AMERICAN INTERNATIONAL UNIVERSITY-BANGLADESH
(AIUB)
Faculty of Engineering
Department of Electrical and Electronic Engineering

PROJECT REPORT **FINAL TERM**

SEC : E

Engineering Shop Lab

PROJECT TITLE: Fridge door alarm on PCB.

Submitted to: Raja Rashidul Hasan Assistant Professor Faculty of Engineering Department of EEE	Semester: Spring 2021 Date of Submission: 23/04/2021

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TITLE: Fridge door alarm on PCB.

Introduction:

A Fridge door Alarm is a simple PCB project designed to detect & inform the status of any refrigeration unit's door: whether it's open or not. It produces a monotonous beeping noise if the fridge door is left open for too long by an accident. Its common use is in refrigerators, Temperature Controlled Freezers & beverage coolers.

Circuit Operation:

The operation of this circuit is based on the simultaneous communication between two NE555 IC's. IC1 evaluates & corresponds with the input of the LDR while IC2 uses the output sent from IC1 to regulate the buzzer as per the position of the fridge door.

Circuit diagram:

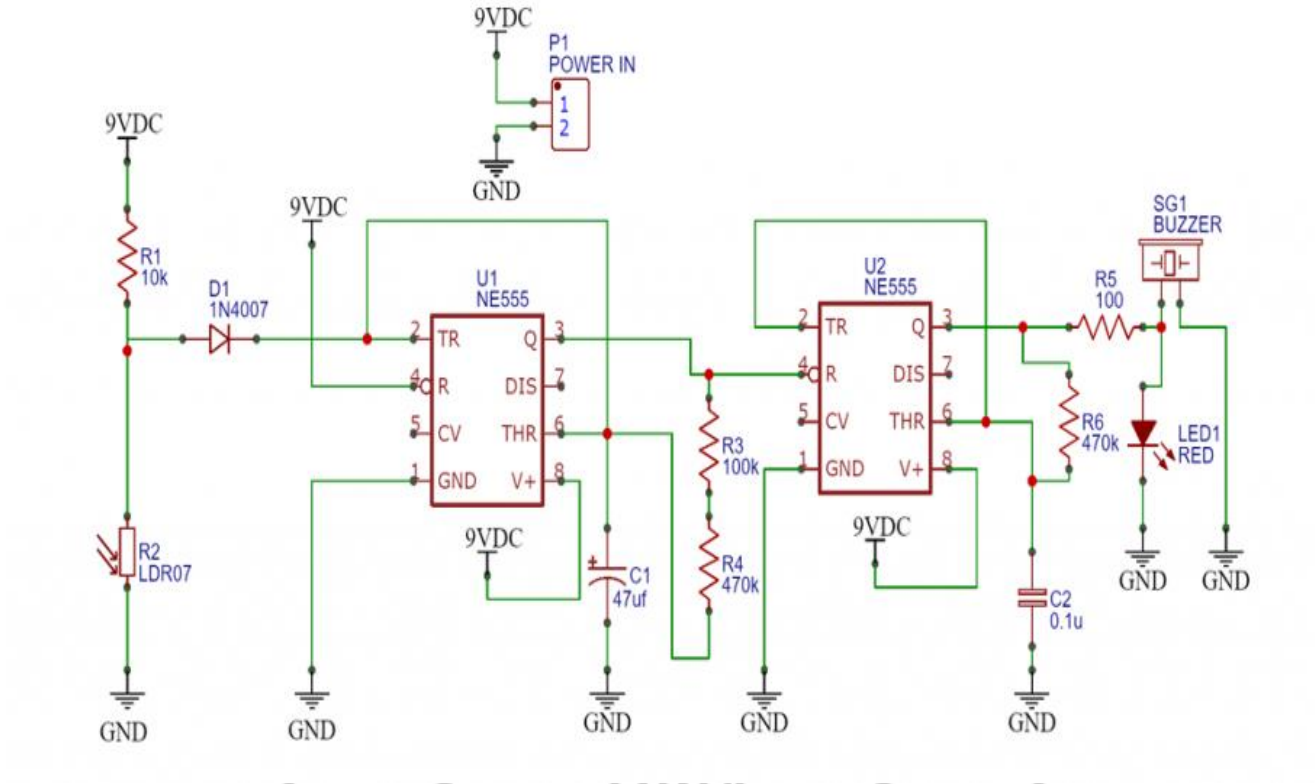

Figure:1

Apparatus:

- Resistors (220 Ω, 470KΩ X 2, 1 KΩ, 10k)
- Electrolytic Capacitor
- Operational Amplifier
- LED-red
- NE555 TIMER X 2
- Ceramic Capacitor
- BUZZER
- TORCH LDR
- Battery Clip/ POWER supply
- DIODE

Simulations:

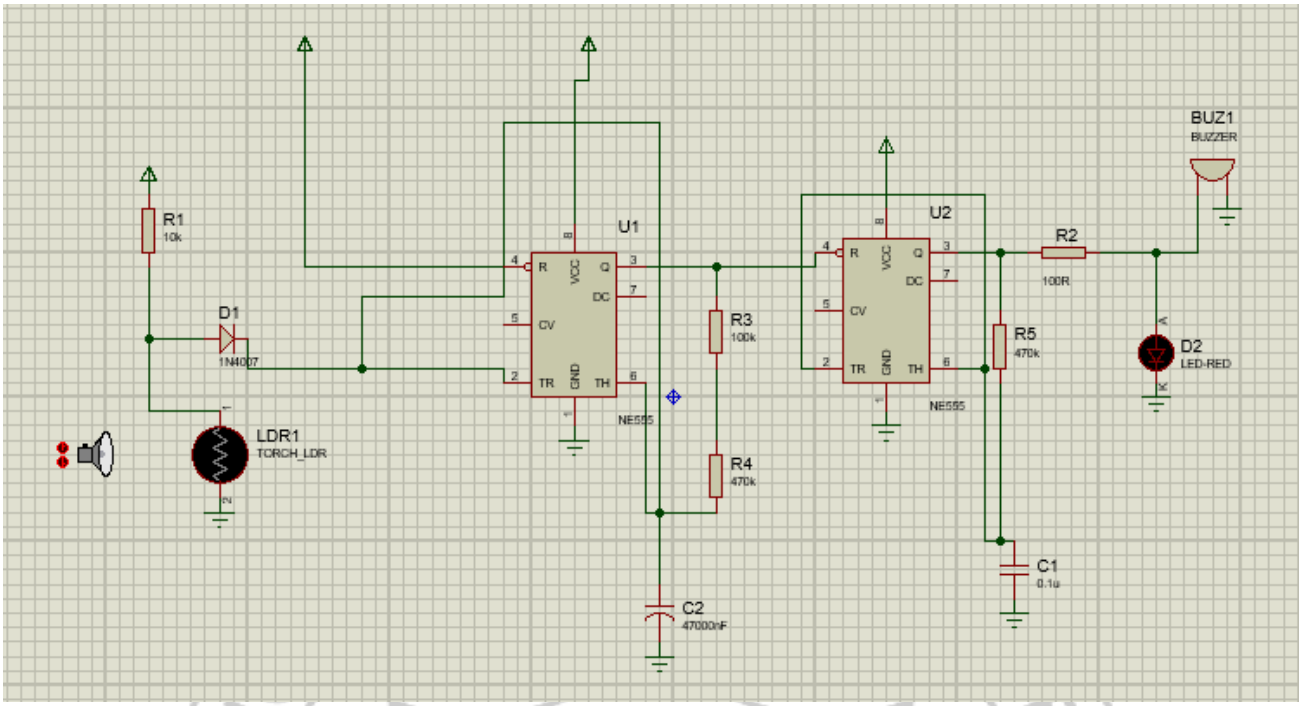

Figure 2: Schematic Diagram.

