



The Infinity Board

By: Jake Asmus, Joseph Brown, Daniel Peterjohn, and Jiangning Xiong

The Line Up

- The Problem Statement
- Currently
- Our Solution
- Terminology
- Software Design
- Hardware Design
- Demo
- Questions



The Problem Statement

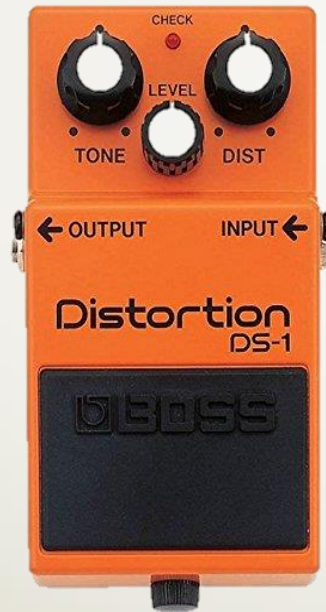
- Asked for a new sound effect device with multiple effects and/or a different way to interact with musicians live
- Our team decided to tackle both problems and allow as much flexibility as possible for the musician

What is a Pedal?

- To the right is an example of a typical guitar pedal



What is a Pedal Board?



Our Solution

- Multiple Sound Options:
 - Multiple Effects from one input to two outputs
 - One output will be the original signal, unchanged
 - The other output will be the effect signal
 - Allowing the user to maximize/diversify their sound and musical options
- Unique User Interface:
 - The pedal board that can do it all
 - Rearranging the effects on the board, wirelessly and painlessly
 - The “knob” values can be adjusted for each effect in the pedal board
 - Quicker, easier, and more accurate adjustments in a live setting

Infinity Board – Broad Scale Idea

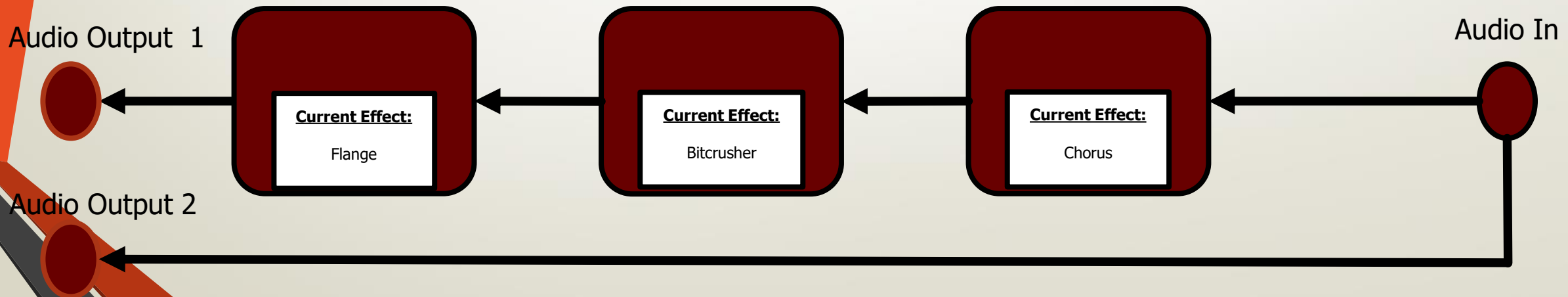
- Have “n” pedal effects
- Sequence “n” pedal effects



Infinity Board – Small Scale Implementation

- For the Project
 - 5 Pedal Effects
 - Sequence 3 Pedal Effects

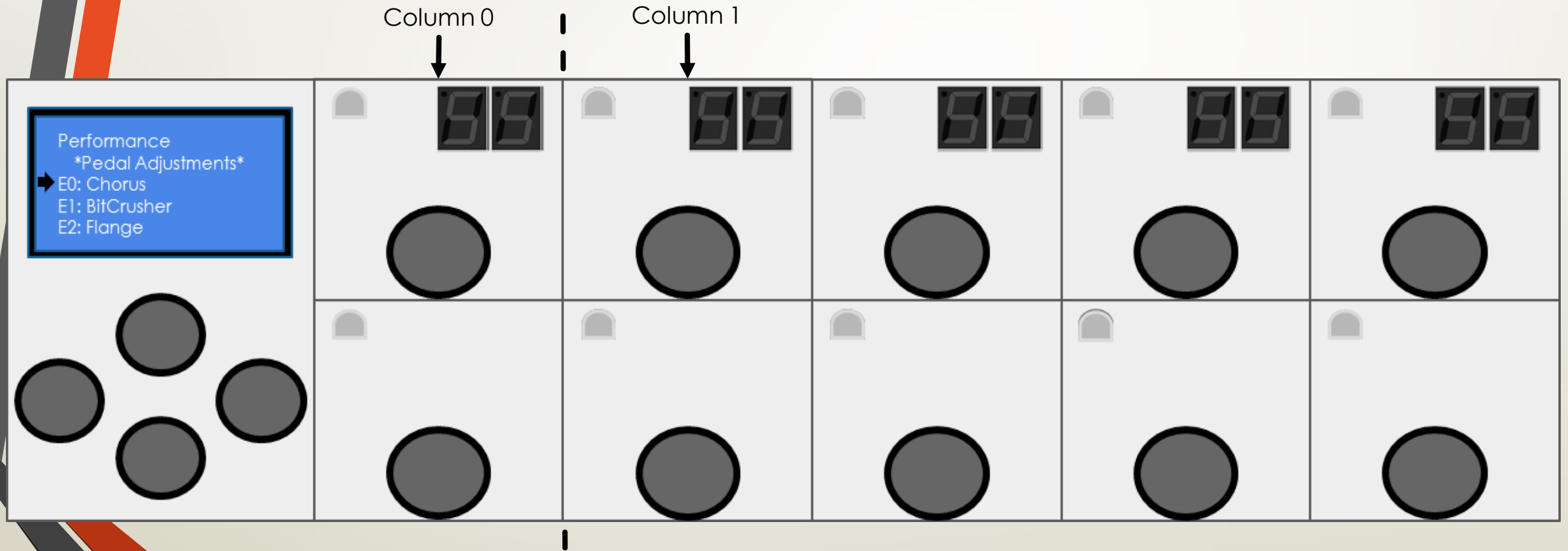
Effect List:
1: PassThrough
2: Chorus
3: Reverb
4: Flange
5: BitCrusher



