



MARA UNIVERSITY OF TECHNOLOGY  
FAKULTI OF ELECTRICAL ENGINEERING

SOUND CONTROLLED FLIP-FLOP

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*Last but not least thanks to our external reviewer have been outstanding and we acknowledge here our debt to each member for their assisting on the earliest and the latest manuscript of this project.*

## ***ABSTRACT***

Sound controlled flip-flop can be use such as remote switching on, activating a camera, tape recorder, burglar alarm, etc. The purpose for this project is to identify that when the microphone pick up the sound, it will directly switch on the LED and the buzzer. IC LM324 offers a good gain to enable sound pick up upto 4 metres. It is because the two-stages amplifier built around a quad op-amp IC. The third op-amp is configured as a level detector whose non-inverting terminal is fed with the amplified and the filtered signal available at the output of second op-amp. The inverting input of the third op-amp is given a reference voltage from a potential divider consisting of a 10k resistor and 4.7k preset. By adjusting the preset, we can control the sensitivity of the circuit. The sensitivity control helps in rejecting any unwanted sounds. The 100mF capacitor also helps in bypassing noise. The output of the level detector is square pulses. The circuit operates at 4.5V, so it can easily incorporate in digital circuit. Transistor T1 & T2 will switch on when Q output is logic 1. While T2 & T2 conduct when Q output is logic 0. Current through the LED & buzzer will changes it direction when the flip-flop is toggles.

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## ***OBJECTIVES***

The main objective of doing this PROJECT:

- ❖ We can communicate in terms of doing work with our partner and make a group discussion with them.
- ❖ Prepare us to face the real world of working life, and prepare of doing the project paper work we should do in the working life.
- ❖ Treat us to be more responsible and aware of the works that have been given to us, do it seriously.
- ❖ Time management, able to finish work in time, not only that but in terms of working time.
- ❖ Furthermore, we are also being able read a schematic diagram, design it for our project on the PCB board.
- ❖ Can apply what we had learn at UiTM in engineering course in this project
- ❖ Makes us aware of the things that have connection with our project like the shop that sell all the component, the prices, the series number, the function of each component and many others.
- ❖ Determine a suitable solution to overcome the problem when we try to run the project we have made.
- ❖ Analyzing and troubleshooting the problem.
- ❖ Write the final report
- ❖ How to present the project properly.

We hope with doing this report and the project, as time go on we can manage problems and can work more efficiently.

Insyallah...