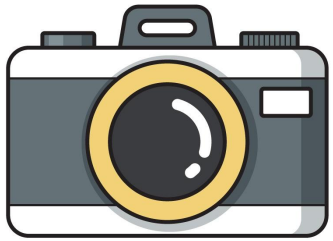
EEC136 Digital Camera



Week 6 Project Update

Waylon, Cassandra, Viktor, Alina, Angel

Overview

1. Assembled PSoC boards
2. Tested out the ADC component
3. Improved and optimized Matlab code
4. Finalized Altium design for the photodiodes

Waylon

This week:

- Worked with Viktor to resolve issues with ADC.
- Worked with Alina to create PCB in Altium.
- Finalized orders for necessary SMD components.

Next week:

- Place order for PCB this weekend after Altium designs are finalized.
- Work with Viktor and Angel with any coding optimizations while waiting for boards.
- Begin developing final report and educational manual.

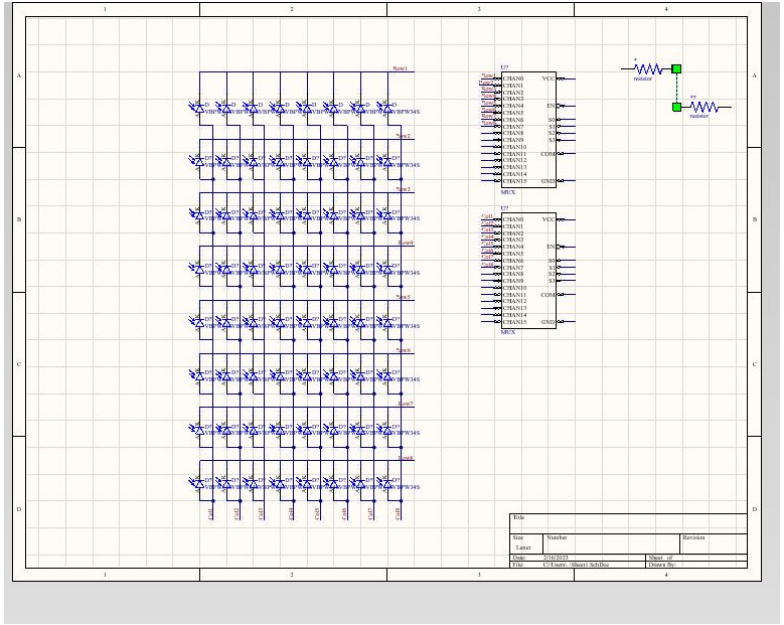
Alina

This week:

- Worked on the schematic for the photodiode board on Altium to begin routing.

Plans for next week:

- PCB Design - Work on the assembly of the photodiode board if it arrives
- Hardware - Test out the ways of how to get ADC working



Viktor

This week:

- Worked through issues with grounding causing erroneous readings on the ADC and Multiplexers.
- Updated PSoC code that allowed ADC readings to occur at the same time as multiplexer switching causing erroneous readings.

Plans for next week:

- Receive photodiode PCBs and begin assembly.
- Work with team on developing final report.

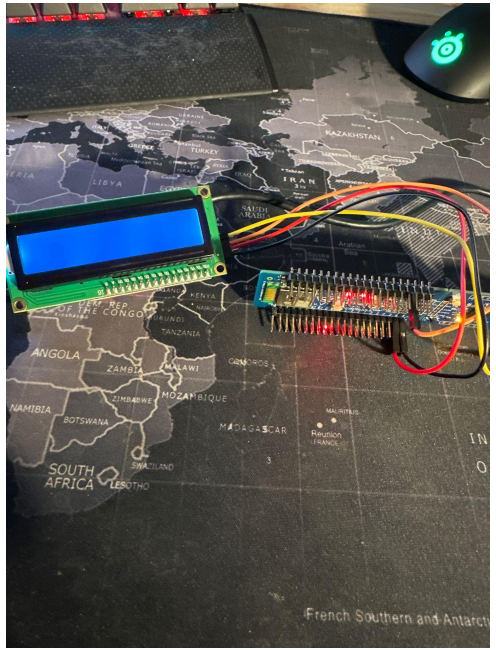
Angel

This week:

- Hardware: Figuring out a way to communicate to a LCD screen with I2C to display text for User Interface.
- Code: Debugged Viktor's Psoc code to read the correct ADC values into putty for image processing.
    - Researched further on UART communicating through MatLab directly from the Psoc port. Cassandra was able to implement the readings using this method, and potentially have a live code.

Plans for next week:

- Start thinking about the enclosure based on all the components that we will have.
- Focus on soldering the new PCB that will be sent to manufacture today, hopefully receive it next week.

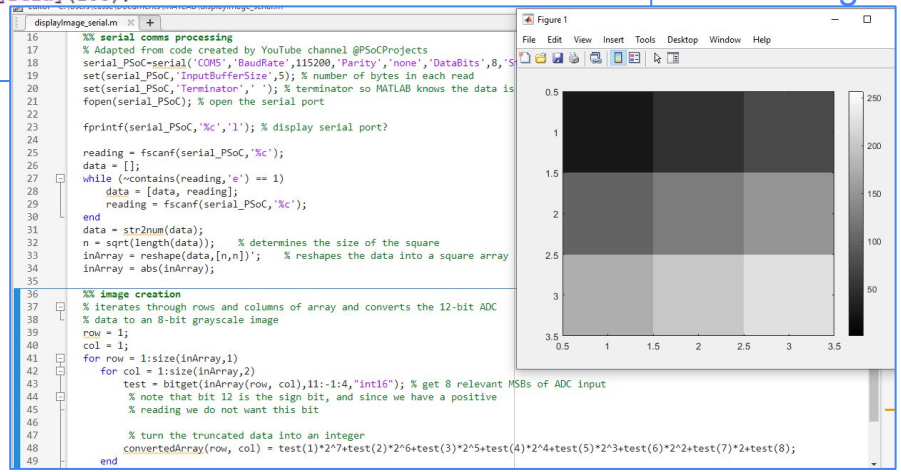


Cassandra

The test firmware

```
for(;;)
{
    /* Place your application code here. */
    if(1UL == Cy_GPIO_Read(P0_4_PORT, P0_4_NUM))
        {
        }
    else
        {
            printf("200 400 600 800 1000 1200 1400 1600 1800 e \n\r");
            CyDelay(100);
            CyDelay(100);
        }
}
```

The resulting image, read through serial



Plans for next week:

- Firmware/Software - test and better integrate MATLAB code with real data acquisition
- Hardware - assist with assembly, if parts arrive
- Documentation - assist with documentation

This week:

- Software - Upgraded MATLAB image processing code - 2 new versions
    1. Reads and processes data from a PuTTY log file
    2. Reads the serial data stream directly (shown in images)

