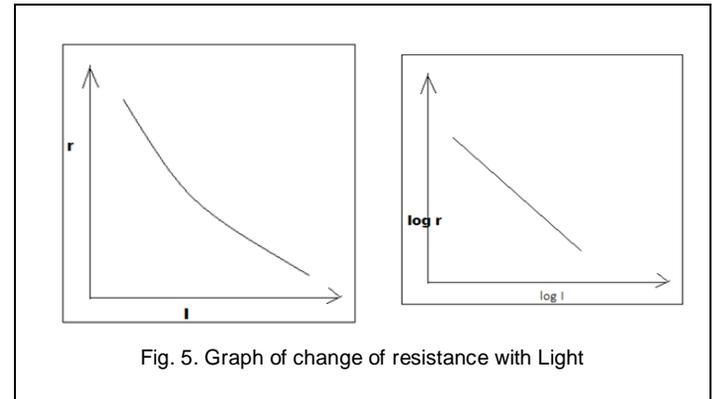


Fig. 5. Graph of change of resistance with Light

Resistance with the change of light intensity. In this circuit Light dependent resistor is work as most important component. When light drop on it its resistance stay less and that does not give input signal to the 555 timer to generate continuous output. When light is off that lead LDR to generate output signal to activate the 555 timer and which then generate a continuous signal to blow horn.

2 WORKING

The word LASER stands for Light Amplification by Stimulated Emission of Radiation [4] [5] [6].

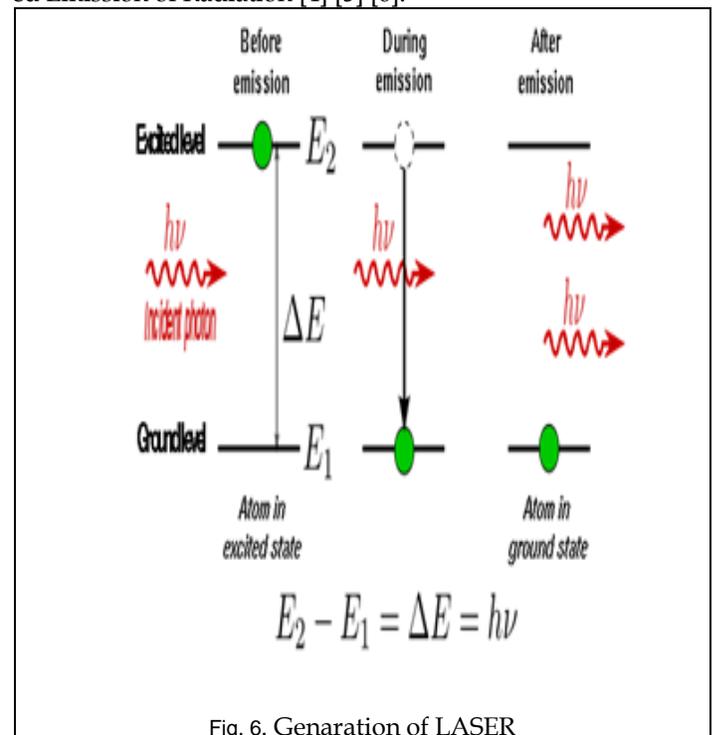


Fig. 6. Generation of LASER

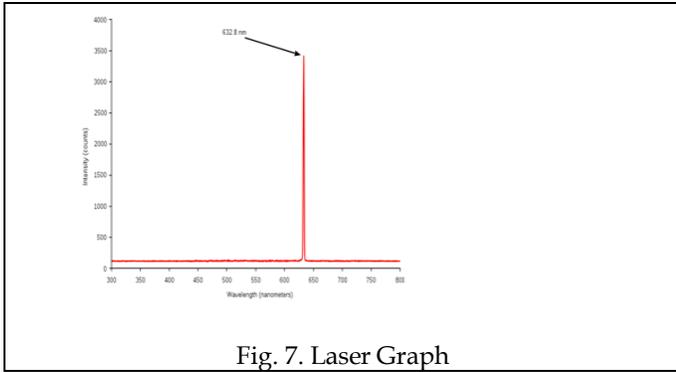


Fig. 7. Laser Graph

These are available in different types like semiconductor, infrared, GaAs laser diode. This has an energy wavelength of approximately 900 nanometres with a beam divergence of 3 million radians i.e. equal to a beam width small beam width [6].

