

# Design and Development of Cordless Multidoor Alarm System Using NE555 Timer

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**Abstract:** - The purpose of this project is to develop as good as well. Generally this project is operated on timer (IC NE555). In this circuit there are many doors are in switching condition, which is controlled by other persons. We consider the project is plat formed on a corporate office. In that farm a BUZZER or ALARM is interfaced at main building or at main Head Quarters where all the secured persons, chief guests are working the official job. And at outside of that building all the door switches are plugged up. When other persons those who has to met to the main high profile persons, they are switched on the door switches. At that time ALARM will be amplified and green LED will be glow on, main part of that big system will be alerted that someone is waited outside the building. Through this process all the system will be connected perfectly. Whatever, this type of project is simple but efficient and useful for every purpose in everyday in daily life. So, this type of project is to be acceptable.

**Index Terms:** NE555-Timer, LEDs, Piezo Buzzer, Zener Diode

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## I. INTRODUCTION

The attempt of burglary by detecting intrusion with this alarm circuit. Each door is protected by a separate circuit built around an independent 555 timer IC[1] in conjunction with reed switch magnet. All the three units are powered from a single power source. The buzzer can be plugged into the earth line connection. There is no need of lying external wires up from different rooms.

A comprehensive report on smoke alarm effectiveness was completed for Fire Protection Association (FPA) Australia to aid fire protection officials around the world in drafting legislation that more accurately reflects the international *de facto* standard. Research shows that photoelectric smoke alarms are more effective than ionization units in most residential fire situations. The current warning tone was shown to be ineffective and should be replaced with a 520 Hz square wave pattern. Analysis of a successful (70% return rate) international survey indicates current compliance monitoring and enforcement practices are insufficient in many regions. A database was developed for FPA Australia through compilation of the survey responses. This project is designed to improve the home safety and the conventional alarm system today. The project is not only to detect any intrusion and turn on the bell alarm but also tell the owners by calling their hand phone. The main focus of this project is to generate the DTMF (Dual Tone Multi Frequency) tones using a cheap PIC Microcontroller and the corresponding circuit. The theory of the DTMF tones generation is discussed in quite detail with suitable graphs shown in this report. This project is already

done successfully since it can generate the DTMF tones and able to make a call to a specific hand phone number.

## II. CIRCUIT DIAGRAM

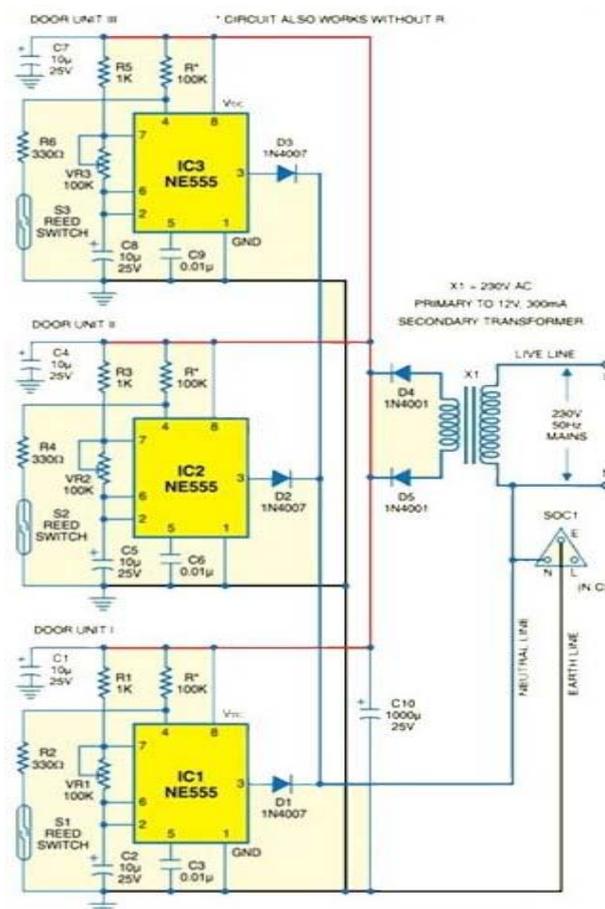


Figure 4: Circuit diagram of Cordless Multi-door Alarm

### III. WORKING PRINCIPLE

In this system door-1 alarm unit, connect reed switch s1 near the magnet of gate 1. Wire IC1 as a frequency oscillator and set door-1 alarm unit to the desired frequency, say, between 1Hz and 3Hz using VR1. Same function happens on door 2, but in case of door-2 the alarm frequency between 5 and 7 Hz using VR2.

