A PROJECT REPORT
On

LASER SECURITY ALARM SYSTEM

Submitted by

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II/IV BACHELOR OF TECHNOLOGY
IN

Electrical and Electronics engineering

UNDER THE GUIDANCE OF

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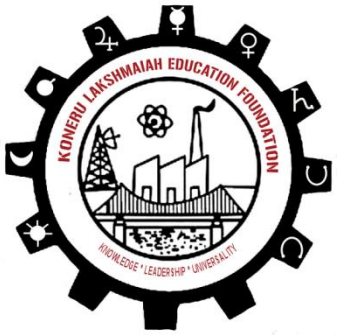
DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING



CERTIFICATE

This is to certify that the project based laboratory report entitled **'LASER SECURITY ALARM SYSTEM'** submitted by **Srija Gouram** (180060012)**, Syed. Rahamat Tabassum** (180060014), **D Sai Pavan Tez** (180060015), **P Vinay Vardan** (180060016) studying II/IV B. Tech in **ELECTRICAL AND ELECTRONIC ENGINEERING** has satisfactorily completed project in the semester - II during the academic year 2019 – 2020.

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ABSTRACT

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 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 mediator between source and destination but to analyse the source a sensor is need, here the use of LDR is applicable. Just analysis is not enough alerting should be done in general alerting is sound effect so here buzzer act as 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 resister sensors. When any person crosses the path, it inhibits laser to reach LDR and the sensor generate a low which is read by controller to power on the buzzer.

INTRODUCTION

INTRODUCTION:

Need of security is the basic necessity of any individual. The feeling that we are safe and everything around us is all right is imperative for a peaceful living. But in this unsafe world, when crime, terror and threats are on their peak, how can one attain that sense of security? Here, laser security system provides us with a solution and for this reason more and more people are installing them in order to stay safe and secure. Various electronic security systems can be used at home and other important working places for security and safety purposes.

Laser Security alarm is a device used for security purposes. It has a wide application in fields of security and defence starting from the security of simple house hold material to a very high valued material of an organization. They once used to be expensive solutions for security needs. Owing to cost cutting and fast technological advancements, this form of security system is becoming more affordable.

Lasers differ from other light sources in a few significant ways. There are two features that are important for security systems. Unlike a light bulb or flashlight, laser light doesn't spread out, it is a narrow beam. And laser light is essentially a single colour. Because laser light doesn't spread much, it can be sent it a long way and still have enough energy in a small area to trigger the security system detector. Because it's a single wavelength, it can put a blocking filter on the detector to let laser light through without letting background light onto the detector.

Laser light travels in a straight line. For instance, to protect the front of the yard, putting the laser at one comer and the detector at the other corner would do the job. That's not a very practical configuration, though. More typically, if it is needed to protect the perimeter of a room, or at least the enhances. So laser security systems start with a laser pointing to a small mirror. The first mirror is angled to direct the beam to a second small mirror, and so on until the final mirror directs the beam to the detector. If the beam is interrupted anywhere between the laser and the detector, the electronics will put the warning signal.

PRINCIPLE:

There are three essential components to a laser security system: a laser, a detector and sensing circuit. The laser is a concentrated light source that puts out a straight line, 'pencil beam, of light of a single colour. The detector is sensitive to light and puts out a voltage when the laser light hits it. The detector is connected to the sensing circuit. When the laser beam is interrupted and cannot reach the detector, its voltage output changes, and the circuit sense the change and put out a warning signal

WORKING:

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, resistor Voltage divider is connected to the non – inverting terminal of Op –Amp and a potentiometer 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 of LDR falls down to few Ohms and as a result, the voltage at the non – inverting terminal 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. 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 a person need to push the reset button. Until the reset push button is pushed, the alarm will stay on hence; place the reset button at a secret location so that only the owner can disable the alarm.

OBJECTIVE:

The core objective of this project is to design a laser security system with laser and light dependent resistor.

BLOCK DIAGRAM:

