

EE/CprE/SE 492 Bi-WEEKLY REPORT 03
 2/14/20 – 2/27/20

Group number: sdmay20-11

Project title: Design of a Charge Measurement Device

Client &/Advisor: Jacob Starr/ Long Que

Team Members/Role: Nicholas Wolf – Scribe, Internal Meeting Facilitator – Daniel Frantik, External Meeting Facilitator – Brandon Degelau, Test Engineer – Ben Buettner, Chief Engineer – Keagan Plummer, Report Manager – Colin Ishman

- **Weekly Summary:** For this week, we continued our low voltage testing. We focused on confirming that the system is working as we expect it to when a charge is placed on the input. We also spent time finalizing our high voltage BOM. We have sent out the order of these parts and hope to begin testing the circuit at higher voltages.

- **Past Week Accomplishments:**

- Testing

- Voltage placed on an offboard capacitor to create a charge on it.
- Offboard capacitor then connected to the input of design.
- Voltage measured on output and before the voltage divider.

Voltage	Voltage Across C1	Charge On C1	Measured Voltage Before Op	Measured Output Voltage	Calc Voltage Out	Calc Voltage Before Op amp
5	4.997	4.94E-05	5	0.0575	4.95E-02	4.996494630E+00
6	5.997	5.93E-05	6	0.06	5.94E-02	5.996393495E+00
7	6.997	6.92E-05	7.0625	0.07	6.93E-02	6.996292360E+00
8	7.998	7.91E-05	8	0.08	7.92E-02	7.997191124E+00
9	8.998	8.90E-05	8.9375	0.0875	8.91E-02	8.997089990E+00
10	9.999	9.89E-05	9.935	0.0925	9.90E-02	9.997988754E+00
11	10.999	1.09E-04	10.93	0.11	1.09E-01	1.099788762E+01
12	11.999	1.19E-04	11.9375	0.12	1.19E-01	1.199778648E+01
13	12.999	1.29E-04	1.29E+01	0.1275	1.29E-01	1.299768535E+01
14	13.999	1.38E-04	1.39E+01	0.135	1.39E-01	1.399758421E+01
15	14.999	1.48E-04	1.48E+01	0.145	1.48E-01	1.499748308E+01
16	15.999	1.58E-04	1.60E+01	0.155	1.58E-01	1.599738195E+01

- BOM Update

Index	Quantity	Part Num	Manufact	Descriptio	Customer	Available	Backorder	Unit Price	Extended Price USD
1	4	Y1633-10C	Y1633100	RES SMD 100K OHM		4	0	22.5	90
2	4	HVCB2512	HVCB2512	RES 10M OHM 0.1%		4	0	14.52	58.08
3	2	AD677JRZ	AD677JRZ	IC ADC 16BIT SAR 285		2	0	64.42	128.84
4	4	495-5904-	B88069X2	GDT 760V 10KA THRC		4	0	2.6	10.4
5	2	2201-R317	R3175800	SHV F STR BHDP		2	0	21.13	42.26
6	4	296-48941	OPA189ID	IC OPAMP ZERO-DRIF		4	0	2.57	10.28
7	4	399-16735	C1210C10	CAP CER 1210 1NF 10		4	0	2.08	8.32

- **Pending Complications:**

The only complication we found this week came with the testing. The method of placing charge onto our system we were using involved a capacitor. The problem is that when this capacitor is introduced into our system, it changed the overall capacitance of the system. We took this into account as we calculated the expected values and then measured the results. It is not the most accurate representation of the system, but it did provide data to confirm our circuit was working as we had previously expected.

- **Individual Contributions:**

Name	Contributions	Hours this Week	Hours Cumulative
Keagan Plummer	Low Voltage Testing and data analysis. Discussed addition methods of placing a charge with experts.	14	94
Ben Buettner	Low Voltage Testing and data analysis. Discussed addition methods of placing a charge with experts.	12	93

Nick Wolf	BOM update and Parts Order. Discussed addition methods of placing a charge with experts.	16	95
Colin Ishman	BOM update and Parts Order. Discussed addition methods of placing a charge with experts.	11	91
Dan Frantik	Low Voltage Testing and data analysis. Discussed addition methods of placing a charge with experts.	14	95
Brandon Degelau	Low Voltage Testing and data analysis. Discussed addition methods of placing a charge with experts.	13	95

- **Plans for Upcoming Week:**

- Decide if any High Voltage testing can be done on a breadboard
- Begin Schematic and PCB designs on Kicad
- Discuss GUI needs