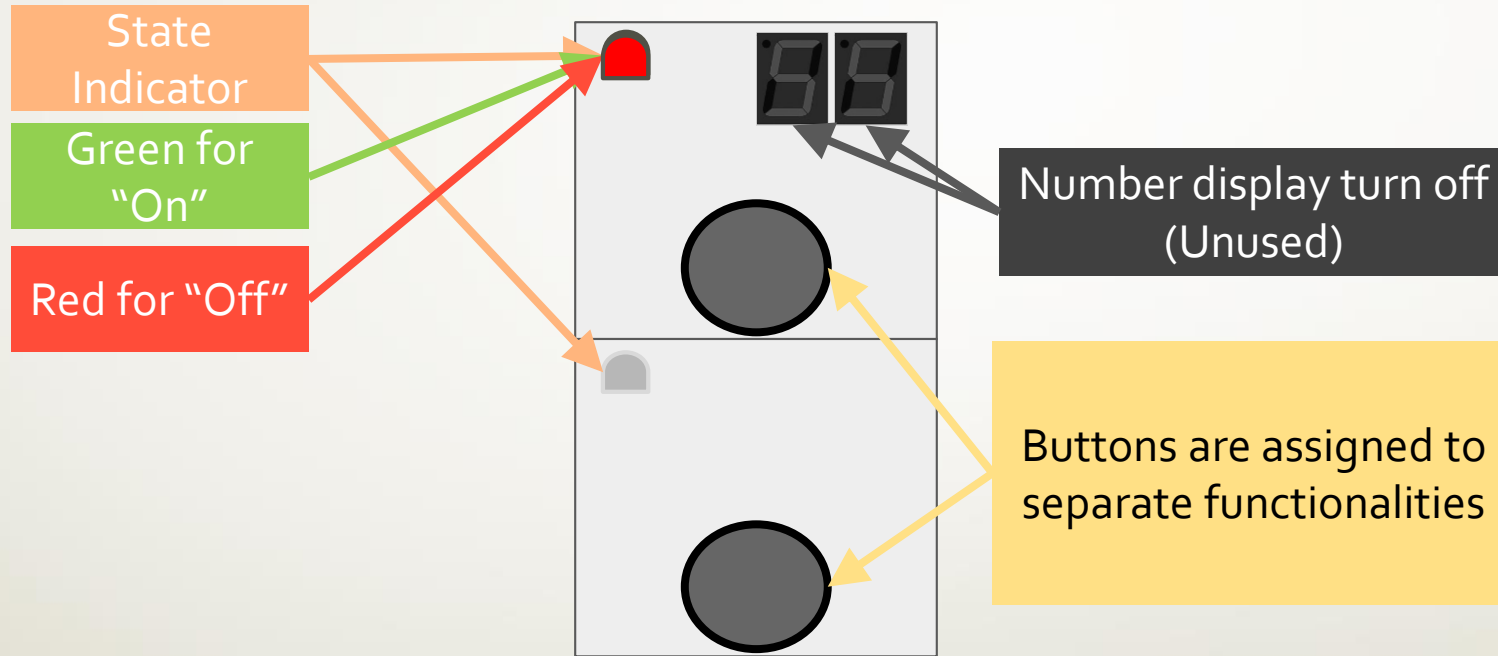


Terminology

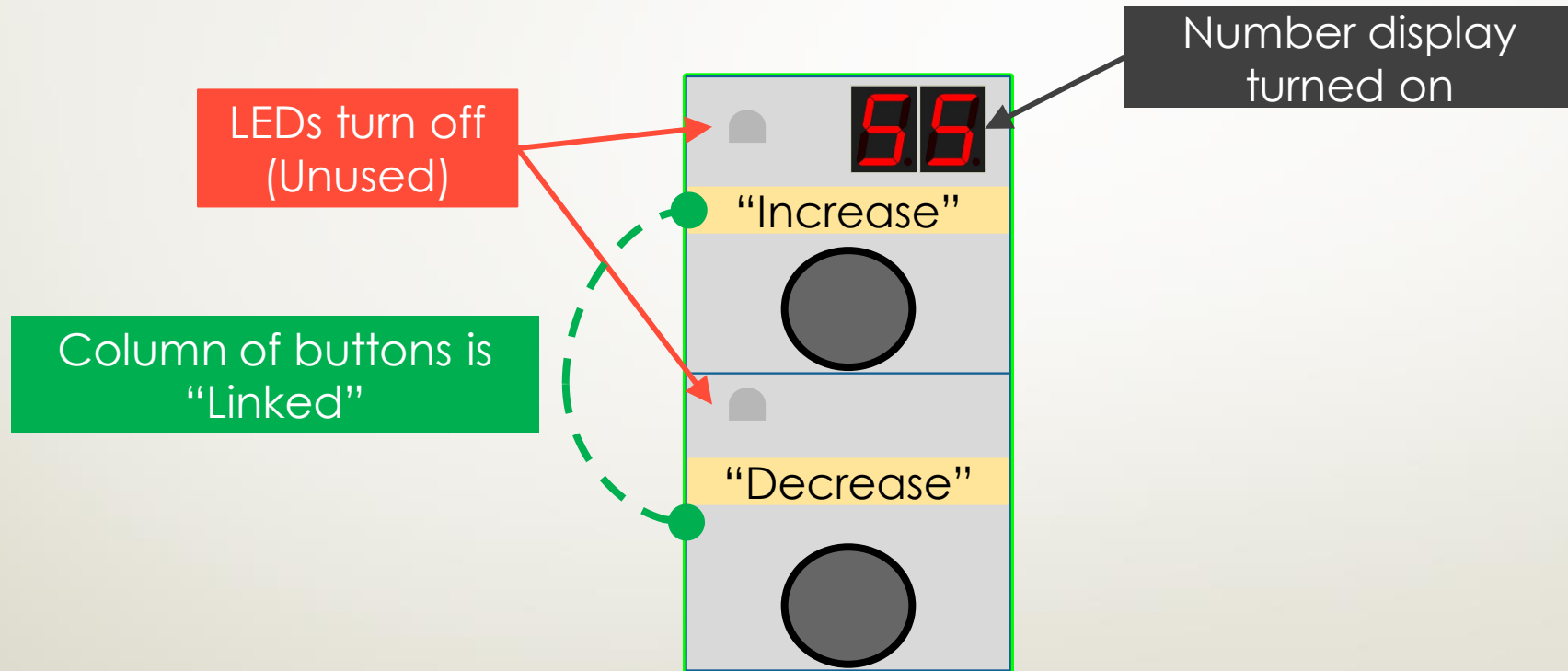
Columns and Cells



Toggle Mode



Knob Mode





Software Design

Teensy Audio Library

Audio System Design Tool for [Teensy Audio Library](#) Export Import

input

- i2s
- i2s_quad