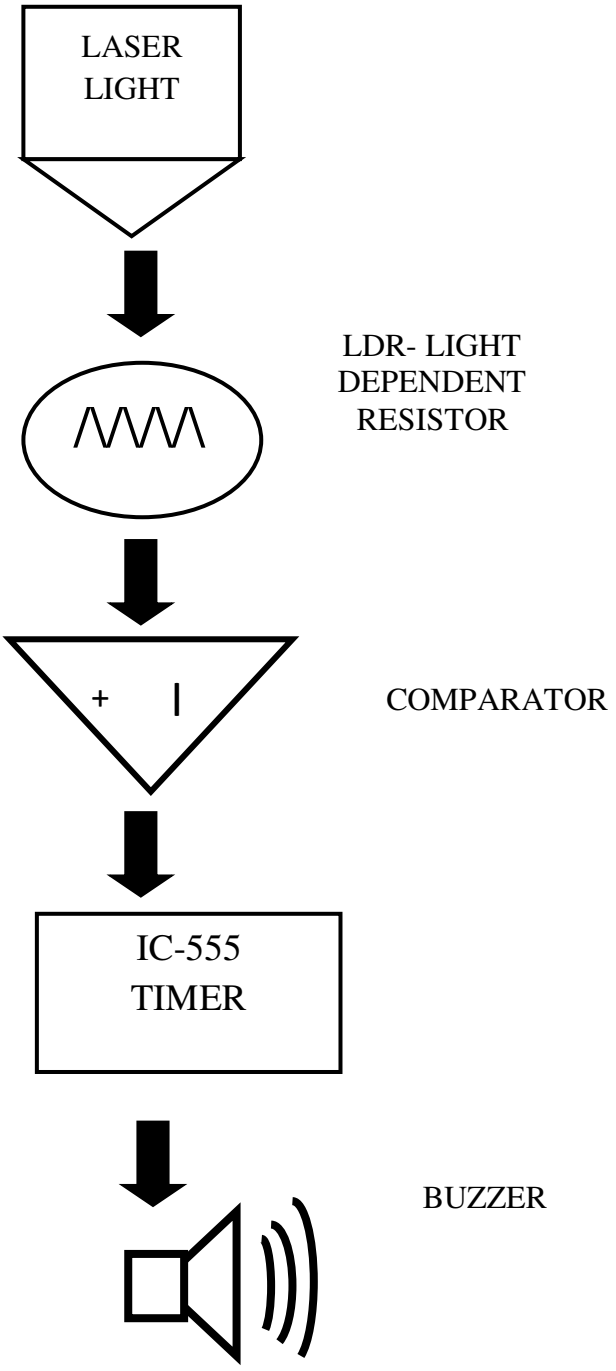

Figure 1: BLOCK DIAGRAM

CIRCUIT DIAGRAM:

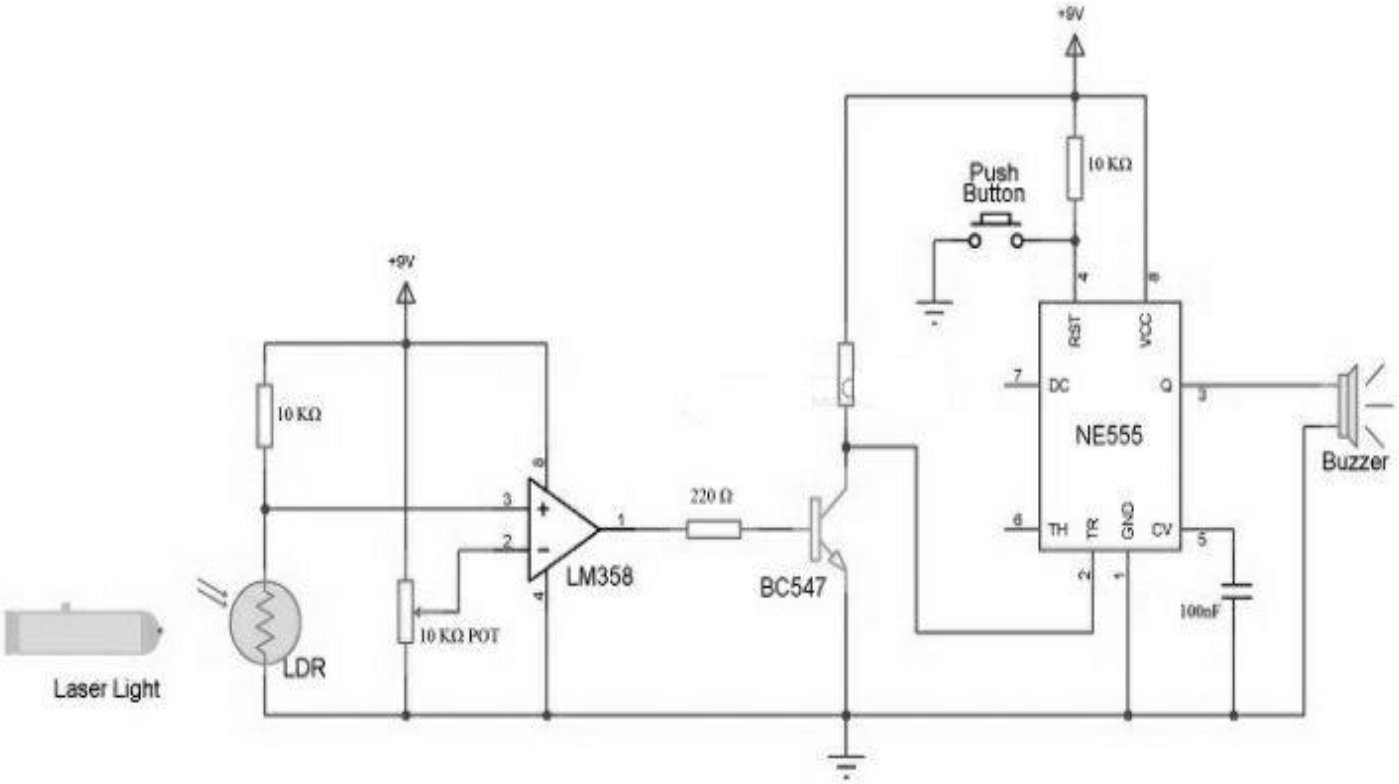

Figure 2: CIRCUIT DIAGRAM

COMPONENTS REQUIRED:

