

Analysing Efficiency and Effectiveness of Clap Switch Mechanism

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ABSTRACT

In this paper, the electronic circuit initiated or activated by outside sound resembling applause sounds occurs at 2200Hz to 2800Hz within. At this point when far off point got the maximum bright once the electronic circuit is switched on. If one data particle proceeded another one, the framework would skip one particle. The basic idea of applauding switch is someone in the next room applauding the building will be turned on and off even though lying in bed. This was directed from the different NE 555 Clap Switches and Arduino Clap Switch. The NE 555 based clapping switch is probably the most cost-effective way for micro controller based clapping controls.

Keywords: Clap switch, Arduino Mega2560, NE 555

INTRODUCTION

The essential idea of "Applaud Switch" is self-explanatory. The audience applauded upon hearing it after listening to the signaling sound. The acclaim clamor gets back to the top stage when the applauding goes past to kill time. The major idea of NE 555 based applause sign is a receiver that received sound more than 25 decibels, and then convert sound into electrical energy by SEPIC circuit NE 555 clock to perceive the sign with the assistance of circuit NE 555. Arduino programmed applause switch get similar usage to 555 based applaud switch, however the usage part is significantly simpler. The clap switch mechanism is useful to solve daily jobs like turning on/off the lights from any location.[3] Install computers into the vehicle and activate the security camera for general purpose and military purpose. My advantages for like-switched circuit are energy-efficient system, normal operational cost, reliable circuit with high accuracy, and total elimination of human efforts.

BACKGROUND

Related Work

Olokele, S.S. were proposed clap switch devices that would work well in detecting several kinds of devices.[1] Jeneeth Subashini et al. designed a new type of system by using TRIAC (BT136). [2] There is a use of condenser microphones to monitor and generate AC signal. The AC signal passes through a DC blocking capacitor before it gets to the base of a transistor amplifier (BC549). Also, when the TRIAC fires the diodes gives off bright glow, illuminating the bulb below the top of the tube. This model of device uses the capability of the NE555 and the relay. A relay has only one conducting path when current flows through it. In the event of the 2nd trigger, a conducting path is established between terminals of the load. In this way, the device is on. The time interval that is judged at $[T=1.1R7 \cdot C3]$ is judged.

Approach

The microphones will pick up the hand claps and convert to electricity.

- Human hands make sounds between 2200Hz and 2800Hz. This means this circuit will help identify the exact time when the person makes his fingers to clap.
- Switch will trigger the device and activate the current.
- The second hand of NE 555 timer is activated within the range.

METHODOLOGY

The device's usage comprises of these stages as shown in the above Figure 1. Thus, the initial tidbit of the recognized spoke is passed on to the framework through the mouthpiece. The "next" sign in order is still in process. After the system is in "second yield" level, it goes to "knock off" stage.

NE 555 Clap Switch Mechanism

Module of NE 555 for clapping is assembled using basic components such as microphone, transistor, resistor, capacitor, semiconductor, and LED. The microphone would pick up the sound of the clap, thus changing sound waves to an electrical energy that would be amplified by the following transistor.[8]

There will be two transistors between them which can switch between them both. These digital devices are going to be control by the handclap.

NE 555 Timer IC is an integral component of the clap switch. A simple or complex circuit involving a single micro-controller and some peripherals or system on chip 555. This circuit is an oscillator and also a flip-flop circuit.

Resistors are used to control the path of current flowing to electronic circuits. The resistors can be fixed or variable resistors.

Capacitor is an electric circuit component used to keep charge impermanently, consisting in general of two metallic plates

separated and insulated from each other by a dielectric. Also called condenser.

Alternating current is an electric current that reverses direction several times a second at regular intervals.

Microphone was officially defined as an acoustic to electronic transducer or simply a sensor that can convert sound format signals to electrical energy.

Diode is a term for an electronic device that directs current flow mainly in one direction.

By using LED, electricity is converted into light. It can be used in lamps and digital displays.

Transformer is a device that is used to transfer the electric energy from one circuit to another.

Wire is a durable and usually flexible metal filament.

Relay is a device that changes voltage to voltage by activating switches in an electrical circuit. Condenser microphone, a circuit of a capacitor in which one of the plates is fixed while the other is moved by the sound waves.

Arduino Controlled Clap Switch Mechanism

Arduino-Based Clap Switch Mechanism employs Analog to Digital conversion to control a barrage of transistors. Microphone and ATmega2560 together determine whether the lamp or light is on. When the user clapped, a peak signal of the microphone, which was higher than all signals, is fed into the amplifier. Then a high frequency signal is converted to analogue voltage, and that to binary voltage in the A/D converter. The output of this chip will be the highest among them. This highest signal finding can

toggle a blinking light on every 9th clap[4]. Arduino Micro controller is used for implementation of simple circuits. This is done by implementing the Arduino clap switch mechanism with Arduino microcontrollers.[5-7]

RESULTS

It is necessary to measure the system's efficiency with sensor readings. Result of the acoustic measurements is mostly influenced by the internal elements of the microphone such as springy clamping, contact, disc capillary, back plate electrode and membrane. The sound velocity determines how well the system is run. The clap switches NE 555 based and Arduino based were analyzed using acoustic and sound velocity measurement. The Arduino based signaling systems were more effective than NE 555 based. You can measure the cost-effectiveness and costs. The minimum cost for the implementation of NE 555 based clap switch is higher than the cost for an Arduino board. Arduino based clap switch module is working perfectly well. The electricity consumption of both systems is the same. It is cheaper to maintain the NE 555 based system compared to the Arduino based system.

CONCLUSIONS

In the beginning we made the circuits on breadboard. And then we tested the project with increasing number of tests.

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