Gesture Controlled Alarm Clock

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Purpose

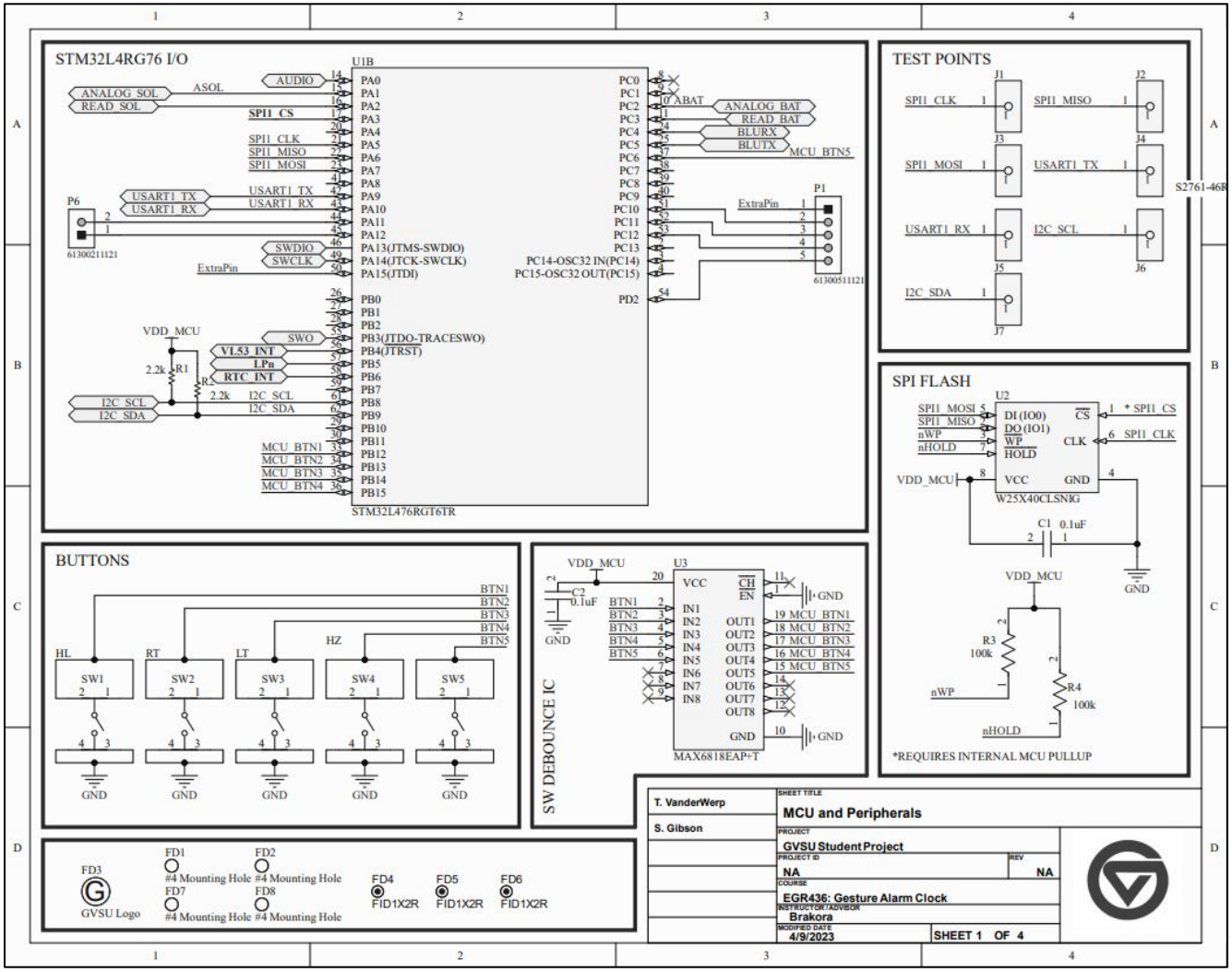
- Alarm Clocks are susceptible to power failure
- Also very unintuitive
- Could be infinitely better if you didn’t have to touch it as much

