

Objective:

To create an affordable electroencephalogram (EEG) that can be built and used by high school students.

Background:

There is lack of educational demonstrations on brain physiology at an affordable level for most high schools across America leading to limited general knowledge of brain structure and function.

Value Proposition:

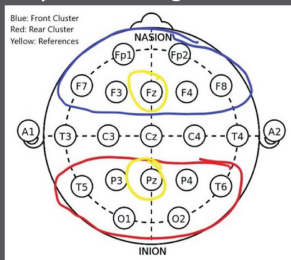
This provides classrooms with an easy-to-use and replicable EEG device that accurately illustrates brain signals.

Key Requirements:

The device needs to be able to be manufactured and built by students with common school materials. The device must also be able to demonstrate distinguishable differences between parts of the brain while in use.

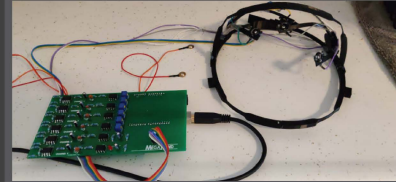
Conceptual Development:

Using six recording electrodes, the device uses modular design to maximize accuracy for each region of the brain.

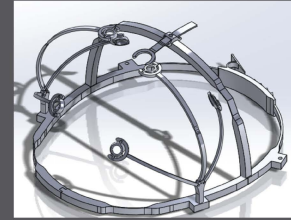


10/20 Node Placement

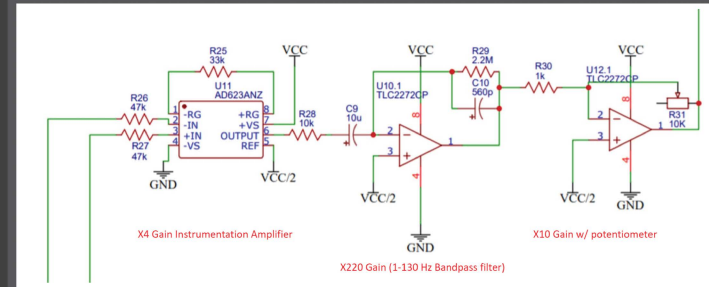
Final Design:



Circuit and Headset Assembly



SolidWorks Headset Design



Circuit Diagram (Single Channel)

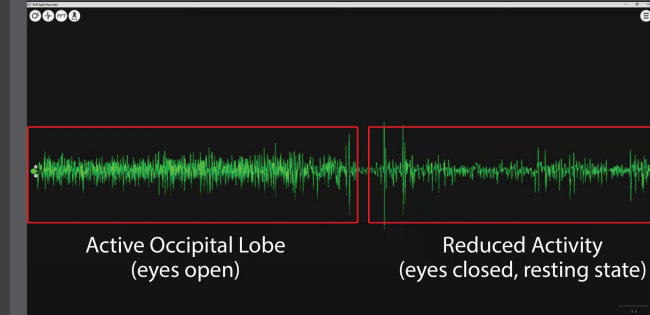
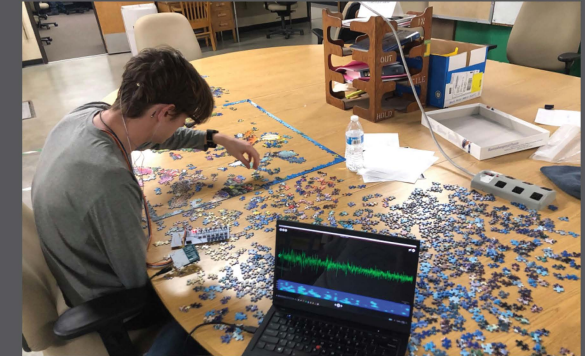
Conclusions and Recommendations:

The results indicated a great potential for making a system that can display various brain activities. However, the device will require some refinement of the headset branches which should improve the challenge of maintaining consistency between the electrodes and the scalp for maximizing contact.



Validation:

The EEG was tested by placing two electrodes on the occipital lobe, the center of visuospatial reasoning. Therefore, completing a puzzle created a cognitive scenario to activate this lobe.



Acknowledgements:

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