

## EE 213 Electrical Circuits Laboratory Term Project

### Sound Level Detector

#### Introduction

Lots of people complain about the noise of the city in which they are living. Noise damages cognitive functions, including attention, concentration, memory, reading ability, and sound discrimination. However, these aren't the only disadvantages of urban noise. It also causes psychological stress, poor quality sleeps, and harms children's development. To solve this problem, we want to create a feedback mechanism that gives a signal. The system will take the external noise as input and provide an output, which shows that if the place is appropriate to live.

#### General System Description

As mentioned above, we will design a system that will take the environmental noise and give output to the user. Our system will have three LEDs, and as the level of noise increases, the number of LEDs that lighten will increase. As an example, if the level of noise 30dB, only one LED will lighten, if the level of noise 60dB, two LED will lighten, and so on. Our project will be consist of three sub-units.

3 Sub-Units:

- Sound Detection Unit
- Comparing Unit
- Displaying Unit

#### Explanation of Sub-Units

- **Sound Detection Unit**

This unit will detect the external noise. We need to use a microphone to detect outer sound. As the level of sound increases, the amplitude of the sinusoidal voltage that is created by microphone increases. The level of signals that are given by the microphone may be low to detect. Thus we may use a signal amplifier to increase its signal. This output voltage values will be the input of the second unit of the system.

- **Comparing Unit**

This unit will decide if the input which is given by sound detection unit is appropriate to give signal to user either which type of signal it need to give to user with this input. We may use comparator op-amps to compare given input with the desired input to determine whether given input is above a certain level of noise

- **Displaying Unit**

This unit will include the LEDs, so we may need to use resistors because voltage may cause LEDs to burn. The aim of this unit is exhibiting the level of sound.

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**Explanation of Output:**

*One lightened LED:* Environmental Noise is so low.

*Two lightened LED:* There is some environmental noise.

*Three lightened LED:* There is too much environmental noise