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**B.VocEAMR**

**ElectricalAppliancesMaintenanceandRepairingProjectRepo**

**rt**

**“LaserSecurityAlarmByusingMobile”**

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Affiliated TO SAVITRIBAI PHULE UNIVERCITY, PUNE

**CERTIFICATE**

Certificated that the project Report entitled

“Laser Security Alarm By Using Mobile”

Has, been successfully completed by:

**Aniket Miraji Pawar**  
**Bhimrao Balaji Dhale**


As partial fulfilment of Degree course in B.voc EAMR under Maharastra state board of Technical Education, pune during the acadmic year 2021-2022.

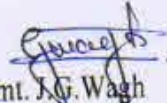
The said work has been assessed by us and we are satisfied that the same is up to the standard envisaged for the level of the course. And that the said work may be presented to the external examiner.

  
Smt. J.G. Wagh


GUIDE

  
25/07/2022  
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## **DECLARATION**

I am hereby declare that this report is record authentic work carried out by \_\_\_\_\_ us \_\_\_\_\_ during \_\_\_\_\_ the \_\_\_\_\_ Vithsemester and has not been submitted to any other university or institute.

Student name

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## Abstract

light goes through long distance without any scattering effect (disturbing) and it is only visible

at source and the destination point so it can be used as a mediator between source and destination but to analyse the source as a sensor is needed, here the use of LDR is

applicable. Just an analysis is not enough, alerting should

be done in general, alerting is sound effects, here a buzzer acts as an alerting. Making use of this, a laser security

system is designed. Its working: There is a laser diode

that generates the laser beam which continuously strikes over the Light dependent

.

This project deals with a model of laser security alarm system design. Laser security systems used to be difficult to install and rarely available to anyone other than the super-rich. Now, there are

dozens of different security systems on the market that utilize lasers and can effectively protect everything from small apartments and businesses to large

areas of property. Most home laser security

systems consist of two parts: a basic alarm unit and an infrared motion detector. Laser

based security system is a type of

security and alarm system that uses laser light and a

light sensor. Why a laser to be used? It is known that a

laser resists sensors. When any person crosses the path, it inhibits laser to

reach LDR and the sensor

generates a low which is read by controller to power on the buzzer.

## **2Introduction**

Laser based Security System is a type of security and alarm system that uses laser light and a light sensor. A security system protects our homes, offices, banks, lockers etc. from intrusion and unauthorised access. There are different types of security systems available and laser based security system is an important and efficient type.

A Laser security system can act as a standalone system, which makes some sound or noise when it detects any irregular activity, or can be part of a much bigger security and home automation system, which can send messages, call the owner etc.

In this project, we have designed a simple DIY laser based security system, which acts as a trip wire like security system and triggers an alarm when the laser is interrupted.

### 3 WORKING PRINCIPLE

of LDR falls down to few Ohms (or tens of Ohms) and as a result, the voltage at the non-inverting terminal A simple, cheap and effective laser based security system is developed in this project. Let us see the working of this project.

First, the Op - Amp circuit acts as a comparator i.e. it compares the voltages at the inverting and non-inverting terminals and produces an output accordingly.

The LDR -  $10\text{K}\Omega$  resistor Voltage divider is connected to the non-inverting terminal of Op-Amp and a POT is connected to the inverting terminal.

Assume, the laser pointer is placed directly in line of sight to the LDR and the light from the laser is continuously being incident on LDR.

In this situation, the resistance will be less than that at the inverting voltage. The output of the Op - Amp is low and the transistor is OFF.

