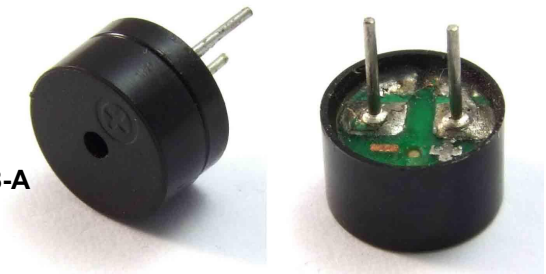
Passive Buzzer
(Technical Note)

What is a Buzzer?

EMA-00006-A



EDT-00008-A

Buzzer is a piezoelectric device that can convert electrical signals into mechanical changes and vice versa. When an AC signal is applied to the terminals it creates a mechanical vibration and sound. Piezo material can also create electrical signals from mechanical strain if it is bent or pressed.

The passive buzzers require an external AC signal to operate. There are Active buzzers that have a resonant circuit built in such that by applying DC voltage it goes into oscillation and generate a fixed frequency sound. If you require to play music you will have to use a passive buzzer and have the Arduino drive the buzzer with different frequency signals.

EMA-006-A includes a driver transistor. EMA-006-B does not have this transistor

Applications

Any electronic device with audio output could use a piezo buzzer. The audio frequency response of a piezo may not be as high as a moving coil speaker. But the piezo buzzer is small and can fit into tight spaces. Also the sound output on a piezo is higher than that of a moving coil speaker.

Usual applications include handheld devices with space restrictions and equipment that do not require high sound quality, such as a microwave oven that beeps when done. Toys usually use passive buzzers to play music albeit not very high sound quality.

Game Console

Microwave oven

Passive Buzzer
(Application Note)

Project

Create a two tone police siren using a buzzer.

Components Required

Component	Z2M Part No.	Quantity
Passive Buzzer	EMA-00006-A **OR** EDT-00008-A	1
Arduino UNO	EMX-00001-A	1
Jumper Wires M-M	EDA-00002-B	3

Procedure

1. Connect the buzzer to the Arduino as shown in the schematic.
2. Choose the frequencies/ notes. For details, see here https://www.arduino.cc/en/tutorial/melody
3. Upload the code.

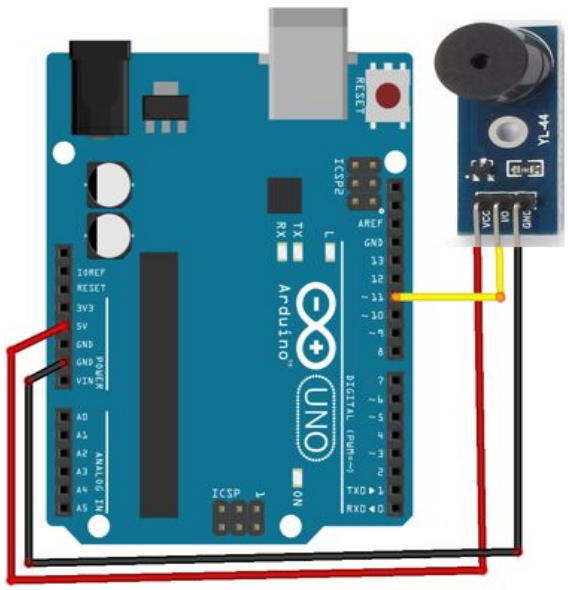
Challenge Yourself

1. **Music Synthesizer:** Using the same setup, write code to play “Twinkle Twinkle Little Star”.
2. **Car reverse sensor:** Using an ultrasonic sensor create a reverse assist for a car.

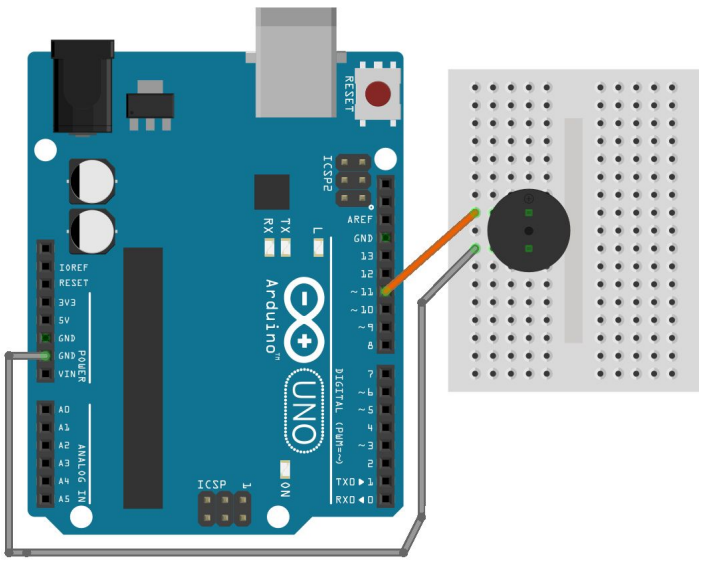
Code

```
/*Connect buzzer to pin 11 to create a
Police siren */

int buzzer = 11;

void setup() {
/* The Tone function does not need
Pin declaration in Setup()
*/
}

void loop() {

/* The Tone function accepts two or
 three parameters
 (Pin#, Frequency in Hz, Duration in
 milli Seconds)
In this example, the 700 mS delay
 leaves 200mS pause between beeps
Of note A4 & A5 */

  tone(buzzer, 440, 500);
  delay(700);
  tone(buzzer, 880, 500);
  delay(700);

}
```

Schematic



EMA-00006-A



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