Solution: VL53L5

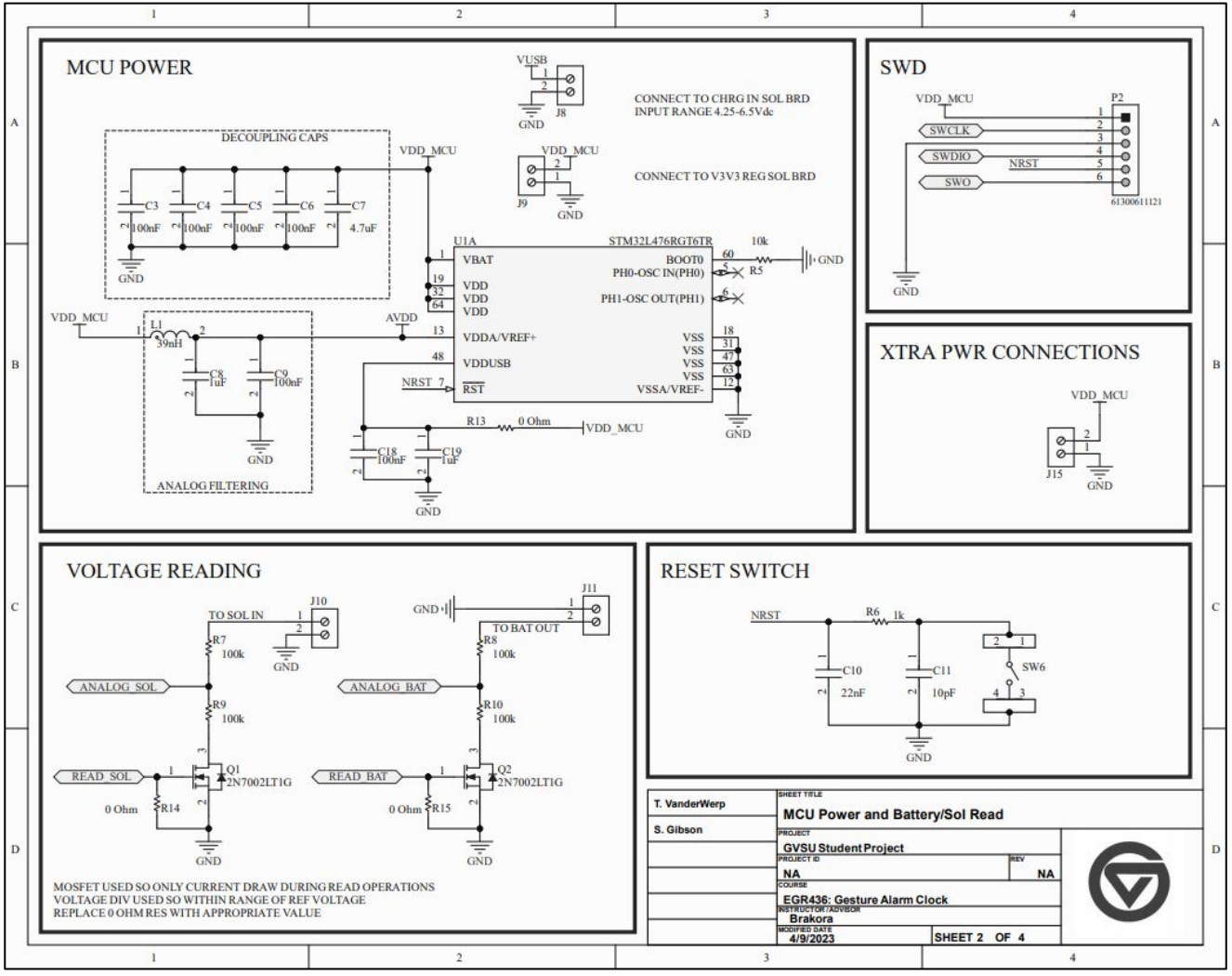
Features to note

- Set alarm via on board buttons, and bluetooth
- Read alarm via bluetooth, terminal, and LCD display
- Turn off alarm via gesture or pushbutton
- Alarms are stored on flash and exist after a total power out event.
    - Main clock still has to be reset during a total power out event.
- Speaker triggers upon alarm
    - Turned off via button or gesture
- LCD Display only powered during USB connection, increasing battery life of the system.
- Voltage on the battery and solar panel can be viewed on the LCD.

