



Electrotherapy (TENS) Device

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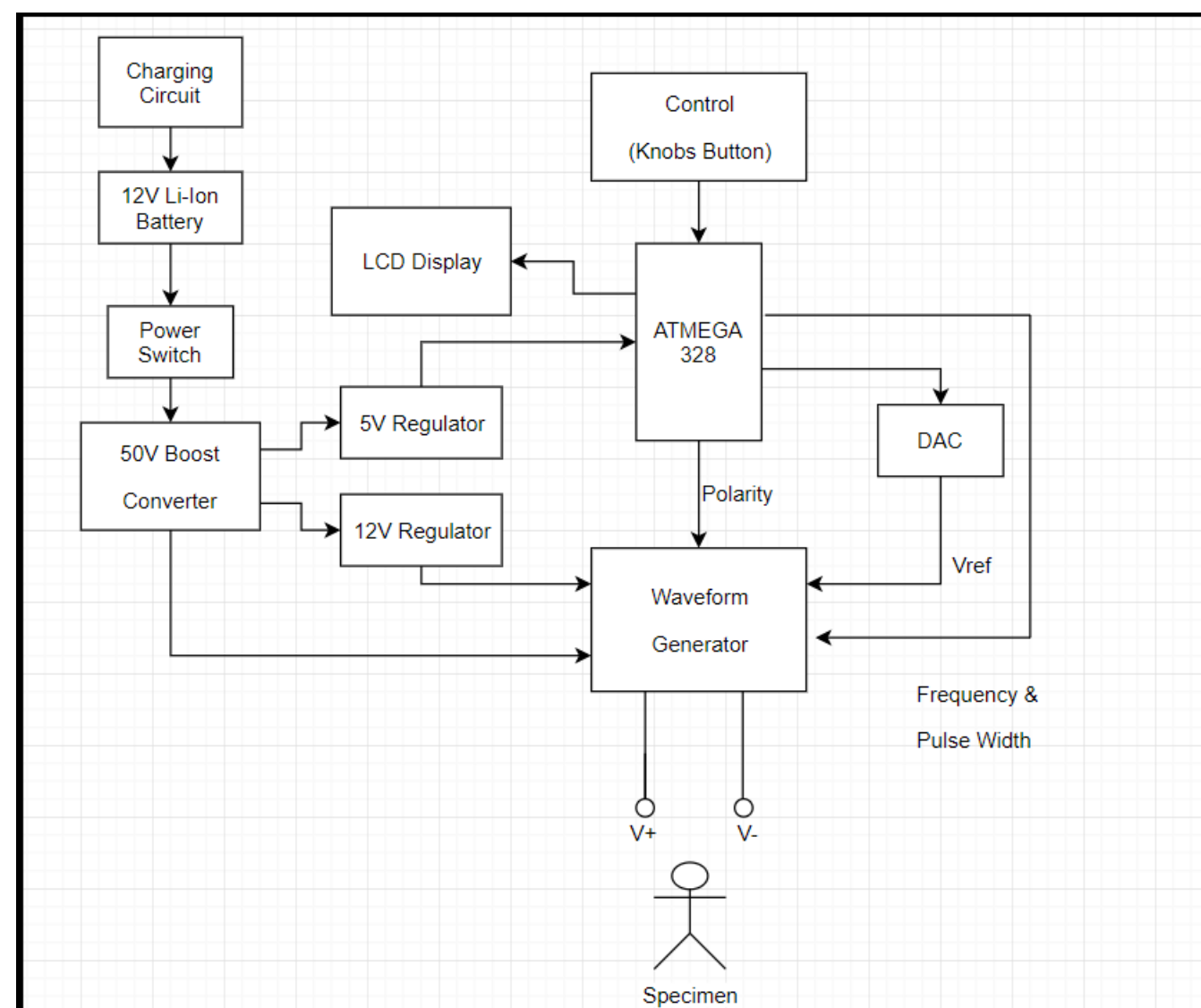


Background

We designed an electrotherapy device to help with pain relief. Formally, this type of electrotherapy is known as “transcutaneous electrical nerve stimulation” (T.E.N.S.). Our TENS device works by applying voltage impulses across a desired location on the body. These impulses stimulate nerve fibers in the body, which then send pain-blocking signals to the brain.