If the laser light is blocked by an intruder from falling on the LDR (even for a small duration), the resistance of the LDR goes to few hundreds of Ohms



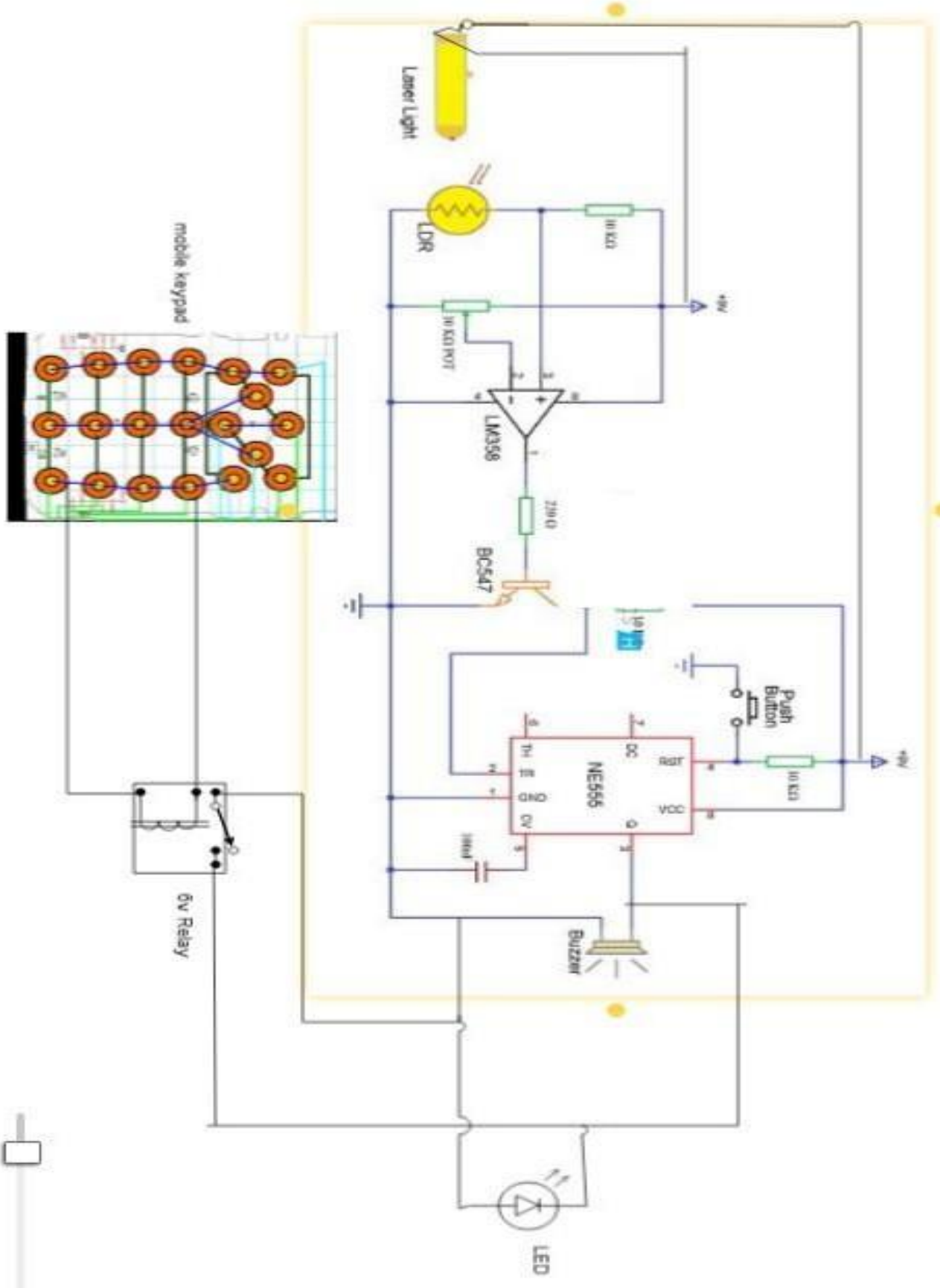
and as a result, the output of the Op-Amp will be HIGH. This will turn on the Transistor.

As the output of the transistor is connected to the Trigger Pin (Pin 2) of the 555 Timer IC, if the transistor is ON, the trigger pin gets a short low pulse and as a result, the output of the 555 becomes HIGH. This will activate the alarm by turning ON the buzzer.