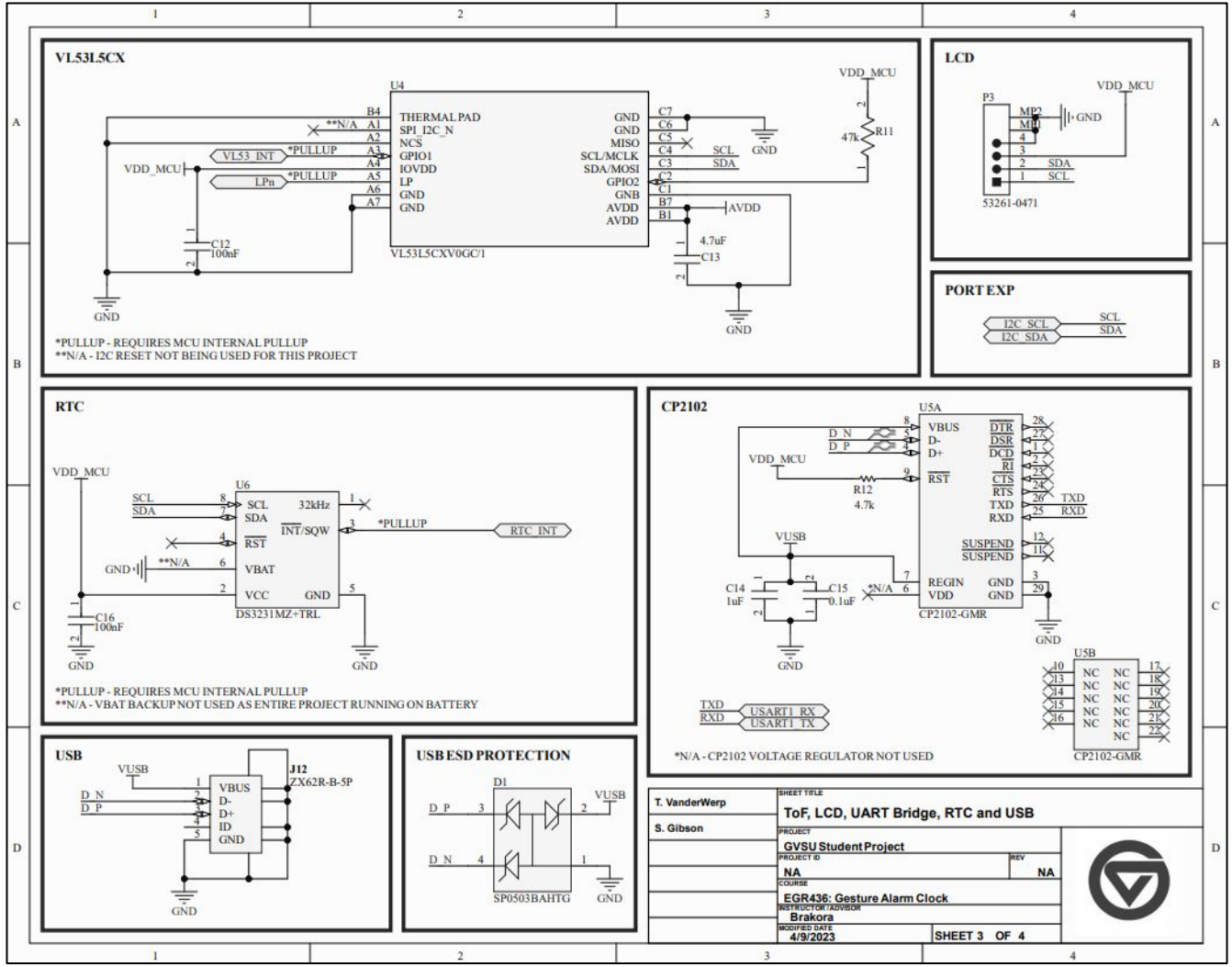
Schematics (1)



