

# **MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR**



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**Department of Electronics Engineering**

**Micro Project Report**

**on**

**Design Hardware Model Doorbell Circuit**

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**SUBMITTED TO**

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## DECLARATION

I hereby declare that the project work entitled "**Design Hardware Model Doorbell Circuit**" submitted to the Madhav Institute of Technology & Science Gwalior, is a record of an original work done by Medhavi Agrawal & Md. Rehan Qureshi under the guidance of Dr. Shubhi Kansal, Department of Electronics Engineering.

The results embodied in this thesis have not been submitted to any other University or Institute for the award of any degree or diploma.

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Place: Gwalior

# CERTIFICATE

This is to certify that the Micro Project report entitled "**Design Hardware Model Doorbell Circuit**" submitted by **Medhavi Agrawal & Md. Rehan Qureshi** has been carried out under the guidance of **Dr. Shubhi Kansal**, Department of Electronics Engineering, Madhav institute of technology & Science, Gwalior. The Project report is approved for submission requirement for Micro Project in 1st semester in Electronics & Telecommunication Engineering, from **Madhav Institute of Technology & Science, Gwalior (M.P.)**

Submitted To:

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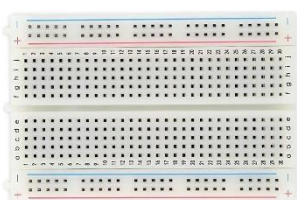
**Objective:** To design hardware model doorbell circuit.

### **Abstract:**

A doorbell is an essential device used to alert occupants of a home or building about visitors. It is a simple yet effective communication tool that enhances convenience and security. This project outlines the design and implementation of a basic doorbell circuit. The circuit utilizes a simple push button switch to trigger an electronic doorbell sound. The circuit components include a 9V battery as the power source, a buzzer to produce sound, an LED as a visual indicator, a 100  $\Omega$  resistor to limit current flow, and a push button to act as the doorbell switch. This project serves as a practical demonstration of basic electronics and circuit design, offering insight into the operation of everyday devices like doorbells. Anyone can easily make this doorbell circuit by their own. The cost of this project is only 150 - 200Rs.

### **Apparatus Required :**

Component	Quantity
Breadboard	1
9V Battery	1
Buzzer	1
LED	1
100 $\Omega$ Resistor	1
Push Button	1



Breadboard



9V Battery



Buzzer



LED



Resistor



Push Button

## Theory :

A **hardware doorbell circuit** operates as a simple electrical system designed to produce a sound when a button is pressed. The circuit is typically in a **series arrangement** where the push button acts as a break in the loop.

- **Components:**

1. **Breadboard:** A reusable platform for building and testing the circuit without soldering.
2. **Push Button:** Acts as a switch to complete the circuit when pressed.
3. **Power Source:** Provides the necessary voltage, typically a battery
4. **Buzzer:** Converts electrical energy into sound.
5. **LED:** Provides visual indication, often used in lighted doorbell buttons.
6. **Resistor:** Limits the current flowing through the LED to prevent it from burning out.