SL.NO.	NAME OF THE COMPONENT	SPECIFICATIO S	QUANTITY
1	Op – Amp IC	LM358	1
2	Timer IC	IC 555	1
3	LDR	--	1
4	Resistors	10 KΩ	3
		220Ω	1
5	Small Buzzer	--	1
6	Potentiometer	10 KΩ	1
7	NPN Transistor	BC547	1
8	Capacitor	100 nF	1
9	Push Button	--	1
10	Laser Pointer	--	1
11	9V Battery	--	1
12	Connecting Wires	--	--
13	Breadboard	--	1

Table I: Components used in the circuit

COMPONENT DESCRIPTION:

LASER:

A laser is a device that emits light through a process of optical amplification based on the stimulated emission of electromagnetic radiation. The term "laser" originated as an acronym for "light amplification by stimulated emission of radiation".

A laser differs from other sources of light in that it emits light coherently. Spatial coherence allows a laser to be focused to a tight spot, enabling applications such as laser cutting and lithography. Spatial coherence also allows a laser beam to stay narrow over great distances (collimation), enabling applications such as laser pointers. Lasers can also have high temporal coherence, which allows them to emit light with a very narrow spectrum, i.e., they can emit a single colour of light. Temporal coherence can be used to produce pulses of light as short as a femtosecond.

Applications:

- Medicine: Bloodless surgery, Laser healing, surgical treatment, kidney stone treatment, eye treatment, dentistry.
- Industry: Cutting, welding, material heat treatment, marking parts, non-contact measurement of parts.
- Military: Marking targets, guiding munitions, missile defence, electro-optical countermeasures (EOCM), alterative to radar, blinding troops.

Figure 3: LASER POINTER

- Law enforcement: used for latent fingerprint detection in the forensic identification field.
- Research: Spectroscopy, laser ablation, laser annealing, laser scattering, laser interferometer, lidar, laser capture micro dissection, fluorescence microscopy.
- Product development/commercial: laser printers, optical discs (e.g. CDs), barcode scanners, thermometers, pointers, holograms, bubble grams.
- Laser lighting displays: Laser light shows.
- Cosmetic skin treatments: acne treatment, cellulite and striae reduction, and hair removal

LDR (Light Dependent Resistor):

A photo resistor or light-dependent resistor (LDR) or photocell is a light-controlled variable resistor. The resistance of a photo resistor decreases with increasing incident light intensity; in other words, it exhibits photoconductivity. A photo resistor can be applied in light-sensitive detector circuits, and light- and dark-activated switching circuits.

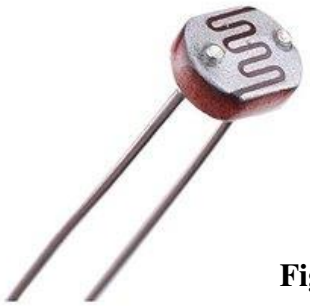

Figure 4: LDR

Photo resistors work based off of the principle of photoconductivity. Photoconductivity is an optical phenomenon in which the material's conductivity is increased when light is absorbed by the material. When light falls i.e. when the photons fall on the device, the electrons in the valence band of the semiconductor material are excited to the conduction band. These photons in the incident light should have energy greater than the band gap of the semiconductor material to make the electrons jump from the valence band to the conduction band. Hence when light having enough energy strikes on the device, more and more electrons are excited to the conduction band which results in a large number of charge carriers. The result of this process is more and more current starts flowing through the device when the circuit is closed and hence it is said that the resistance of the device has been decreased. This is the most common working principle of LDR**.** In the dark, a photo resistor can have a resistance as high as a few mega ohms (M ohms), while in the light, a photo resistor can have a resistance as low as a few hundred ohms. If incident light on a photo resistor exceeds a certain frequency, photons absorbed by the semiconductor give bound electrons enough energy to jump into the conduction band. The resulting free electrons conduct electricity, thereby lowering resistance. The resistance range and sensitivity of a photo resistor can substantially differ among dissimilar devices. Moreover, unique photo resistors may react substantially differently to photons within certain wavelength bands.

LED (Light Emitting Diode):

A light-emitting diode (LED) is a two-lead semiconductor light source. Like an ordinary diode, the LED diode works when it is forward biased. In this case, the n-type semiconductor is heavily doped than the p-type forming the p-n junction. When it is forward biased, the potential barrier gets reduced and the electrons and holes combine at the depletion layer (or active layer), light or photons are emitted or radiated in all directions. A typical figure blow showing light emission due electron-hole pair combining on forward biasing. It is a PN-junction diode, which emits light when activated. The explanation behind the emission of photons in an LED diode lies in the energy band theory of solids. According to this theory, whether the electron-hole combining will give out photons or not depends on whether the material has a direct band gap or indirect band gap. Those semiconductor materials which have a direct band gap are the ones that emit photons. When a suitable voltage is applied to the leads, electrons are able to recombine with electron holes within the device, releasing energy in the form of photons. This effect is called electroluminescence and the colour of the light (corresponding to the energy of the photon) is determined by the energy band gap of the semiconductor. An LED is often small in area (less than I mm2) and integrated optical components may be used to shape its radiation pattern

Figure 5: RESISTOR

Applications:

LED uses fall into four major categories:

- Visual signals where light goes more or less directly from the source to the human eye, to convey a message or meaning.