- adc
- adcs
- i2sslave
- tdm
- usb

output

- i2s

filter

AudioInput

AudioOutput

chorus1

bitcrusher1

mixer1

info

Summary

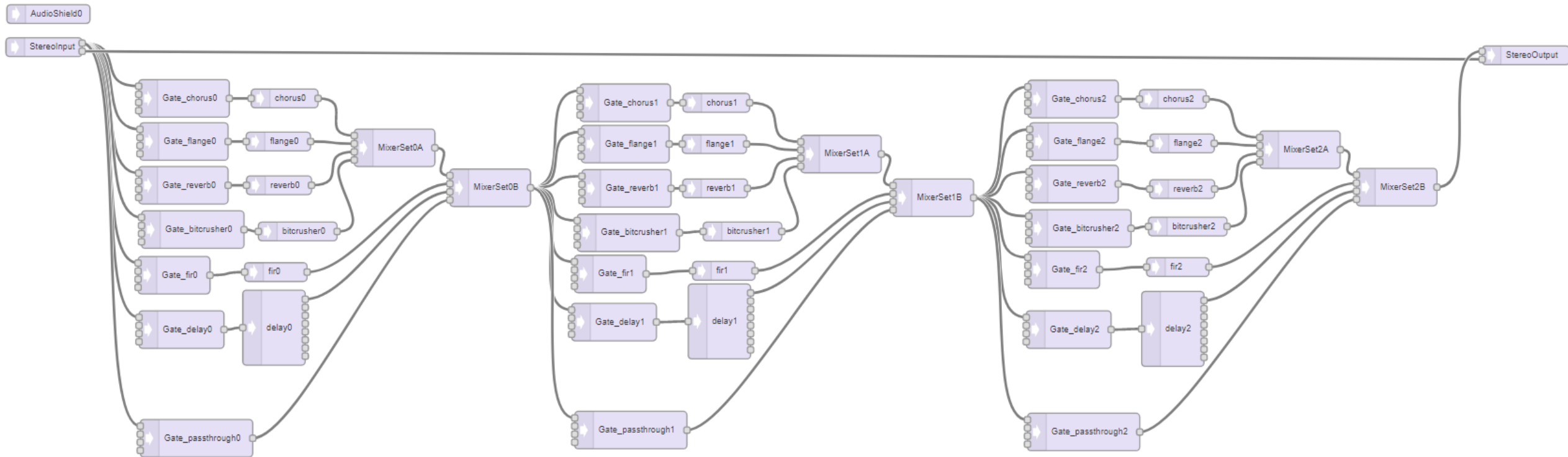
Transmit 16 bit stereo audio to the [audio shield](#) or another I2S device, using I2S master mode.

