

A Simple and Reliable Touch Sensitive Security System

¹Mohammed Sameer Hussain, ²Mirza Mohammed Abed Ullah Baig, ³Adnan Adil,
⁴Syed Samdani, ⁵S V Altaf

^{1,2,3,4}Student VII- Semester, Electronics and Communication Engineering, Lords Institute of Engineering & Technology

⁵Associate Professor, Department of Electronics and Communication Engineering, Lords Institute of Engineering & Technology, Hyderabad

Abstract: Insecurity and crime constitute some of the major problems facing our society today. People live with fear of being attacked by thieves. Despite all the effort, resources and time this lead to the development of tools that will reduce crime rates and make the world a safer place to live, these problems are still on the increase. These gave rise to the need for an increasing development in the technology of alarm systems.

Keywords: Touch Sensing, Alarm, Security System, Indicator.

I. INTRODUCTION

Insecurity and crime constitute some of the major problems facing our immediate society today. People live with fear of being attacked by burglars, vandals and thieves. Despite all the effort, resources and time that has been devoted to the development of tools that will reduce crime rates and make the world a safer place to live, these problems are still on the increase. These gave rise to the need for an increasing development in the technology of alarm systems which utilizes various principles such as infrared motion detection, light (photo) sensitive electronic devices and so on. Even with the introduction of these alarm systems which have reduced greatly the level of insecurity, there is still a problem of false alarm which needs to be minimized. In order to effectively reduce the level of insecurity and avoid false alarms which can create unnecessary unrest, a touch activated security system is required. This system if properly designed will provide security and ensure alarms are activated only when an unauthorized person try to gain access to the protected area or device by touching the entrance or any other part of the device. An alarm is a loud noise or signal for alerting or informing people of danger or a problem. An alarm system is thus a security system that produces a form of sound to warn people of a particular danger. The development of alarm systems started with the creation of man.

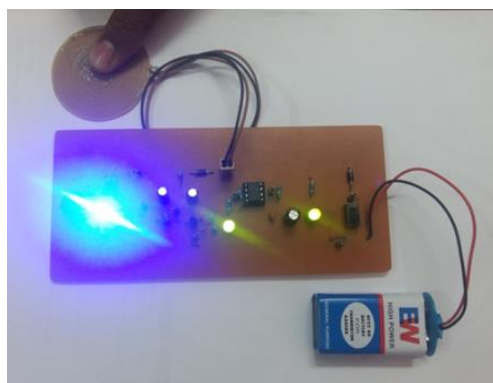


Figure 1

II. SCHEMATIC

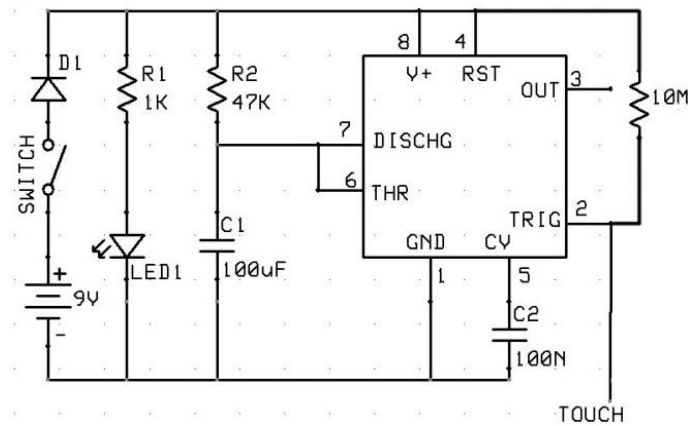


Figure 2 – Trigger Unit

As shown in Fig, the schematic diagram of the trigger unit consist of 1 major components which are NE555 timer. The 555 timer (IC2) produces a trigger current which comes out through its pin 3 whenever pin 2 is activated through the sensor. Pins 4 and 8 are connected to positive power supply while pin 1 is grounded. R2 and C1 determines the time out period of the 555 timer (i.e. the period at which the alarm sound). While R1 is a resistor which is placed before the LED1 (i.e. the positive terminal of the LED is connected to the resistor and other end is connected to ground). This LED indicates the power supply given to the circuit is ON. Switch is also connected to the circuit to ON and OFF the power supply without removing the battery. And the diode D1 stops the reverse current. And the whole circuit is connected to the 9v battery which provide the power to the circuit as shown in the Fig. The basic operation of the circuit, and the duration of the output pulse in seconds is approximately equal to:

