

Ultrasonic Pest Repeller using 555 Timer

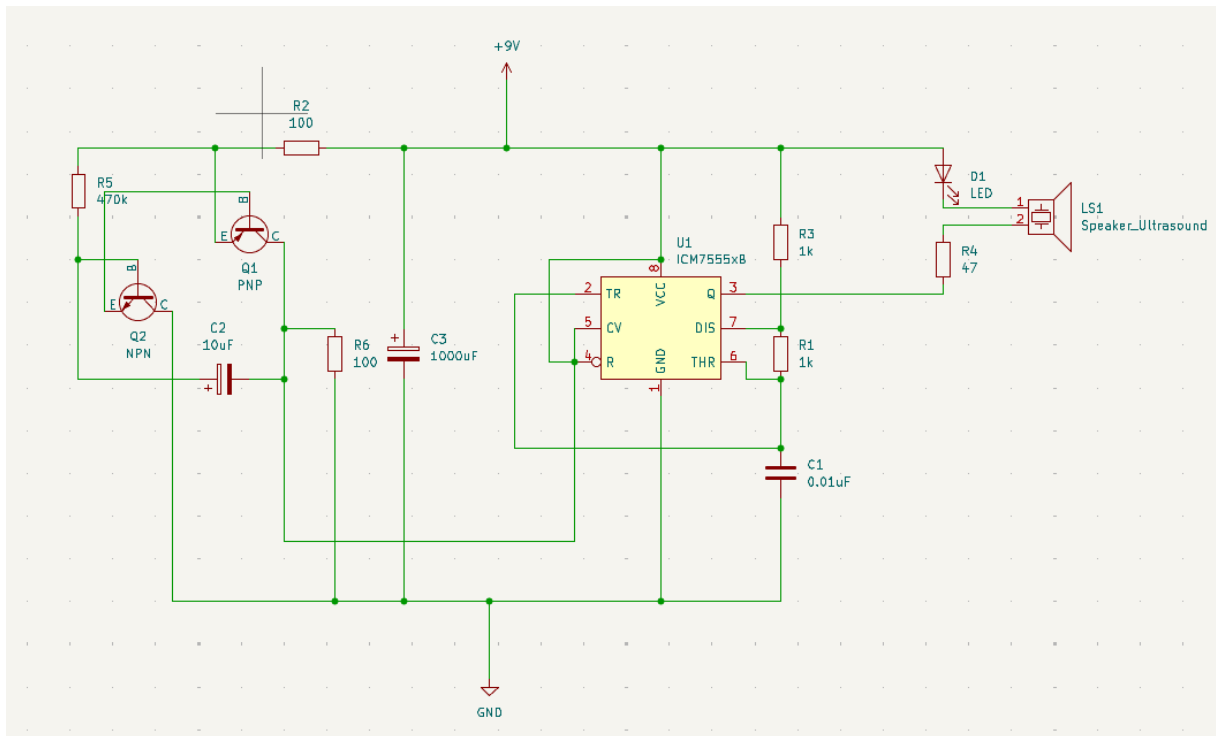
Aim-

To design and implement an **ultrasonic pest repeller** that emits **high-frequency ultrasonic waves** to deter pests like rodents and mosquitoes using a **555 Timer-based oscillator circuit**.

- Components Required-**

Component	Specification	Quantity
ICM 555 Timer	555 timer IC	1
PNP Transistor (Q1)	General Purpose (e.g., BC558)	1
NPN Transistor (Q2)	General Purpose (e.g., BC547)	1
Speaker (Ultrasonic Transducer)	40 kHz	1
LED (D1)	Indicator	1
Resistors	1kΩ(2), 47Ω, 100Ω, 470kΩ	6
Capacitors	0.01μF, 10μF, 1000μF	3
Diode	1N4148 (Optional Protection)	1
Power Supply	9V Battery	1

• Circuit Diagram-



Working Principle:

- The Ultrasonic Pest Repeller operates based on the astable multivibrator configuration of the 555 Timer, which generates a continuous high-frequency ultrasonic signal (typically 40 kHz).
- The 555 Timer is wired as an oscillator, producing a square wave output.
- This signal is amplified by the transistor driver circuit (Q1 & Q2) to drive the ultrasonic transducer.
- The LED indicator provides a visual confirmation that the circuit is active.
- The emitted ultrasonic waves are beyond the hearing range of humans but disrupt pests' communication and navigation, forcing them to leave the area.

Applications-

- **Home Pest Control:** Repels rodents, insects, and mosquitoes without chemicals.
- **Agricultural Use:** Protects crops from small pests without harming the environment.
- **Food Storage & Warehouses:** Prevents infestation in storage areas.
- **Hotels & Restaurants:** Keeps dining areas pest-free without toxic pesticides.
- **Eco-friendly Alternative:** Safe for pets and humans, unlike chemical repellents.

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