Right **Left**

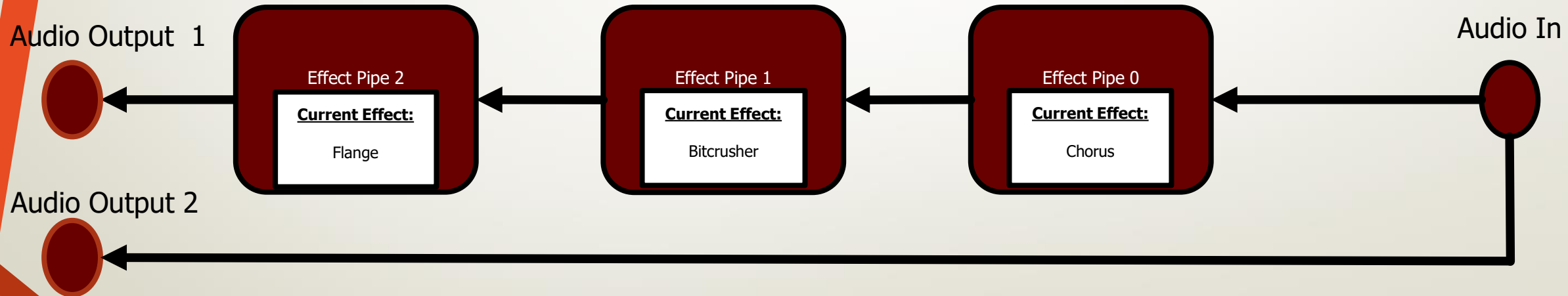
Headphone

GND
VOL
3.3V

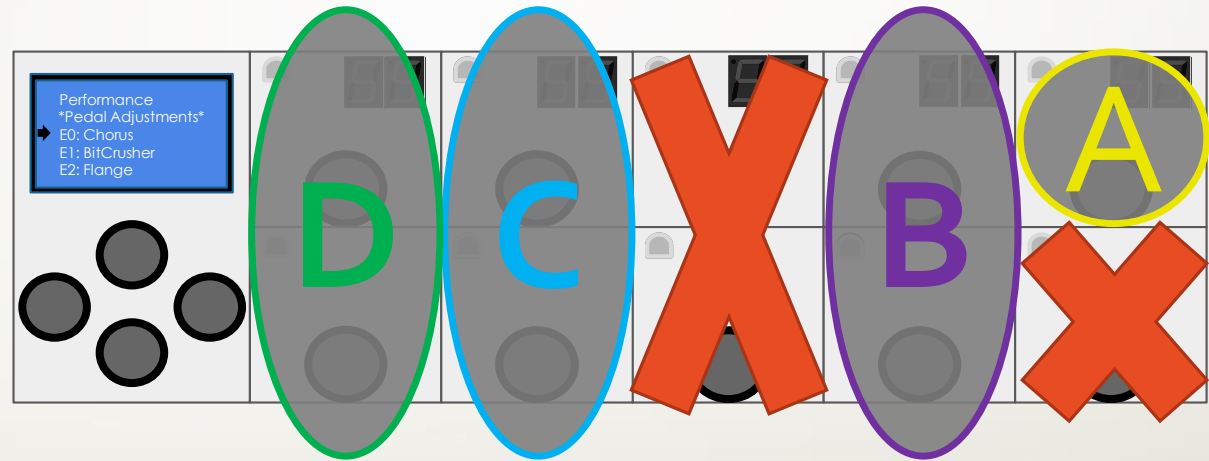
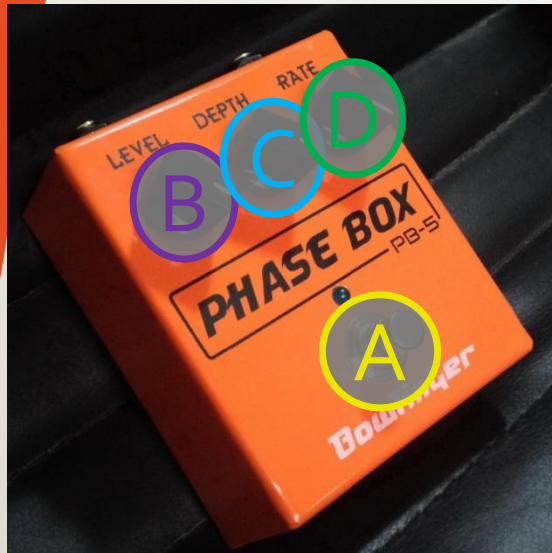
Teensy Audio Library



