

High Current Pulse Generator for the Application of Transcranial Magnetic Stimulation

Clients/ Advisors: Priyam Rastogi, Neelam Gaunkar, Jayaprakash Selvaraj, Dr. Mani Mina

Project Objective: Over the course of 2 semesters, design, fabricate, and test TMS pulses.

Team Members:

Brian Kirkpatrick: Head of Circuit Design

John Rothfus: Head of Micro-Controllers, Team Communications Leader, Webmaster

Tania Alvarado Carias: Head of Electrical Safety

Abdullah Bahashawn: Head of Rectification Circuits

Yan Wang: Head of Component Selection

Curtis Richards: Team Leader

Sub Teams:

Chassis Design: Tania, Curtis, Yan

Rectification Circuit: Abdul, Yan, Brian

Power Circuit: Tania, Curtis, Abdul

Micro Controller: John, Brian

Weekly Summary:

We met with our customers to better understand the project objective and limitations. We are developing sub teams and dividing the team members among them.

Accomplishments of the Past Week:

Every team member has been reviewing documents of past designs write ups for this project as well as doing other types of research. Each member is to write up a reflection on these papers.

Brian standardized our circuit design software.

John successfully found a weekly meeting time for our clients and a group.

Tania researched past circuit designs.

Abdullah researched possible rectification circuits.

Yan researched current project budget limitations, and ways to increase it.

Curtis started analyzing the desired waveform.

Pending Issues:

As a team with the client, we need to better define the requirements of this project and develop a timeline of the deliverables. Below are the current objectives we have:

- Objective of Circuit

Peak Current of 5 KA +10%

EMF feedback must be considered

Peak Current Sustained for 400 μ s

Rise fall time of 100 μ s

Up to 36 KHz pulse frequency (Commercial Benchmark)

Circuit Input- 120 V wall outlet.

- Develop Timeline of Deliverables

Develop a Gantt Chart

Individual Contributions:

Group Member	Accomplishments	Time Worked Last Week	Total Time Worked
Abdul	Research	1	1
Yan	Research +Budget	1	1
John	Research + Micro Control/GUI Specs	3	3
Brian	Research +Eagle Circuit Design	1	1
Tania	Research	3.5	3.5
Chuck	Research +Analyzing Waveform	3	3

Deliverables:

- Semester 1:
 1. Early Concept Implementation and Simulation
 2. Design Circuit with High Current Carrying Components
 3. Programming of Micro-Controller to Control Pulses
 4. Select and Order Components
 5. Assembly of Components
- Semester 2:
 1. Testing of the Pulsar

Individual tasks to be completed before next meeting:

Everyone:

- Research and Write Paper
- Be able to answer these Questions:
 - What is TMS? Explain Faraday's Law and how it applies to this project.
- Request Access to the 324 and Senior Design Lab
- Project Plan
 - Develop a Gant Chart

Yan: Email Prof Zambrino about Budget

EE/CPRE/SE 491 Weekly Report 1
Date: Week of January 29, 2018
Group Number 4

Meeting Times 2:00 – 3:00 P.M. Mondays in TLA

Brian: Email Group Eagle program

Summary of Weekly Advisor Meeting:

We discussed the type of group research we will start doing, and began developing a plan of action for the deliverables.