

## ***DIGITAL ELECTRONICS***

# **SIMPLE CLAP SWITCH**

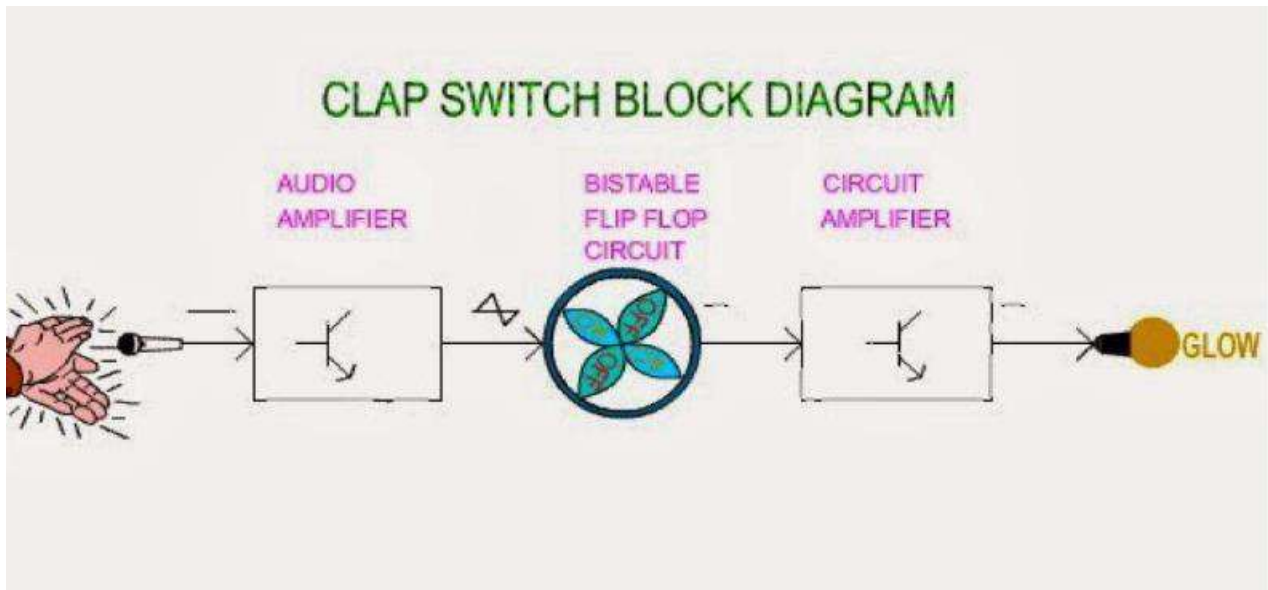
*Submitted by:*

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### **Abstract:**

This is a simple clap switch circuit with high sensitivity. It switches ON/OFF electrical appliances through claps. Clap operated circuit is operated by clapping from a particular distance (Depends upon the microphone used). Then that leads to the first output of the circuit which is to be turned on, then when another clap is given to the circuit it will show us the next output & that continues with the clap. The main component of this circuit is the Electric Condenser Microphone, This Microphone used as a sound sensor and converts sound energy into electrical energy, and that continues with another two IC's and then with the Transistor. Primarily it is a Sound operating switch. For example, real life application based on this device include fan, fluorescent light, TV and other appliances which can be switched on off by clapping. This clap switch circuit can be changed based on situation.