- Illuminations where light is reflected from objects to give visual response of these objects.
- Measuring and interacting with processes involving no human vision.
- Narrow band light sensors where LEDS operate in a reverse-bias mode and respond to incident light, instead of emitting Light.

BUZZER:

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

Early devices were based on an electromechanical system identical to an electric bell without the metal gong. Similarly, a relay may be connected to interrupt its own actuating current, causing the contacts to buzz. Often these units were anchored to a wall or ceiling to use it as a sounding board. The word "buzzer" comes from the rasping noise that electromechanical buzzers made.

The buzzer consists of an outside case with two pins to attach it to power and ground. When current is applied to the buzzer it causes the ceramic disk to contract or expand. Changing this then causes the surrounding disc to vibrate. That's the sound that you hear. Adjust the potentiometer to increase or decrease the resistance of the potentiometer. If you increase the resistance of the potentiometer then it will decrease the Volume of the buzzer. If you decrease the resistance of the potentiometer then it will increase the Volume of the buzzer.

Applications:

- Annunciator panels
- Electronic metronomes
- Game show lock-out device
- Microwave ovens and other household appliances
- Sporting events such as basketball games
- Electrical alarms

Figure 6: BUZZER

TRANSISTOR

A transistor is a semiconductor device used to amplify and switch electronic signals and electrical power. Transistor has many functions, such as detecting, rectifying, amplifying, switching, voltage stabilizing; signal modulating and so on. It is composed of semiconductor material with at least three terminals for connection to an external circuit. A voltage or current applied to one pair of the transistor's terminals changes the current through another pair of terminals. As a variable current switch, transistor can control the output current based on the input voltage. Because the controlled (output) power can be higher than the controlling (input) power, a transistor can amplify a signal. Today, some transistors are packaged individually, but many more are found embedded in integrated circuits.

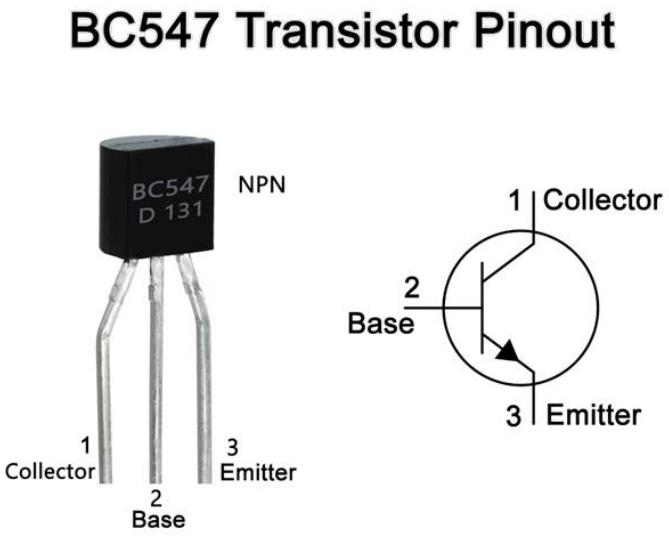

Figure 7: TRANSISTOR

The fundamental principle behind all transistors is simple: Current flow between two terminals is prevented by an energy barrier that has been set up between them. To operate the transistor, a third terminal is provided that allows you to lower the energy barrier.

Common applications of transistor comprise of analog & digital switches, power regulators, signal amplifiers & equipment controllers. Transistors are also the constructing units of incorporated circuits and most up to date electronics.

RESISTOR

A resistor is a passive two-terminal electrical component that implements electrical resistance as a circuit element. Resistors act to reduce current flow, and, at the same time, act to lower voltage levels within circuits. In electronic circuits resistors are used to limit current flow, to adjust signal levels, bias active elements, terminate transmission lines among other uses. High-power resistors that can dissipate many watts of electrical power as heat may be used as part of motor controls, in power distribution systems, or as test roads for generators. Fixed resistors have resistances that only change slightly with temperature, time or operating voltage. Variable resistors can be used to adjust circuit elements (such as a volume control or a lamp dimmer), or as sensing devices for heat, light, humidity, force, or chemical activity.

Resistors are common elements of electrical networks and electronic circuits and are ubiquitous in electronic equipment. Practical resistors as discrete components can be composed of various compounds and forms. Resistors are also implemented within integrated. The electrical function of a resistor is specified by its resistance: common commercial resistors are manufactured over a range of more than nine orders of magnitude. The nominal value of the resistance will fall within a manufacturing tolerance.