Reference Images

Fig 1.1 New Multiplexer Layout

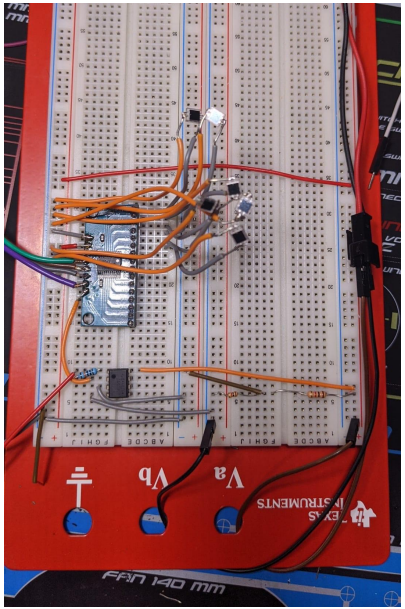


Fig 1.2 Whole Schematic Diagram

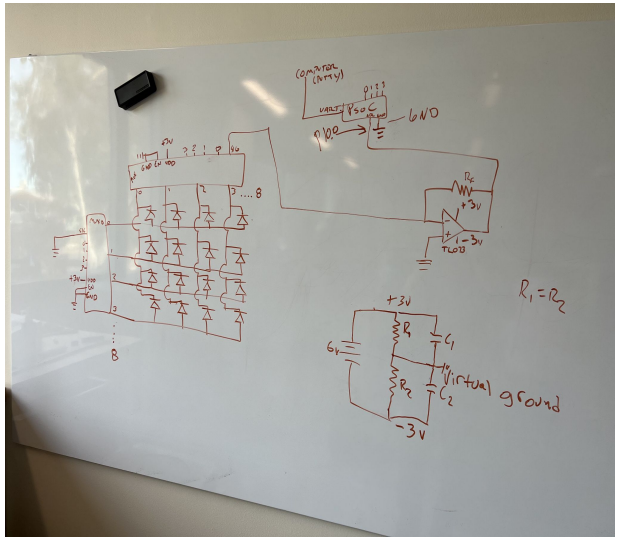
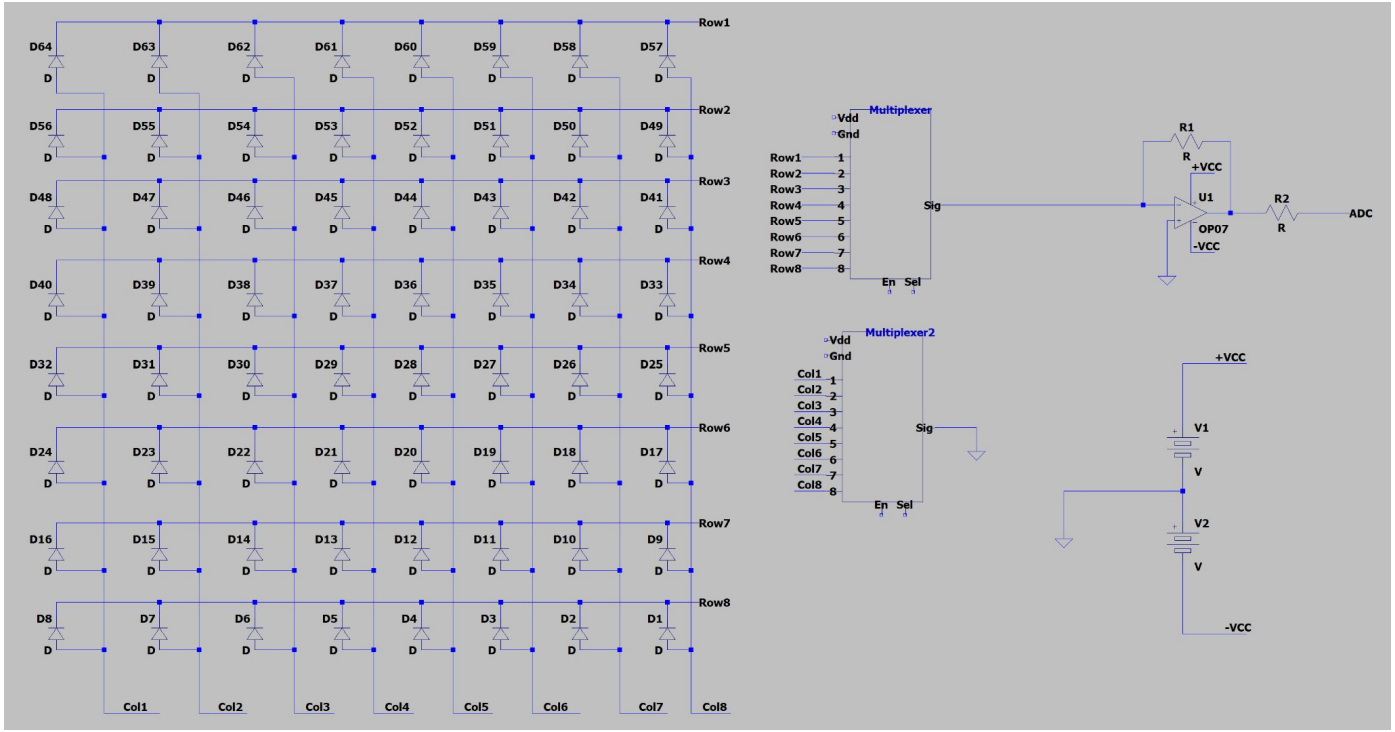


