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Department of Physics

Project On

"ELECTRONIC EYE"

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INTRODUCTION

·An **electric eye** is a photo detector used for detecting obstruction of a light beam. An example is the door safety system usedon garage door openers that use a light transmitter and receiver at the bottom of the door to prevent closing if there is any obstruction in the way that breaks the light beam. The devicedoes not provide an image; only presence of light is detectable. Visible light may be used, but infrared radiation conceals the operation of the device and typically is used in modern systems. Originally, systems used lamps powered by direct current or the power line alternating current frequency, but modern photo detector systems use an infrared light-emitting diode modulated at a few kilohertz, which allows the detector to reject stray light and improves the range, sensitivity and security of the device.

Circuit Components:

7805 regulator U1

Resistors R1, R2, R3, R4, R5-100k, 1k, 100, 22o, 820

1N4007 diode D1 Capacitors C1, C2

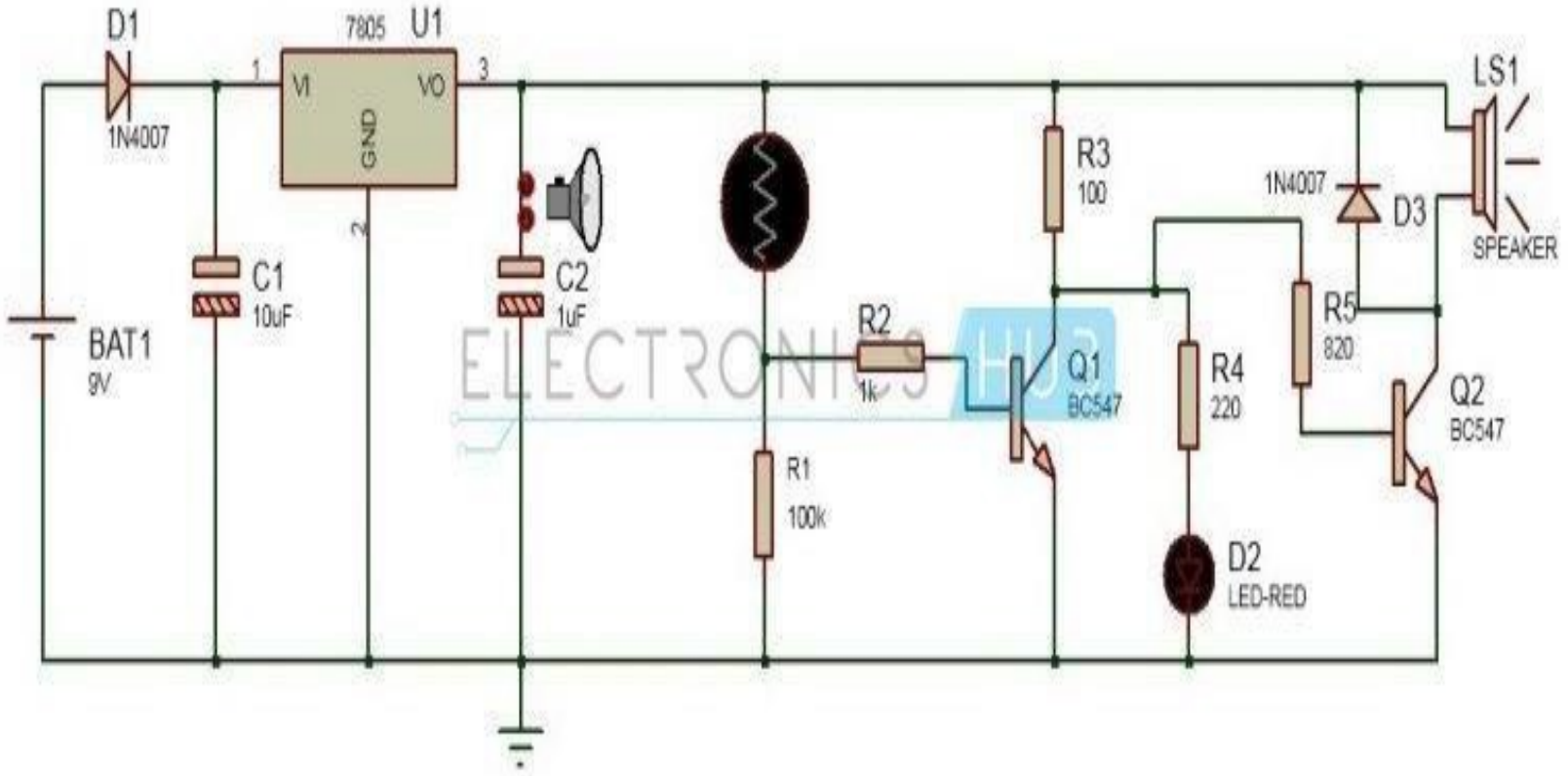
BC 547 transistors Q1, Q2 Light Dependent Resistor

