# The T.R.A.V.I.S. Project

(Television Remote and Voice Interpretation System)

Team 9:

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# Introduction

Need:

Elderly people have a hard time navigating modern entertainment devices.

Goal:

Make it easier for elderly people to navigate modern entertainment devices.

# Personas

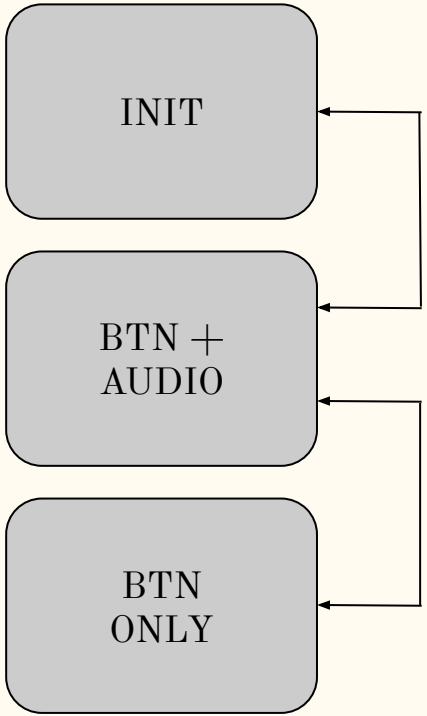
If we need more content

