

Clap Circuit Designing By Using Arduino

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Abstract

This paper represent, the assessment of ARDUINO BASED CLAP CIRCUIT. Clap switch is a fascinating circuit that helps to turn the sound signal into electrical energy. There are so many basic components that are used in the clap circuit like resistors, transistors, relay, and capacitors. The basic idea of the clap switch is that the microphone picks up the sound of your clap then it produces a small electric signal which is amplified by the transistor stage.

Keywords: Ardino, Clap Switch, Sensor.

Introduction

This circuit is very simple and it is easy to make hardware only on the clap on/clap off. Clap switch is an interesting circuit that turns on the lights with a clap sound. In spite of the fact, its name is CLAP SWITCH. It is a basic electronics mini – project, made with the help of basic components. This circuit is formed with the help of sound activated sensor, which sense the sound of clap as an input.

List of Components

- DC source
- Arduino uno
- Jumper wires
- Bread board
- Microphone
- Capacitor
- Resistor
- Diode
- Transistor
- LED

Working

Since it is a circuit which work on sound, a sound sensor is required to make a sound sensor. By the help of sound we can switch ON and OFF any appliances . This make human life easier as well as save electricity.

Sound fed into microphone and the microphone consist of dielectric medium which generate a voltage pulse across terminals.

In this we use filter circuit to filter out noise. Microcontroller use as a CPU of the system.

The analog input from the microphone sensor is fed into microcontroller . We have use arduino board which uses ATMEL328P microprocessor. The microcontroller is programmed to sense the signal and provide a digital output from its pins.

A transistor is used as a switch, the digital output from microcontroller is fed into base of transistor. From supplying adequate base voltage to transistor the transistor turned ON connecting its collector to ground. A relay along with a fly back diode in parallel is connected across relay. The relay is connected at collector terminal of transistor.

The relay powered from a 5V signal when it gets the signal it gets turned ON and the appliances connected across its terminal is switched ON or OFF.