LASER is used here to provide useful instanced light and its constant intensity help to the resistive value of LDR.

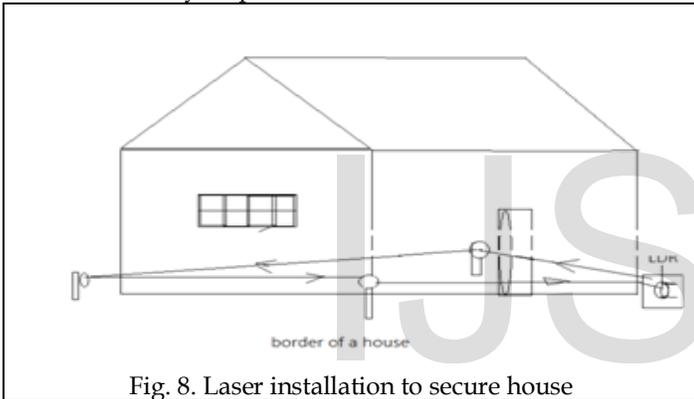


Fig. 8. Laser installation to secure house

Here LASER is use to make ray net or to make borders. If anybody enters inside the ray area the laser can't reach to the LDR. Now various types of Ray net and borders are there. For a very large area (A secure place of an industry) we can use high intensity laser to cover whole area.

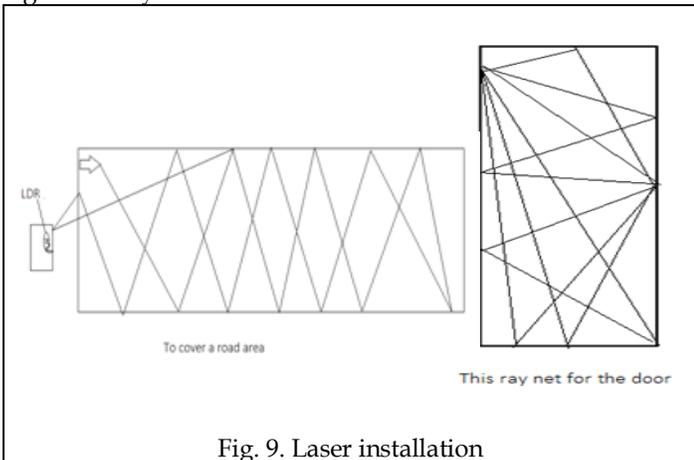


Fig. 9. Laser installation

4 NE555 TIMER [8] [9]

The Figure 8 shows the block diagram of 555 timer circuit [7] [for actual circuit, refer to Grebene (1984)]. This circuit is con-

sists of two comparators, SR flip-flop and a transistor that operates as a switch here. To operate this VCC (5V) is required. A resistive voltage divider, consisting of the three equal-valued resistors provides threshold voltage [1] [2] for comparators. An SR FF or latch is bistable circuit having complementary outputs. Q and Q¹. In set state, the output at Q is "high" (Approximately equal to vcc) and at Q¹ is "low" (Approximately equal to 0v). In the other stable state, termed as reset state, the output at Q is low that at Q¹ is high. The FF is set by applying high level Vcc to its set input terminal labeled S. And it is reset by applying high Level at the terminal labelled R. Note that the reset and set terminal input terminal of the FF in 555 timer circuit connected to the output of the comparator 1 and comparator 2, respectively.

