Fast, Compact, High Strength Magnetic Pulse Generator

EE 492 Weekly Report | May 15-30 | Week 13

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 focused heavily on getting final results in order to finalize the poster by next week. Members of our team met with the advisor to discuss ways of proving that we achieved 500 G instead of just in theory. Below in meeting information, you can view how we are going to accomplish this task.

Meeting Notes

04/07 Poster Beginnings

Duration: 1 hour **Members Present:** Brittany, Adam, Meiyong
Purpose and Goals: Meet to begin initial stages on poster design, content, and layout.

Achievements: Began work on poster, created .pub file, and shared with all on OneDrive.

04/10 Presenting to John

Duration: 1 hour **Members Present:** All
Purpose and Goals: Get questioned by John about our circuit

Achievements: Discovered what areas we needed to improve our knowledge on.

- Need to go over circuit parts list
- Why those capacitors? - Power line filtering - do we need?
- Tantalum versus Aluminum
- Diodes and safety - Do they work?
- Order new diodes

04/08 Test/Discuss with John

Duration: 1 hour **Members Present:** Adam, Alain, Megan
Purpose and Goals: Alain wanted to perform some testing, Megan and Adam were creating a 16-turn coil with 38 gauge wire to test.

Achievements: Discussed how we can theoretically obtain 500 G. We will explore how to achieve 225 G to test on the FLM material which begins to saturate at 225 G so it is easy to see if it has been obtained. If our calculations for our theoretical gauss match the results, then we know we are performing our work accurately in that instance. We can say with reasonable certainty that we are performing our calculations correctly and we believe we are hitting 500 G. John believes the MLG material cannot latch fast enough and that is why we aren't seeing a

response. The purpose of our circuit is to meet the 1 microsecond requirement but that won't work with the MLG material we are using it on. John thinks this is a great way to test/prove we are doing things right and wants us to emphasize this was our idea when we discuss it in our presentation.

Pending Issues

N/A

Plans for Next Week

Adam: Finalize and submit poster, work on final document, circuit testing
Greg: Work on final document, voltage protection testing and help with poster
Meiyong: Finalize poster, work on final document
Brittany: Finalize poster, circuit testing
Megan: Work on final design doc, circuit testing
Brandon: Learn more about the overvoltage protection of our circuit, update circuit diagram on user guide
Alain: Work on final document, circuit testing, help out with user guide, able to help where help is needed

Individual Contributions This Week

Adam: 04/07 Poster Meeting (1 hr), 04/08 Test/Discuss with John (1 hr), Group team meeting (1 hr), 04/10 Presenting to John (1 hr)
Greg: 04/10 Presenting to John (1 hr), Group team meeting (1 hr)
Meiyong: 04/07 Poster Meeting (1 hr), Group team meeting (1 hr), Work on poster (1 hr), 04/10 Presenting to John (1 hr), Reflow soldering of LEDs and Zener Diodes (1.75 hrs)
Brittany: 04/07 Poster Meeting (1 hr), Work on poster design/layout (2 hrs), Group team meeting (1 hr), weekly report (0.5 hrs), 04/10 Presenting to John (1 hr)
Megan: 04/10 Presenting to John (1 hr), Group team meeting (1 hr)
Brandon: 04/10 Presenting to John (1 hr), Group Meeting (1 hr), Reflow soldering of LEDs and Zener Diodes (1.5 hrs)
Alain: 04/10 Presenting to John (1 hr), Group team meeting(1hr), create a PCB board and videotape process with Protomat S62(1.5hr), Testing Voltage across the coil and Vgs (1hr), Reflow soldering of missing parts with Meiyong and Brandon (1.75hrs)

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

Adam: 4 hrs / 44.5 hrs
Greg: 2 hrs / 38 hrs
Meiyong: 5.75 hrs / 35.5 hrs
Brittany: 5.5 hrs / 39 hrs
Megan: 2 hrs / 28.75 hrs
Brandon: 3.5 hrs / 41.5 hrs
Alain: 6.25/42.5hrs