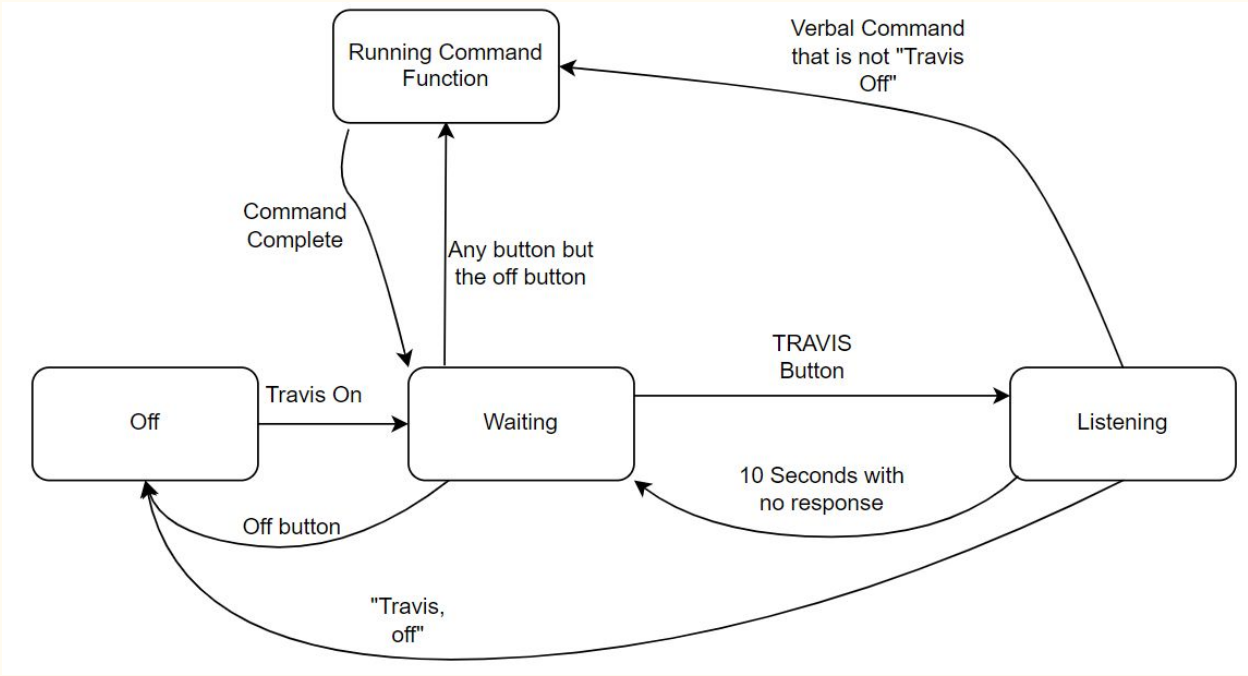
# Design Overview

# Principle Features

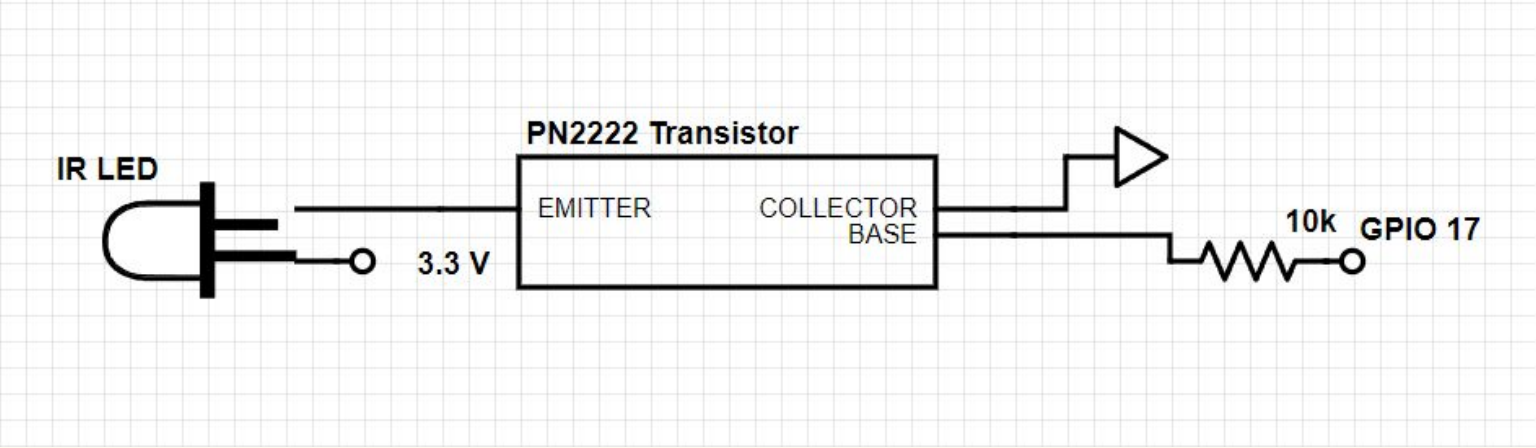
- Large, Simplified Button Layout
- Voice Activated
  - LED to indicate if listening to you, auto-turn-off available
- Simple Set-Up
  - Can either run through every option from a manufacturer or save signals from current remote
- Find-My-TRAVIS
- Rechargeable or Replaceable Batteries

