

Objective:

To create an affordable and easy to use 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:

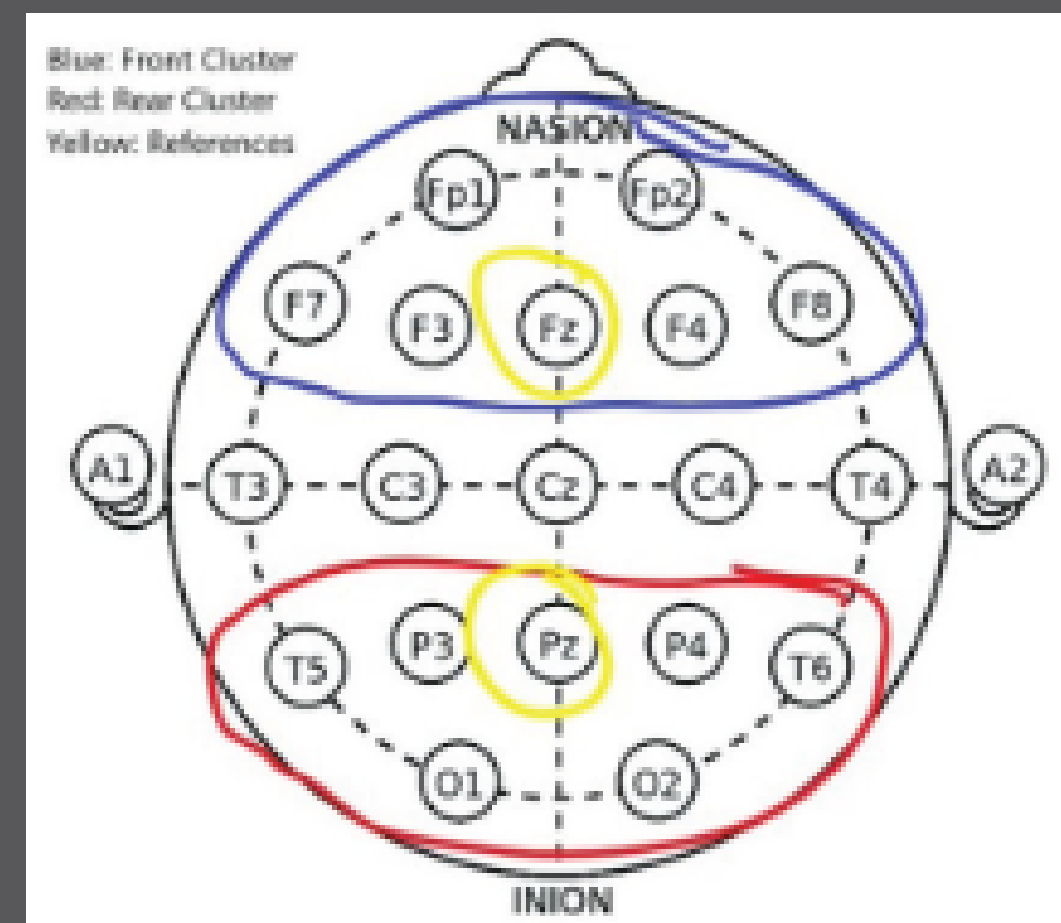
This provides classrooms with an easy-to-use and replicable EEG device that accurately illustrates brain signals.

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.