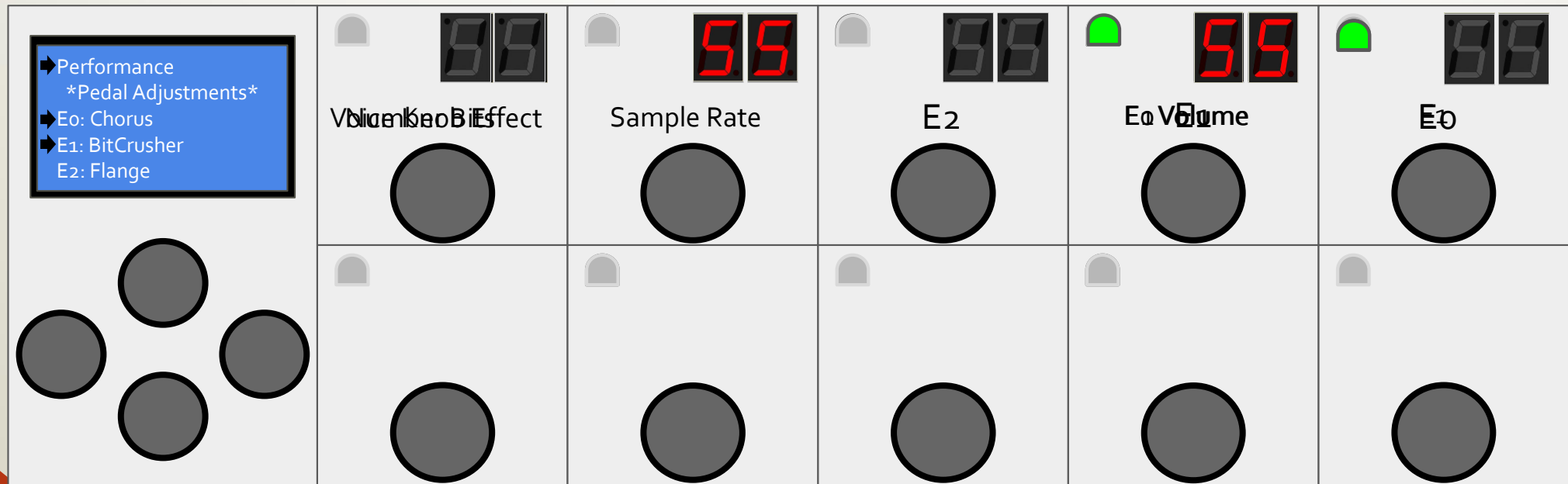
Effect Pipeline Diagram



Pedal Effect Mapping Example



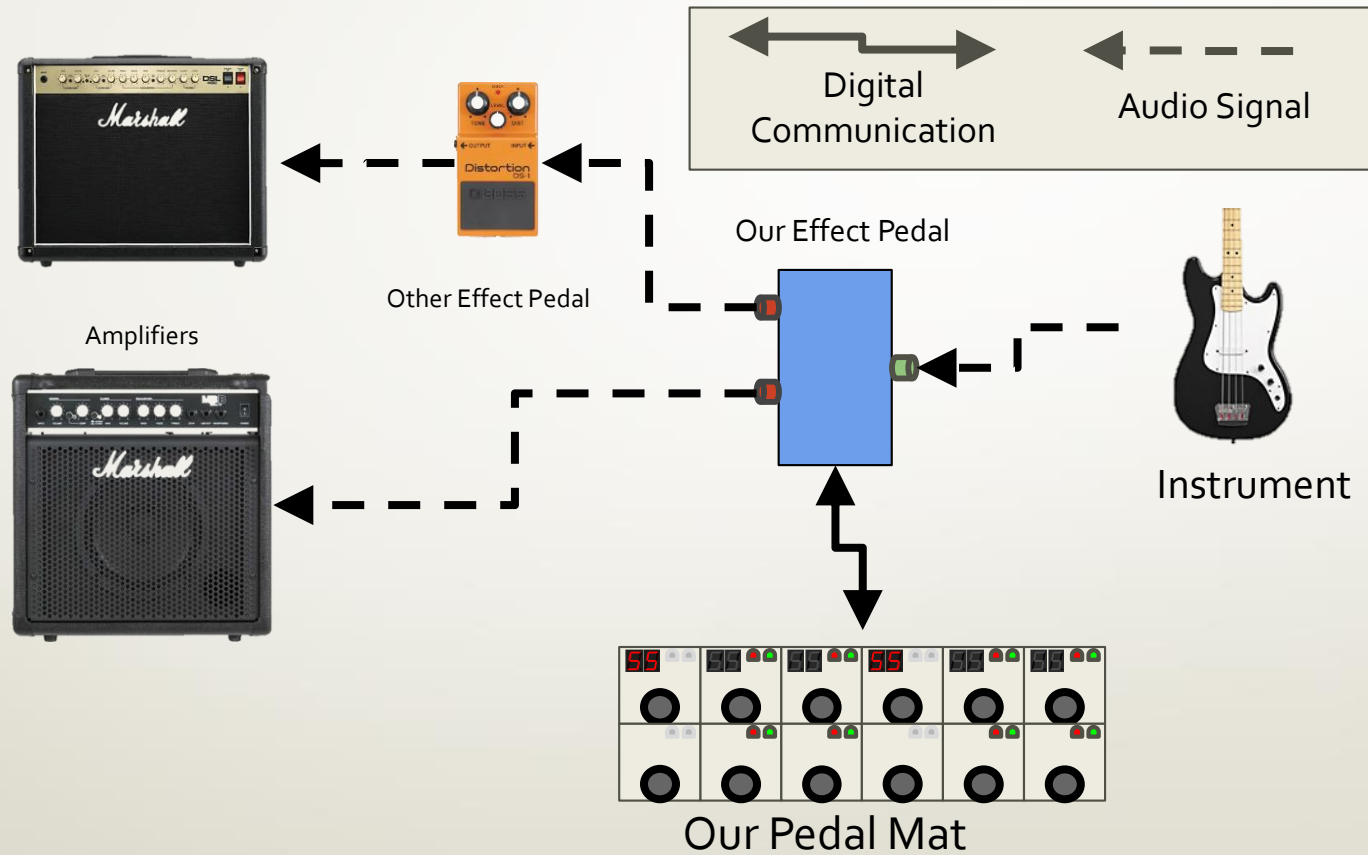
Page Switching



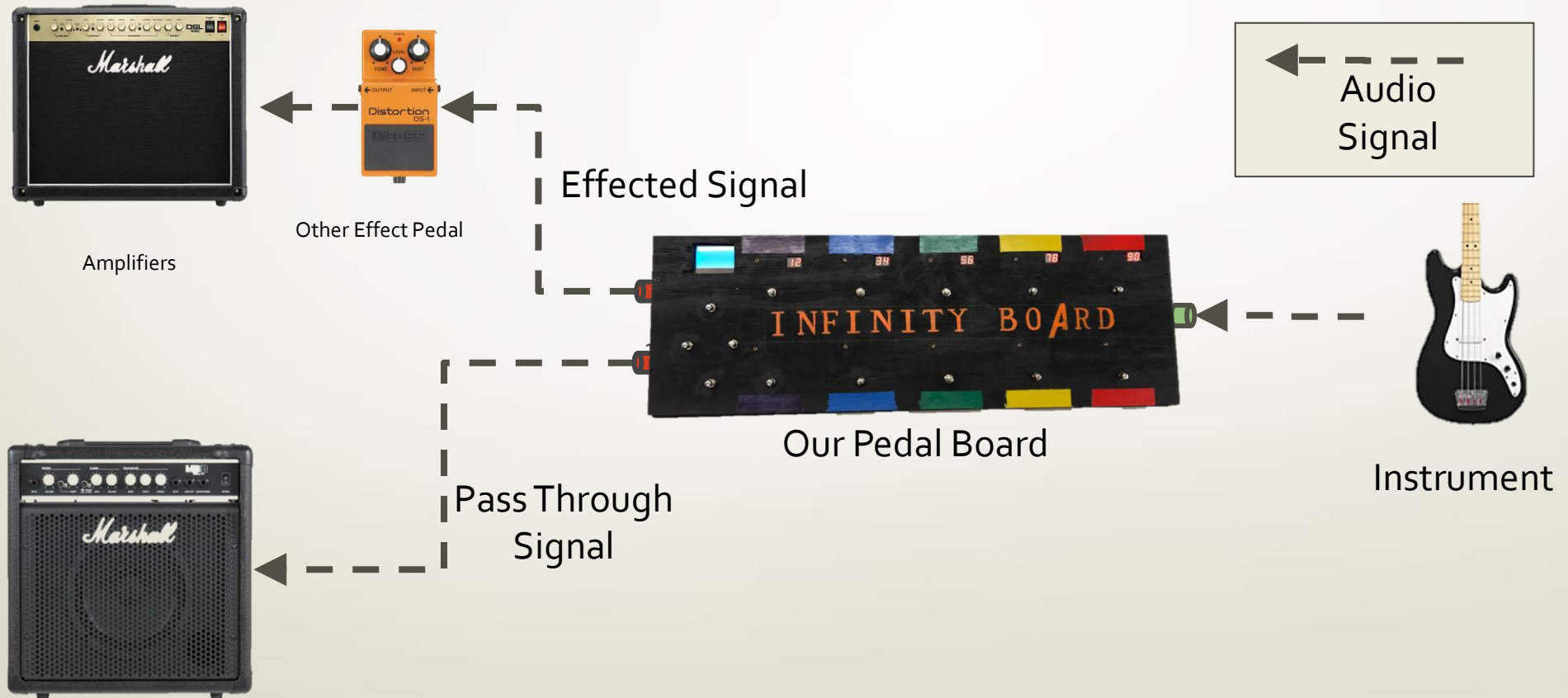