$$T = 1.1 \times R \times C \text{ (in seconds)}$$

From the fig 3.1

$$T = 1.1 \times R_2 \times C_1 \text{-----(1)}$$

where $R_2 = 47K\Omega$, $C_1 = 100\mu F$

Substituting R_2 and C_2 values in the above equation (1)

$$T = 1.1 \times 47K \times 100\mu F$$

$$T = 1.1 \times 47 \times 10^3 \times 100 \times 10^{-6}$$

$$T = 5.17 \text{ seconds}$$

So the circuit from the fig will give the output from pin 3 when ever pin 2 gets the trigger. The output remains ON for 5 seconds approximately.

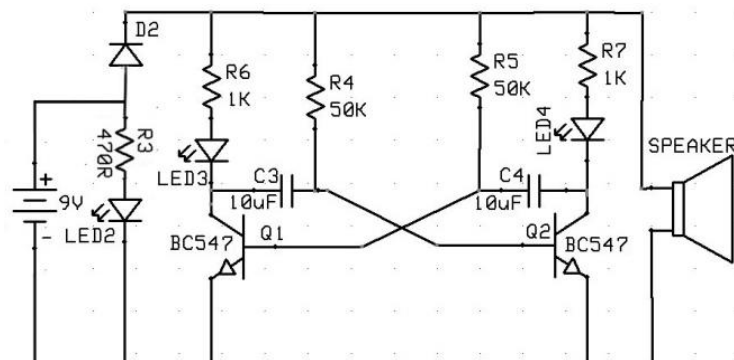


Figure 3 – Alarm Unit

Alarm Unit is the output part of the circuit it produce the sound form the buzzer and also it has two LED's which will blink one by one. Basically the circuit works on the astabel multivibrator mode. Let us consider the transistor Q1 is in the saturation state the capacitor C3 is fully charged and capacitor C4 is fully discharged. So the current from the resistor R5 flows to the base of the transistor Q1. It acts like a short circuit and the LED3 starts glowing and capacitor c3 starts discharging slowly and also current from resistor R4 flows from the capacitor C3 and transistor Q1 and reaches the ground. Simultaneously the capacitor C4 charges slowly when the capacitor C4 is fully charged and capacitor C3 is fully discharged the current from the resistor R4 flows to the base of the transistor Q2 then the transistor Q2 gets into the saturation region. It acts like a short circuit and the LED4 starts glowing and the capacitor C4 starts discharging .In this circuit there are two logics that are the a transistor gets a high potential to the base of the transistor then the potential on the collector of the same transistor will be low.

When there is a low potential at the base of the transistor then the potential on the collector of the same transistor will be high. When the potential is high at the collector the capacitor starts charging. else the capacitor will discharge. By this two logics the whole alarm circuit will works. And this cycles will repeat again and again until the circuit gets the sufficient power supply. At the last the buzzer produce the sound. It will alert the people that there is an un authorized access.

III. APPLICATIONS

1. It can be used in cars for security
2. It can also be used in the security of the houses
3. The circuit is also used in Fences to avoid unauthorized access

IV. CONCLUSION AND RESULT

Conclusion : It can be concluded that the sole aim of carrying out the design, analysis and implementation of a simple and reliable touch sensitive security system was achieved, in that the aim was to develop a cheap, affordable, reliable and efficient security system, which was successfully realized at the end of the design process. One factor that accounts for the cheapness of the product was the proper choice of components used. The ones that were readily available were used, while a close substitute was found for those that were not readily available. The system was tested and found to be working to specifications and predictions. Summarily, a cheap and reliable way of checking the activities of burglars and intruders has been successfully developed, which is the aim of the research. We can conclusively say therefore, that the benefits of having this burglar alarm system cannot be overemphasized. In future, we shall find a way of improving the system by interfacing the alarm system with the microcomputer to boost the effectiveness of the entire system or integrating a digital door lock.