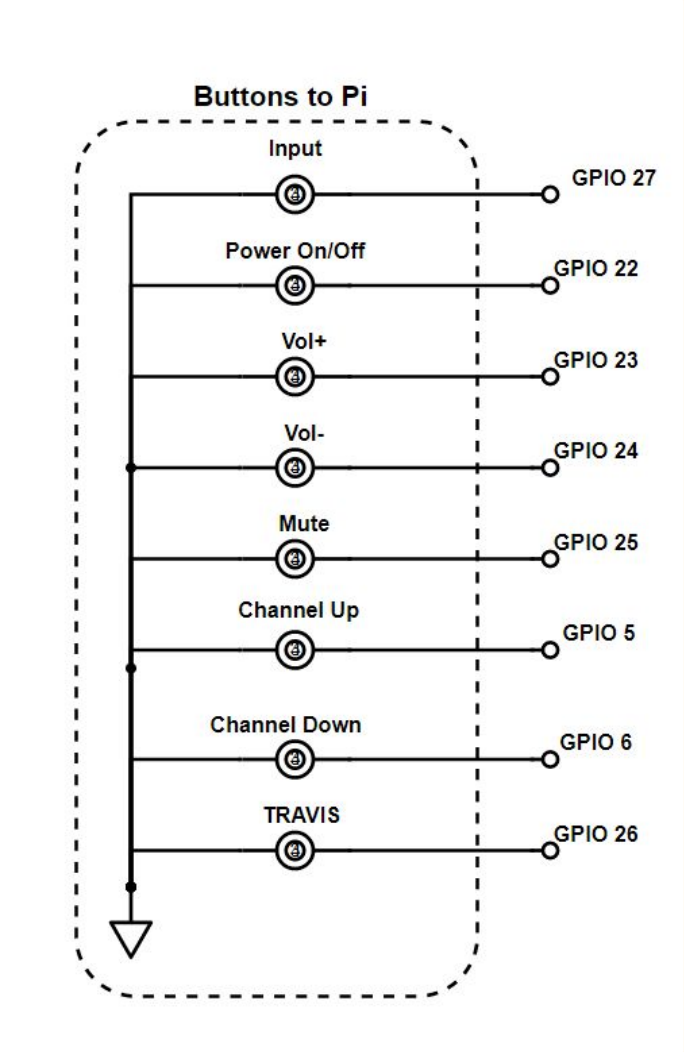
# Block Diagrams



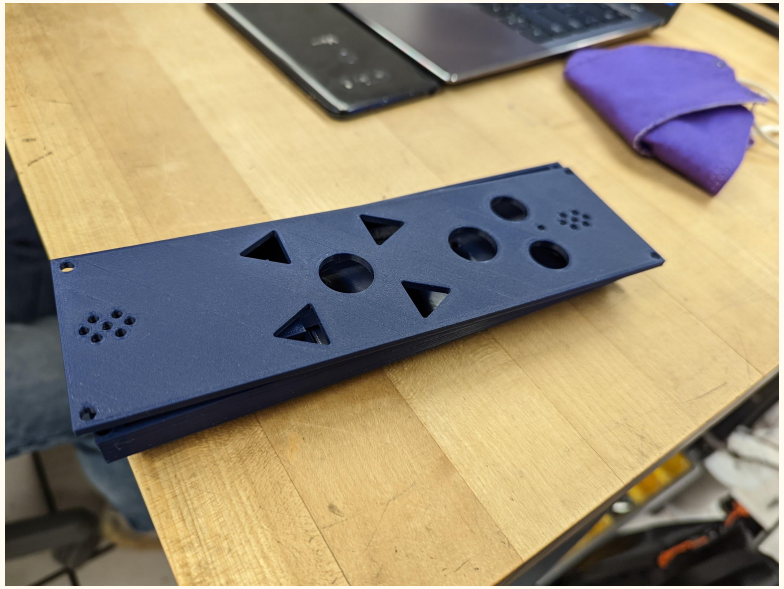
# Wiring Diagrams

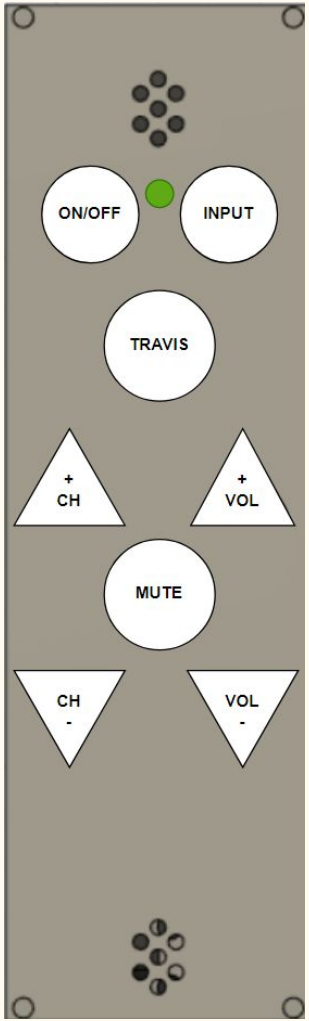



Buttons to Pi
Input
GPIO 27
Power On/Off
GPIO 22
Vol+
GPIO 23
Vol-
GPIO 24
Mute
GPIO 25
Channel Up
GPIO 5
Channel Down
GPIO 6
TRAVIS
GPIO 26

# Manufacture & Maintenance

- 3D-printed outer shell.
- Screws used to keep components in place
- User can maintain device by changing battery
- Raspberry pi and wiring fits neatly inside of shell
- Do not get it wet or hit the device.