Buzzer BUZ1

Light Emitting Diode D2. Bread board

Connecting wires DC 9V battery.

Circuit Diagram of Electronic Eye Controlled Security System



Electronic Eye Controlled Security System Circuit Design:

This circuit can be divided into two parts. One is the power supply and the other is logic circuit. In the power supply 9v supply is converted to the 5v .The logic circuit operates the buzzer when any shadow falls on it.

Power supply circuit consists of battery, diode, regulators and capacitors. Initially a 9v battery is connected to the diode. Diode used here is a P-N junction diode of 1N4007 series. In this circuit

1N4007 is connected in the forward bias condition .The main purpose of the diode in this circuit is to protect the circuit from negative voltages .There is a chance of connecting battery with reverse polarities which damages the circuit. So P-N junction diode connected in the forward bias allows the current to flow only in one direction and thus the circuit can be protected . There is some voltage drop across the diode. A voltage of 0.7V is dropped across the diode.

A regulator is used for regulating the output voltage of the circuit .The regulator IC used here is 7805.78 represents the series and 05 represents the output voltage .Thus a voltage of 5v is producedat the output of the regulator .Two capacitors are used before and after the regulator .These two capacitors eliminate the ripples .Thus a constant voltage is produced at the output of theregulator.

Working

When NOT gate goes high(1) the input pin is at lower and at 1/3rd level of the supply voltage. Conversely the output goes low(o) when it is above 1/3rd level. So small change in the voltage of pin 2 is enough to change the level of output (pin-3) from 1 to 0 and 0 to 1

The output has only two states high and low and cannot remain in any intermediate stage it is powered by a 9V batter for portable use. The circuit is economic in power consumption. Pin 1 is connected to the positive supply and pin 8 is grounded. LDR used in the circuit is a special type of resistance whose value depends on the brightness of the light which is falling on it.

It has resistance of about I mega ohm when in total darkness, but a resistance of only about 5k ohms when brightness illuminated. It responds to a large part of light spectrum. We have made a potential divider circuit with LDR and 220 kilo ohm resistance connected in series. We know that voltage is directly proportional to conductance so with more voltage we will get from this divider when LDR is getting light and low voltage in darkness

This divided voltage is given to input of Not gate. As soon as LDR gets dark the voltage of input not gate drops 1/3rd of the supply voltage and pin 2 gets high and LED or buzzer which is connectedto the output gets activated.

Electronic Eye Controlled Security System

Applications:

This can be used in door bell circuits.

This can be used in garage door opening circuits. Electronic eye can be used in security applications.

References

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- Internet
- School library Teachers
- Electronic devices and circuit theory

ACKNOWLEDGEMENT

I would like to sincerely and profusely thank my Physics teacher Prof. Sherkar V.B., for his able guidance and support in completing my project

I would also like to extend my gratitude to the principal for privinding me with all the facility that was required

Last but not the least, I would extend my gratitude towards all teaching and non teaching staff of New Art's Commerce and Science College, Parner and towards my friends who have supported me to complete this project

Mr. Barshile Dinesh

Bhanudas

THANK YOU