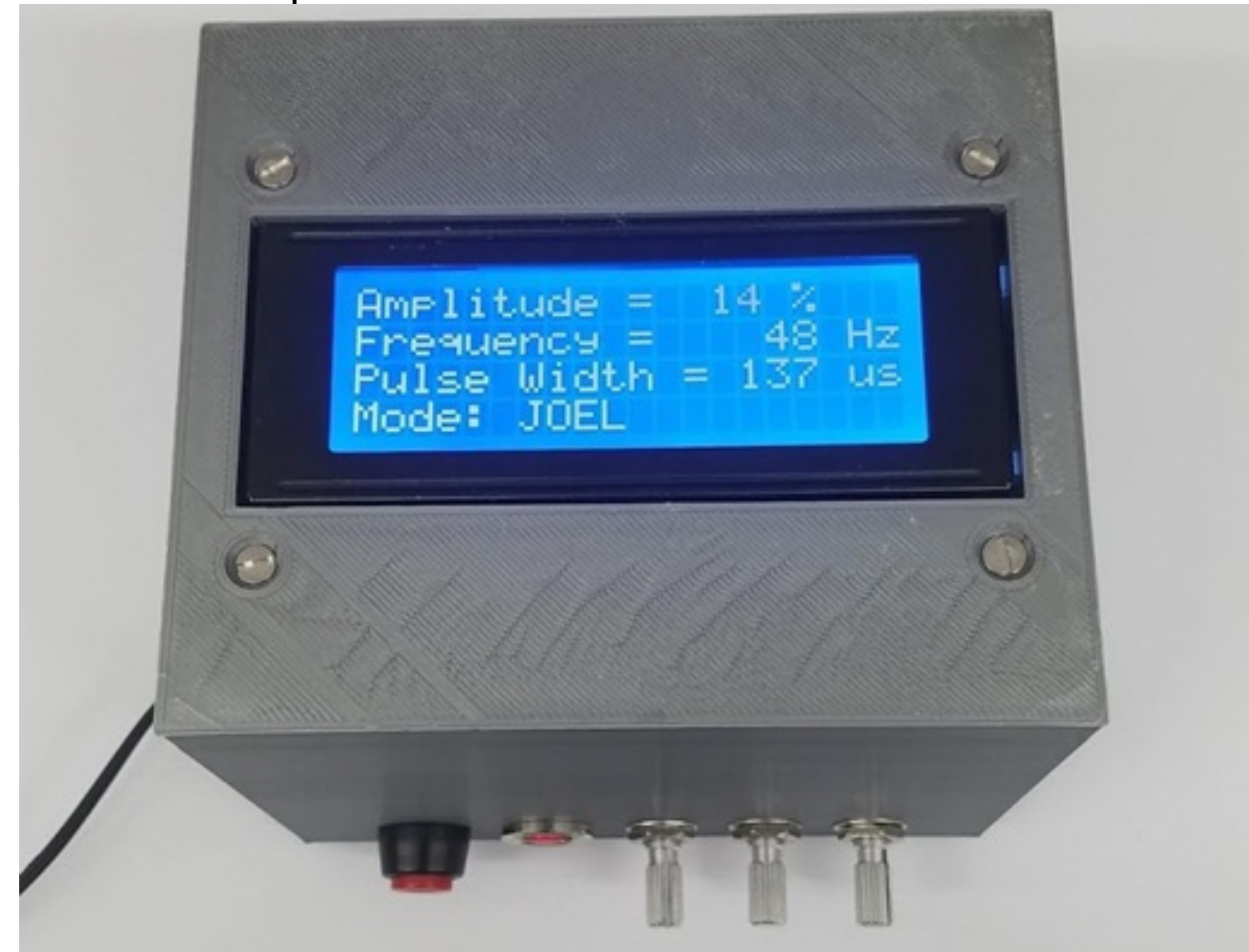
System Operation

Our system block diagram is shown below. Sticky electrode pads are applied to the body. Waveform parameters are displayed on the LCD. The parameters are controlled by potentiometers. The waveform parameters are processed by a microprocessor and then sent to the waveform generation circuit. As a result, the waveform generation circuit outputs the corresponding waveform to the body.



Final Result

Our final product is shown below inside its enclosure.



