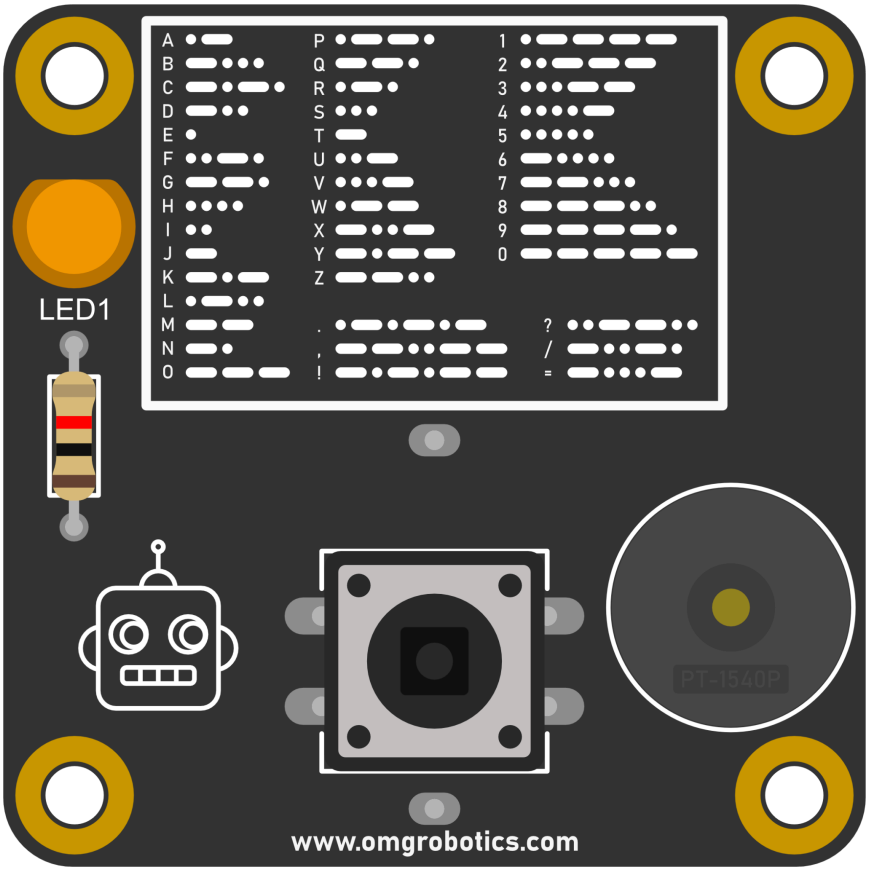
Morse Key

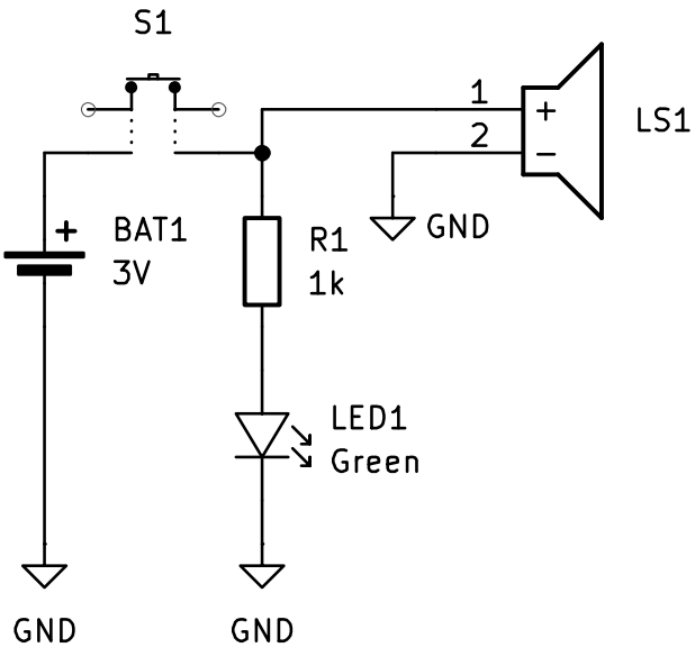
Introduction

The Morse key soldering kit uses a simple electronic circuit. By means of a push button, an LED, and a piezo buzzer, it allows easy transmission of coded messages in Morse code.

Assembly requires a soldering station or a soldering iron to melt solder at temperatures between 250 °C and 350 °C. **Special care must be taken to avoid burns during the process**.