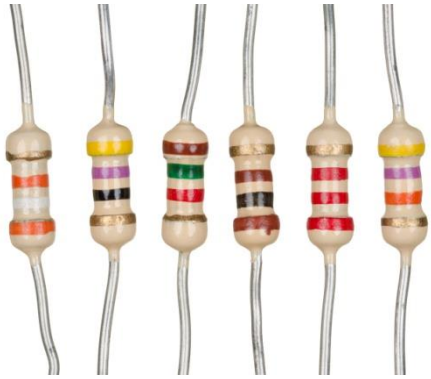

Figure 8: RESISTOR

The main function of resistors in a circuit is to control the flow of current to other components. Take an LED (light) for example. If too much current flows through an LED it is destroyed. So a resistor is used to limit the current.

CAPACITOR

A capacitor (originally known as a condenser) is a passive two-terminal electrical component used to store energy electro statically in an electric field. The forms of practical capacitors vary widely, but all contain at least two electrical conductors (plates) separated by a dielectric (i.e. insulator). The conductors can be thin films, foils or sintered beads of metal or conductive electrolyte, etc. The non-conducting dielectric acts to increase the capacitor's charge capacity. A dielectric can be glass, ceramic, plastic films, air, vacuum, paper, mica, oxide layer etc.

Capacitors are widely used as parts of electrical circuits in many common electrical devices. Unlike a resistor, an ideal capacitor does not dissipate energy. Instead, a capacitor stores energy in the form of an electrostatic field between its plates.

An ideal capacitor is characterized by a single constant value for its capacitance. Capacitance is expressed as the ratio of the electric charge Q on each conductor to the potential difference V between them. The SI unit of capacitance is the farad (F), which is equal to one coulomb per volt (1 C/V). Typical capacitance values range from about 1 pF (10^{-12} F) to about 1 mF (10^{-3} F).

Capacitors are widely used in electronic circuits for blocking direct current while allowing alternating current to pass. In filter networks, they smooth the output of power supplies.

In resonant circuits they tune radios to particular frequencies. In electric power transmission systems, they stabilize voltage and power flow.

Applications:

- Energy storage
- Pulsed power and weapons
- Power conditioning
- Suppression and coupling
- Motor starters
- Signal processing
- Sensing
- Oscillators

Figure 9: CAPACITORS

- Hazards an safety

BATTERY:

An electric battery is a device consisting of two or more electrochemical cells that convert stored chemical energy into electrical energy. Each cell contains a positive terminal, or cathode, and a negative terminal, or anode. Electrolytes allow ions to move between the electrodes and terminals, which allows current to flow out of the battery to perform work. Primary (single-use or "disposable") batteries are used once and discarded; the electrode materials are irreversibly changed during discharge. Common examples are the alkaline battery used for flashlights and a multitude of portable device. Secondary (rechargeable batteries) can be discharged and recharged multiple times; the original composition of the electrodes can be restored by reverse current. Examples include the lead-acid batteries used in vehicles and lithium ion batteries used for portable electronics. Batteries come in many shapes and sizes, from miniature cells used to power hearing aids and wristwatches to battery banks the size of rooms that provide standby power for telephone exchanges and computer data centres.

Figure 10: BATTERY

BREADBOARD AND CONNECTING WIRES:

A breadboard is a construction base for prototyping of electronics. These solderless breadboards does not require soldering, it is reusable. This makes it easy to use for creating temporary prototypes and experimenting with circuit design. A modern solderless breadboard socket consists of a perforated block of plastic with numerous tin plated phosphor bronze or nickel silver alloy spring clips under the perforations. Interconnecting wires and the leads of discrete components such as capacitors, resistors, and inductors, power supply, one or more signal generators, LED display or LCD modules, and logic probes can be inserted into the

remaining free holes to complete the circuit. A bus strip usually contains two rows: one for ground and one for a supply voltage. Typically the row intended for a supply voltage is marked in red, while the row for ground is marked in blue or black.

