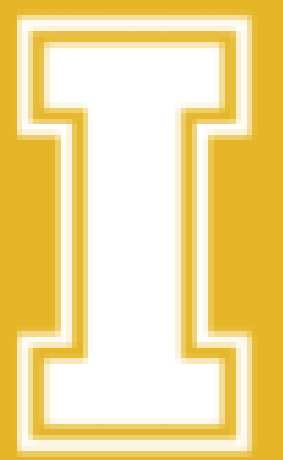


10 Tesla Coil Security Door

Team Members: Justin D. Stephens, Connor Radford, Andrea Cardona, Nico Piccioni
Mentors: Phillip Hagen, Ian Glasglow
Instructor/Sponsor: Herbert Hess



Objective: To design an apparatus to startle an intruder with visual electric arcs across a doorway.

Value Proposition: Currently, security systems lack a flare for the dramatic. The goal of Security Shock Door is to construct a new security system utilizing a Tesla Coil to arc across a doorway.

Key Req:

- Inside standard doorway
- Standard 120V outlet
- Non-lethal

What We Did:

- Each of the individual concept development points were worked on individually then brought together at the end to make the full system

Concept Development:

Circuit Simulation - Needed to know how the Tesla Coil worked

Electromagnetic Simulation - Measured field densities with specific geometry

Heatsinks - Needed to fix circuit board overheating

Circuit Board Placement - Required to relocate board for heatsinks

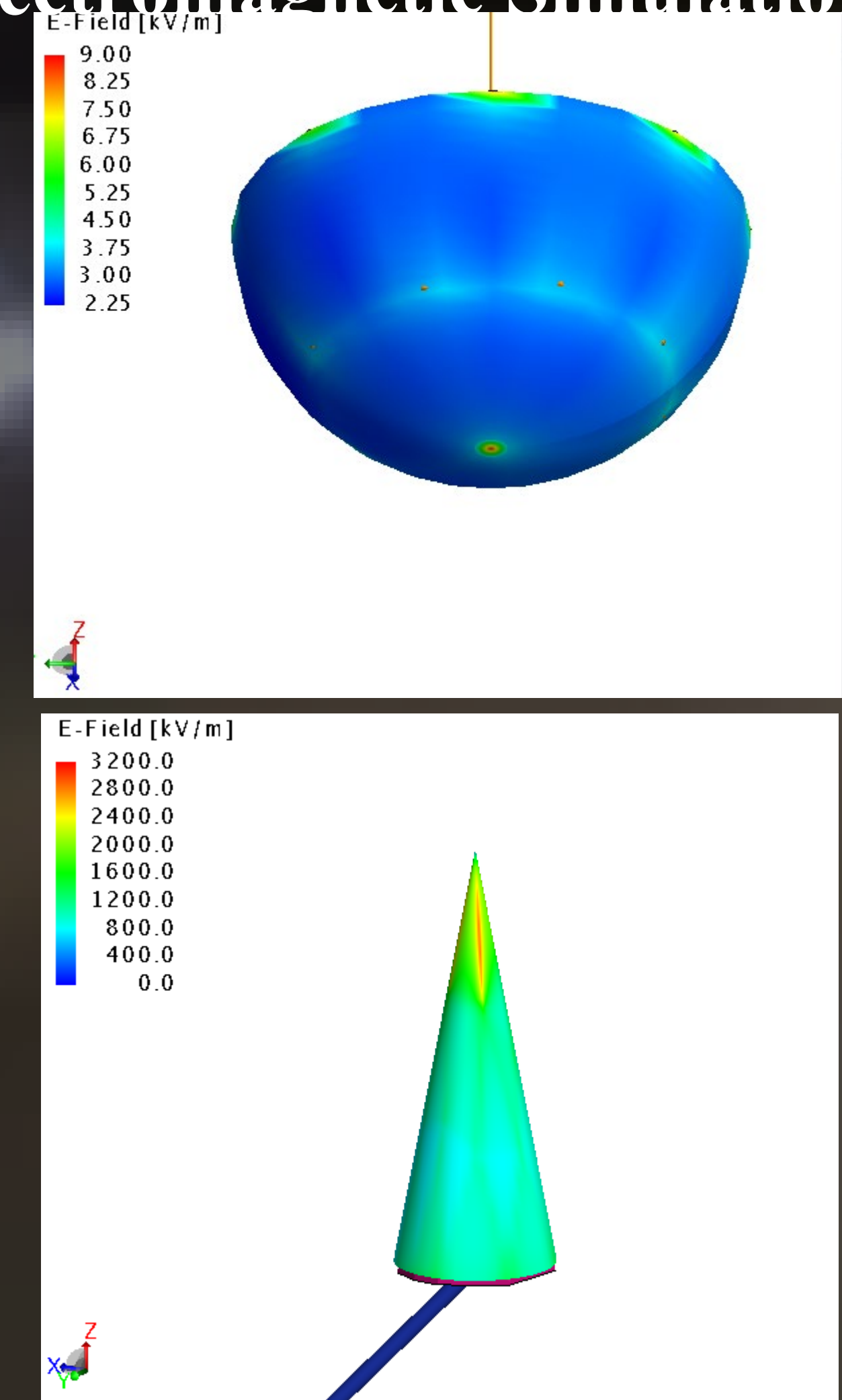
Thermal testing - Confirmation of overheating fix