Hardware Design

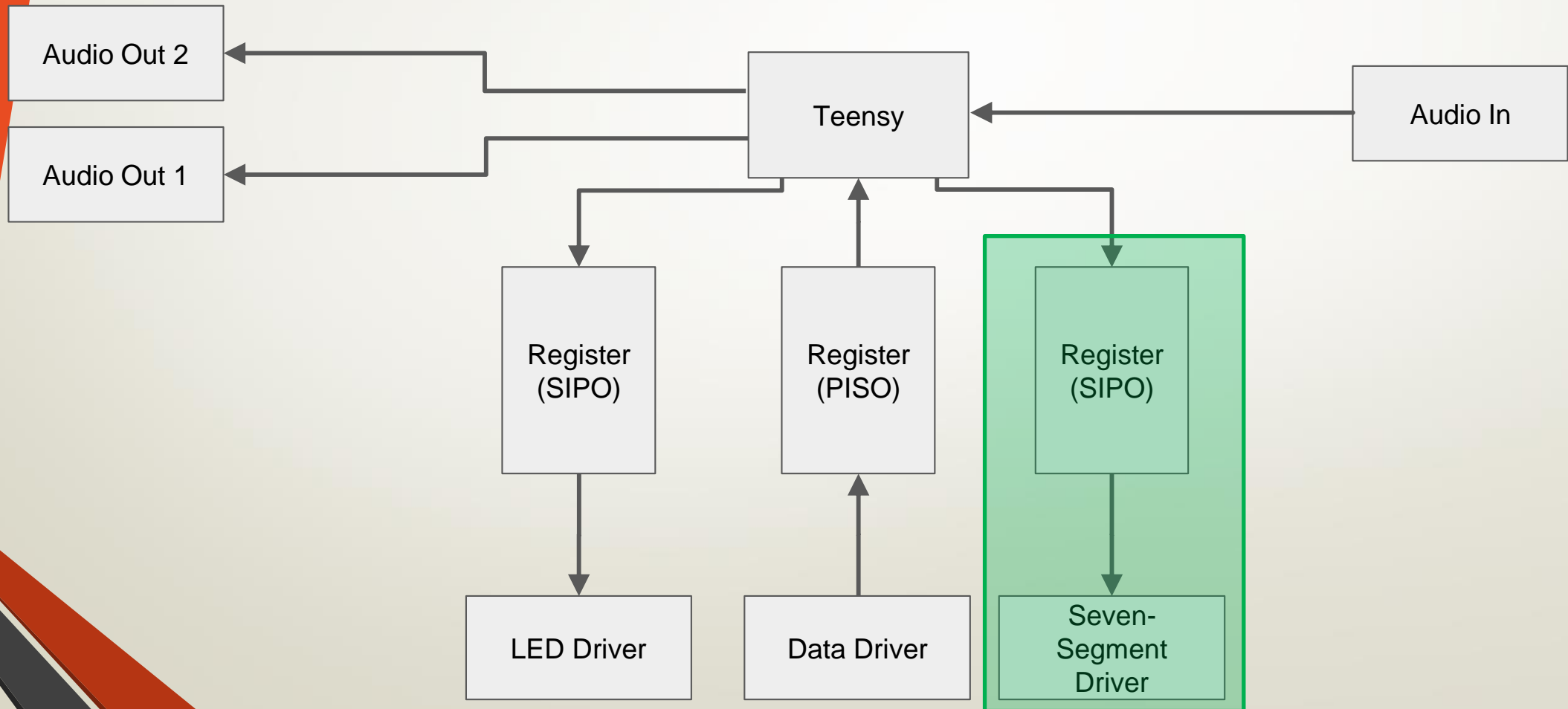
The Old Plan



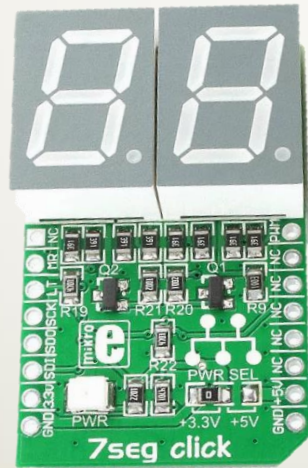
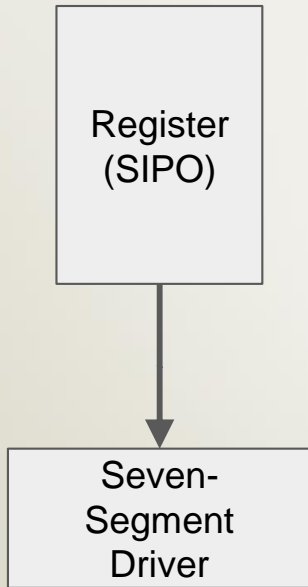
The New Plan