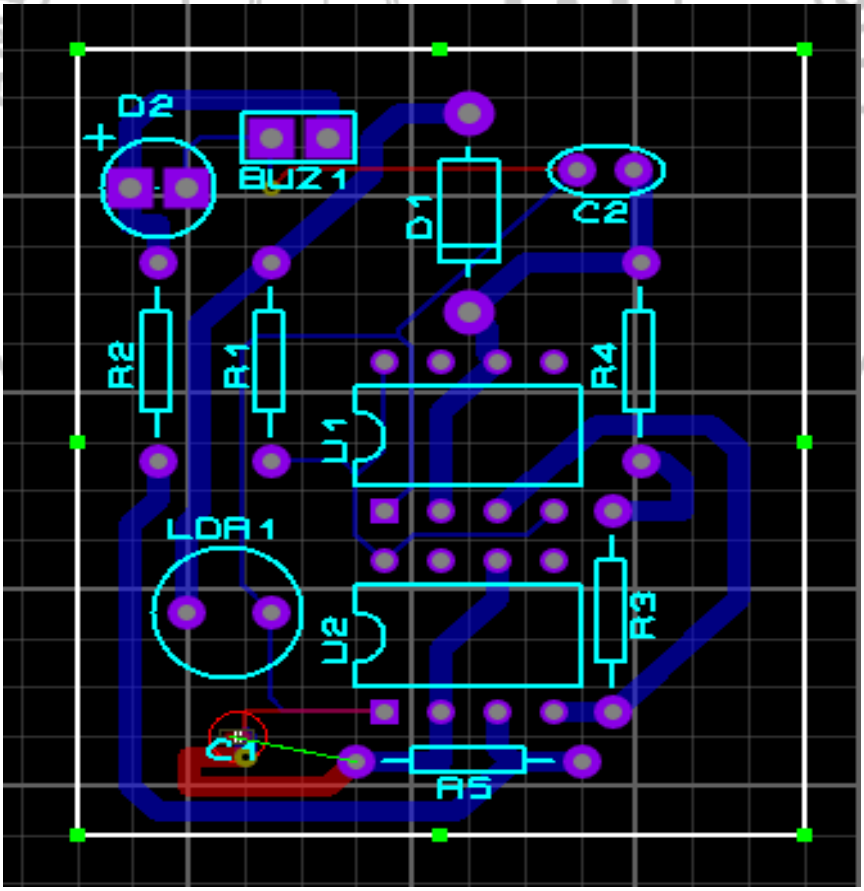

Figure 3: PCB Layout

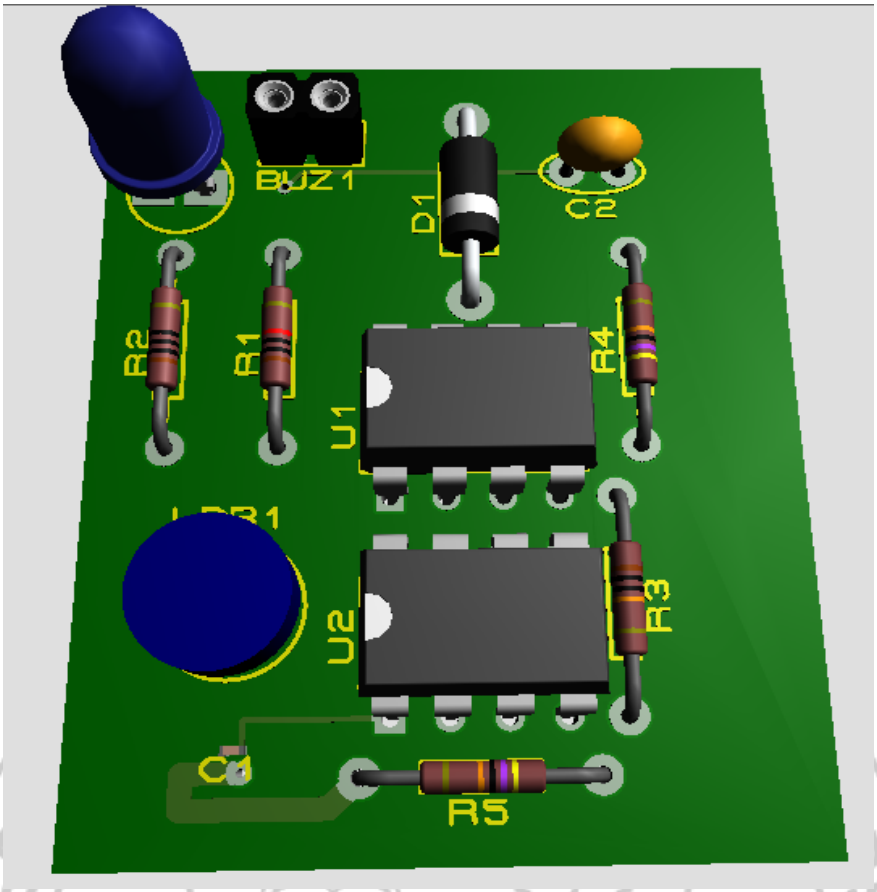

Figure 4: 3D View

Gantt chart:

Task	7 April	10 April	11-15 April	16-18 April	19-20 April	21-22 April
Topic Selection						
Preparing Proposal reports						
Literature Review						
Design and Simulate the system						
Test and Analysis						
Writing Report						

Cost estimation and tabular breakdown:

Name	Quantity	Price (BDT)	Source
Resistors (220 Ω, 470 KΩ, 1 KΩ)	4	4*5=20tk	https://store.roboticsbd.com/
Electrolytic Capacitor	1	2tk	https://store.roboticsbd.com/
Operational Amplifier	1	9tk	https://store.roboticsbd.com/
LED	1	5tk	https://store.roboticsbd.com/
NPN Transistor	1	30tk	https://store.roboticsbd.com/
Ceramic Capacitor	2	2*5=10tk	https://store.roboticsbd.com/
IC Jacket	1	120tk	https://store.roboticsbd.com/
Soldering Iron	1	309tk	https://store.roboticsbd.com/
Soldering Flux	1	180tk	https://store.roboticsbd.com/
DC Battery	1	40tk	https://store.roboticsbd.com/
Battery Clip		9tk	https://store.roboticsbd.com/
Total Cost (BDT)		**734tk**	

Justification of the merits and demerits of project:

The name of the circuit itself infers the application. This circuit triggers the alarm if the door of Fridge is left open for the long time. When the door of the refrigerator is left open, the temperature inside the cabin will increase. This rise in temperature will be sensed by thermostat and try to cool down the cabin. It will always try to maintain constant temperature of the system. The compressor will be working continuously to remove the heat from cabin, this increases the power consumption from the receptacle. Also, continuous usage under this condition would reduce the life of compressor and probably do malfunction.

Conclusion:

Hence, this Fridge Door Alarm Circuit is a good solution which will indicate the user about the door in prolonged open condition. We can also set different pre-set time after which the audible indication has to be given. This is done here by using the versatile 555 timer IC under astable multivibrator mode and LDR. As soon as we open the Door of refrigerator, LDR senses it and start the countdown using 555 Timer, and after a preset time the buzzers starts beeping as alarm signal.

Reference(s):

1. https://circuitdigest.com/electronic-circuits/fridge-door-alarm-circuit-diagram
2. https://www.circuitstoday.com/fridge-door-open-alarm
3. https://www.eeweb.com/fridge-door-open-alarm-circuit-project/