And then the relay will be activated and at the same time the two points of the mobile will be pressed the button connected to the output of the relay and the call will be made to the set mobile.

Since, the 555 Timer IC is configured as a Bi-Stable Multivibrator, a small active low trigger pulse at the trigger pin will set its output to HIGH and in order to reset it we need to push the reset button.

Until the reset push button is pushed, the alarm will stay on hence, we can place the reset button at a secret location so that only the owner can disable the alarm.



## COMPONENTSLIST

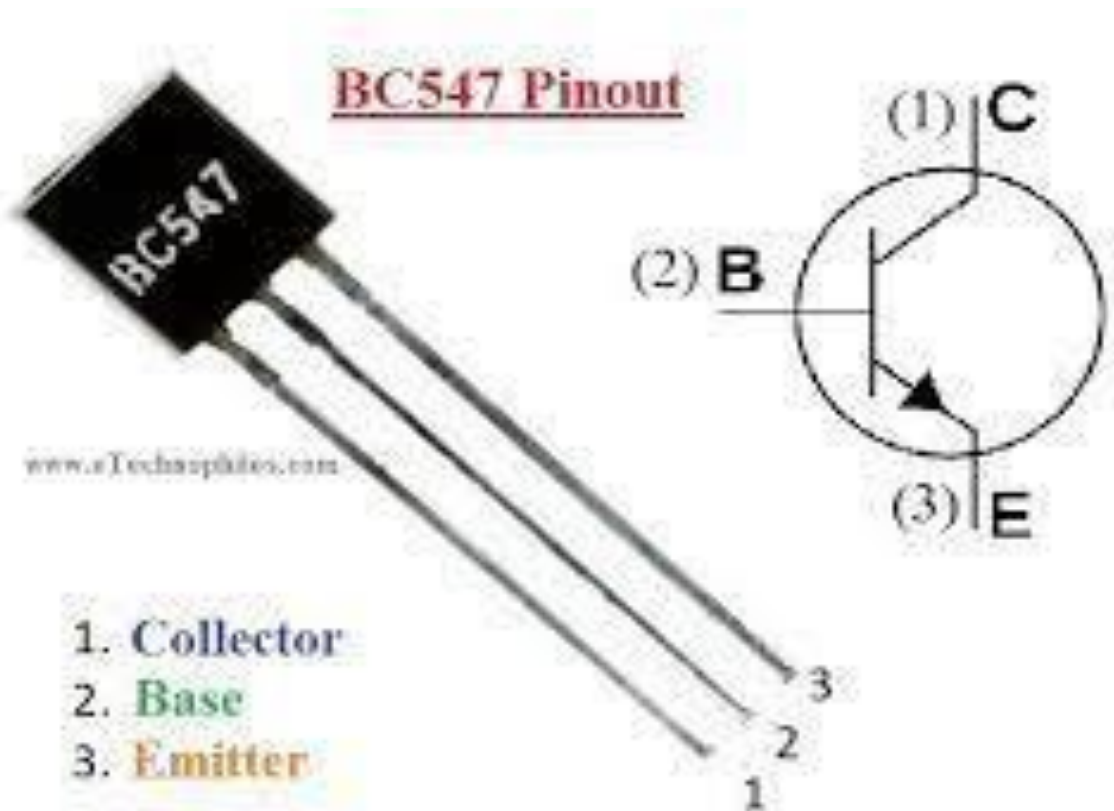
Sr.	Components	Qty.	Price
1	LM358(Op–AmpIC)	1	20
2	BC547Transistor	1	5
3	10kResistor	5	5
4	6VRelay	1	30
5	9VBattery& connector	1	40
6	LEDLight	3	5
7	LDR	1	20
8	100nFCapacitor	1	2
9	PushButton	1	5
10	LaserDiode	1	100
11	Breadboard(Prototypingboard)	1	100
12	jumperWires	10	30
13	10KPot	1	10
14	HeatSrinkableSleev	5	15
15	555timerIC	1	15
16	Buzzer	1	15
17	Cellphone	1	1000

## LM358(OP-Amp)



LM358 is a dual Operational Amplifier IC and it is capable of operating in all the conventional operational amplifier circuits. In this project, the LM358 is used as a Comparator.