Hardware Diagram

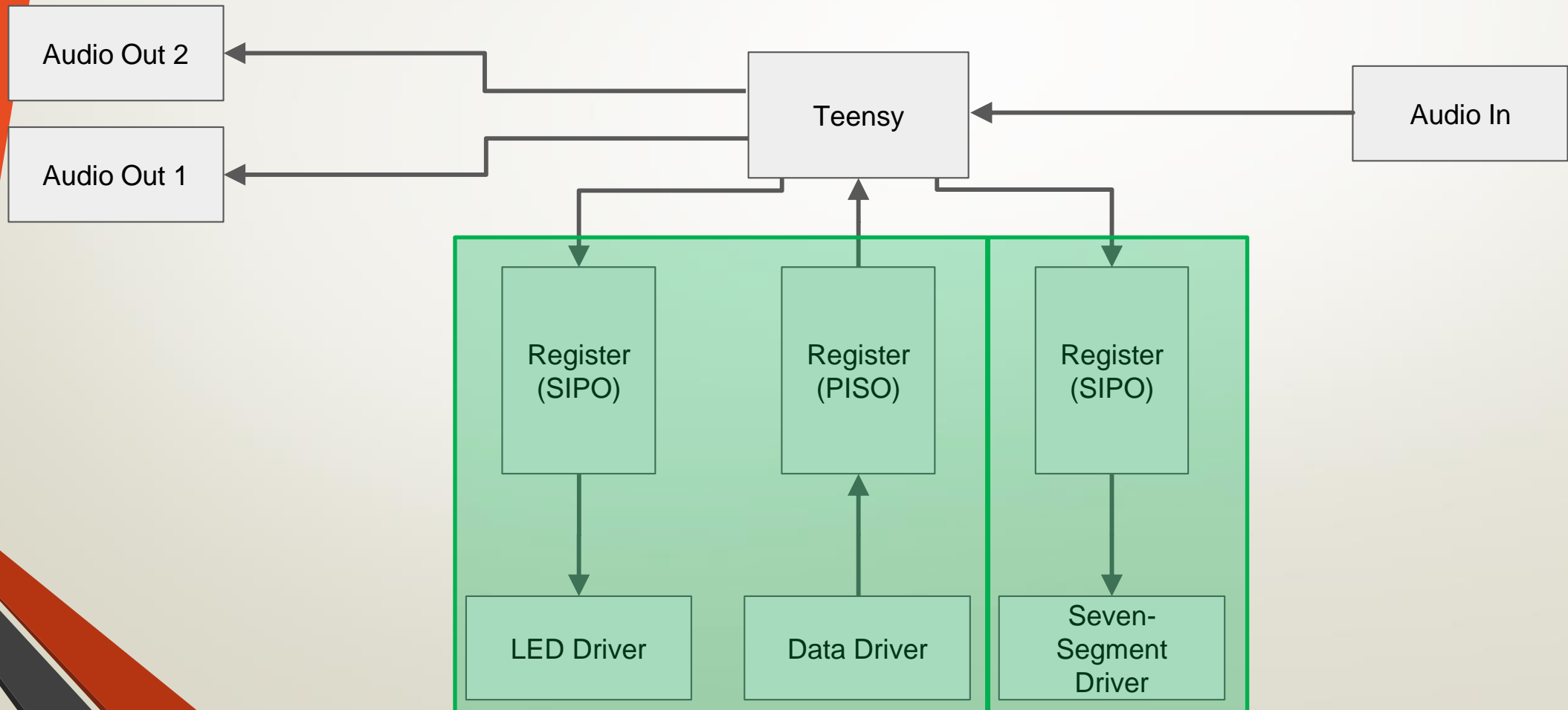


Seven-Segment Driver Hardware

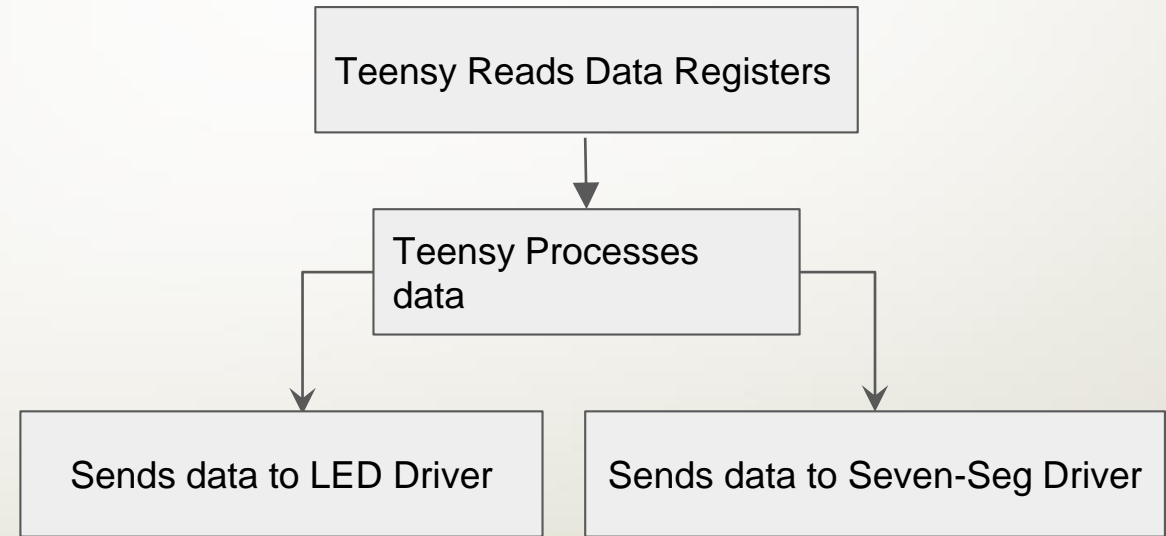
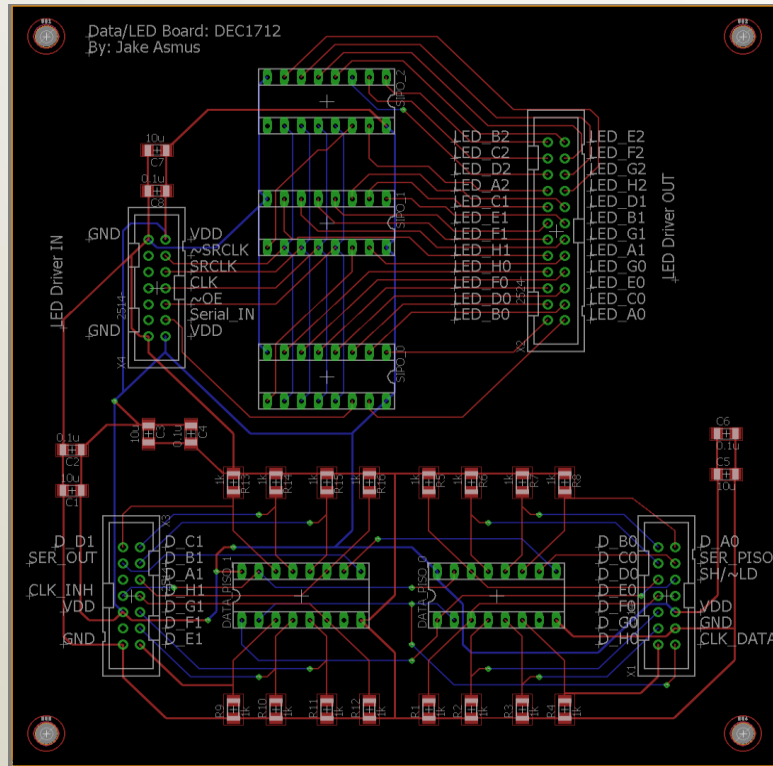


- 5 Seven-Seg PCB for the Infinity Board
- Made the main PCB much smaller
- Just uses data inputs