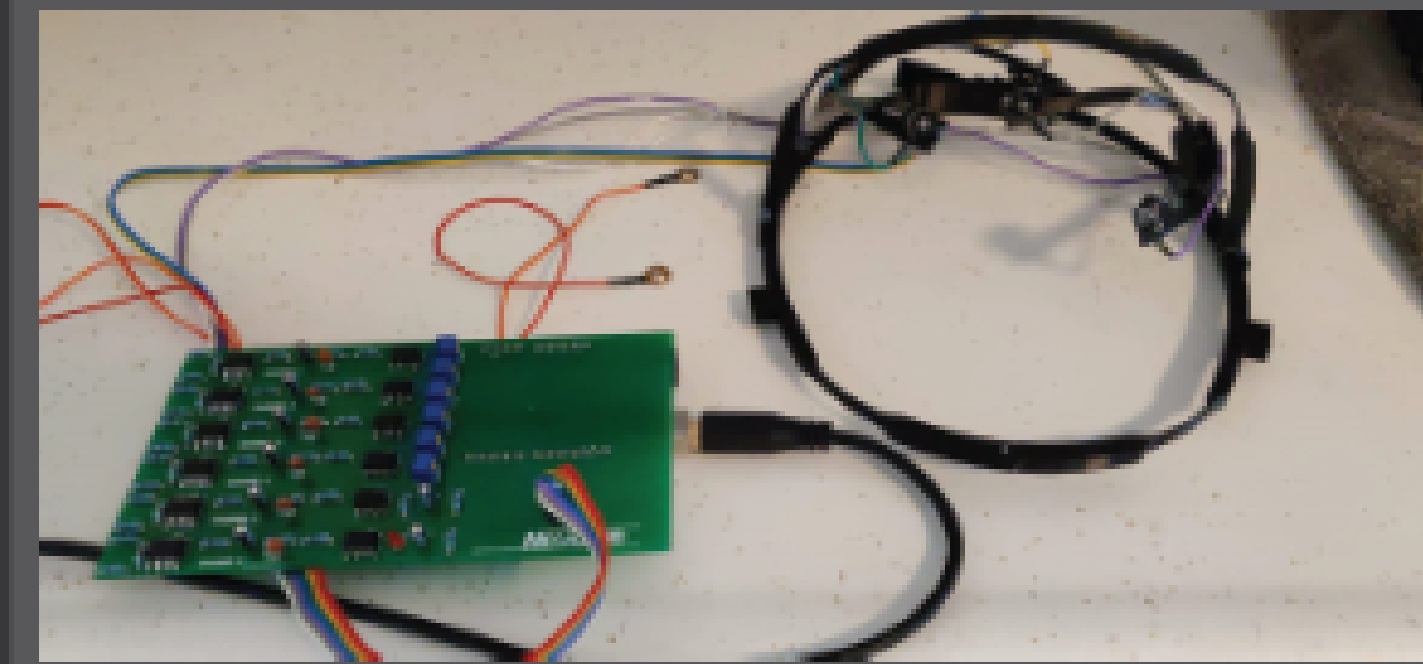
Conceptual Development:

Using six recording electrodes, we decided to use a modular design to maximize accuracy for each region of the brain being recorded.