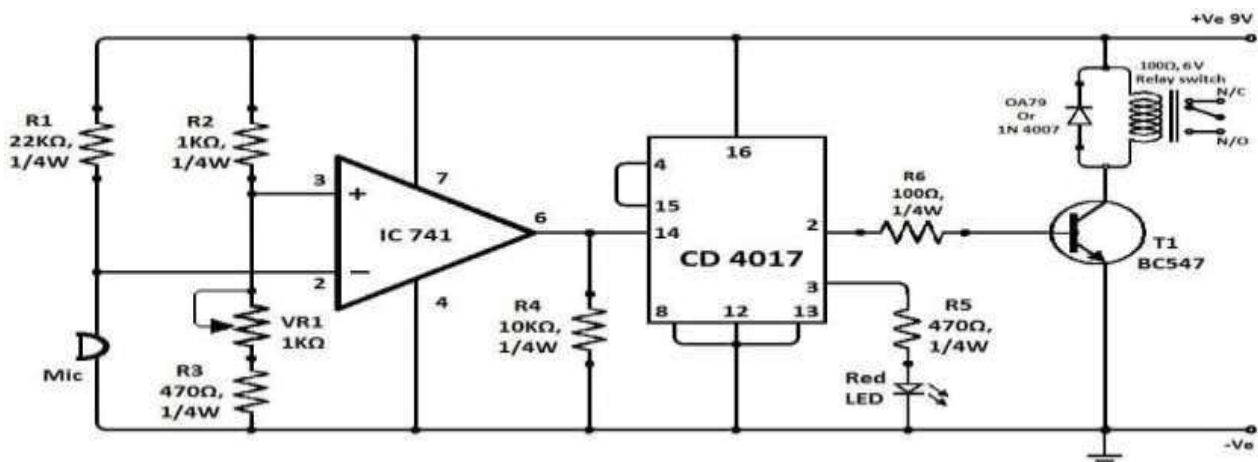
## Block Diagram:



## Components list:

- IC 4017 -1
- IC 741 -1
- RESISTOR (10K) -1
- RESISTOR (1K) -2
- RESISTOR (22K) -1
- RESISTOR (470R) -2
- RESISTOR (100R) -1
- RED LED -1
- DIODE IN4007 -1
- GREEN LED -1
- MICROPHONE -1
- BC 107 -1
- VARIABLE RESISTOR (1K) -1
- BATTERY (9V) -1

## Circuit Diagram:



**Operation:**

When you clap your hands near the microphone. The sound signal is converted into the electrical signal by the condenser microphone. These sound vibrations are given to the inverting input of IC 741 as opamp (amplifier) merged with IC 4017 as a flip flop to get on and off. Then connected to the T1 as the driving force of the Relay. The Relay is connected to other electronic or electrical devices. Resistors R2, R3 and the variable resistor VR1 adjusts the sensitivity of the amplifier. Resistor R1 sets the sensitivity of the Mic. The Output pulses are amplified from IC1 passes to the input (CD 4017). Resistor R4 make input of IC2 to low so as to prevent false triggering. IC2 is a decade counter IC Which receives a clock signal through the clock input and it turns ON all the 10 outputs one by one, every time it gets the clock input pulse. When you clap once, the relay is activated and the LED (or any load) is turned ON. When you clap for the second time, the relay is deactivated and the LED is turned OFF. Red LED indicates OFF position.

**Output:**

During the practical implementation of the project, some of the values or components had to be changed in order to get more accurate result. The circuit was successfully performed on bread board (PCB). A red LED is used to indicate the first clap. When the first IC471 generates the output, the LED glows. The relay can drive any common home electrical appliance like fan, light, etc.

The practical value of T in this circuit is 2 seconds, which will be having some variation in theoretical output. That is due to the tolerance of the components used in the circuit.

**Application:**

Clap activated switch device will serve well in different phone-controlled applications. Clap switch is generally used for a light, television, radio or similar electronic device that the person will want to turn on/off from bed. The primary application involves elderly or physically disabled person. The major advantage of a clap switch is that you can turn something (e.g., a lamp) on and off from any location in the room (e.g., while lying in bed) simply by clapping your hands.

Here we Have done a simple home-based simple clap switch with commonly used electrical components.

This circuit can be made further as more accurate and more sensible. By increasing the sensitivity, the amplification from the circuit may be increased and used in some modified circuits.

**Conclusion:**

The clap activated switching device function properly by responding to both hand claps at about one meter and finger tap sound at very close range, since both are low frequency sounds and produce the same pulse wave features. The resulting device is realizable, has good reliability and it's relatively inexpensive. This circuit is very useful in the field of electronic circuits. By using some modification, we can use this in various fields.