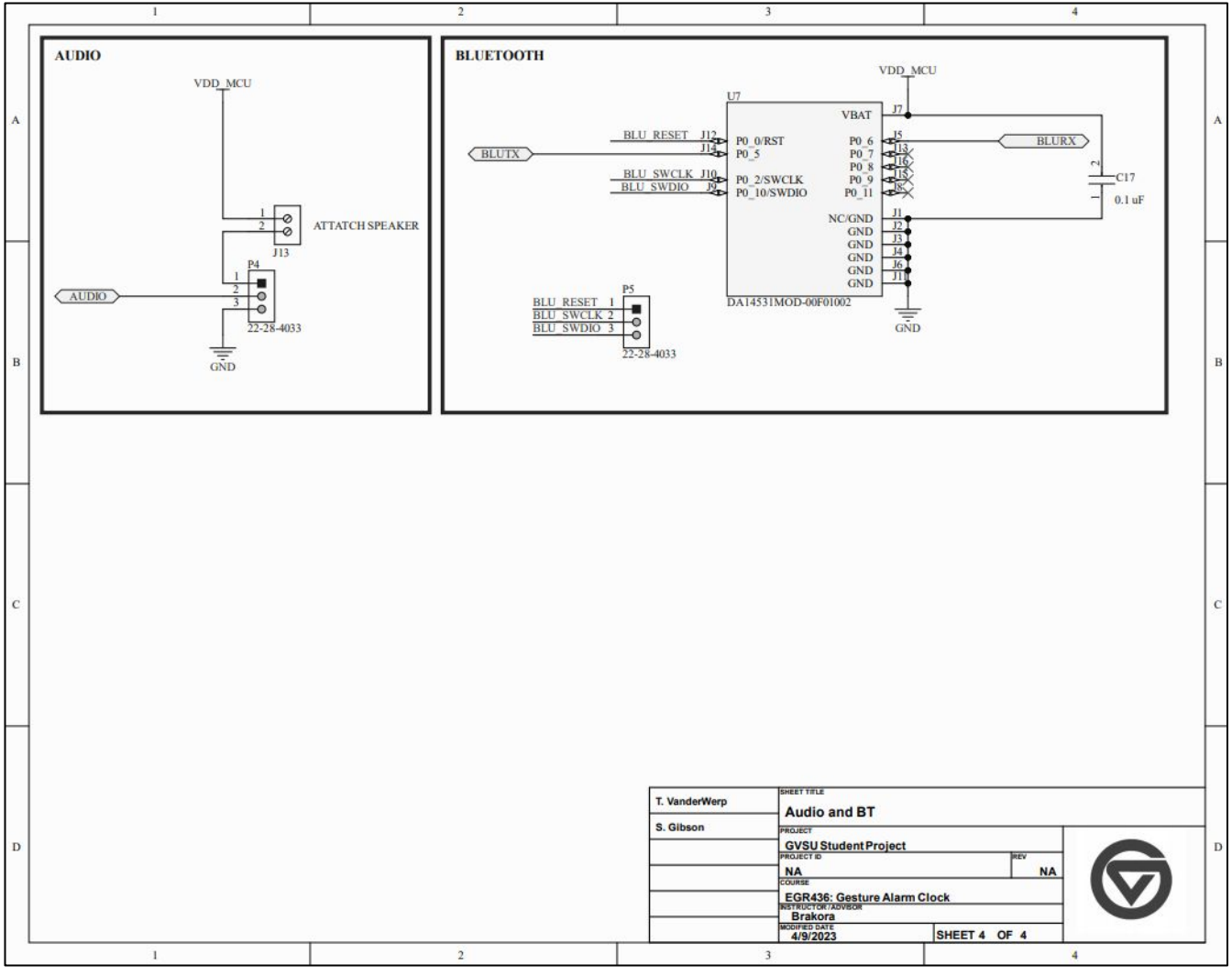
Schematics (2)