Circuit Diagram



Parts List

Before starting, verify that all listed components are included.

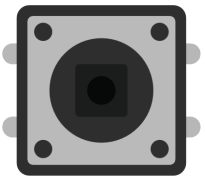
Designation	Component	Details	Qty
R1	Resistor	1k	1 pc
S1	Push button	-	1 pc
BAT1	Battery Holder	CR2032	1 pc
LS1	Piezo buzzer	-	1 pc
LED1	THT LED	-	1 pc
PCB	Printed Circuit Board (PCB)	Morse Key	1 pc

R1

Resistor

1 pc

1k



S1

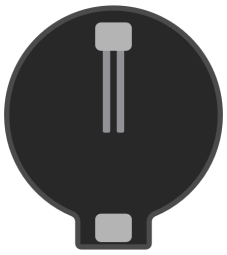
Push button

1 pc

LED1

THT LED

1 pc



BAT1

Battery Holder

1 pc

LS1

Piezo buzzer

1 pc

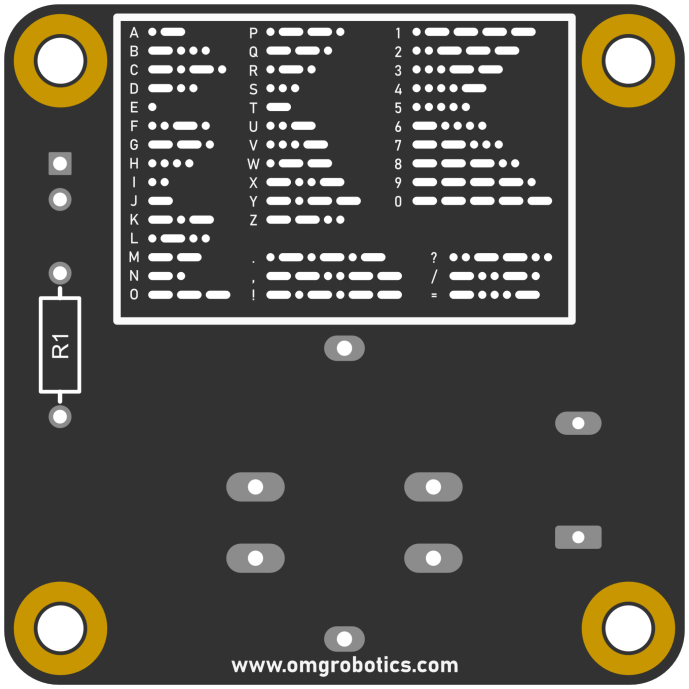
Assembly

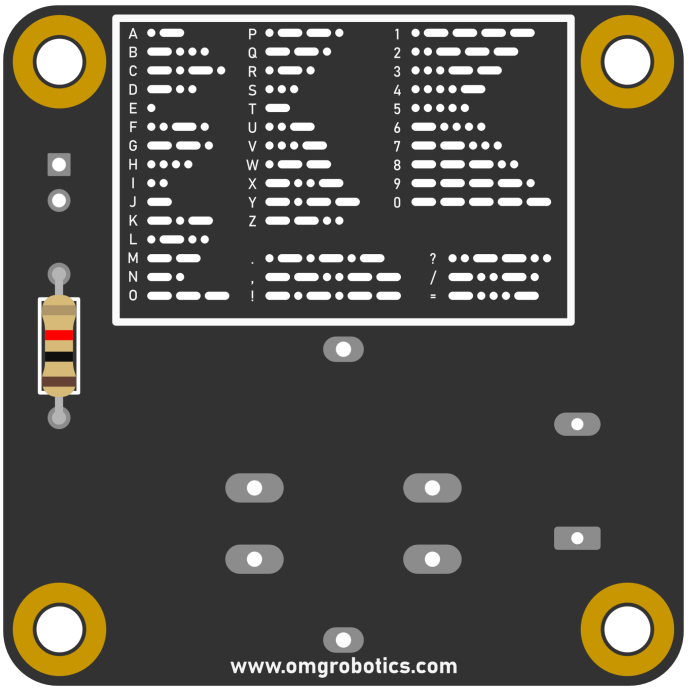
Resistors

The first component to be mounted on the printed circuit board is **resistor R1.** The orientation of the component is not important – it will function the same in either direction.