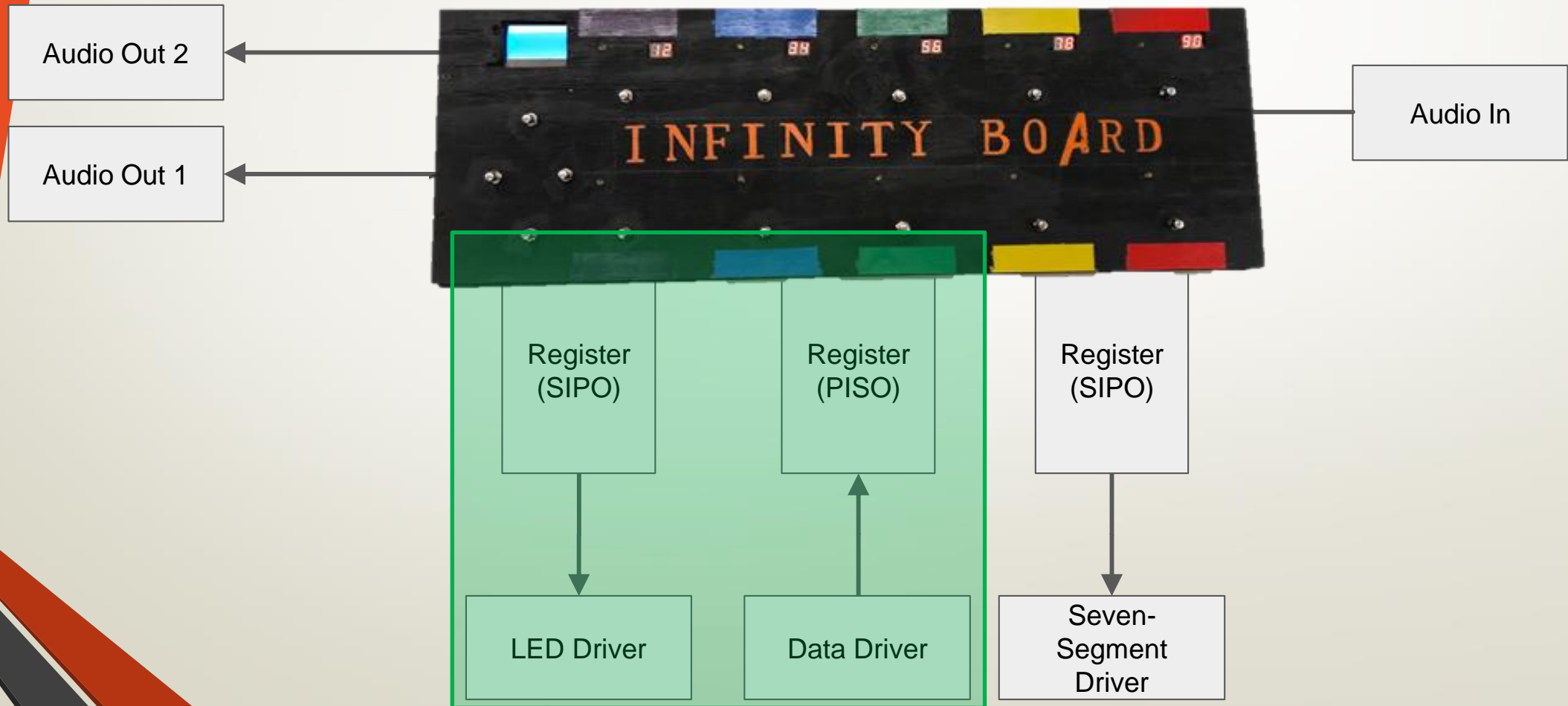
Infinity Board Hardware Diagram



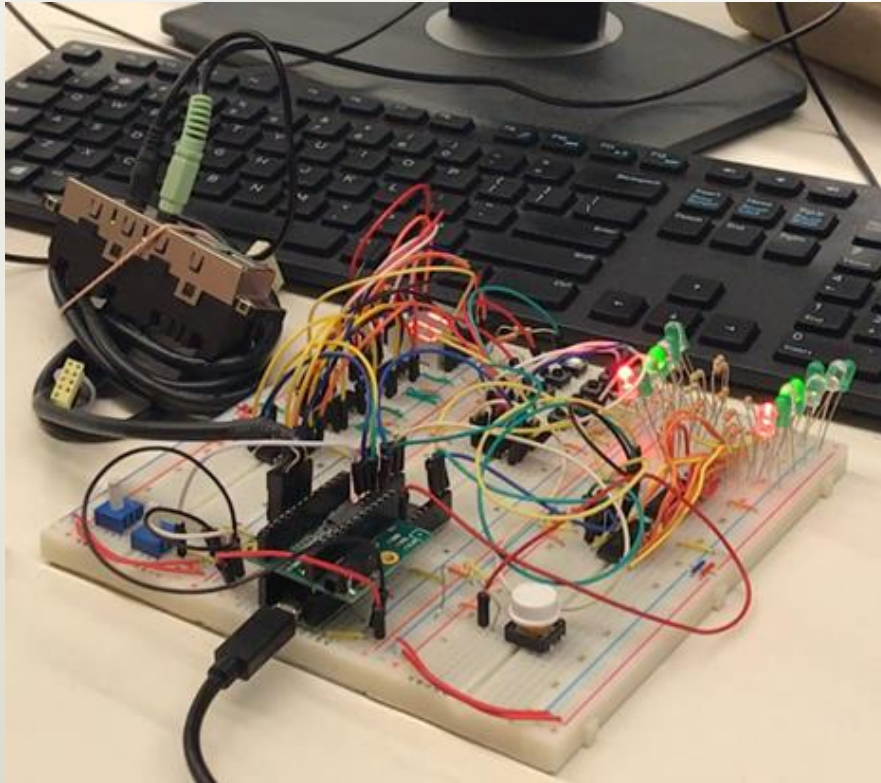
Data and LED Driver Hardware



Infinity Board Hardware Diagram



Semester 1 Project



Semester 2 Project





Demo Time!!!

Questions?