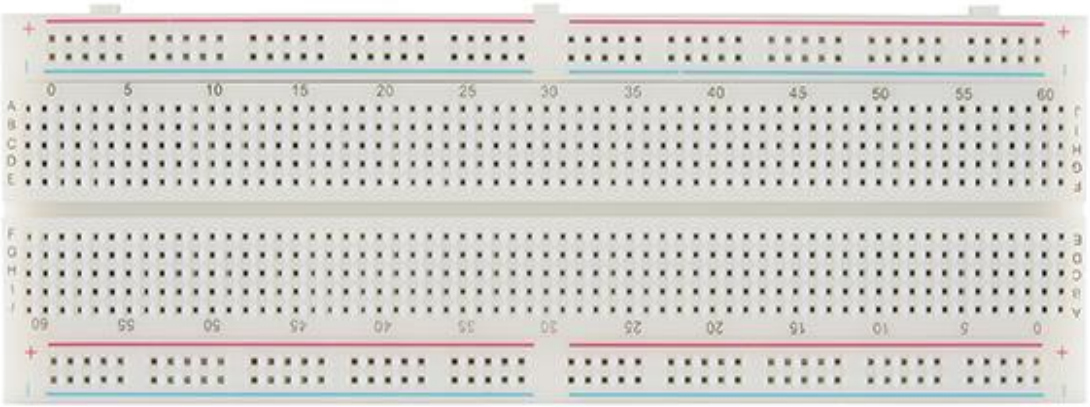

Figure 11: BREAD BOARD

Figure12: CONNECTING WIRES

Jump wires (also called jumper wires) for solderless bread boarding can be obtained in ready-to-use jump wire sets or can be manually manufactured. The latter can become tedious work for larger circuits. Ready-to-use jump wires come in different qualities, some even with tiny plugs attached to the wire ends. Jump wire material for ready-made should usually be solid copper, tin-plated wire - assuming no tiny plugs are to be attached to the wire ends. Shorter stripped wires might result in bad contact with the board's spring clips (insulation being caught in the springs). Longer stripped wires increase the likelihood of short-circuits on the board. Needle-nose pliers and tweezers are helpful when inserting or removing wires, particularly on crowded boards.

IC555 TIMER:

The 555 timer IC is an integrated circuit (chip) used in a variety of timer, pulse generation, and oscillator applications. The 555 can be used to provide accurate time delays, as an oscillator, and as a flip-flop element. Derivatives provide two (556) or four (558) timing circuits in one package. In bistable mode, the 555 timer acts as a SR flip-flop. The trigger and reset inputs (pins 2 and 4 respectively on a 555) are held high via pull-up resistors while the threshold input (pin 6) is grounded. Thus configured, pulling the trigger momentarily to ground acts as a 'set' and transitions the output pin (pin 3) to V_{CC} (high state). Pulling the reset input to ground acts as a 'reset' and transitions the output pin to ground (low state). No timing capacitors are required in a bistable configuration. Pin 7 (discharge) is left unconnected, or may be used as an open-collector output.

Figure13: IC 555 TIMER

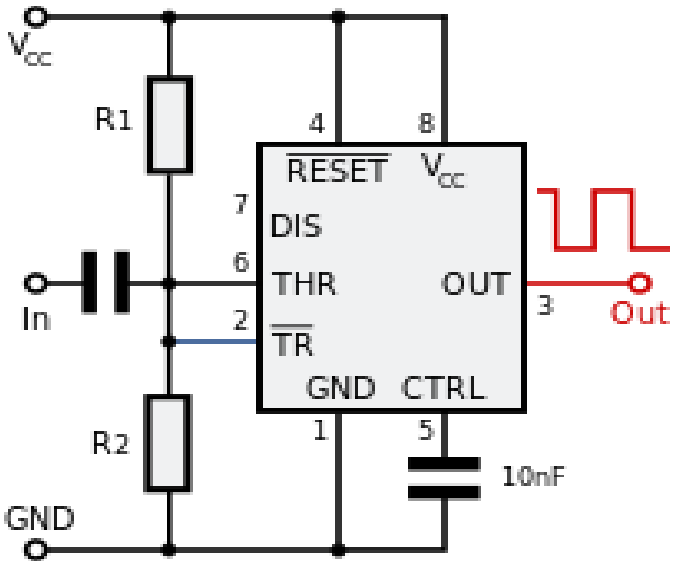

Figure14: PIN DIAGRAM OF IC 555 TIMER

IC LM358:

In this project, the LM358 is used as a Comparator. The LM358 IC is a great, low power and easy to use dual channel op-amp IC. It is designed and introduced by national semiconductor. It consists of two internally frequency compensated, high gain, and independent op-amps. This IC is designed for specially to operate from a single power supply over a wide range of voltages. The LM358 IC is available in a chip sized package and applications of this op amp include conventional op-amp circuits, DC gain blocks and transducer amplifiers. LM358 IC is a good, standard operational amplifier and it is suitable for your needs. It can handle 3-32V DC supply & source up to 20mA per channel. This op-amp is apt, if you want to operate two separate op-amps for a single power supply. It's available in an 8-pin DIP package

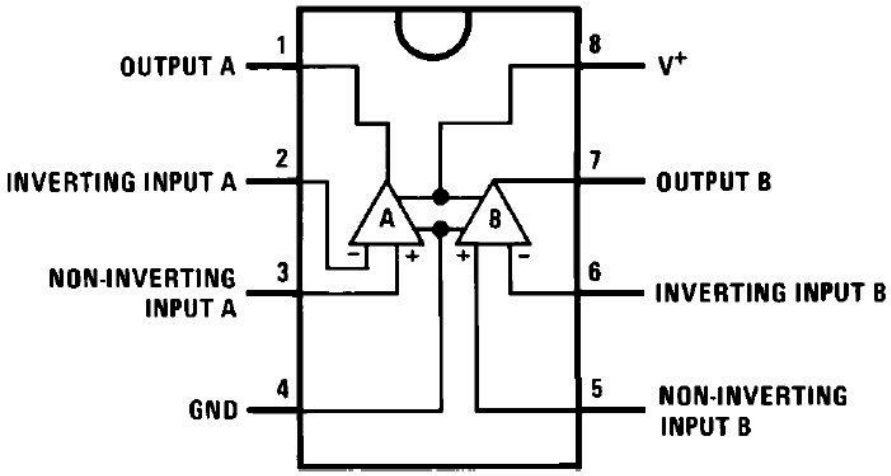

Figure 15: PIN DIAGRAM OF LM358

Figure 16: LM385

ADVANTAGES:

- Two operational amplifiers are compensated internally
- Two internally compensated op amps
- Removes the necessity of dual supplies
- Permits direct sensing close to GND & VOUT
- Well-suited with all methods of logic
- Power drains appropriate for the operation of the battery

POTENTIOMETER:

A potentiometer is a three-terminal resistor with a sliding or rotating contact that forms an adjustable voltage divider. If only two terminals are used, one end and the wiper, it acts as a variable resistor or rheostat. The potentiometer is a simple device used to measure the electrical potentials (or compare the e.g. of a cell). One form of potentiometer is a uniform high-resistance wire attached to an insulating support, marked with a linear measuring scale. The basic working principle of this is based on the fact that the fall of the potential across any portion of the wire is directly proportional to the length of the wire, provided wire has uniform cross-sectional area and the constant current flowing through it.“When there is no potential difference between any two nodes there is electric current will flow”.

Figure 17:
POTENTIOMETER

APPLICATIONS:

- Potentiometer as a Voltage Divider: the potentiometer can be worked as a voltage divider to obtain a manual adjustable output voltage at the slider from a fixed input voltage applied across the two ends of the potentiometer.
- Audio Control: Sliding potentiometers, one of the most common uses for modern low-power potentiometers are as audio control devices. Both sliding pots (faders) and rotary potentiometers (knobs) are regularly used to frequency attenuation, adjust loudness and for different characteristics of audio signals
- Television: Potentiometers were used to control the picture brightness, contrast, and colour response. A potentiometer was often used to adjust "vertical hold", which affected the synchronization between the received picture signal and the receiver's internal sweep circuit (a multi-vibrator).
- Transducers: One of the most common applications is measuring of displacement. To measure the displacement of the body, which is movable, is connected to the sliding element located on the potentiometer. As the body moves, the position of the slider also changes accordingly so the resistance between the fixed point and the slider changes. Due to this the voltage across these points also changes

CIRCUIT DESIGN:

The design of the laser security system circuit is very simple.

Coming to the design of the circuit,

First, the LDR and a 10 K Ω resistor are connected in series with the voltage divider and its output (common point) is connected to the pin 3 (non – inverting) of the Op- Amp IC LM358.

For the inverting terminal (pin 2), connected the wiper of a 10 KΩ potentiometer (other two terminal of the POT are connected to VCC and GND).

The 8^{th} and 4^{th} pin of Op-Amp IC LM358 are connected to the voltage divider and ground respectively.

The output of the Op – Amp (Pin 1) is connected to the base of the transistor (BC547) through a resistor of 220 ohms.

The trigger pin of 555 (Pin 2) is connected to the common point of 10 KΩ resistor and collector of transistor common point. The other end of resistor is given to voltage divider.

The emitter of the transistor is given to the ground

The reset pin (pin 4) of the 555 is connected to VCC through a 10 KΩ resistor and a push button is connected between Pin 4 of 555 and GND.

The non-inverting input (5^{th} pin) is connected to ground through 100nano farad capacitor. A buzzer is connected to pin 3 of ic555 IC. The other end of buzzer is given to the ground

The voltage divider (8^{th} pin) of ic555 timer is given to voltage divider and the output pin (1^{st} pin) is given to the ground.

MODEL CIRCUIT:

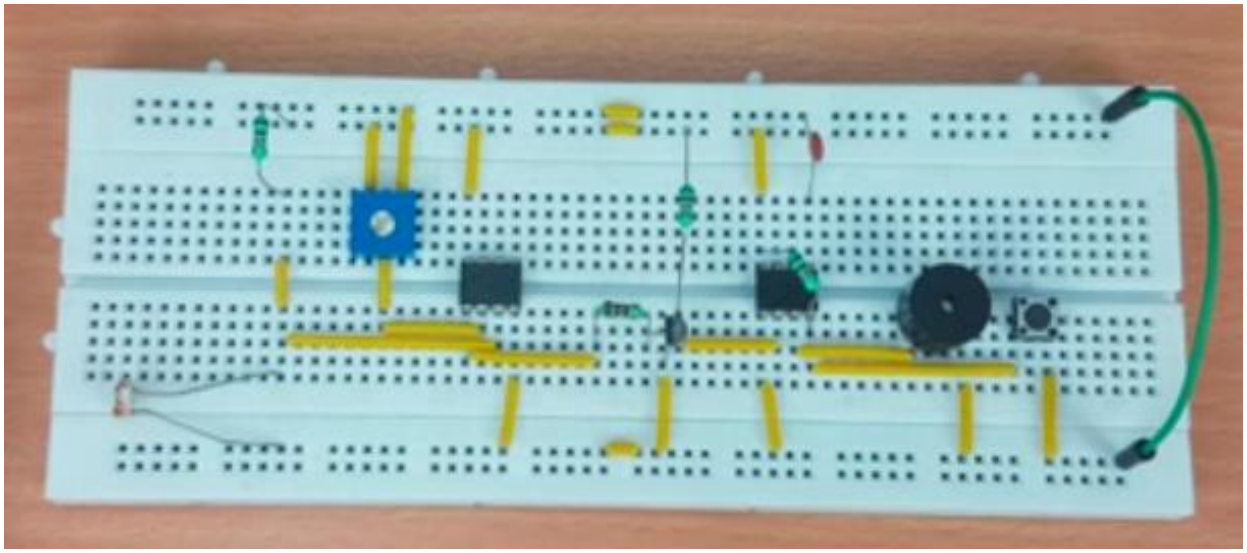

Figure 18: circuit model

Basing on the instructions circuit is connected.

PRECAUTIONS:

- We have used a laser pointer in this project. Direct exposure of laser light on eyes can be very dangerous. Even though it is a low power laser, avoid direct eye exposure of laser.
- Make sure the connections are correct.(mainly op-amp, transistor, ic555timer, potentiometer)
- Using potentiometer change the volume of buzzer.
- Check proper biasing of OP-Amp and transistor.

ADVANTAGES AND DISADVANTAGES

ADVANTAGES:

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.

Lasers are strong in beam width and can be focused on the perfect target. By using laser security system one can be safe in the case of harmful effects to the body. As the beam width used in the laser security systems are not strong beam widths.

The circuit, construction and setup for the Laser Security System are very simple. If used with a battery, the laser security system can work even when there is a power outage.

DISADVANTAGES:

- 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.

RESULT AND DISCUSSION:

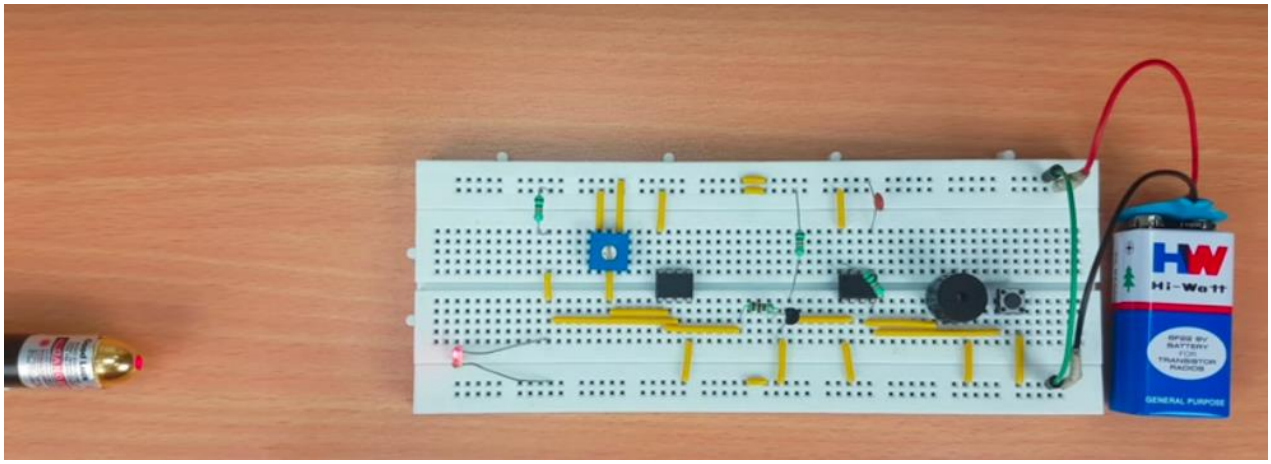

Figure 19: implementation of circuit model

When the laser beam falling over the LDR is interrupted by the object in the field of laser net, hence the LDR develops an output voltage and the alarm rings showing the sign of any intruders. The Laser Security System has been successfully designed and developed. The buzzer is turned on as the laser beam falling on the LDR is interrupted. The experimental model was made according to the circuit diagram and the result was as expected.

The LDR has to be placed in dark place or inside a case so that the other source of light except the laser beam doesn't affect the LDR. This helps the circuit to work faster and properly.

CONCLUSION:

Laser security system provides us the security against any crime, theft in our day to day life and so people are installing them in order to stay safe, secure and sound. Various electronic security systems can be used at home and other important working places for security and safety purposes. It is a great opportunity and source of saving man power contributing no wastage of electricity. The "Laser Security System" is an important helping system. Using this system robbery, thefts & crime can be avoided to large extend. Avoiding thieves results in the safety of our financial assets and thereby this system provides us protection against all.

The Laser & LDR system is highly sensitive with a great range of working. The system senses the light emitted by the Laser falling over the LDR connected with the circuit. Whenever the beam of light is interrupted by any means, it triggers the alarm or siren. This highly reactive approach has low computational requirement, therefore it is well suited to surveillance, industrial application and smart environments.

REFERENCE:

1. https://www.electronicshub.org

2. http://en.wikioedia.org/wiki/Main-Page