R1

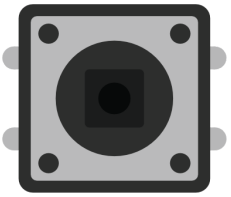
1k



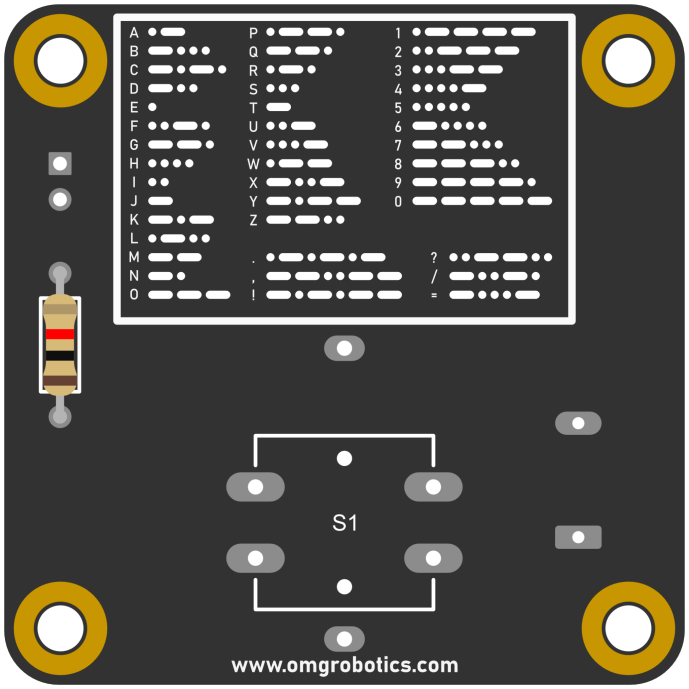


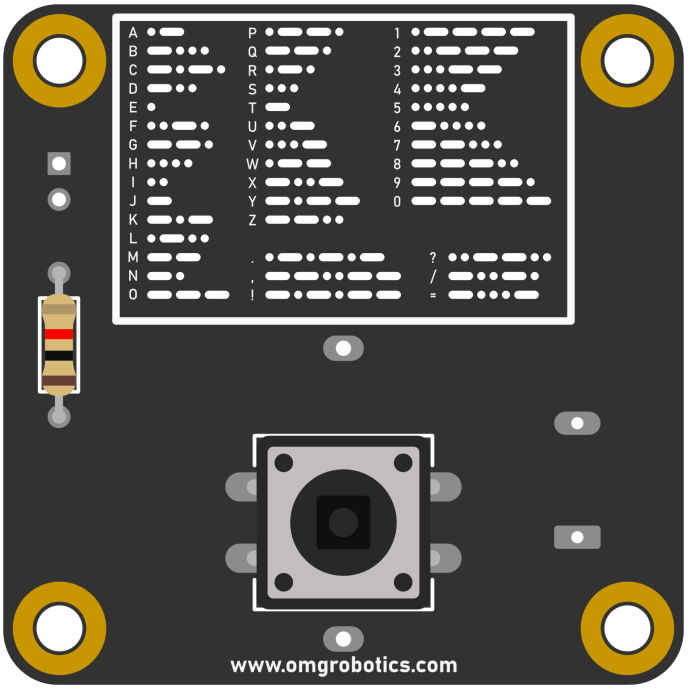
Push Button

Push button S1 is soldered as the second component, since after soldering the battery holder the solder joints would no longer be accessible. Insert the button into the marked position on the printed circuit board. Turn the board over and solder all four contacts.