## Circuit Diagram :

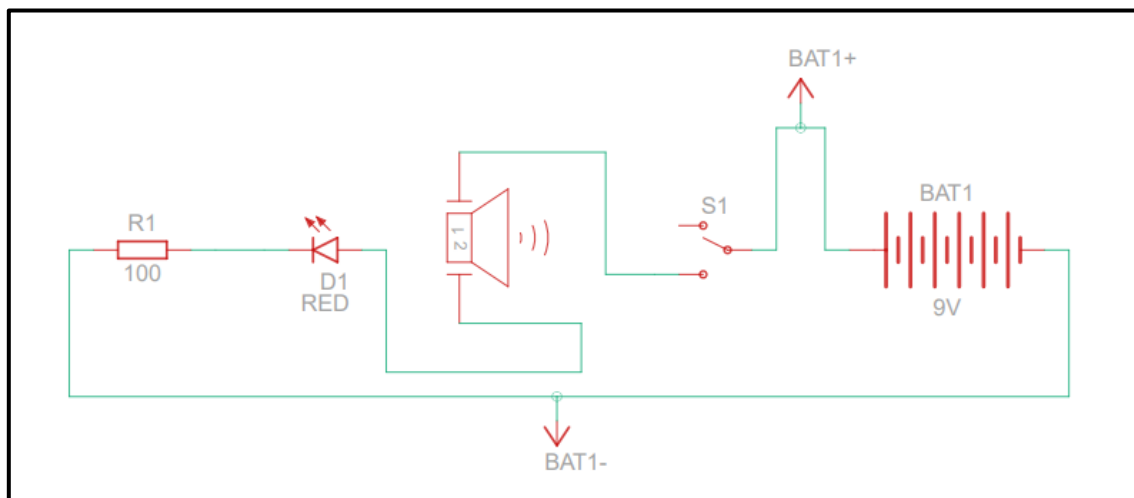


Fig. 01

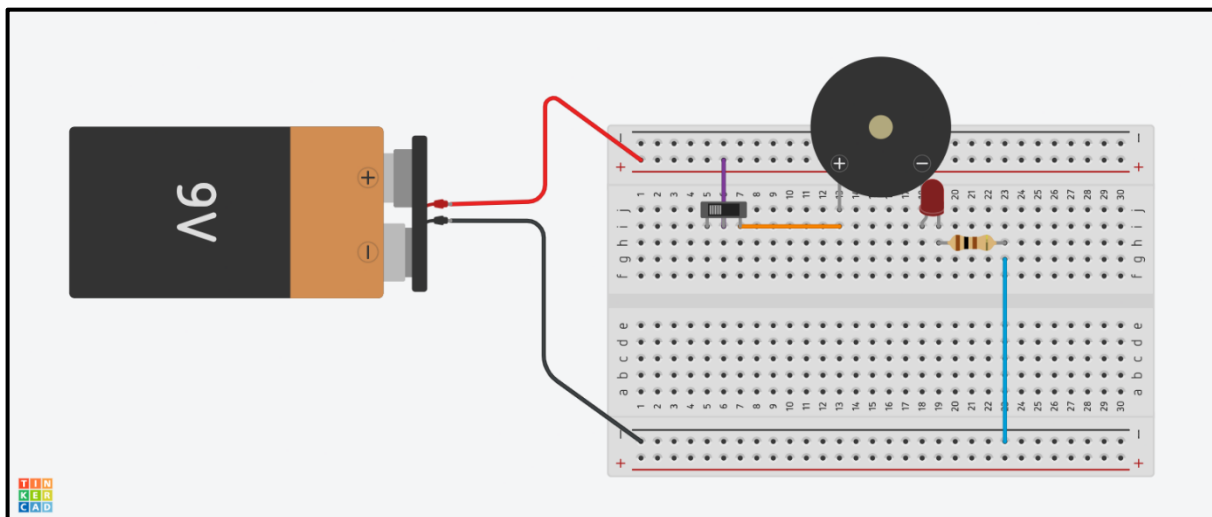


Fig. 02

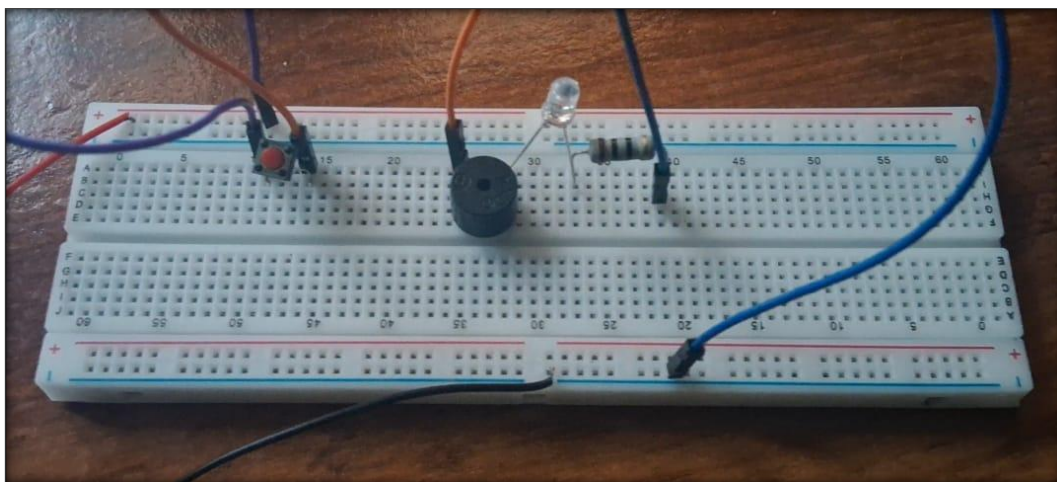
## Procedure :

1. Place the buzzer on the breadboard, ensuring proper alignment with the breadboard holes.
2. Connect the negative terminal of the buzzer to an LED in series.
3. Attach a 100-ohm resistor in series with the LED.
4. Connect the positive terminal of the buzzer to one terminal of the push button.
5. Complete the circuit by connecting the other terminal of the push button to the positive terminal of the battery.
6. Connect the free end of the resistor to the negative terminal of the battery.
7. Double-check all connections to ensure proper placement and secure assembly.