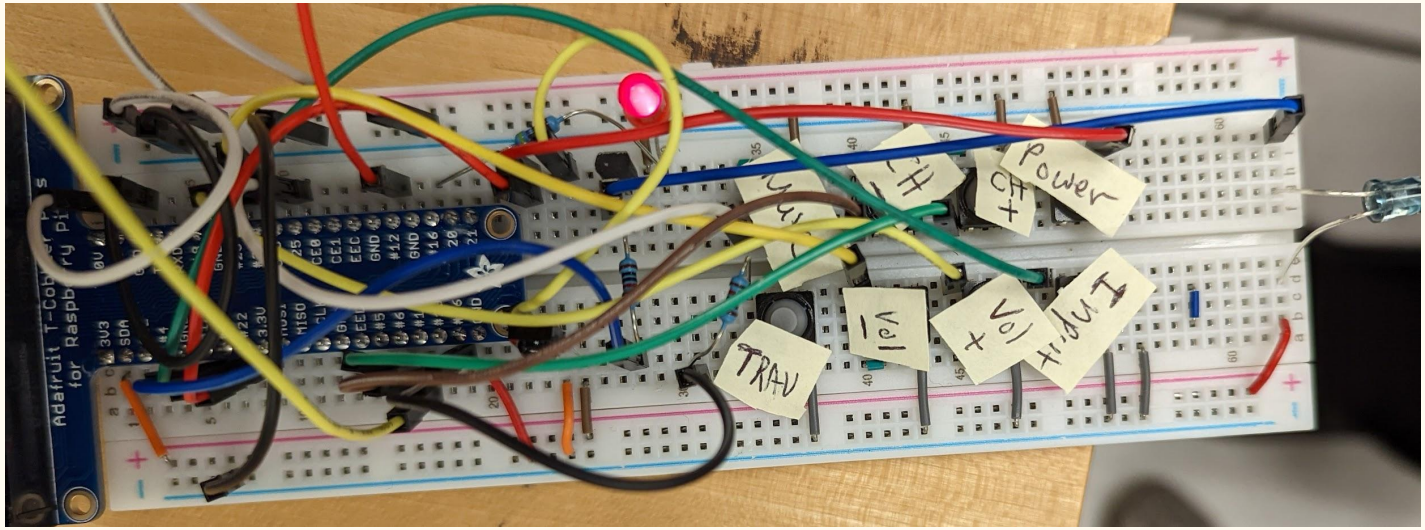





Goals for remote design:

- Intuitive/familiar button layout
- Limited button selection to keep things simple
- Large, easy-to-press buttons

# Functional Prototype Overview



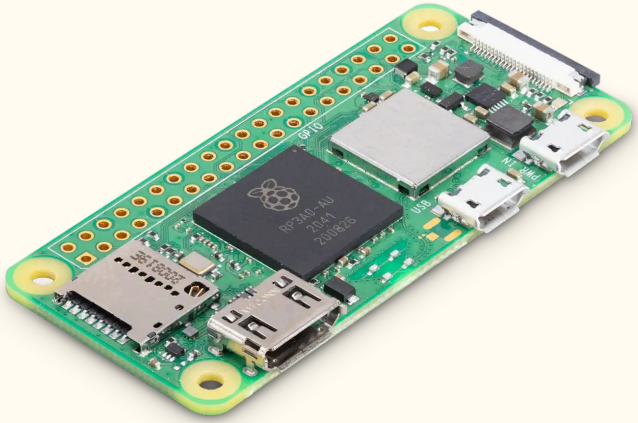
# Prototype Features

- Large, Simplified Button Layout
- Voice Activated
  - LED to indicate if listening to you, auto-turn-off ~~available~~
- Simple Set-Up
  - ~~Can either run through every option from a manufacturer or save signals from current remote~~
- ~~Find-My-TRAVIS~~
- ~~Rechargeable or Replaceable Batteries~~

# Voice Commands:

“TRAVIS, initialize”
“TRAVIS, turn power On/Off”
“TRAVIS, change input/source…”
“TRAVIS, change channel (to)…”
“TRAVIS, channel Up/Down”
“TRAVIS, mute”
“TRAVIS, turn volume Up/Down”
“TRAVIS, assign…”

