TempoPulse Necklace









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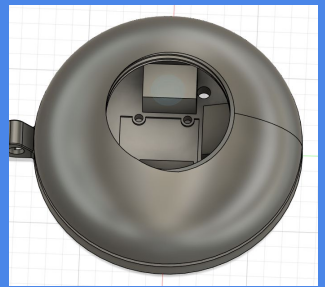
Problem:

I have mediocre rhythm. I record music digitally through a DAW called Ableton Live and I find it hard to mix operating a computer and playing a guitar, especially when it comes time to press the record button and keep tempo.
Additionally, when recording acoustic guitar through a microphone, the tempo "click" is picked up.

Design:

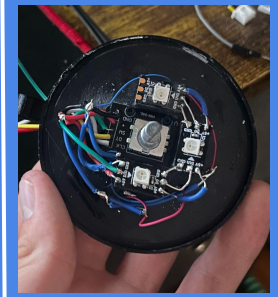
I had an idea for a "Haptic Metronome" necklace that would vibrate against your body to the beat of a tempo.
Additionally, I wanted to incorporate an LED visual tempo and two methods of MIDI control in my DAW. The design would be based on a rotary encoder, which you can turn to increase or decrease tempo, and press in for recording. I was inspired by Dr. Strange's necklace and the sleekness of Apple Products. I designed a 3D Printed shell in Fusion
I also designed a screw-on top.
-Additionally- I found later that a haptic metronome already exists in the form of a wrist watch. My invention is still unique and I believe advantageous over the existing.





Build Process:

I started with a rotary encoder I got at the Bangor Makerspace, 3 Amazon WLEDS for a cool multicolor effect, and 3 Aliexpress vibration motors. I tried to send voltage to all 3 3.3v motors just from the MCU (I tried a couple, Raspberry Pi Pico worked best.) This did not work. I switched in a transistor and the vibration motors worked much better. I ran the wires through the necklace part (made of a small insulating sleeve- the Chinese Finger Trap kind) to the Pi Pico protected at the back of the neck. The top I printed opaque, cast that 3D Print in silicon and filled the silicon mold with resin







Results/Retrospective:

The necklace is super useful for eliminating bleedthrough in loud tempo clicks in open backed headphones with a close microphone. The motors don't vibrate as powerfully as I'd like, especially at higher tempos, so in the future I'll be redesigning with bigger vibration motors.