

INTERNATIONAL INSTITUTE OF INFORMATION TECHNOLOGY BANGALORE



ANALOG CIRCUITS LAB PROJECT

EC 212P

Home Security System

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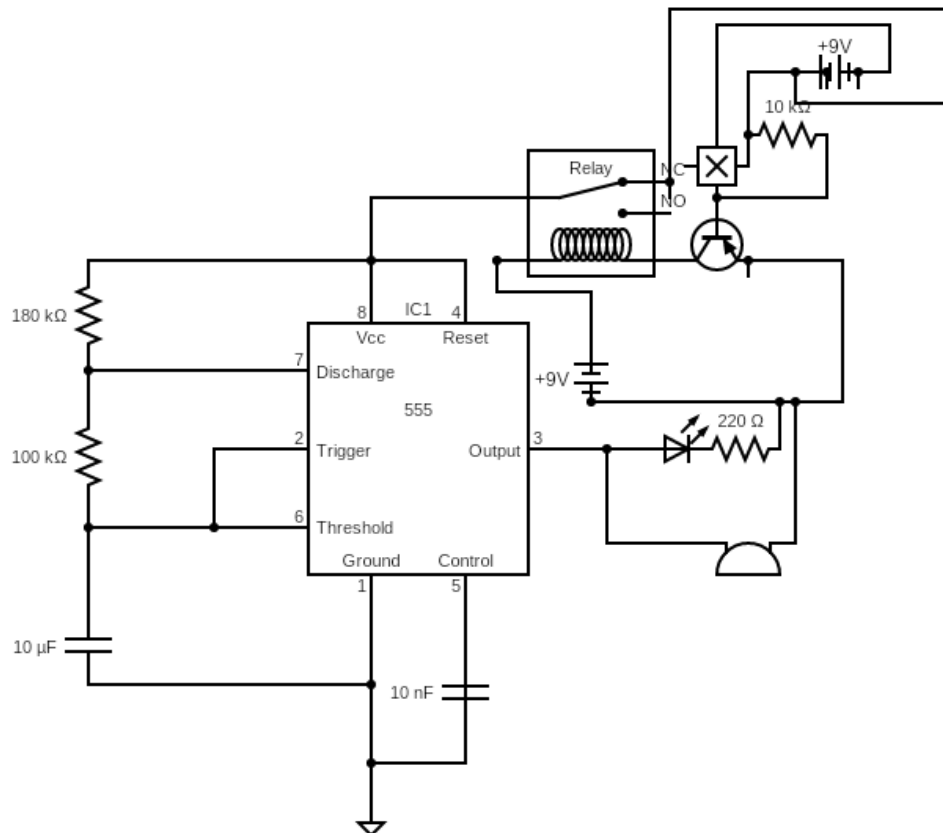
Problem Statement

Components

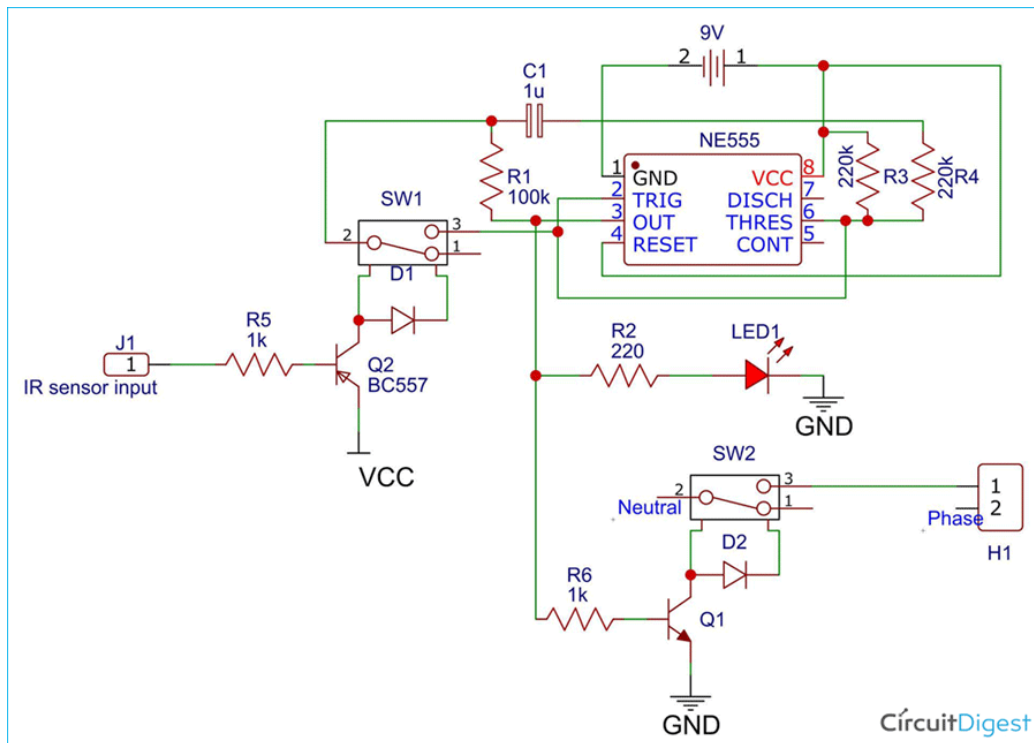
The following components have been used in the making of the circuit for the Home Security System:

1. 555 Timer
2. Magnetic Hall Sensor
3. IR Sensor
4. 9V Battery
5. Relays
6. LEDs
7. Potentiometer
8. OR Gate
9. BJT Transistor
10. Resistors and Capacitors

Working



In this Magnetic Door Alarm circuit, we have used a 555 timer IC in astable mode to generate a tone as an alarm. Frequency of tone can be adjustable by using a potentiometer. A Hall Effect Sensor or magnet sensor is used to detect if the door is open or closed. It's output connected to the base of the transistor BC547 which is responsible to provide a path to 555 timer IC. A buzzer and an LED are connected for indication of alarm. Finally, we have connected a 9v Battery to power the circuit.



Initially, the 555 timer's output is off due to the voltage divider. When motion is sensed by the IR sensor, the capacitor begins to charge, altering the voltage at pin 2 and triggering the timer's output on. Once the capacitor fully charges, subsequent motion detection causes the voltage at pin 6 to rise, turning the output off. Transistors are utilized to drive relays due to their ideal switch characteristics, with a PNP transistor driving the main relay in response to the IR sensor's output and an NPN transistor controlling the output relay, synced with the 555 timer's active high output.