S1

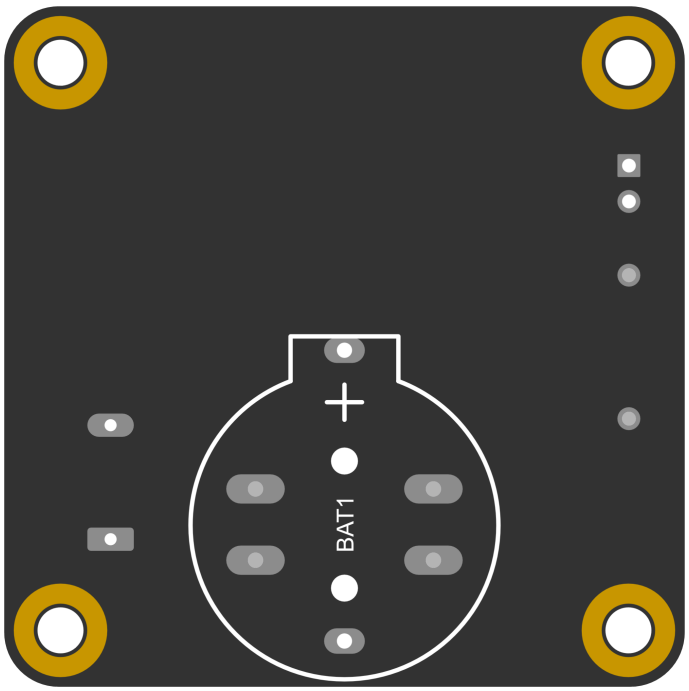


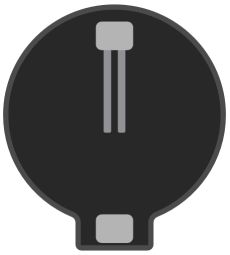


Battery Holder

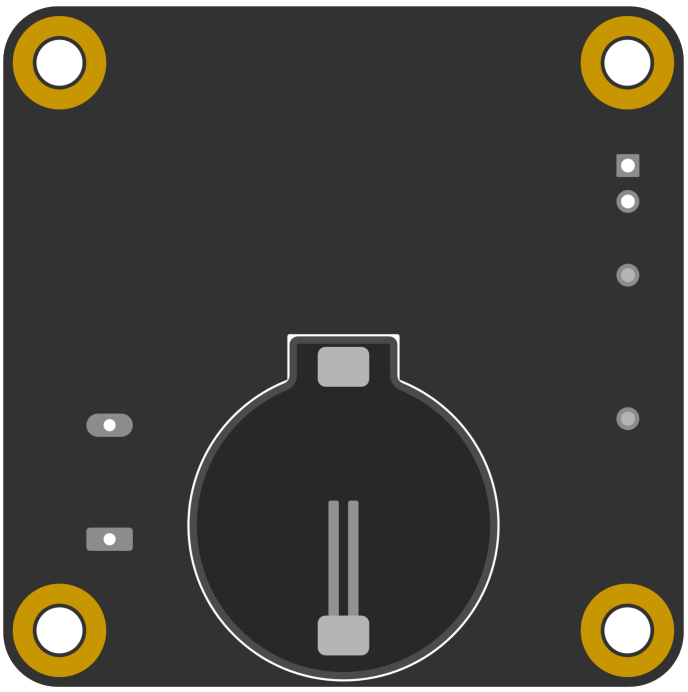
The **battery holder BAT1** is mounted on the rear side of the printed circuit board. **The correct orientation is marked on the board**; insert the holder so that it matches the outlined shape. Finally, solder it from the front side.

Note: The battery must not be inserted during soldering of the holder.