Fig 1.3 PsoC PCB Assembly

Reference Images

Fig 1.4 Sensor PCB Schematic



PROJECT TITLE	Digital Camera	COMPANY NAME	EEC136B
PROJECT MANAGER	Waylon	DATE	2/10/23

WBS NUMBER	TASK TITLE	TASK OWNER	START DATE	DUE DATE	DURATION	PCT OF TASK COMPLETE
1	Project Conception					
1.1	Concept Design	Casandra	1/9/23	1/27/23	18	100%
1.1.1	Bill of Materials	Vic/Way	12/1/22	1/13/23	42	100%
2	Circuit Design					
2.1	PSOC Programming Board	Angel	1/9/23	1/27/23	18	80%
2.2	Photo Diode Board	Alina	1/13/23	2/10/23	27	75%
3	Software/Coding					
3.1	Reading charge on pixels	Cassandra	1/21/22	2/18/22	27	100%
3.2	Processing Data	Cassandra	1/21/22	2/18/22	27	100%
3.4	Displaying Files	Angel	2/4/22	2/25/22	21	90%
4	PCB Assembly					
4.1	Parts Order Placed	Waylon	1/13/23	2/3/23	20	95%
4.2	PCB Boards Order Placed	Angel	1/13/23	2/3/23	20	80%
4.3	Soldering	Waylon	2/11/22	2/18/22	7	15%
4.4	Continuity Testing	Waylon	2/25/22	3/4/22	9	10%
5	Enclosure Design					
5.1	3D Model	Victor	1/14/22	2/11/22	27	5%
5.2	3D Print	Victor	1/28	2/11/22	13	5%
5.3	Assembly		2/11/22	2/18/22	7	0%
5.4						

[Gantt Chart Google Slides Link]

Bill of Materials Page 1 of 2

Item	Part No.	QTY	Cost	Received
Photodiode (final board)	VBPW34S	64	$54.00	
MOSFET (n-type)	SQ1922AEEH-T1_GE3	200	$60.20	X
Button	474-COM-08720	5	$5.25	X
Header Pins	HDR100IMP40M-G-V-TH	10	$4.95	X
PSOC	CYBLE-416045-02	2	TBD	X
Crystal Oscillator	ECS-2520MV-250-CL-TR	1	TBD	X
Battery	LIPO Battery (3.7V)	1	$10.95	X
OLED Display	LCD-13003	2	$35.76	
Tri-LED	HSMD-C191	5	TBD	X
Multiplexer	BOB-13906	2	$5.90	

Bill of Materials Page 2 of 2

Item	Part No.	QTY	Cost	Received
10KΩ Resistor	3503G2B10K7FTDF	4	$6.56	X
0Ω Resistor	MCT0603HZ0000ZP500	10	$6.10	X
1KΩ Resistor	RA73F1J143RBTDF	2	$3.88	X
10uF Capacitor	GMK316BJ106KL-T	1	$0.33	X
22pF Capacitor	12065A220JAT2A	2	$2.80	X
4.7KΩ Resistor	263-4.7K-RC	2	$0.20	X
330Ω Resistor	CMP0805-FX-3300ELF	1	$0.21	X
220Ω Resistor	CRGCQ2512F220K	8	$3.68	X
470Ω Resistor	CRG0603F470R	1	$0.14	X