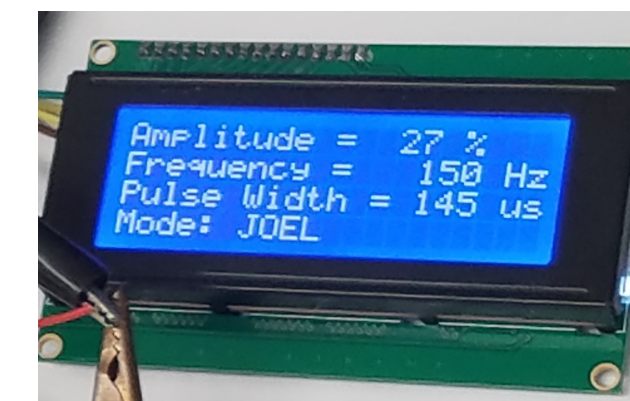
Critical Components



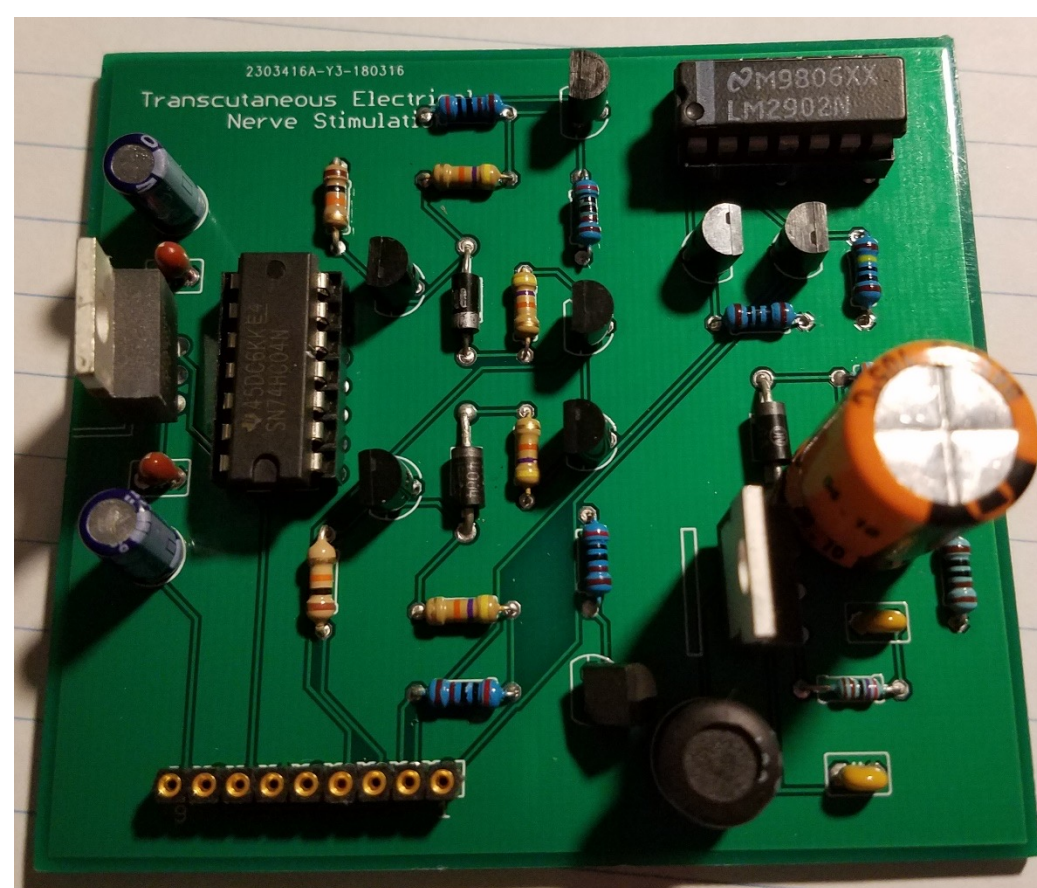
Rechargeable 12V Battery Pack



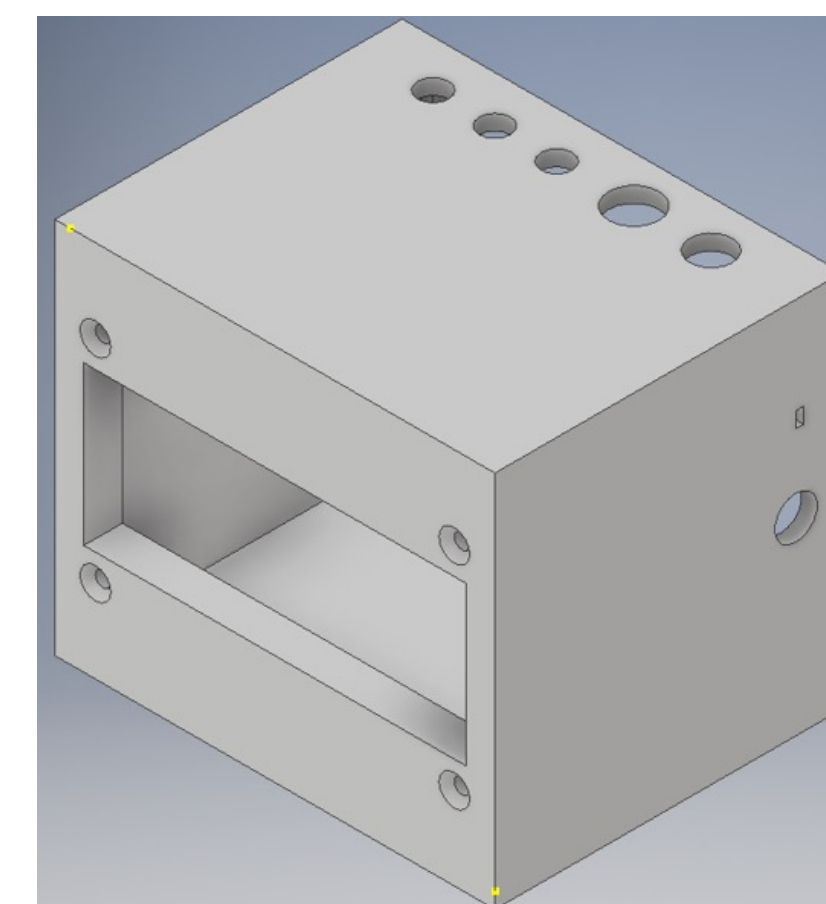
Sticky Electrode Pads



LCD



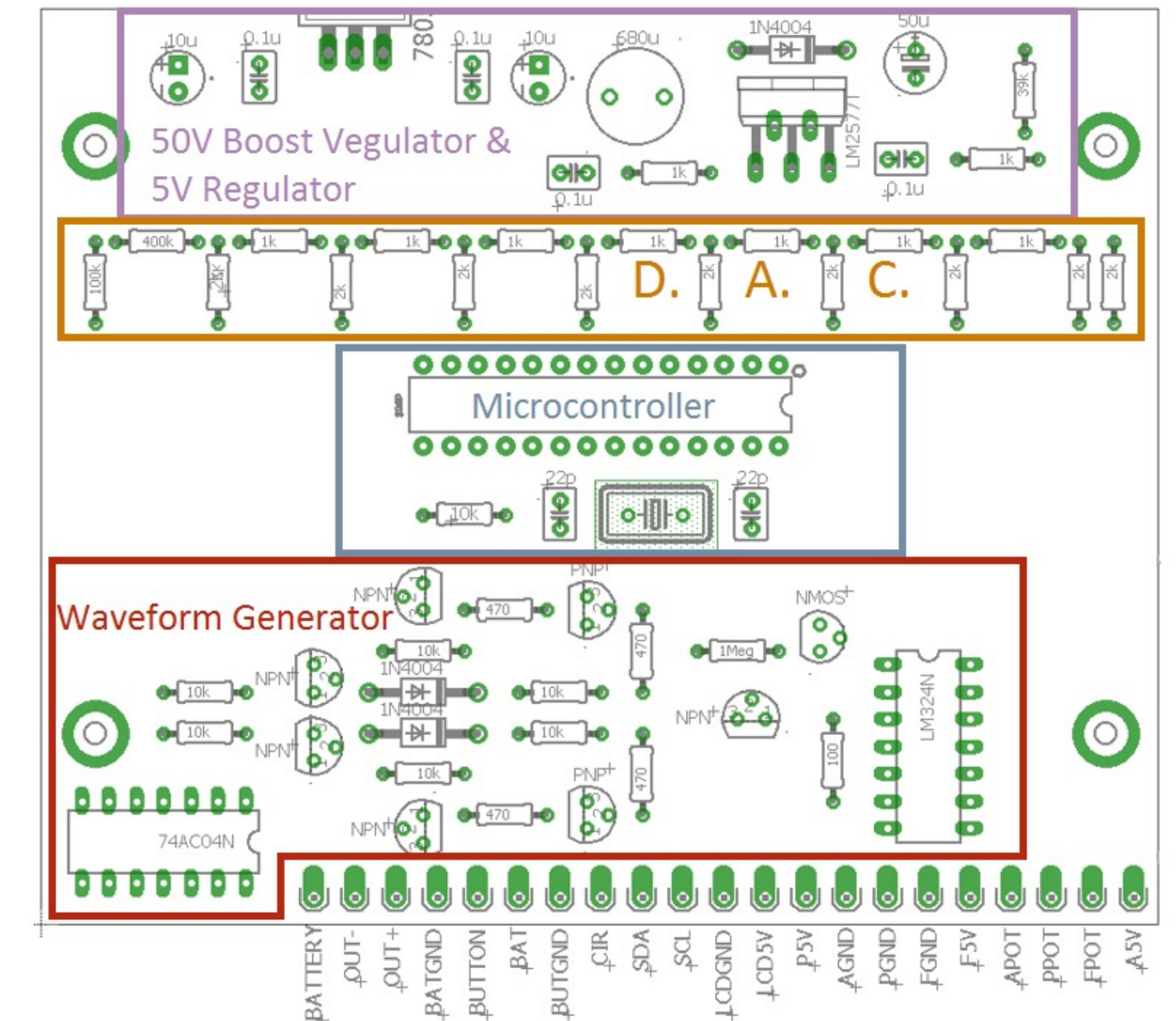
PCB (Assembled, Rev.1)



Enclosure (Sketch)

PCB Design

The layout for our PCB Rev. 2 is shown below. We used EAGLE CAD to design our project’s PCB. We then ordered it via JLCPCB



Future Direction

- Research and develop more therapy modes
- Incorporate digital potentiometers for more complex waveforms
- Reduce size for portability

Contact Information

Feel free to reach us at the following emails if you have any questions or comments!

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