Schematics (3)

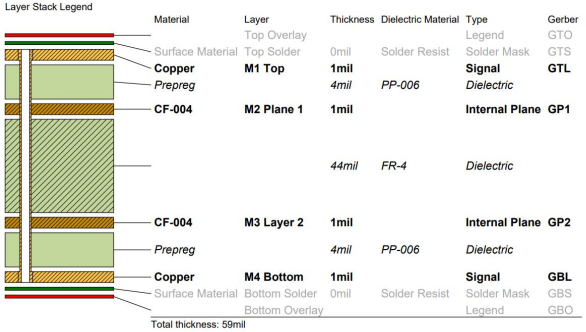


Schematics (4)



PCB

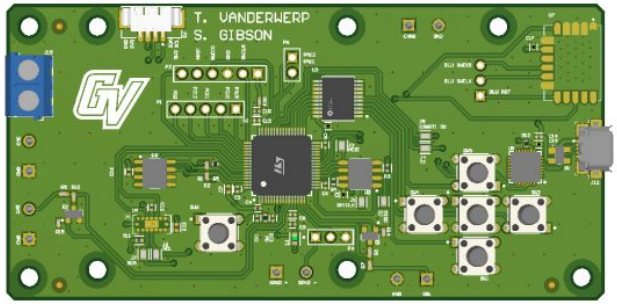
Layer Stack Legend



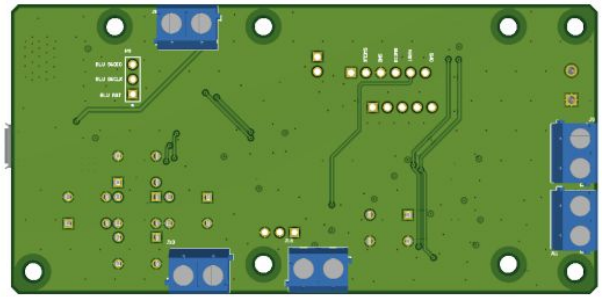
Material	Layer	Thickness	Dielectric Material	Type	Gerber
	Top Overlay			Legend	GTO
Surface Material	Top Solder	0mil	Solder Resist	Solder Mask	GTS
Copper	**M1 Top**	**1mil**		**Signal**	**GTL**
Prepreg		*4mil*	*PP-006*	*Dielectric*	
CF-004	**M2 Plane 1**	**1mil**		**Internal Plane**	**GP1**
		44mil	*FR-4*	*Dielectric*	
CF-004	**M3 Layer 2**	**1mil**		**Internal Plane**	**GP2**
Prepreg		*4mil*	*PP-006*	*Dielectric*	
Copper	**M4 Bottom**	**1mil**		**Signal**	**GBL**
Surface Material	Bottom Solder	0mil	Solder Resist	Solder Mask	GBS
	Bottom Overlay			Legend	GBO

Total thickness: 59mil

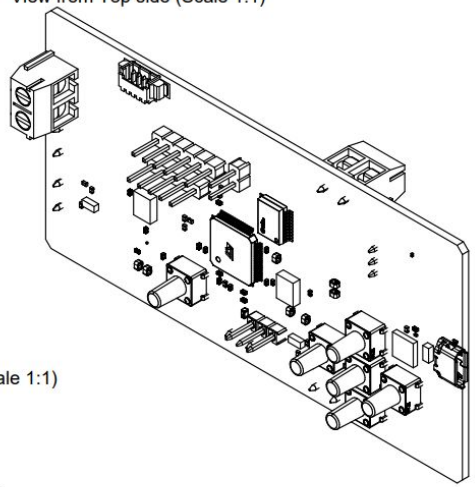
Realistic View



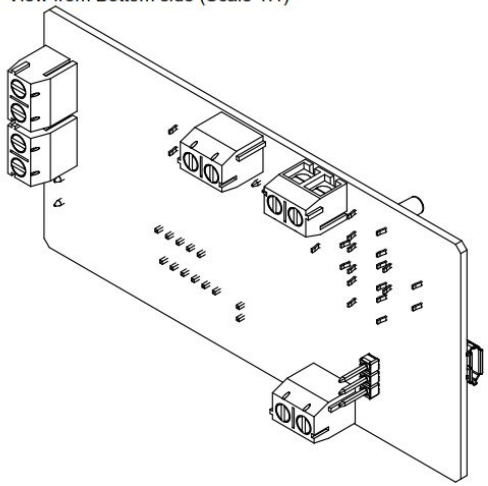
Realistic View



View from Top side (Scale 1:1)