# Prototype Hardware

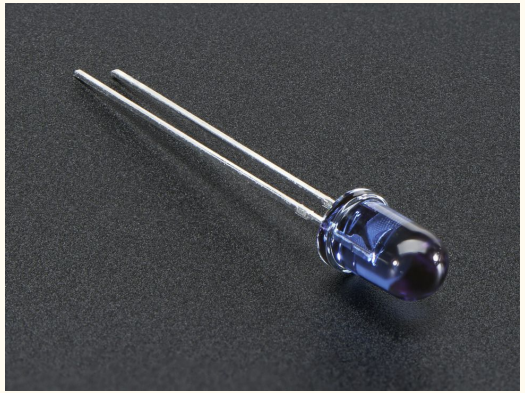


Raspberry Pi Zero 2 W
Microprocessor

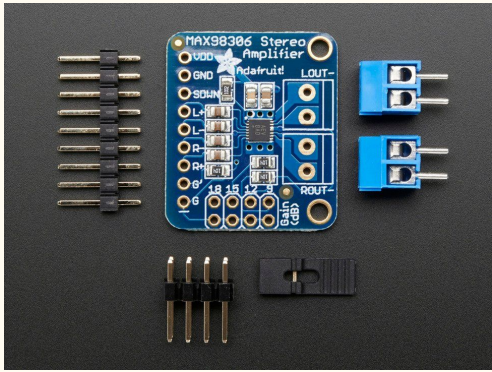
Power Input: Plugged In
Current Cost: ~$35

Youmi Mini USB Microphone

Mini Metal Speaker



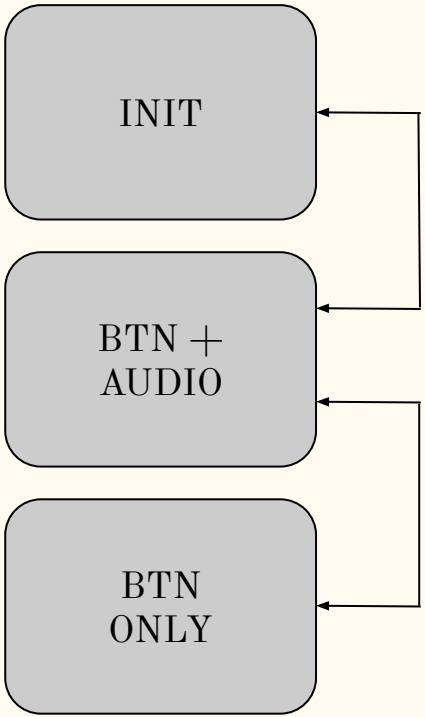
Super-bright 5mm IR LED
- 940nm IR Transmitter



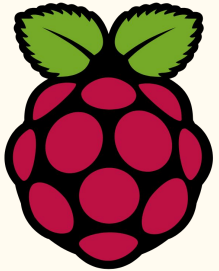

Stereo 3.7W Class D Audio Amplifier
- MAX98306

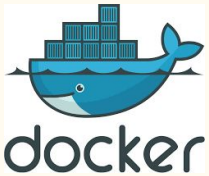
# Prototype Code

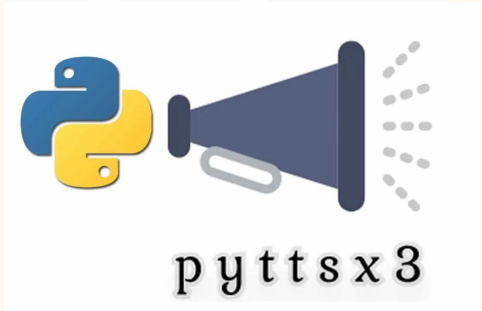
State Machine:



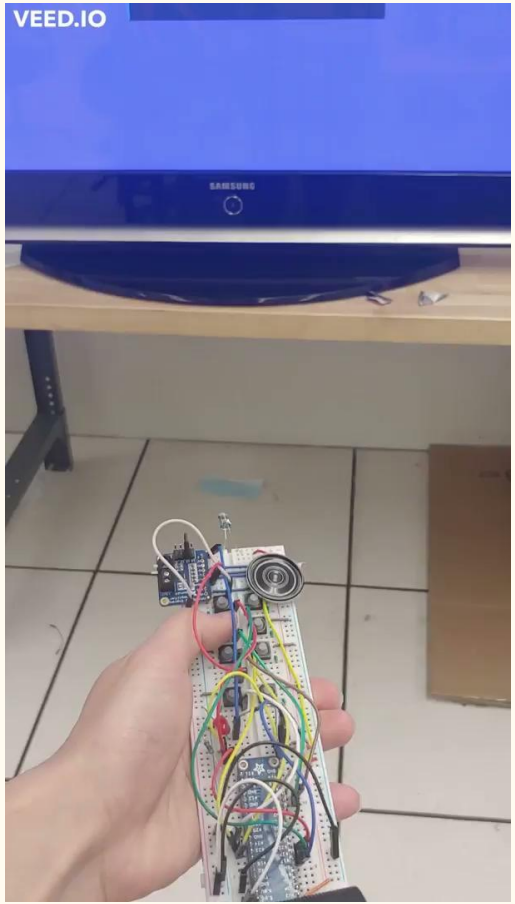

Technologies:


# Prototype Demo



# Isolated Tests

- Able to isolate and test speech recognition since it doesn't require special hardware

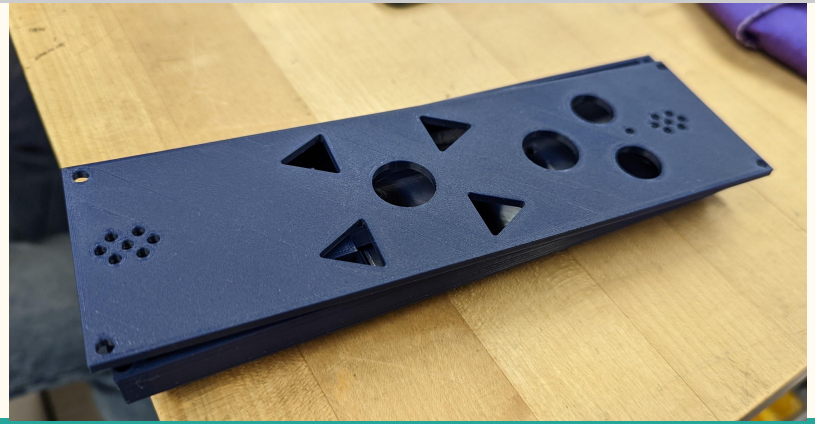
- Able to test television communication without our program running using the handy irsend LIRC command

# Prototype Testing

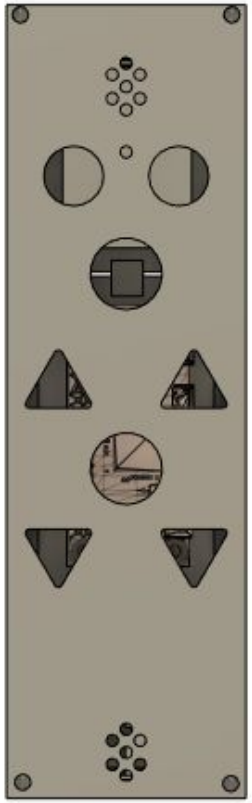
- When testing our full prototype, we had it output logs to a console so that we could easily see what TRAVIS thought it was doing.

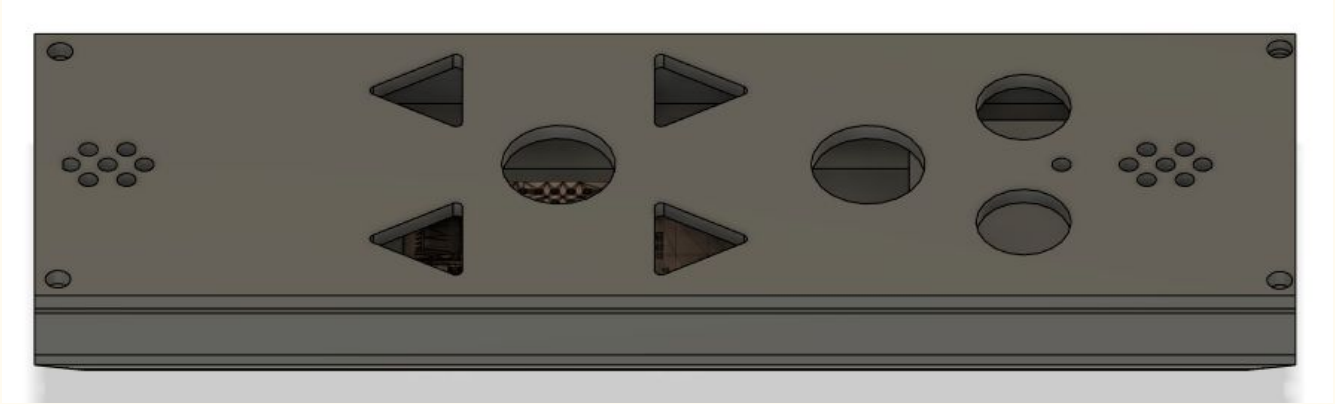
- We learned that speech recognition is limited by microphone quality, especially in noisy environments
  - This, plus the fact that Travis is a proper noun, makes it really dislike to hear its own name. Often, it would think it's another word or just omit it entirely.