Result: This section described the steps taken in the verification of the output of the circuit which is described. These steps are given below

Step 1: To ensure that all the components to be used are functionally operating, they were first tested with a digital multi meter and failed ones are replaced before finally soldering them on the printed circuit board(PCB).

Step 2: To ensure that there was no breakage in the circuit path on the PCB, immediately after soldering on PCB, the circuit path was tested using the Digital Multi-meter. This was done to also ensure continuity of circuit on the PCB. As shown in the figure.

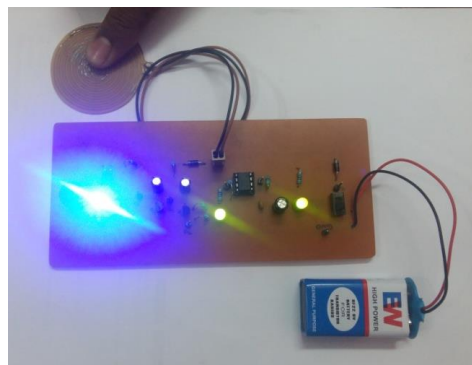


Step 3: Now connect the battery to the battery connector which is provided on the PCB. Then switch on the switch to give the power supply to the circuit. the green LED starts glowing which indicates that the power supply to the circuit is properly working. As shown in the figure



At this stage only green LED will glow to ensure the power supply.

Step 4: As the power supply is given to the circuit with 9v battery initially green led will glow to ensure the power supply. Now touch the given touch plate to activate alarm. The Touch plate act as a trigger to the pin 2 of the 555 timer which is in monostable mode. By touching the touch plate alarm will activate indicating unauthorized access. As shown in the figure 4.3



There are two LEDs at the output side which is in astable mode using the transistors. The LED will glow one by one. This will give a visual effect to the alarm circuit. So this is how the circuit look like after making on PCB board. And we get the output.

ACKNOWLEDGEMENT

We thank the capable faculty of LORDS INSTITUTE OF ENGINEERING AND TECHNOLOGY for providing us with an opportunity to conduct project work in college.

We are also thankful to Mr.S.V.ALTAf, ASSOCIATE PROF internal guide for his valuable academic guidance and support.

We whole heartedly thank all staff members of Department of Electronics and Communication Engineering of LORDS INSTITUTE OF ENGINEERING AND TECHNOLOGY for their support and encouragement related to our project work.

Lastly, we thank all those who helped us directly and indirectly with this project work which turned out to be very successful, and we finally thank our beloved parents and family for their extreme support throughout the project.

REFERENCES

- [1] Linear Integrated Circuits--D. Roy Chowdhury, New Age International (p) Ltd, 3rd Ed., 2008.
- [2] Linear Integrated Circuits-- k. Lal Kishore- Pearson, 2008.
- [3] Electrical Engineering and Electronic--V.K Mehta, Rohit Mehta

- [4] www.electroniccircuitsforu.com
- [5] www.extremecircuits.com
- [6] www.mycircuits.com
- [7] www.buildcircuits.com
- [8] www.electronicshub.org

AUTHORS PROFILE:



Mr. Mohammed Sameer Hussain Pursuing B-Tech in Electronics and Communication Engineering from Lords Institute of Engineering and Technology, Hyderabad.



Mr. Mirza Mohammed Abed Ullah Baig Pursuing B-Tech in Electronics and Communication Engineering from Lords Institute of Engineering and Technology, Hyderabad.



Mr. Adnan Adil Pursuing B-Tech in Electronics and Communication Engineering from Lords Institute of Engineering and Technology, Hyderabad.



Syed Samdani Pursuing B-Tech in Electronics and Communication Engineering from Lords Institute of Engineering and Technology, Hyderabad.



Mr. S V Altaf Assoc professor in ECE department at Lords Institute of Engineering and Technology has 27 years of Industrial experience in the field of Embedded Systems along with 10 years of teaching experience in Micro-Processors, Micro-Controllers and its applications. Also published Micro-Processors and Micro Controllers (MP-MC), Micro-Processor and Interfacing (MPI) books.