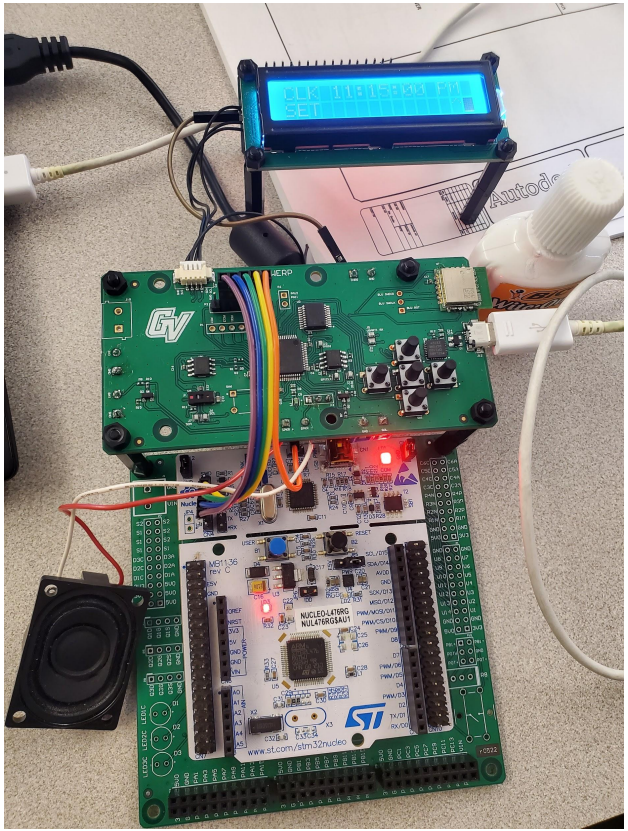
View from Bottom side (Scale 1:1)