## BC547



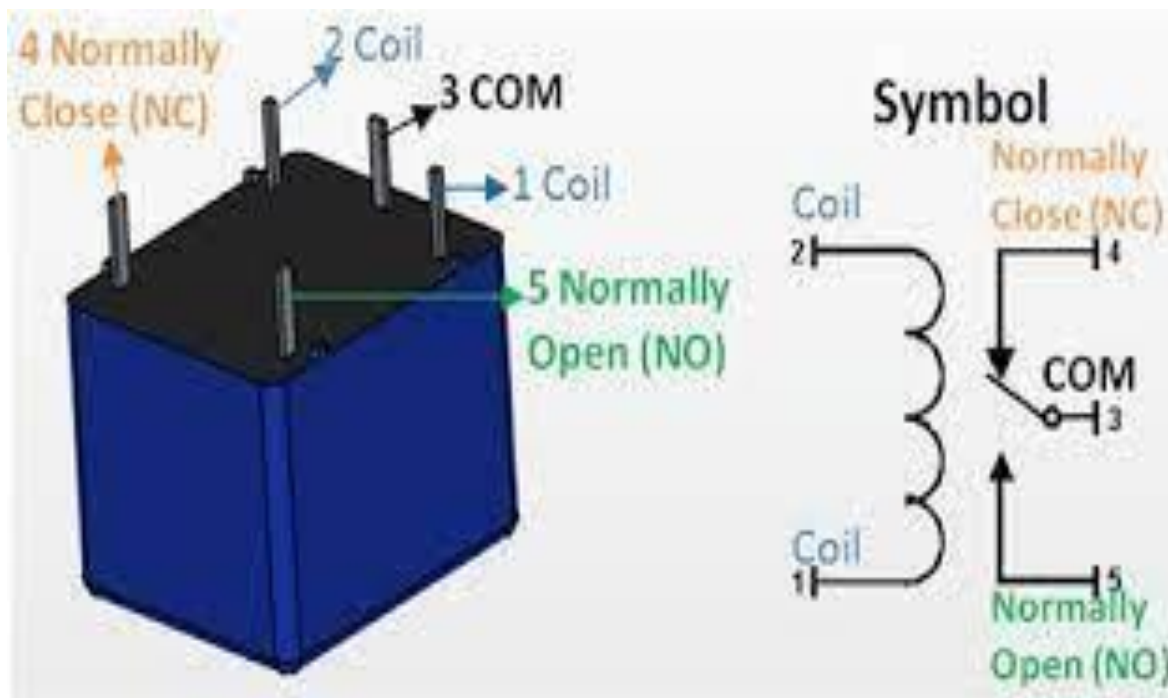
is a NPN transistor hence the collector and emitter will be left open (Reverse biased) when the base pin is held at ground and will be closed (Forward biased) when a signal is provided to base pin.

## Resistor-



A resistor is a passive two-terminal electrical component that implements electrical resistance as a circuit element. In electronic circuits, resistors are used to reduce current flow, adjust signal levels, to divide voltages, bias active elements, and terminate transmission lines, among other uses.

## 6V Relay



Relays are nothing but mechanical switches operated using electromagnetic induction technique. When you give DC supply to 2 of its terminals of electromagnet, switch is shifted from N/C position to N/O position. Now the 6V relay is operated by giving a 6V supply to the electromagnet while a 12V relay has to be operated by giving a 12V supply. So now how will you choose which relay has to be taken? Obvious choice will be a low power relay viz.