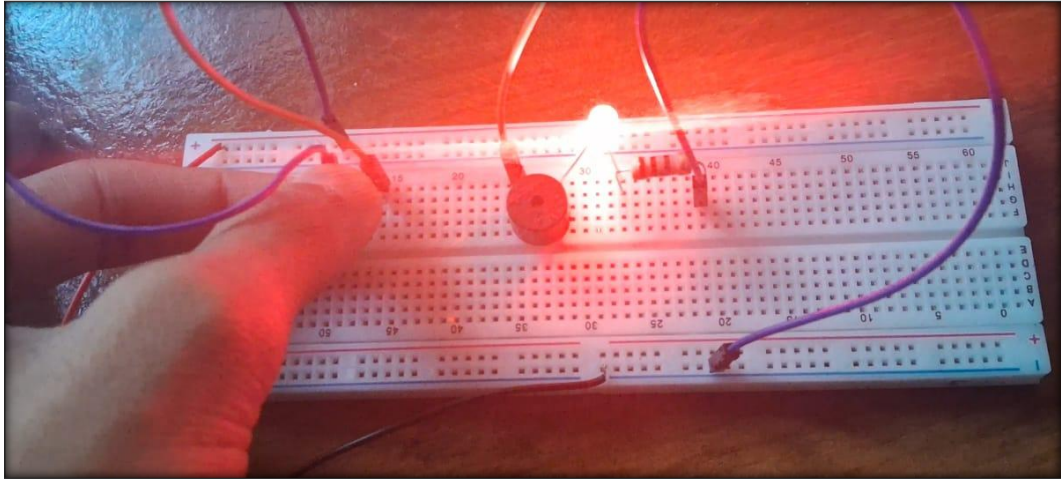
This procedure ensures that the doorbell circuit functions correctly with the LED and resistor integrated.

## *Working Principle:*

1. **Operation:**
  - When the button is not pressed, the circuit is open, and no current flows.
  - When the button is pressed, it closes the circuit, allowing current to flow from the power source to the buzzer.
2. **Sound Production:** The flow of current activates the buzzer, which produces a sound (e.g., a bell ring or buzz).



**Fig. 03 (a) : The doorbell circuit**



**Fig. 03 (b) : Successful demonstration of the circuit.**

## **Result :**

The hardware doorbell circuit was successfully prepared by following the given procedure.

## **Applications:**

### **1. Residential Use:**

Doorbell circuits are widely used in homes to notify residents of visitors, ensuring convenience and improving communication.

### **2. Schools and Institutions:**

Doorbell circuits are used as calling systems for administrative purposes or for alerting staff and students in specific areas.

### **3. Hospitals and Care Facilities:**

Doorbell circuits are adapted for patient calling systems or entry notifications in sensitive areas.

### **4. DIY Projects and Education:**

Doorbell circuits are popular in electronics projects and educational settings to teach basic circuit design and functionality.



## **Conclusion:**

The doorbell circuit project successfully demonstrates the practical application of basic electronic components and principles in creating a functional device. By integrating a 9V battery, push button, buzzer, LED, resistor, and breadboard, the circuit effectively mimics the operation of a standard doorbell. The hands-on experience provided valuable insights into circuit design, component selection, and troubleshooting techniques. This project not only showcases the simplicity and efficiency of such circuits but also highlights their importance in everyday applications, from residential to commercial use. The knowledge gained can serve as a foundation for exploring more advanced electronic systems and further innovations in similar devices.

## **Reference:**

<https://www.tinkercad.com/things/0n0IgykfG5q-hardware-doorbell-circuit?sharecode=gaQ5VmiAH2dv22zLgUm7xjcKUZogwXs9cQwiMEdsaP8>