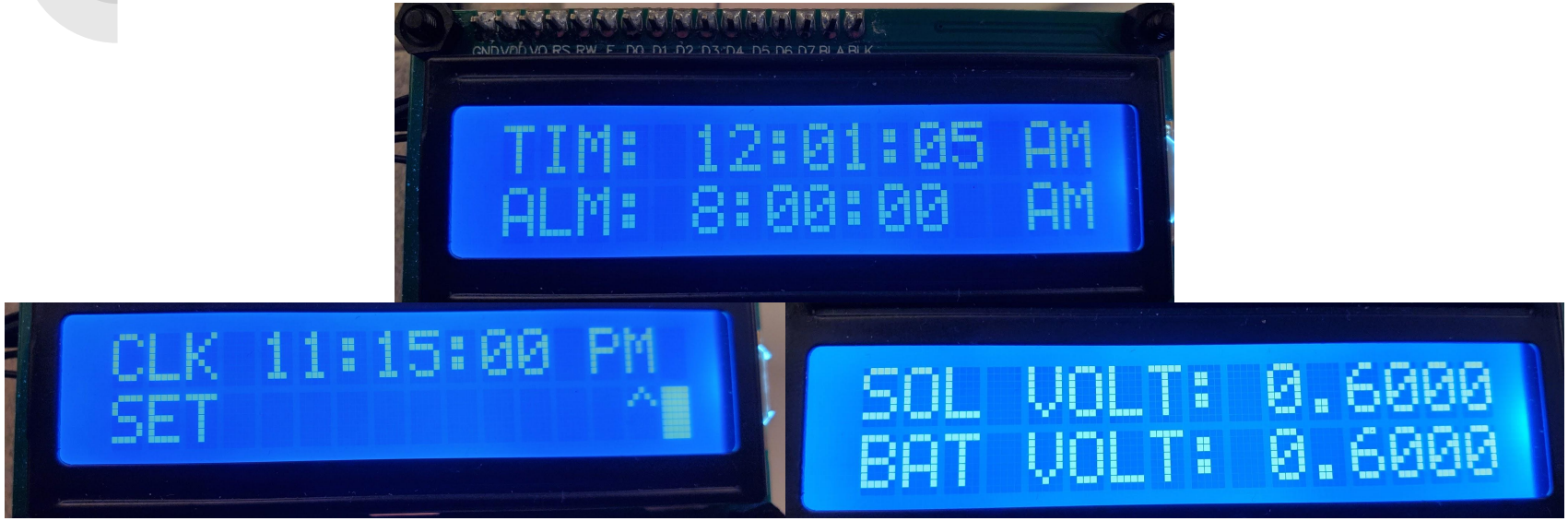
Prototype/Demo

It’ll look pretty,

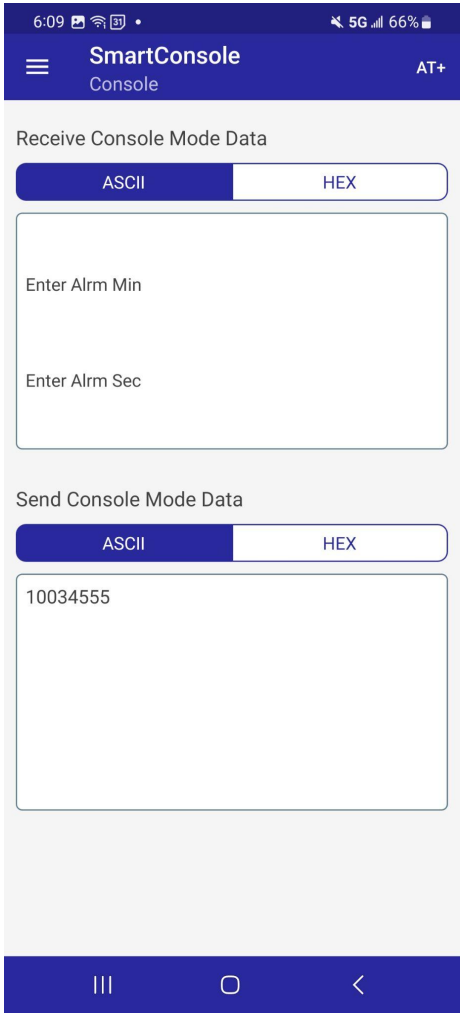
we promise.

