

## **sdmay19-15: Capacitor Gun**

Week 6 Report

April 11 - April 19

Client: Max Balzer

Faculty Advisor: Mani Mina

### **Team Members**

Grant Larson — *Test and Design Engineer*

Max Balzer — *Meeting Facilitator and Production Engineer*

Bret Tomoson — *Projectile and Power System Designer*

Brett Nelson — *Documentation, Engineer Designer*

Mark Fowler — *Test Engineer, scribe*

Zachee Saleng — *Engineer designer*

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### **Summary of Progress this Report**

We reflected on what we accomplished last semester as a group and what we need to improve on and change. We split into three groups to effectively divide up the work which Mani recommended in our bi-weekly meeting.

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### **Past Week Accomplishments**

- Split into three groups to divide work
  - Group 1: Max and Bret will work on creating a small, demo model of an electromagnetic propulsion device to help convey engineering theories and technology.
  - Group 2: Mark and Grant will work on the charging circuit either by fixing the current one or making a new one.
  - Group 3: Brett and Zachee will create a document clearly outlining the theory of operation of an electromagnetic propulsion device.
- Worked with group on project poster and final report- Mark
  - Worked with group to add material to project poster.
  - Started work on final report.
- Materials and small scale design research and production- Max
  - We have gone fully to working on the project poster, project report, and the presentation slides.
  - I have come up with theories as to how it would work if we did test it. Some errors I think we would have is unforeseen friction losses and not enough power due to the inoperable charging circuit.
  - We have all worked on the completion of the poster with Bret leading that portion. We will get all of the necessary content on the poster and get that submitted.
- Theory of Operations and final materials - Brett

- Finished up the calculations and other missing areas in this document
- Started to look at the final materials and what all needs to be done
- Finished the project poster - Bret
  - Gathered information for the poster
  - Used outline to create and finish the poster
- Began the beginning stages of designing a new charging circuit -Grant
  - Researched ways to amplify voltages
  - Learned about diode voltage multipliers and rectifiers
  - Created a preliminary design to create 450V
- Theory of operation- Zachee
  - Went through the calculation with brett document template and worked though different questions that we had, and make sure that it meets the requirement about the questions that was asked during the presentation last semester.
  - Added valuable information on the poster

**Pending Issues**

- Work on finalizing documents and equations

**Plans for Upcoming Reporting Period**

We will all continue working to finish the final materials.

**Individual Contributions**

Team Member	Contribution	Weekly Hours	Total Hours
Grant Larson	This week I finished touching up the charging circuit document, began working on our final project report, and added material to our poster design.	4	44
Max Balzer	We have all come together to work on the poster. We have completed the poster and got that submitted. Since we didn't test the project we have discussed how we think it would work if we had a chance to test it.	10	58

	This is just so that we have something to discuss during our presentation day to the IRP.		
Bret Tomoson	Gathered information in an outline from team members and created poster from that information.	10	40
Brett Nelson	Finished up working on the theory of operations and started to look at the final materials and what needs to be done.	10	48
Mark Fowler	Begin working on project report and presentation. Add any relevant material to poster outline. Added information on rails and the structure on the the railgun.	5	39
Zachee Saleng	Worked on the theory of operations "equation part" with Brett. Worked on the poster , adding information such as: current, magnetic field, magnetic force, velocity, and force.	10	48

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### Plans for the Upcoming Week

- In the coming weeks we will be working on Theory of Operations: Zachee
  - Will keep on adding valuable information and references.
  - Continue to clean up the document
- Gather material for project report, presentation, and poster - Mark
  - Help to write the report, adding information obtained from this semester.
- Small scale prototype design and calculations - Max
  - We will all have to work on the presentation slides and report next week.
  - Also, we will continue to discuss how we would like our presentation to go. We will all walkthrough what questions we think we might get and make sure we have all the necessary information set in place for a final presentation.
- Final Materials- Brett
  - Start planning out the materials for the poster
  - Figure out what materials to use for the final report
    - Use materials from project plan, design document and theory of

operations

- Finalize presentation slides
  - Finalize documents - Bret
    - Will be working with the team to finalize all documents
  - Work on final documents and presentations - Grant
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### **Gitlab Activity Summary**

Nothing to report.

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