The power supply required to operate the alarm circuit consist of a bridge rectifier and a filter capacitor. In normal condition i.e., when all doors are closed RESET pin-4 of IC1 through IC2, remains slow. As a result, these do not oscillate and Piezo Buzzer remains silent.

When door is opened, the magnet moves away from reed switch, generates (DOOR-1, 1-3HZ, DOOR-2 ,5-7Hz). Signals and the piezo buzzer beeps to indicate that door has been opened.

Thus sitting in the room where the buzzer unit is fitted, you can easily know (through the typical sound of the buzzer) which room has someone gained entry into.

### IV. DESIGN STEPS OF THE PROJECT

Step1: Connect pins 4 (reset) and 8(Vcc) to a 5V power source.

Step2: Connect pin 1 to ground.

Step3: Connect pin 3 to an output source

Step4: Connect pin 7(Discharge) to pin 8 through a resistor

Step5: Connect pin 7 to pins 6(Threshold) and 2(Trigger) through a second resistor

Step6: Connect pins 6 and 2 to the positive side of a capacitor

Step7: Connect 3 pin to the transformer

Step8: Connect to the LED & BUZZER section

#### Circuit of buzzer unit

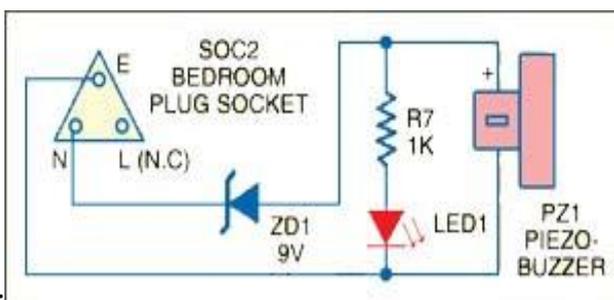


Figure : Circuit diagram of Buzzer Alarm unit.

### VI. CIRCUIT DESCRIPTION

- First of all it will be executed on bread board and then interfaced on Vero Board.
- The D1 can be used as output of IC1 NE555 and D2 can be used as output of IC2 NE555.

- The D4 & D5 must be mounted close (~2cm) to each other, looking in same direction. And by these two diodes it is connected with Transformer.
- PIEZO BUZZER (PZ1) can be used as sound amplification.
- The variable register can be used as regulator of the register.(vr1,vr2)
- The main battery source can be powered from the transformer (230 v-ac).
- All capacitors must be rated 25v.
- This timer based circuit is operated by two door switches.
- In Buzzer Circuit Neutral part of Plug Socket is connected to the negative end of the Zenor Diode.
- Positive end of the Buzzer is connected to resistor (1kΩ) and negative part is connected to the LED.

In astable mode, the output constantly switches between high and low. A blinking light on an electronic device is an example of astable mode. If the chip is attached to a speaker, then a continuous tone can be generated if there is a high rate of change (frequency) between high and low output.

#### To set up the 555 timer chip for astable mode,

- Connect pins 4 (reset) and 8 to a 5V power source.
- Connect pin 1 to ground.
- Connect pin 3 to an output source (eg. to an LED through a 220Ω resistor).
- Connect pin 7 to pin 8 through a resistor (R1).
- Connect pin 7 to pins 6 and 2 through a second resistor (R2).
- Connect pins 6 and 2 to the positive side of a capacitor (connect the negative end of the capacitor to ground).

An Astable Circuit has no stable state - hence the name "astable". The output continually switches state between high and low without without any intervention from the user, called a 'square' wave. This type of circuit could be used to give a mechanism intermittent motion by switching a motor on and off at regular intervals. It can also be used to flash lamps and LEDs, and is useful as a 'clock' pulse for other digital ICs and circuits.

