

EE/CprE/SE 492 GROUP PROGRESS REPORT

Group number: *sdmay22-39*

Project title: *Fast, Compact, High Strength Magnetic Pulse Generator*

Client: *Mani Mina, Wei Shen Theh*

Advisor: *Robert Bouda*

Team Members: *Ben Newell, Harith Arsyad, James Camp, Tom Zaborowski, Tyler Bolton, Raheem Alqunais*

○ **Project Summary:**

The goal of the project is to design and fabricate a device that can speed up signals in optic cable applications via the use of high speed magnetic pulses and magneto-optic material. The device will be capable of producing magnetic field pulses greater than or equal to 500 gauss within 100 nanoseconds, will be powered by a source voltage of less than or equal to 15 Volts DC, and will be less than 3.5" by 2" in physical size. Given the design requirements and resources from the previous iterations of this project, we plan to create an improved design including a reduced rise time of 10ns, functional programmable control of the magnetic field generation, reduced overall noise, and increased stability. The team currently have a monophasic magnetic pulse generator prototype on a perforated board. As of this semester, we are trying to add an op-amp into the pulse generator/resistor network portion of the circuit. The team is also trying to design and test a monophasic and biphasic magnetic pulse generator.

○ **Accomplishments**

The past week, the team worked on creating and simulating a new monophasic design for the magnetic pulse generator in Multisim. Each member worked individually on their own simulations, and the group met Tuesday 2/1 to work out any problems with the simulations. With the monophasic design, the group needed to find an op amp with a high slew rate and change the feedback resistor values to obtain an output that met the requirements.

○ **Pending issues**

The team is awaiting a meeting with the client to determine the applications of the biphasic magnetic pulse generator. Since the client requested the team analyze this circuit this week, we were not able to test the circuit created the previous semester. Once the client explains how he wants the biphasic circuit implemented into the design, the team will continue to test the made circuit. This will have to include testing potential Op-Amps to be used in the biphasic circuit, which may add additional time to producing the final product.

○ **Advisor Input/Signature:**

Please select one of the options below and sign.

_____ I am pleased with the progress the team is making.

_____ The teams progress could use some minor improvements which I will discuss with them.

_____ The team's progress has some major concerns that I will discuss directly with Dr. Bigelow

bigelow@iastate.edu , 515-294-4177

Signature: _____

○ **Client Input/Signature:**

Please select one of the options below and sign.

_____ I am pleased with the progress the team is making.

_____ The teams progress could use some minor improvements which I will discuss with them.

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