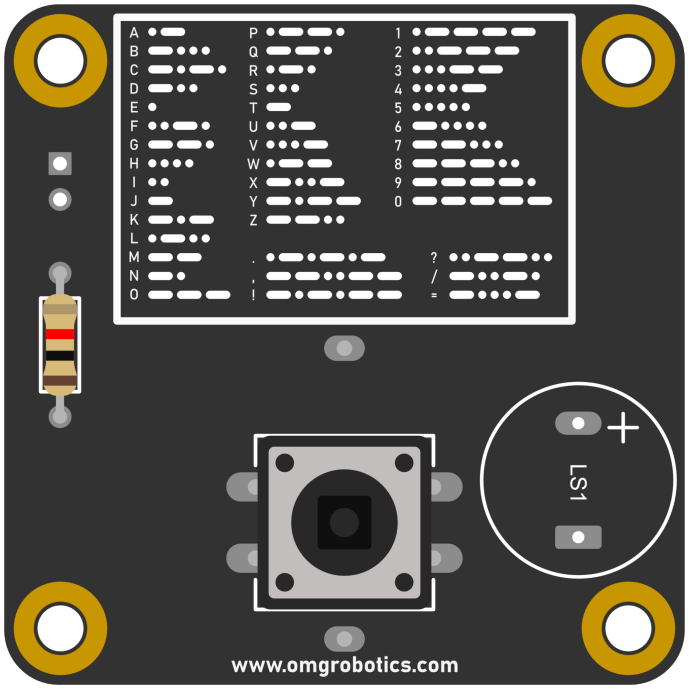


BAT1

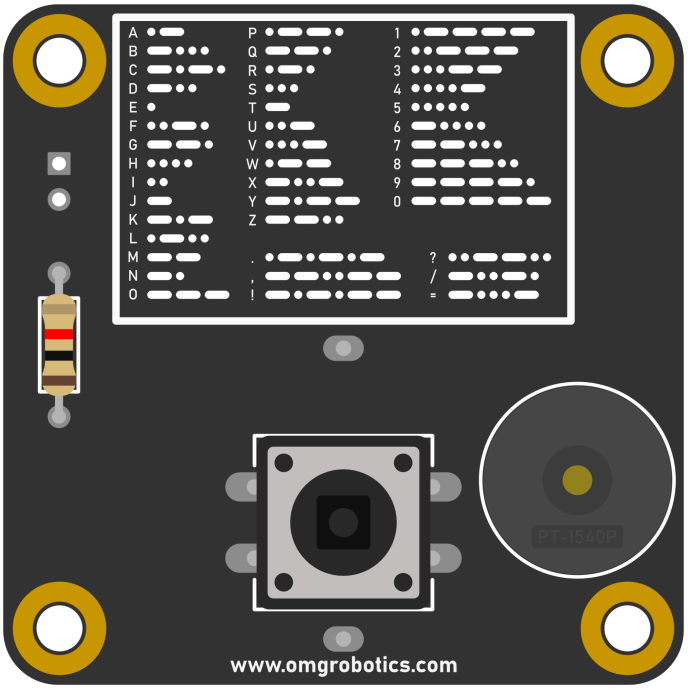


Piezo Buzzer

The **piezo buzzer LS1** is another component for which **the orientation must be observed.** It has a label with a plus sign, as does one of the holes on the printed circuit board. Position the buzzer so that the plus signs are on the same side.