## 9V Battery & Connector



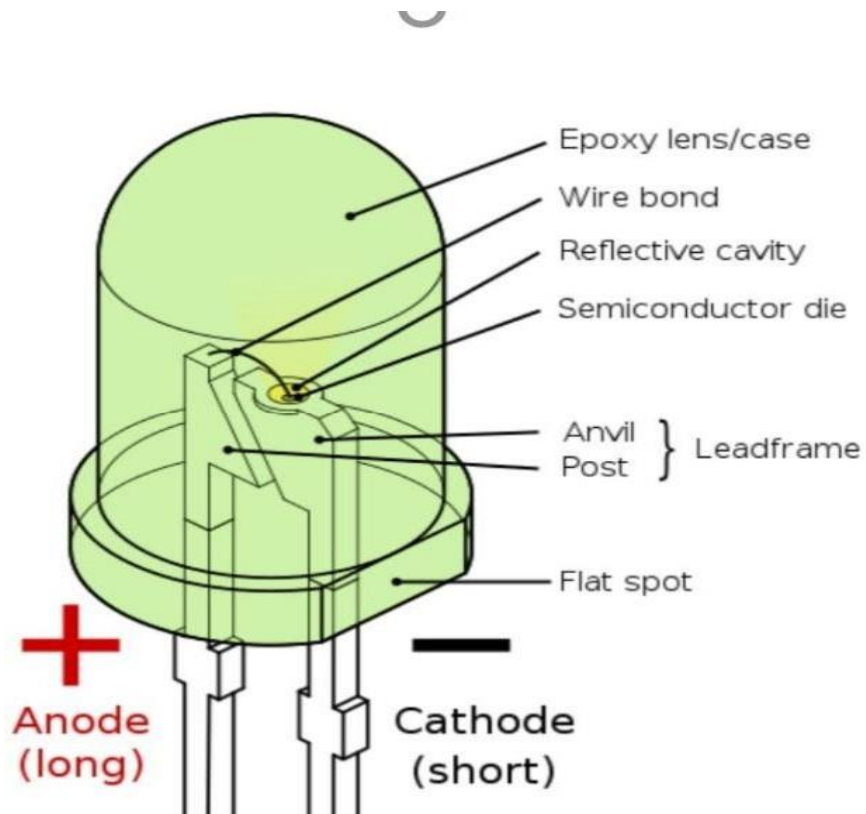
The nine-volt battery, or 9-volt battery, is a common size of battery that was introduced for early transistor radios.

It has a rectangular prism shape with rounded edges and a polarized snap connector at the top. This type is commonly used in smoke detectors, gas detectors, clocks, walkie-talkies, electric guitars, and effects units.

**Connector-**The battery has both terminals in a snap connector on one end. The smaller circular (male) terminal is positive, and the larger hexagonal or octagonal (female) terminal is the negative contact. The connectors on the battery are the same as on the load device.