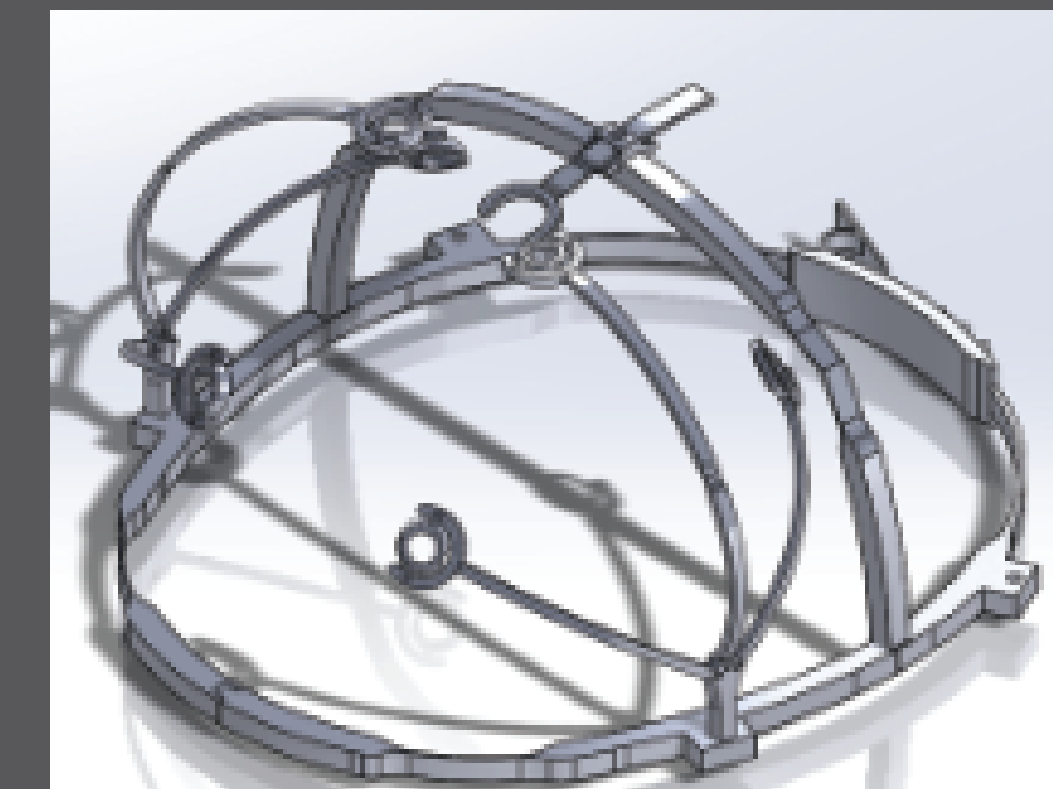


10/20 Node Placement

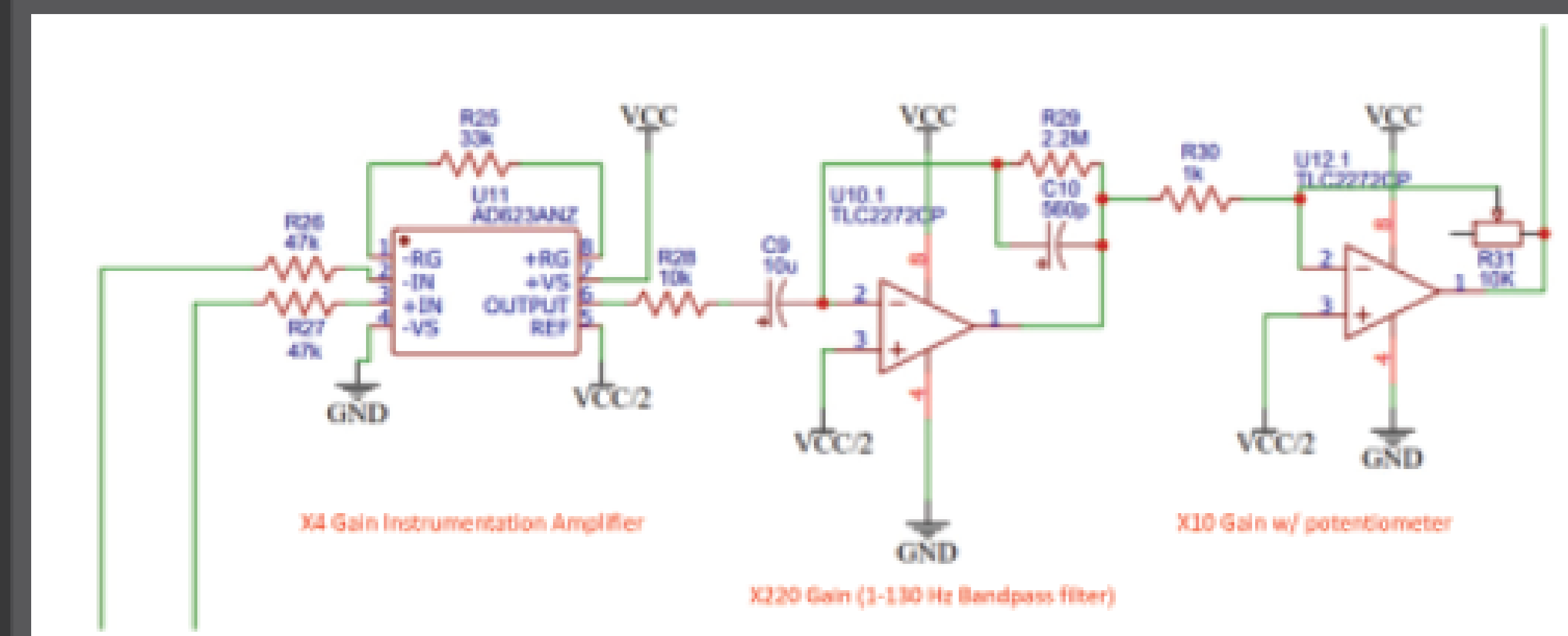
Final Design:



Circuit and Headset Assembly



SolidWorks Headset Desing



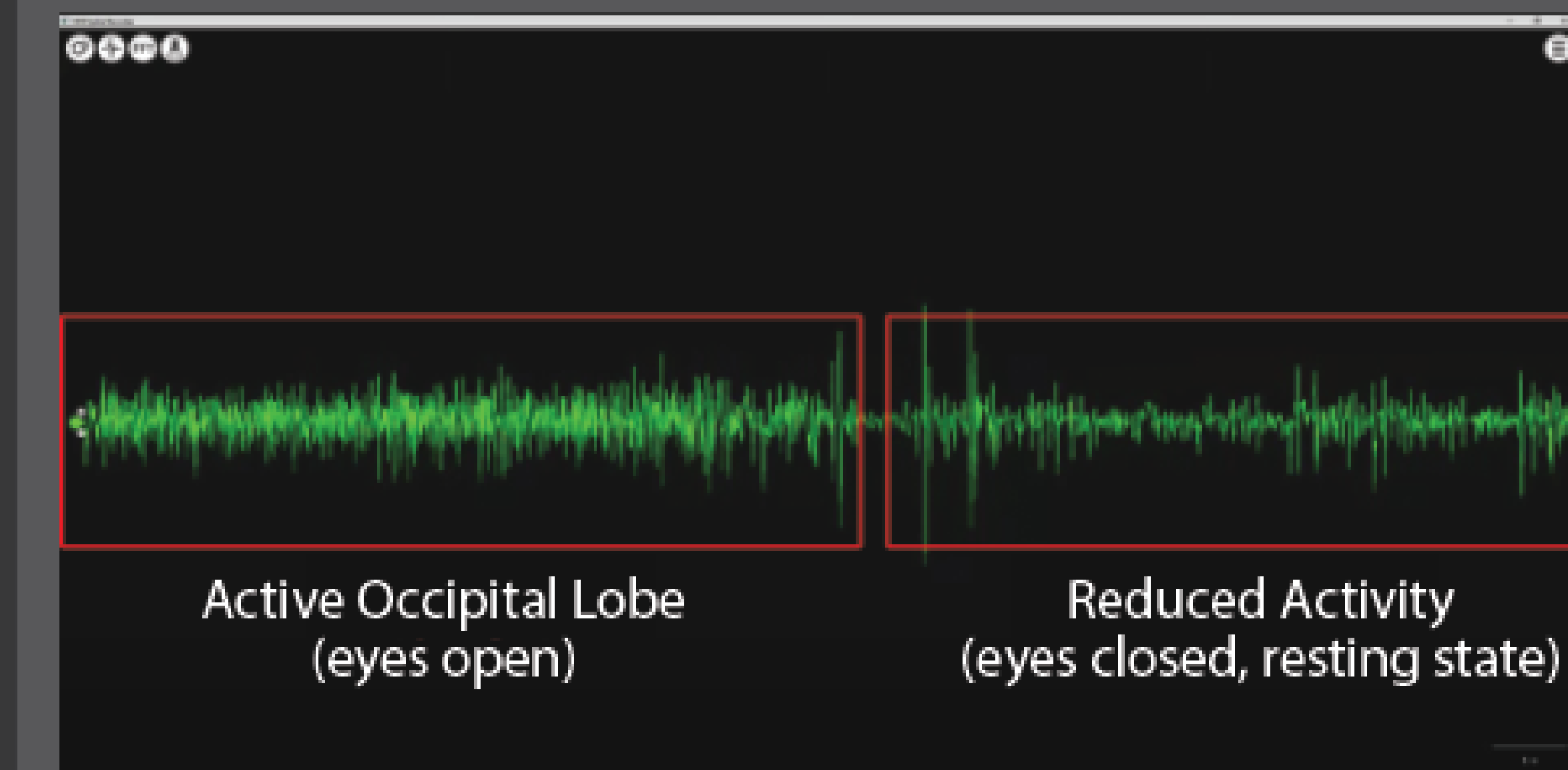
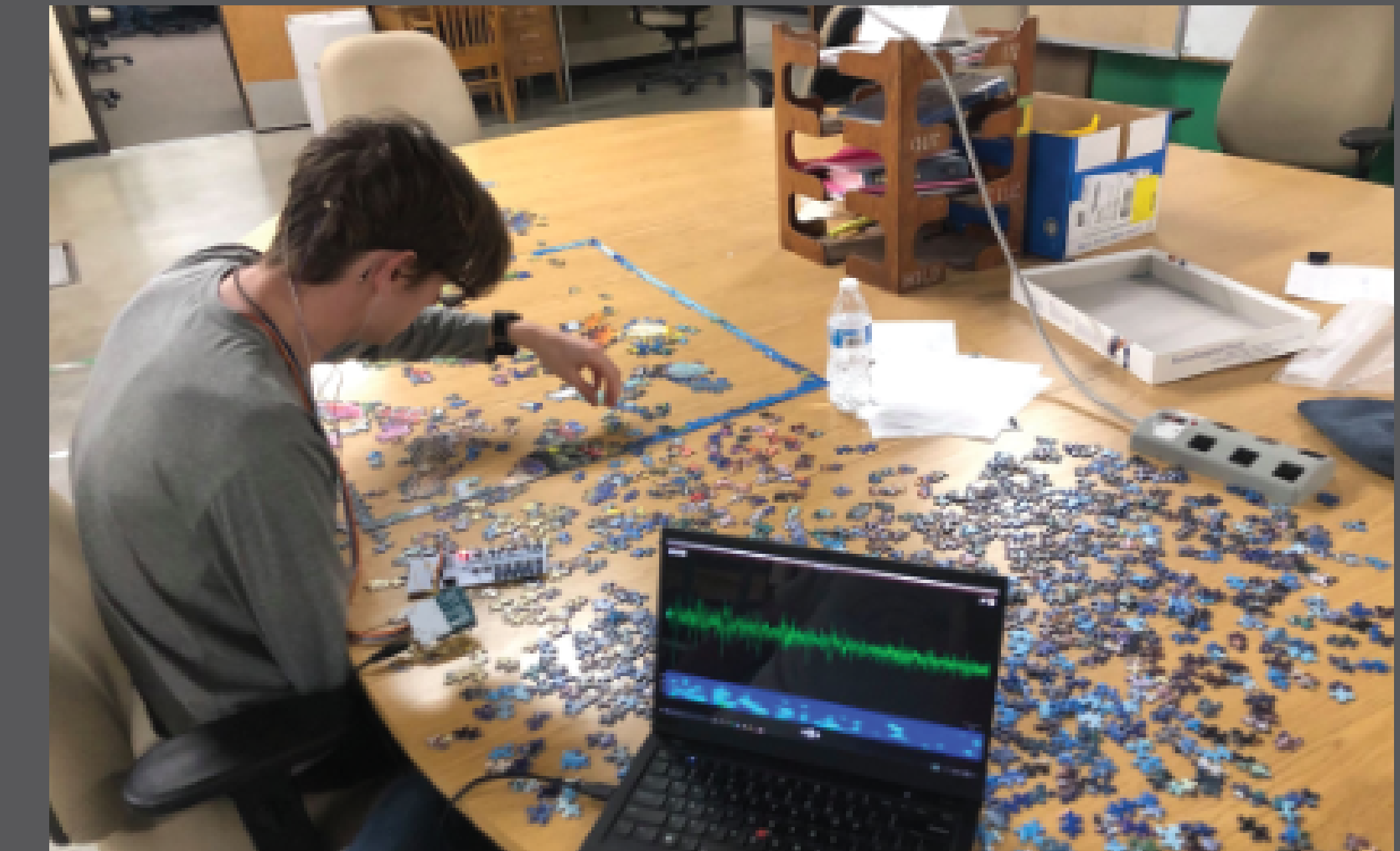
Circuit Diagram (Single Channel)

Conclusions and Recommendations:

We have shown that it is possible to make a system that can display differing brain activity, however moving forward the device needs some refinement. Consistent contact with the electrode and the scalp proved to be the hardest challenge to overcome.

Validation:

The EEG is tested by placing two electrodes on the occipital lobe. The lobe is the center of visuospatial reasoning, so completing a puzzle is the perfect scenario to activate this lobe.



Acknowledgements:

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