

Fast, Compact, High Strength Magnetic Pulse Generator

EE 491 Weekly Report

May 15-30

Week 9 (10/27/14-11/03/14)

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 reached a vital point in our project. We have found the difficulties in creating low inductance in the coil while achieving the necessary rise and fall times to make a fast switch. Now is an important step in our project as we test various simulations and create test coils. Another part of our team will be soldering on components to the test PCB created from Iowa State's Protomat. This test PCB will create a blinking LED in the circuit. This week, we completed the Design Document and now look forward to updating our Project Plan.

Meeting Notes

10/27 Group meeting with core members

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

Purpose and Goals:

Individual reports covering what everyone will do this week. Discuss finalization of the Design Document.

Achievements:

All purposes and goals were met. Moving forward, Brittany and Greg are responsible of the selection of the MOSFET. We have decided to meet every Wednesday to use as a "work day".

10/27 Group meeting with Coil/MOSFET team

Duration: 2 hours **Members Present:** Greg, Meiyong, Alain, Megan, Brittany

Purpose and Goals:

Brittany and Greg teamed up with Megan in order to determine which components of the circuit we will need.

Achievements:

The team has decided that we need low inductance in the coil. They have decided they will need to know the inductance of the coil before we can choose the MOSFET. Megan is determining whether or not we need a single or dual (helmholtz) coil. We have realized that a successful rise and fall time in the simulations is going to be very difficult to achieve.

10/31 Prototype team meeting with Lee Harker

Duration: 1 hour **Members Present:** Meiyong, Alain, Greg

Purpose and Goals:

The purpose of this meeting was to make more prototype boards to test.

Achievements:

All purposes and goals were met. At this meet up, we were able to make four more prototype boards on the Protomat machine.

Pending Issues

N/A

Plans for Next Week

Adam: Test the Gauss meter with a breadboard circuit with known parameters. Look ahead to the Project Plan and figure out what needs to be updated.

Greg: Play with gauss meter. Work on simulations with the rest of the team. Make some coils.

Meiyong: Solder parts onto a prototype board to test the circuit, take a look at parts needed to be ordered on digikey

Brittany: Focus on simulations with the team. Work with Megan on the single coil. Begin looking at project plan updates.

Megan: Do more research into the MO materials for the center of the coil and work with Greg and Brittany to get a single coil with a small enough number of turns to accomplish a fall time close to our goal.

Brandon: Continue working on new schematic and layout, continue researching parts based on the requirements given by team members and begin ordering parts on digikey.

Alain: Work on the next to-do list with team members. Test circuits we made in the workshop. Order mosfet on digikey.

Individual Contributions This Week

Adam: Attended core team meeting on Monday (1 hr), Help finalize design document (1 hr)

Greg: Attended core team meeting on Monday (1 hr), Met with Meiyong, Megan, Brittany, and Alain about MOSFET and coil (2 hr), Met with Young Mei, Alain, and Lee in lab on Friday to create more circuits board (1hr)

Meiyong: Attended core team meeting on Monday (1 hr), Met with Greg, Megan, Brittany, and Alain about MOSFET and coil (1 hr), Met with Lee in the shop on Friday to create more prototype boards (1hr), looked at different templates for the website (1hr)

Brittany: Attended core team meeting on Monday (1 hr). Met with Greg and Megan to move forward with simulations and coil manipulation (2 hrs). Finalized Design Document (3 hrs).

Megan: Attended core team meeting on Monday (1 hr). Met with Greg and Brittany to move forward with simulations and coil manipulation (2 hrs). Wrote a portion of the Design Document (1 hrs) Looked for alternative website template (0.5 hr) Looked into MO materials (1 hr). Did further coil calculations in Matlab (0.5 hr)

Brandon: Attended team meeting (1 hr), met with John and Alain to get MOSFETs and review how to order parts (1 hr), looked up parts on digikey and began creating an early-stage Eagle schematic for the circuit we will build (1.5 hr)

Alain: Attend team meeting on Monday, summed up last week work, made the to-do list and assigned roles with team members (1hr), met with Megan, Brittany, Meiyong, and Greg, coil and mosfet team to learn more about the mosfet and coil functionality and simulations (2hrs). Meet on Wednesday, work on choosing and how to order the mosfet with Brandon and John to test our circuit (1hr). Met with Lee in lab on Friday to create more circuit boards (1hr)

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

Adam: 2 hrs / 37.15

Greg: 4 hrs /32.75

Meiyong: 4 hrs/ 36.75 hrs

Brittany: 6 hrs/49.8 hrs

Megan: 6 hrs/ 35 hrs

Brandon: 3.5 hrs/ 36.25 hrs

Alain: 5 hrs hrs / 33.25 hrs