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**EN2110 - ELECTRONICS III**



**DEVICE TO INCREASE SOUND INTENSITY  
FOR HEARING-IMPAIRED PEOPLE**  
**Project Proposal**

**Group 21**

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## 1. Introduction

According to the statistics presented by the World Health Organization, over 278 million people globally, are suffering from some form of hearing loss. This number is further rising due to growing global population and life expectancy. Hence a device that can effectively amplify the necessary sounds to a frequency audible by such people would have a high demand.

Loss of hearing maybe total (throughout the audible range) or partial (through part of the audible range) i.e., the person may lose the sense of his complete range of frequencies or fail to hear a part of his audible range. This proposed project targets an electronic hearing aid, which typically fit behind the wearer's ear and extend in to the ear as a small speaker and amplify sounds of ordinary amplitude (loudness) to higher intensity in order for the people with hearing deficiencies to be able to perceive them.

## 2. Block Diagram



## 3. Functionality

We take inputs of audio signals from a microphone. Pre-amplifier (small signal amplifier) circuit increases the volume (amplitude) of the soft sounds. Then the sound goes to tone control unit which consists of a network of filters which modify the signal before it is fed. Tone control is used to make specific pitches or frequencies in an audio signal softer or louder. Next, the power amplifier circuit boosts the power of the audio signal to a level which is audible to a person with impaired hearing. Finally, the amplified audio signal is sent to an earphone (speaker). The volume (or intensity) may be varied to the level required by the user. As the circuit amplifies the sound of all frequencies, noise will be a major issue. It is proposed to implement a noise reduction circuit in the device to resolve this issue.

#### **4. Objectives**

- i. To amplify the range of frequencies required by the patient.
- ii. Ability to adjust the abovementioned range, in cases where the required frequency range of amplification changes overtime.
- iii. Ability of the volume to be adjusted.
- iv. Easily wearable and removable.