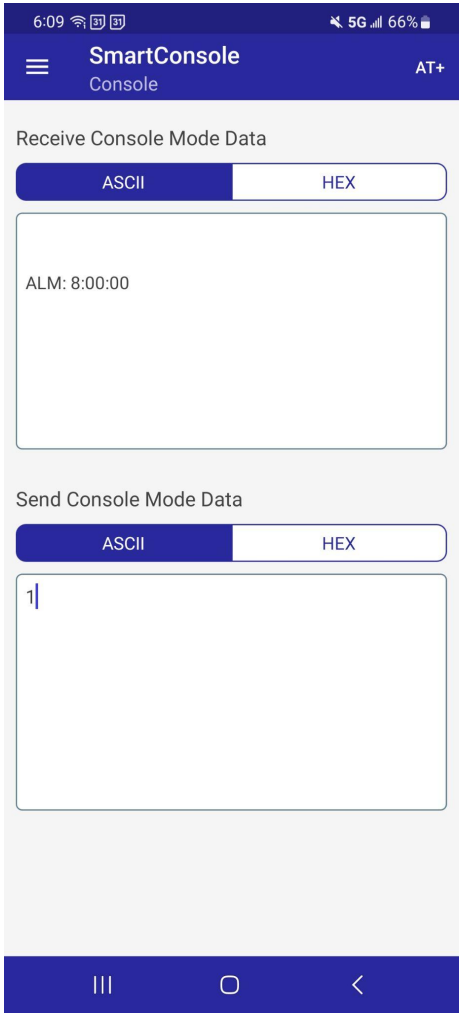


Results

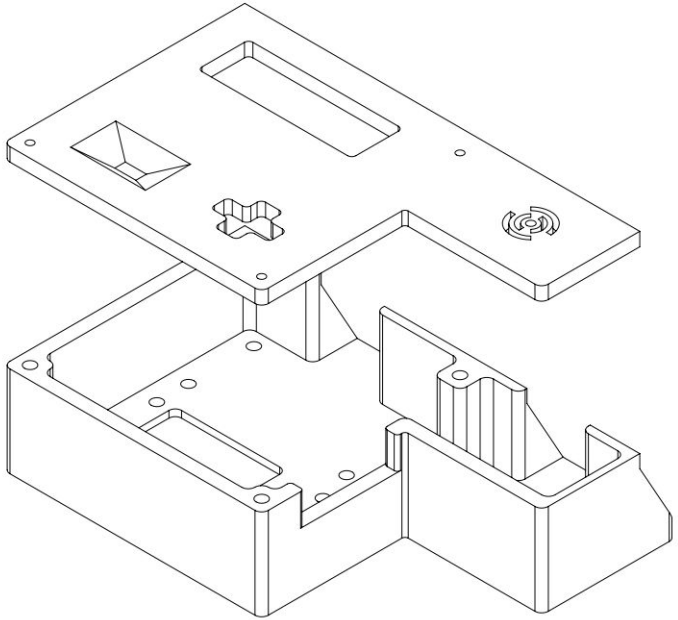

TIM: 12:01:05 AM
ALM: 8:00:00 AM
CLK 11:15:00 PM
SET
SOL VOLT: 0.6000
BAT VOLT: 0.6000

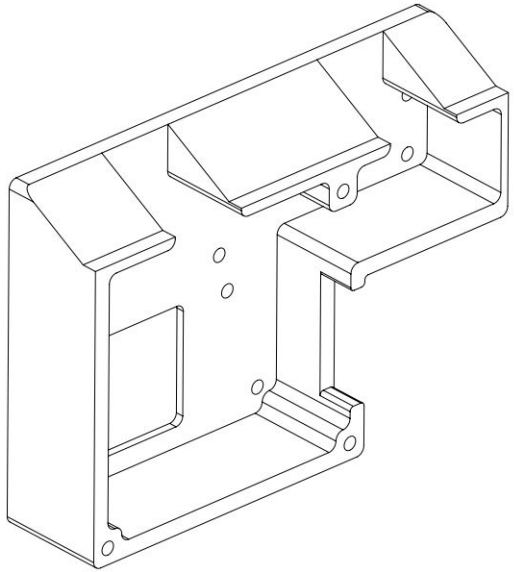
Bluetooth


6:09
5G 66%
SmartConsole
Console
AT+
Receive Console Mode Data
ASCII
HEX
Enter Alrm Min
Enter Alrm Sec
Send Console Mode Data
ASCII
HEX
10034555


6:09
5G 66%
SmartConsole
Console
AT+
Receive Console Mode Data
ASCII
HEX
ALM: 8:00:00
Send Console Mode Data
ASCII
HEX
1

Enclosure





Final Progress (Completed)

- “Legacy” System
  - Solar/Battery/USB Power Capabilities
  - Time and Alarm visible on LCD
  - Alarm visible over UART (Serial & BT)
  - Menu Navigation w/ Buttons
  - Time and Alarm can be set by buttons & hand wave
  - Time and Alarm can be set by UART (Serial & BT)
  - Alarm Time stored to FLASH
  - Voltage ADC Readouts available
  - Alarm Triggers with horrible noise
  - Alarm can be turned off by button & hand wave

Future Improvements (To Do)

- Final System
  - Integrating TOF Time Selection
  - General Debugging
  - Final Assembly
  - **GOAL - Friday, 4/21**
- Cut Features
  - Selecting time values via hand swiping
  - Snooze button functionality

Questions