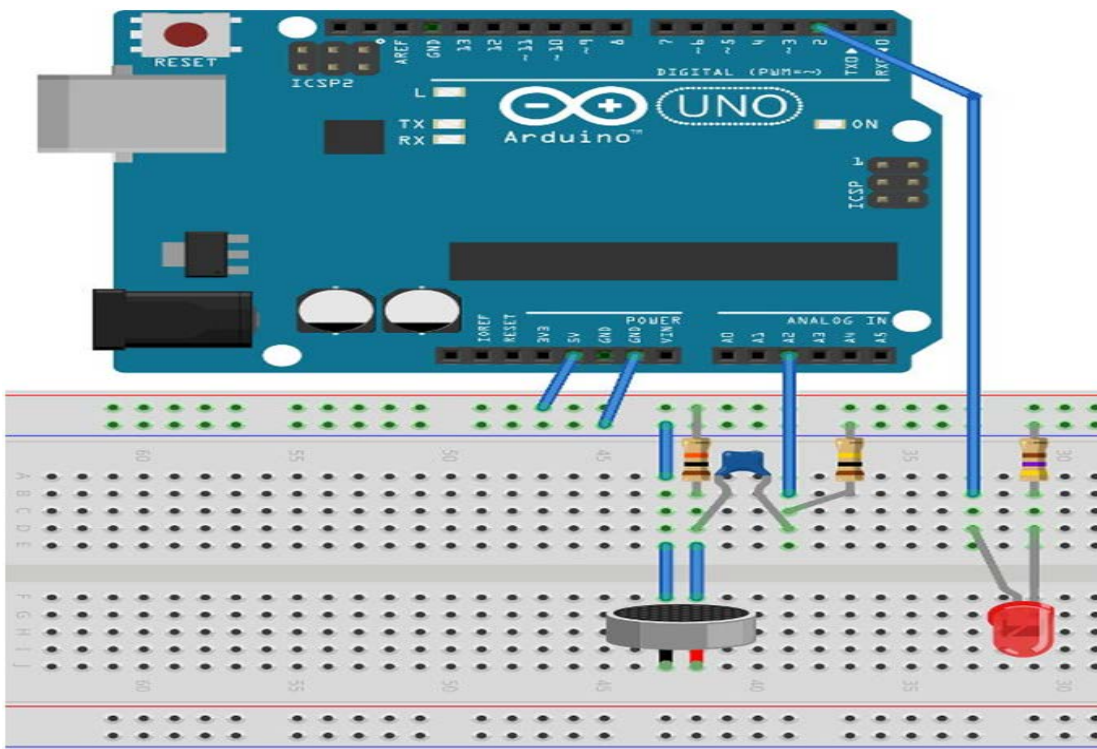
Code

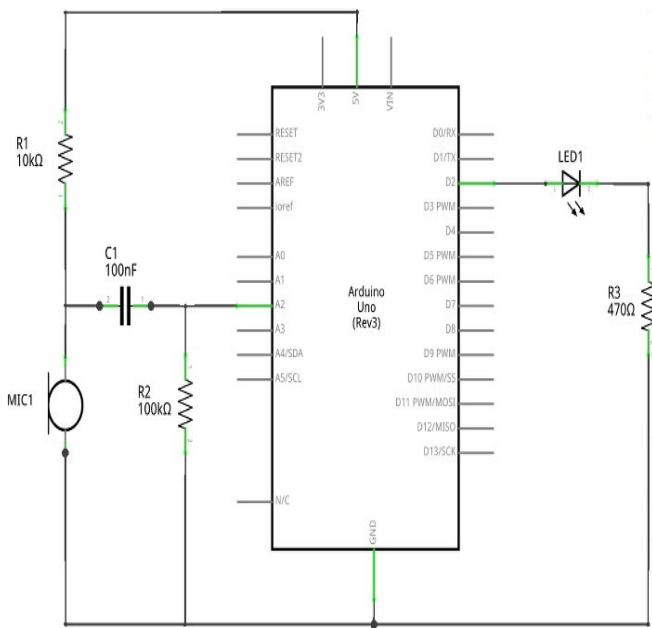
```
if(analog_val>10){    // trigger threshold
```

The value used in this check can be changed if the switch is too sensitive or not sensitive enough.

```
//-----  
// Program:    clap switch  
//  
// Description: Switches on an LED when hands are clapped.  
//             Electret microphone connected to A2, LED and series  
//             resistor connected to digital pin 2  
//  
// Date:       6 April 2016    Author: W.A. Smith  
//             http://startingelectronics.org  
//-----  
void setup(){  
    Serial.begin(9600);    // using serial port to check analog value  
    pinMode(2,OUTPUT);    // LED on digital pin 2  
}  
  
void loop(){  
    int analog_val;        // analog value read from A2  
    static bool led_state=false; // current state of LED  
  
    analog_val=analogRead(A2);  
  
    if(analog_val>10){    // trigger threshold  
        // toggle LED  
        if(led_state){  
            led_state=false;    // LED was on, now off
```

```
digitalWrite(2,LOW);  
Serial.println(analog_val);// print analog value for debug purposes  
}  
else{  
  led_state=true;  
  digitalWrite(2,HIGH);    // LED was off, now on  
  Serial.println(analog_val);  
}  
delay(50); // wait for clap noise to subside  
}  
}
```





Applications

It is generally used for light, radio or electronic device that the person want to turn on/off from bed.

It is used to turn on the relay.

Advantages

- Low cost and reliable circuit
- Energy efficient
- Complete elimination of man power

Disadvantages

- The major disadvantage is that it is generally cumbersome to have a clap ones hand to turn on or off.

Conclusion

It responds to both hand clap at about 3 to 4 meter away and finger tap sound at very close range. The resulting devices realizable, has good reliability and it is in expensive. The circuit is very useful in the field of electronic circuits. Its area of application can be extended in various fields. It can be used to raise alarm in security system in noise and also used at the place where silence is needed.

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