

Fast, Compact, High Strength Magnetic Pulse Generator

EE 491 Weekly Report

May 15-30

Week 11 (11/10/14-11/17/14)

Advisors: Mani Mina, John Pritchard, Robert Bouda
Client: High Speed Systems Engineering Lab
Members: Team Leader – Adam Kaas
Team Webmaster – Gregory Fontana, Meiyong Himmtann
Team Communication Leader – Brittany Duffy
Team Key Concept Holder – Megan Sharp, Brandon Dixon
Team Commissioner – Alain Ndoutoume
Website: <http://may1530.ece.iastate.edu>

Weekly Summary

This week, our team completed Project Plan 2. In the midst of completing that documentation, our team realized that we would yet again be making major changes to our circuit. Fortunately, we are able to use the same MOSFET we ordered and currently have. Our circuit will need more diodes, capacitors and a way to test the magnetic field. This new circuit design we have sketched up will help to control back EMF and hold a charge of 15 Volts. This design has not been simulated yet, but our team is confident that, at least theoretically, we have a good product to show at the end of this semester.

Meeting Notes

11/10 Group meeting with core members

Duration: 1 hour **Members Present:** All

Purpose and Goals:

Discuss how we can make large progress this week to update our Project Plan 2 with relevant, up-to-date information.

Achievements:

All purposes and goals were met. We assigned necessary tasks to appropriate team members.

11/11 Group meeting with John

Duration: 1 hour **Members Present:** Brandon and Greg + Advisor John

Purpose and Goals:

Ask questions about connectors and testing needs.

Achievements:

New circuit design with additional capacitors to combat inductance in the line. The need for a diode to prevent back EMF into the MOSFET. The team also discussed a need for a comprehensive testing procedure. The schematic for this circuit will be on the next weekly report.

11/11 Group meeting to complete Project Plan 2

Duration: 3 hours **Members Present:** Greg, Brittany, Adam

Purpose and Goals:

Complete Project Plan 2.

Achievements:

After completing finishing touches and running circuit simulation to provide in-depth pictures for documentation, our second project plan was completed.

11/12 Group meeting to discuss future steps

Duration: 1 hour **Members Present:** All Members

Purpose and Goals:

Updates on everyone's progress within the last couple days.

Achievements:

Discuss what our advisor, John, spoke with Brandon and Greg about. Everyone should now be on the same page and know where to move forward with their own parts. We learned what our circuit design is going to look like a bit more so we can include it in our final Design Doc and Project Plan as well as order the correct parts needed (diodes, capacitors, etc). The coil team is now aware of how they will connect their coil to the circuit and also how the magnetic field is going to be measured.

11/13 Group meeting for circuit and coil team

Duration: 1 hour **Members Present:** All Members

Purpose and Goals:

Move forward with our new circuit. Discuss inductance calculations.

Achievements:

Our team tentatively picked a diode and a capacitor so we could get it approved by our advisor. We emailed our advisor asking about these components and he said to multiply our capacitance value by 100. This will give us the store of charge necessary.

Pending Issues

N/A

Plans for Next Week

Adam: Design Document Final work, assist as needed to help ensure board is created and populated this week if possible.

Greg: Complete circuit design with Brittany. Help team finalize parts selection.

Meiyong: Help with the final design document, hopefully get a new prototype made.

Brittany: Work hard on the final design document. Complete circuit design for the semester with Greg. Begin working on PowerPoint presentation we will be showing board of staff members during our final presentation.

Megan: Research resistance of the coil to find how it will affect current and help with the final design document.

Brandon: Try to finish schematic and layout before break, work on design document.

Alain: Work on design documents where it is needed, work with team to simulate the new circuit, implement it on eagle, create it on protomat and test it if possible.

Individual Contributions This Week

Adam: Attended core team meeting on Monday (1hr), Circuit Coil Meeting on Thursday (1hr), Attended team meeting on Wednesday (1hr), Project Plan review and edits (5hrs)

Greg: Attended core team meeting on Monday (1hr), Meeting with John (1 hr), reviewed project plan v2 (2hr) ,Team meeting on Wednesday (1hr), Circuit Coil Meeting on Thursday(1hr)

Meiyong: Attended core team meeting on Monday (1hr), Circuit Coil Meeting on Thursday (1hr), Attended team meeting on Wednesday (1hr), Project Plan review and edits (1.5hrs), worked on website updates (2 hrs)

Brittany: Attended core team meeting on Monday (1hr), Circuit Coil Meeting on Thursday (1hr), Attended team meeting on Wednesday (1hr), Completed Project Plan 2 (3 hr) . Discussed updated circuit design with Greg and Brandon (1 hr). Found new components to order on Digikey after thorough research (1 hr).

Megan: Attended core team meeting on Monday (1hr), Attended team meeting on Wednesday (1hr) Researched coil resistance effect on current. (2hrs)

Brandon: Attended core team meeting (1hr), Meeting with John (1hr), began rebuilding schematic on Eagle (.5hr), looked up circuit components on Eagle and Digikey (1.5hr), Attended circuit coil meeting on Thursday (1hr), Attended team meeting on Wednesday (1hr).

Alain: Attended monday meeting with team(1hr), Worked on project plan 2 (2hrs), started working on eagle to implement our old circuit while waiting on the new circuit from the simulation team(serving as a back up to Brandon, who is working on eagle)(1.75hrs), attended simulation and coil team on thursday(1hr), ordering parts, communicated and kept in touch with Lee (0.25hr)

Total Contributions for Project (This Week / Total for Semester)

Adam: 8 hrs/ 49.65 hrs

Greg: 6 hrs / 44.25 hrs

Meiyong: 6.5 hrs/ 50.25 hrs

Brittany: 8 hrs/ 66.3 hrs

Megan: 4 hrs/ 44.5 hrs

Brandon: 6 hrs/ 46.25 hrs

Alain: 6hrs /42.25hrs