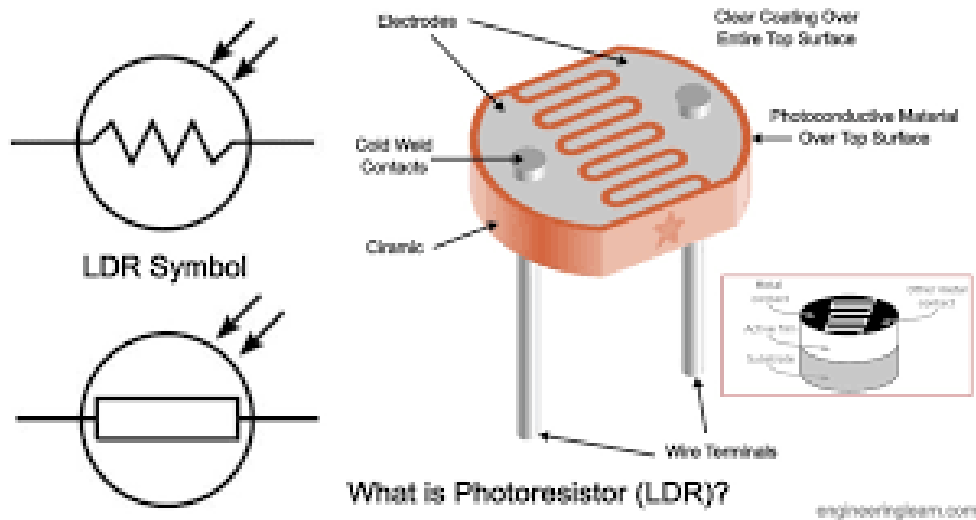


# LED Light



LED Indicator are used as indicating, warning,accidental signals and other signals of instrumentcircuitsintheareasofelectricpower.

## LDR-Light-dependent resistor.



A photoresistor or light dependent resistor is an electronic component that is sensitive to light. When light falls upon it, then the resistance changes. Values of the resistance of the LDR may change over many orders of magnitude the value of the resistance falling as the level of light increases.

Light dependent resistors have a lower sensitivity refer to the relative change in the resistance value when the Photoresistor is not illuminated by light and the resistance value when illuminated by light as compare to phototransistors and photodiodes.

## 100nfc ceramic capacitor (code 103)



This is a 0.01 $\mu$ F -(103) Ceramic Capacitor Use this capacitor for power decoupling, having a smooth power in your circuit, timing circuits etc. It is always a good idea to put one of these next to the power pins of a microcontroller.

## PushButton



A push-button (also spelled pushbutton) or simply button is a simple switch mechanism to control some aspect of a machine or a process. Buttons are typically made out of hard material, usually plastic or metal.

Push buttons can be explained as simple power controlling switches of a machine or appliance. These are generally metal or thermoplastic switches that are intended to grant easy access to the user.

## **Breadboard(Prototypingboard)**



A breadboard, or protoboard, is a construction base for prototyping of electronics. Originally the word referred to a literal bread board, a polished piece of wood used when slicing bread. In the 1970s the solderless breadboard became available and nowadays the term "breadboard" is commonly used to refer to the e.

There are two major types of breadboards; these are solder and solderless boards. Solder boards are boards you have to solder components onto (per the name). These are most of your standard circuit boards, and if you flip one over you'll notice that all of the connections are soldered to the board itself.

## Jumperwires



Jumper wires are electrical wires with connector pins at each end. They are used to connect two points in a circuit without soldering. You can use jumper wires to modify a circuit or diagnose problems in a circuit.

Jumper wires are simply wires that have connector pins at each end, allowing them to be used to connect two points to each other without soldering. Jumper wires are typically used with breadboards and other prototyping tools in order to make it easy to change a circuit as needed.

## 10K $\Omega$ Potentiometer(Pot)



Standard 10 K $\Omega$ Potentiometer(Pot)

A potentiometer is a manually adjustable variable resistor with 3 terminals.

Two terminals are connected to both ends of a resistive element, and the third terminal connects to a sliding contact, called a wiper, moving over the resistive element.