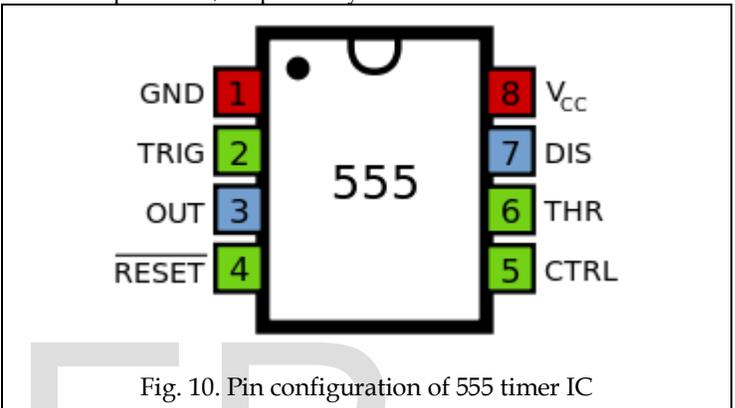


Fig. 10. Pin configuration of 555 timer IC

The positive input terminal of comparator 1 is brought out to an external terminal of the 555 package, labelled Threshold. Similarly, the negative in put terminal of comparator 2 is a connected to an external terminal labeled Trigger, and the collector of the transistor is connected to the terminal discharge. Finally, The Q output of the FF is connected to the output terminal of the timer package [1], labeled out.

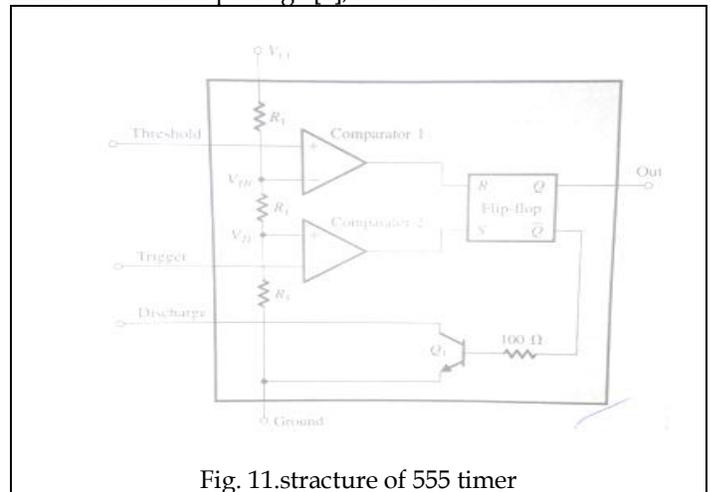


Fig. 11. structure of 555 timer

TABLE 1.
PURPOSE OF ALL PIN

PIN	NAME	PURPOSE
1	GND	Ground reference voltage, low level (0 V)
2	TRIG	The OUT pin goes high and a timing interval starts when this input falls below 1/2 of CTRL voltage (which is typically 1/3 VCC, CTRL being 2/3 VCC by default if CTRL is left open).
3	OUT	This output is driven to approximately 1.7 V below +VCC, or to GND.
4	RESET	A timing interval may be reset by driving this input to GND, but the timing does not begin again until RESET rises above approximately 0.7 volts. Overrides TRIG which overrides THR.
5	CTRL	Provides "control" access to the internal voltage divider (by default, 2/3 VCC).
6	THR	The timing (OUT high) interval ends when the voltage at THR ("threshold") is greater than that at CTRL (2/3 VCC if CTRL is open).
7	DIS	Open collector output which may discharge a capacitor between intervals. In phase with output.
8	VCC	Positive supply voltage, which is usually between 3 and 15 V depending on the variation.

In this circuit 555 timer is use to provide continuous signal to the siren. The advantage is that any high speed ob-

jects are also be able to sense by the Device.

5 SIREN

A buzzer [12] or beeper is an audio signalling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers and confirmation of user input such as a mouse click or keystroke.

6 CONCLUSION

In the end, we made the laser security in low budget. It had been protect in full security. Laser security systems are a high tech technology that used to be a part of home security only available to the wealthy. It is manually switch dependent sensors and a basic alarm unit. Laser security system a person moves in front of the sensor, that person triggers the system's alarm by cutting the laser. And the alarm signals the security monitoring company and local law enforcement. The basic alarm unit will also sound a loud alarm. Both analysis and experiment indicate that rather stringent requirements must be met in order to obtain efficient optical heterodyne detection. At some wavelengths it may provide the only means of overcoming noise and detect noise problems. The operation of LDR depends upon the photoconductivity [3] process. Nowadays, in our daily life the home-security system was popularly adopted, but in most occasions the security system was usually occupied or organized by big insurance companies or specific security companies. That means users need to pay higher money for management fee to protect the safety of their own houses. In this paper we develop another home-security system combining with some brand-new technologies such as wireless sensor network. This security system has been tested under many conditions and has given a satisfactory result and has proved to be very efficient. Some improvements in its technical and aesthetic design can be expected in the future.

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