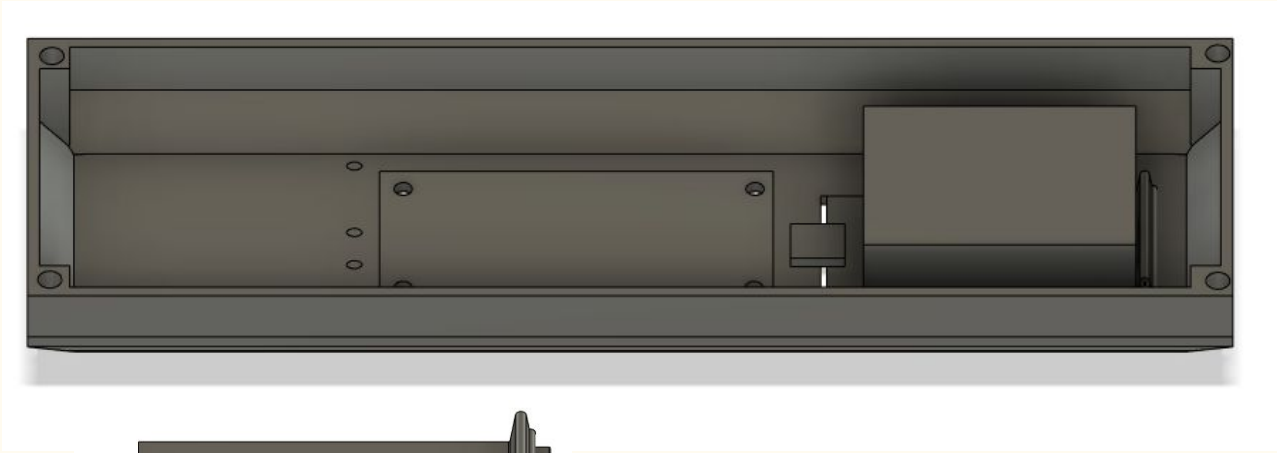
# Aesthetic Prototype Overview



# CAD



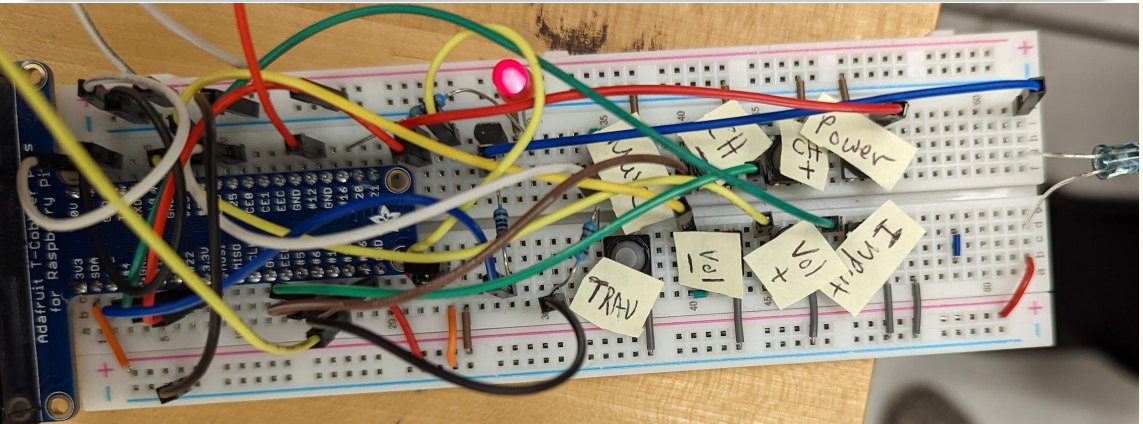




# Voice Recognition Alternatives

| |  |  |  |
|---|---|---|---|
| Detection Accuracy | ++ | ++ | – |
| Offline Availability | + | – | + |
| Access To Data | + | – | ? |
| Setup Cost | – – | + | ++ |
| Power Consumption | – – | + | – |

# Wrap Up


Power
TRAV
Vol -
Vol +
Input


TV ON
TV OFF
SOUND ON
CHANNELS
VOLUME
CHAN PAGE

# Questions?