Team 15

Vibro-Tone

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Department of Electrical Engineering and Computer Science

Goal

To design a low-cost, multi-purpose audio device for people suffering from conductive hearing loss.

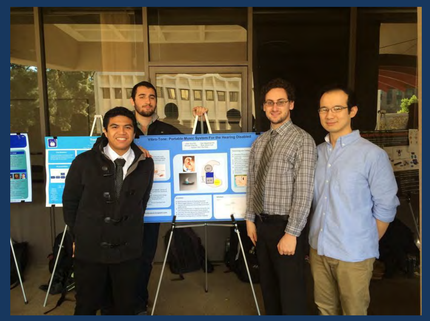
Introduction

Conductive hearing loss occurs when there is damage to the outer ear or the middle ear. This means that while natural hearing is impaired, the inner ear is still functioning, and it requires an external stimulus to process sound. Bone conduction is a technique often employed to provide this stimulus. Current bone conduction devices are costly or require invasive operations, so Vibro-Tone is our robust, user-friendly, and low-cost solution.

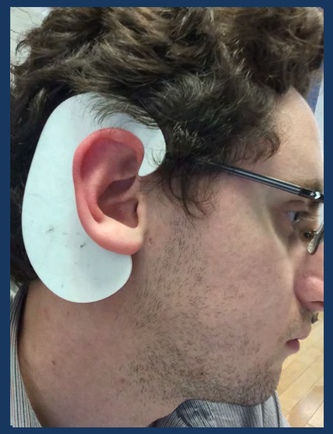
Innovation

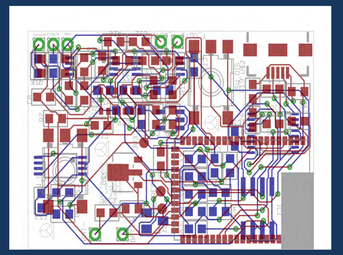
- Allows toggle between “real world” sound with capsule mic pickup and transmitted sound from digital device
- Wireless transmission to hearing device for use with smartphones and modern audio players
- No need for surgery like traditional bone conduction hearing aids or cochlear implants

Team Members



(left to right) Ryan Bendo, Ojan Negahban, Julian Shur, and Michael Chao
Advisor: Professor Pai H. Chou



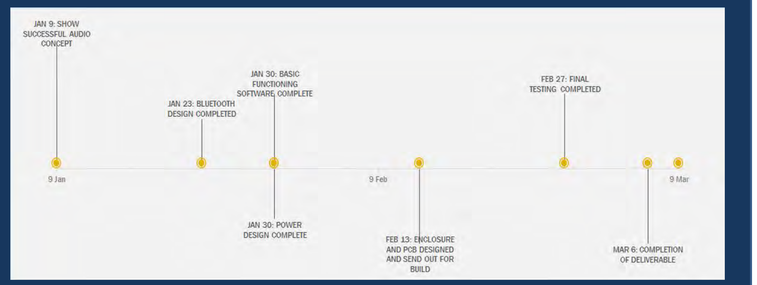


SolidWorks and a 3D printer were used to create the enclosure
The PCB was designed using CadSoft’s EAGLE PCB

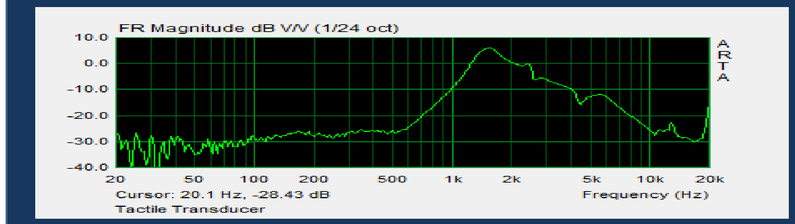
Responsibilities

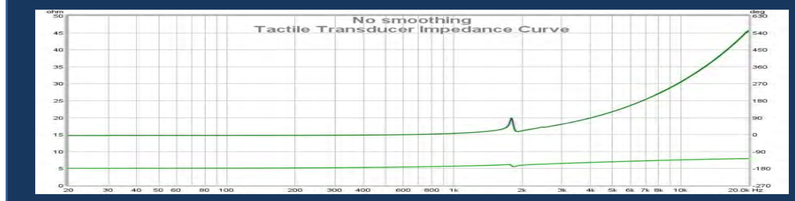
- *Julian Shur* (EE) : Team captain. Design of embedded H/W system incl. Bluetooth. Enclosure.
- *Ojan Negahban* (EE): Acoustics. Analog design. Human interaction. Enclosure.
- *Michael Chao* (EE): Bluetooth S/W. Documentation.
- *Ryan Bendo* (CpE): Device Interface S/W. Documentation.
- Advisor: Professor Pai H. Chou

Schedule



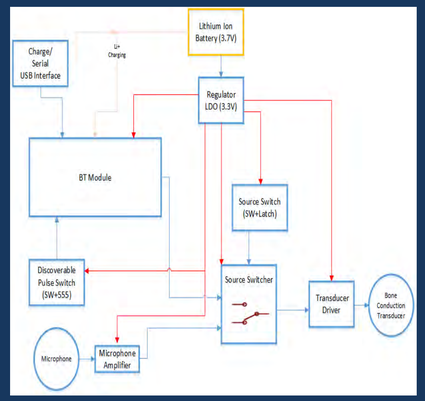
Measurements

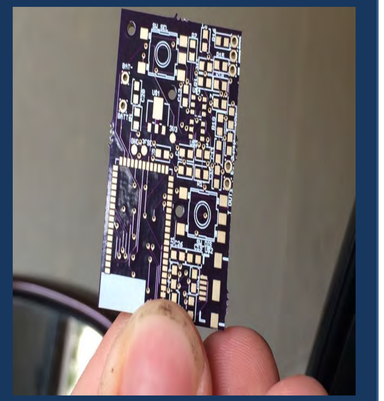




(top) Tactile Transducer: 77/100
(200 mV rms for average listening levels)
(bottom) Tactile Transducer Impedance Curve

Results





(left) Block diagram of our overall system
(right)) Our unpopulated PCB

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