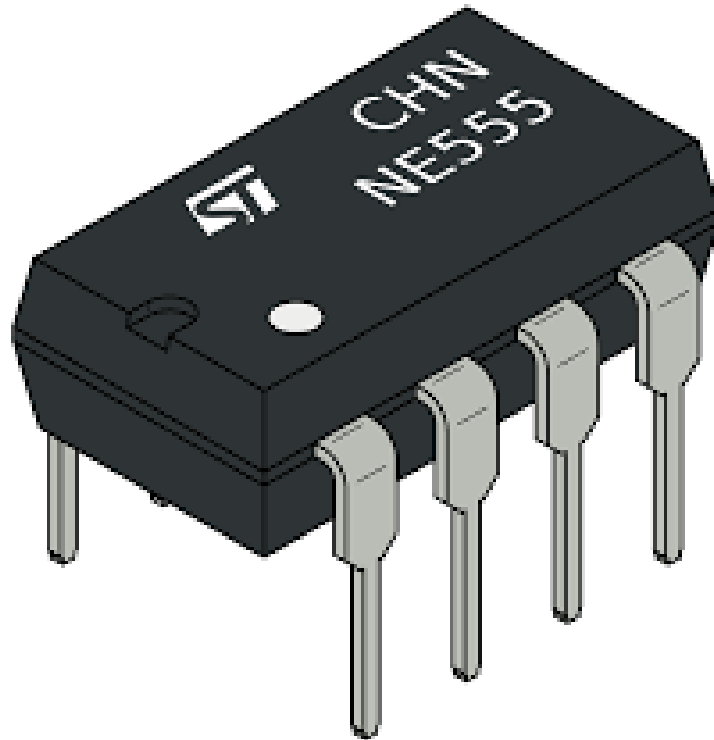
## HeatShrinkablesleeve



Heat-shrinkable sleeve (or commonly "shrink sleeve") is a corrosion protective coating for pipelines in the form of a wrap around or tubular sleeve that is field-applied.



## 555 timer IC



The 555 timer IC is an integrated circuit used in a variety of timer, delay, pulse generation, and oscillator applications. Derivatives provide two or four timing circuits in one package. The design was first marketed in 1972 by Signetics.

### Principle of 555

The 555 timer power supply has a high range from +5 volts to +18 volts. The load current for the 555

timer is sourcing 200 mA. The 555 timer has high output current and the output

is driven for the TTL. To change in temperature in the 555 timer it has a temperature stability of 50 ppm/degree.

## Buzzer



A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric (piezo for short). Typical uses of buzzers and beepers include alarm devices, timers, train and confirmation of user input such as a mouse click or keystroke.

## Laser Diode



A laser diode is a semiconductor that uses a p-n junction for producing coherent radiation with the same frequency and phase which is either in the visible or infrared spectrum. It is also called an injection laser diode and the technology is similar to that found in LEDs

A laser diode is an optoelectronic device, which converts electrical energy into light energy to produce high-intensity coherent light. In a laser diode, the p-n junction of the semiconductor diode acts as the laser medium or active medium.

## AdvantagesOfALaserSecuritySystem

- The circuit, construction and setup for the LaserSecuritySystemisverysimple.
  
- If used with a battery, the laser security system can work evenwhenthereisa power outage.
  - BeamTravelsALongDistance....
  
  - Cost StartsOutLow....
  
  - Easily VisibleSystem....
  
  - CostCanGetVeryExpensive

## **Disadvantages of a Laser Security System**

- The laser security system works only if the laser is obstructed. If the intruder passes without obstructing the laser, it is considered as a failure.
  
- In order to secure a larger area, we need more lasers and corresponding sensors.

## Applications

- Laser Security System can be used in safety lockers in our homes, where even if the locker's code is hacked, it acts as an additional layer of security.
  
- Apart from security systems, this laser based setup can also be used to check if pets or babies crossed a certain boundary.
  
- A laser security alarm is a system designed to detect intrusion—unauthorized entry—into a building or area. They are also called security alarms, security systems, alarm systems, intrusion detection systems, perimeter detection systems, and similar terms.
  
- Burglar alarms are used in residential, commercial, industrial, and military properties for protection against burglary (theft) or property damage, as well as personal protection against intruders. Car alarms likewise protect vehicles and their contents. Prisons also use security systems for control of inmates.

## **FUTURESCOPE**

- Soon it will be possible to generate powerful beam sources at exactly the right wavelength for all conceivable applications. Second, lasers are getting smaller. Semiconductor lasers, direct diode lasers and other lasers are steadily shrinking into miniature formats.
- Laser Security System can be used in safety lockers in our homes, where even if the locker's code is hacked, it acts as an additional layer of security. Apart from security systems, this laser based setup can also be used to check if pets or babies crossed a certain boundary