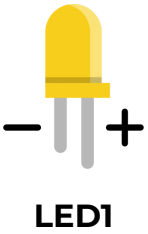
LS1

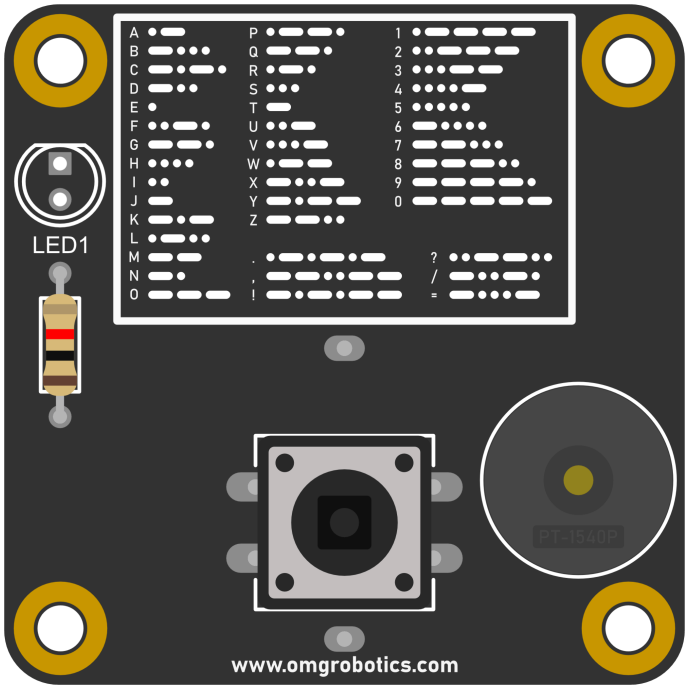


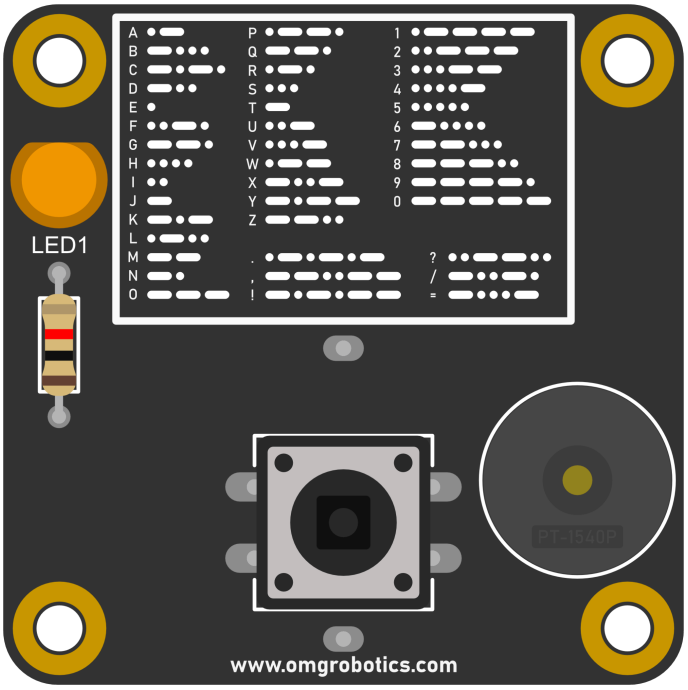
LED

Next, mount the **THT LED LED1.** Ensure correct placement to **maintain polarity**.

The short leg of the LED is the negative lead, and the long leg is the positive lead. Insert the long leg into the round hole.

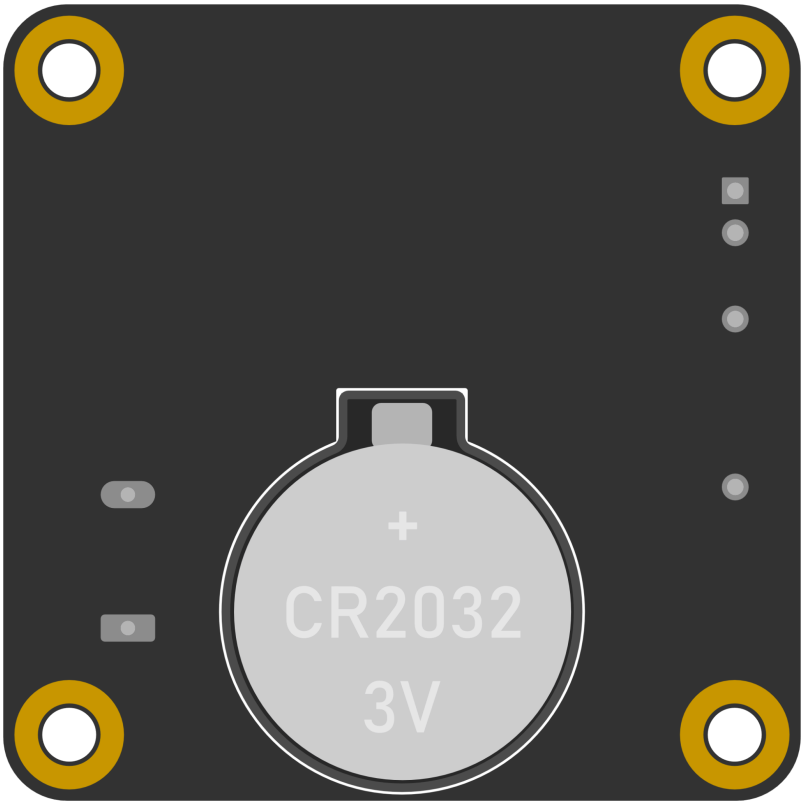






Testing

After inserting the battery and successfully soldering all components, the circuit is operational. When the push button is pressed, the buzzer emits a sound and the LED lights up. Using the table printed on the circuit board, coded communication in Morse code can begin.



Tips & Troubleshooting

Power-Up

After inserting a CR2032 coin cell into the battery holder, the circuit is powered on. When the push button is pressed, the buzzer emits a sound and the LED lights up.

Possible Issues

- **Short circuits** – Two adjacent pins may be accidentally connected, creating an unwanted conductive path.
- **Cold solder joints** – A solder connection may not have been completed properly and lacks electrical contact.
- **Incorrect orientation** – Components may be installed in the wrong direction; check all positions and polarities according to the manual.
- **Misplaced components** – Components may have been installed in the wrong positions (e.g., resistors in incorrect locations).
- **Heat-damaged components** – Some parts may have been damaged by excessive heat during soldering. Identify and replace the affected component.

How It Works

Pressing the push button closes the circuit, supplying voltage both to the LED with its series resistor and to the piezo buzzer. When voltage is applied, current flows through these components. The resistor is connected in series with the LED to limit the current and protect it from damage. Inside the piezo buzzer is a thin piezoelectric layer that vibrates when current passes through it. These vibrations propagate through the air to the eardrum, which also begins to vibrate. These vibrations are perceived as sound.