### VII. PIEZO BUZZER

Basically, the sound source of a piezoelectric sound component is a piezoelectric diaphragm. A piezoelectric diaphragm consists of a piezoelectric ceramic plate which has electrodes on both sides and a metal plate (brass or stainless steel, etc.). A piezoelectric ceramic plate is attached to a metal plate with adhesives.

In general, man's audible frequency range is about 20 Hz to 20 kHz. Frequency ranges of 2 kHz to 4kHz are most easily heard. For this reason, most piezoelectric sound components are used in this frequency range, and the resonant frequency (f0) is generally selected in the same range too.

This method produces sound by driving the piezoelectric diaphragm with electric signals supplied from an external oscillating circuit such as a multi-vibrator. Using this method, the piezoelectric buzzer can work as a speaker. In this method, a

mechanical oscillation  $Q_m$  of the piezoelectric diaphragm is damped properly to provide a wider frequency band of the sound pressure. This is applied to a switching sounds of home electric appliances, key-in sounds of OA equipment, alarm sounds of digital watches and the multiple sounds like those used in electronic games. This method is also applied to the ringers, transmitters, receivers of telephone sets, card radios and speakers of crystal TV's.

## VIII. TESTING & EXECUTION

- Design circuit diagram in which the connection between the pins (including pin number) are correctly drawn.
- Collect the components as per circuit diagram required for this purpose.
- At first connect the components in their proper slot in bread board.
- As the testing purpose we observed the timer output in the CRO, and when CRO displayed the TIMER (555) output is Square Pulse.
- So it concludes that the main timer circuit is perfect.
- Check the continuity whether there is any shorting between the components not required for this circuit design.
- When all circuits are perfect, then soldering them as per instruction.

Here we design a circuit on the Vero Board by all the required components. Also it is required various types of wires through which we implement the perfect circuit.

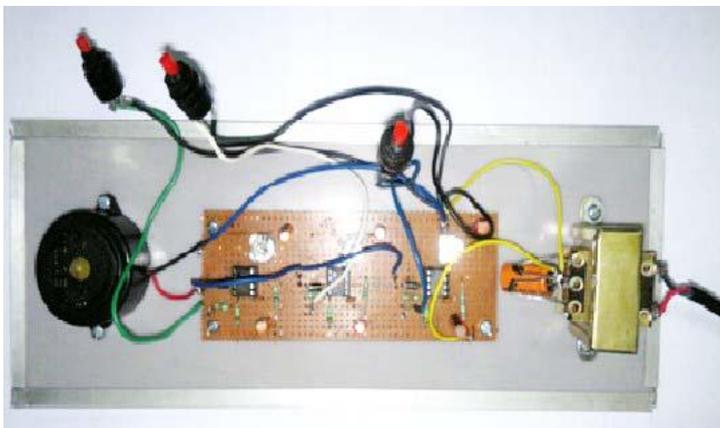


Figure 6: Photocopy of running project

## IX. APPLICATION

This type of project is very efficient and useful. This project is applicable in daily life for various purpose and applicable in anywhere like as School, College, University, Trade security farm, Shopping Malls, Seminar Halls, Corporate Offices, Banks, Hospitals, etc.

## X. CONCLUSIVE EFFECTS

**Economical:** As the circuit is simple, expenditure is less and will require less time to execute the project. It is cost effective.

**Environmental:** No environmental threats are issued, except that it is associated with ALARMS (BUZZER) which causes pollution. Therefore, no direct threats are issued.

**Social:** Helps to park cars in small tight places without causing any damage to them as they are much precious to the owners.

**Political:** NOT AVAILABLE

**Ethical:** Morally correct and acceptable in the society.

**Health and Safety:** There are no threats in health.

**Manufacturability:** Easy to manufacture in large numbers.

**Sustainability:** NOT AVAILABLE

## XI. CONCLUSION

This very project can be also implemented with the use of laser technology. This laser door alarm is based on the interruption of Laser beam. A low cost Laser pointer is used as the source of light beam. When somebody breaks the laser path, the alarm will be generated for few seconds. Thus it is mainly used for security purposes. This security system can be further strengthening by the use of a CCTV camera with it. This CCTV camera will not only provide the view of the area of concern, but will also provide the view of other peripheral points of interest.

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#### BIOGRAPHY:



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