

CLAP-BASED SWITCHING FOR DEVICES



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It is quite difficult to find the switch board in a dark room to turn on the light. Here's a clap switch that allows you to switch on lights, fans, and motors sequentially by just clapping in the vicinity of the microphone used in the circuit.

The mains supply is stepped down to 15-0-15V AC by step-down transformer X1. The output of the transformer is rectified, filtered, and regulated by diodes D1 through D4, capacitors C1 through C4, and IC1 (regulator IC 7812) and IC2 (regulator IC 7912), respectively. Additional

filtering is performed by capacitors C5 through C8 to get +12V, 0V (Gnd) and -12V DC required for the operation of the circuit.

The clap sound impulses are converted into electrical signals by a condenser microphone that forms a Wheatstone bridge together with resistors R4, R5, and R3. The microphone is suitably biased through resistor R3. The output of the microphone is coupled to op-amp IC 741 (IC3) having a voltage gain of 45. The output of IC3, after passing through capacitor C10, is free from any DC component of signal. Capacitors C15 and C17 are used for spike and surge suppression.

Diodes D5 and D6 and capacitor C11 form the detector circuit. Resistor R6 is used here for quick discharge of capacitor C10. The detected clap signal is used to switch on transistor T1. On conduction of transistor T1, its collector voltage falls to trigger timer IC4 connected as a monostable. The combination of resistor R9 and capacitor C12 determine the pulsewidth of the monostable (about one second, with the component values shown).

AND gate IC5 (4081) is used as a buffer between the output of IC4 and clock input to decade counter IC6 (CD4017). Thus each clap causes outputs of IC6 to advance in sequential manner and switch on the corresponding devices.

If you want a lamp to be switched on when output Q1 goes high (after first clap), then in place of R11 and LED2 use a relay driver circuit at Q1 output similar to that used for Q2 output (for fan).

As stated earlier, only one output of CD4017 can be high at any given time. Thus first clap causes LED1 to go off and LED2 to glow. The second clap causes only the fan to switch on via relay RL1. The third clap causes the miniature 12V motor to run. On fourth clap, Q4 output goes high momentarily to reset IC6 since Q4 output is connected to its reset pin 15. In reset state, LED1 connected to Q0 output lights up.

The circuit costs around Rs 150.