Node Manufacturing - Construct an arcing source and receiver node

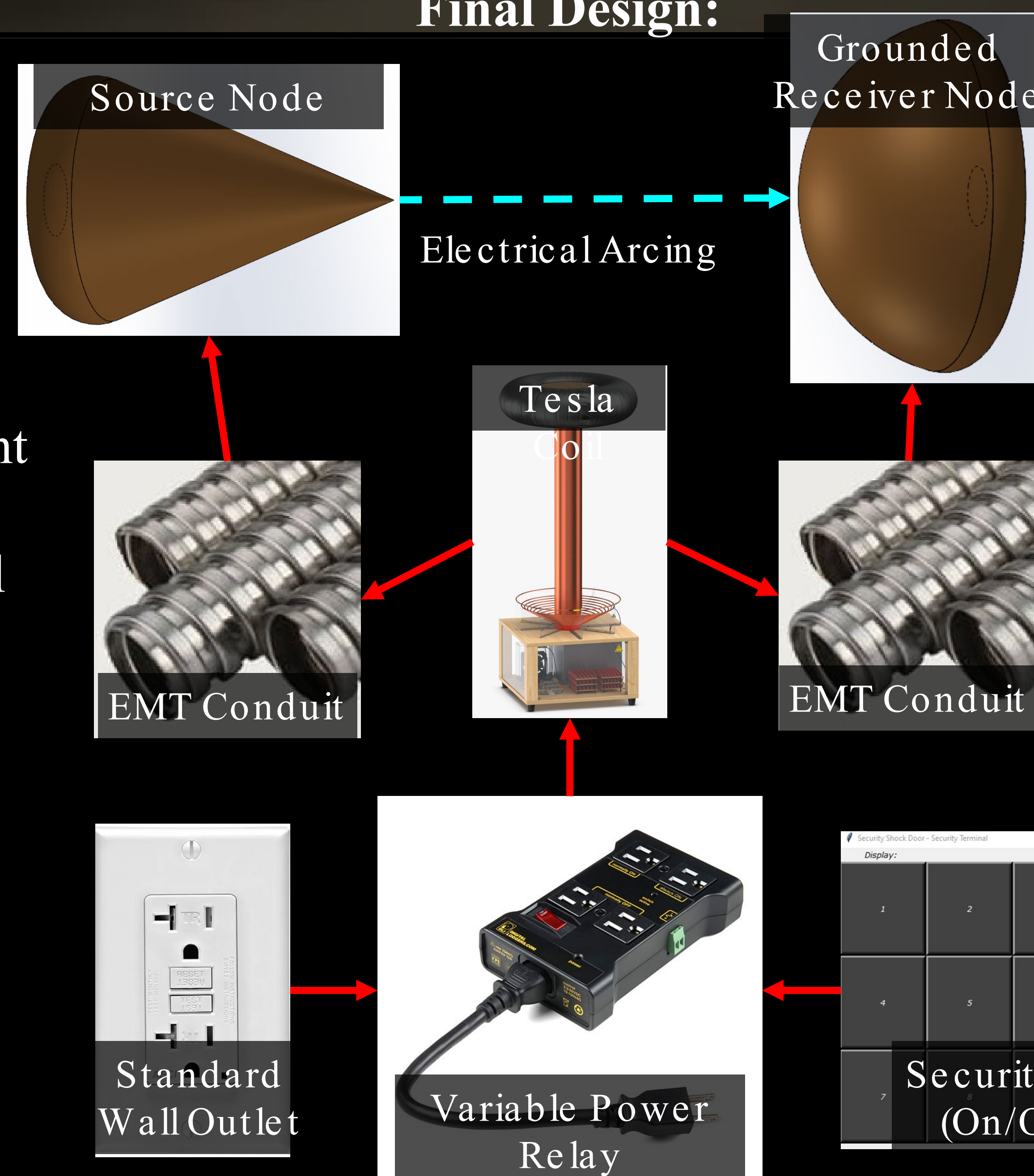
Electrical Metallic Tubing - Protect wiring between coil and nodes

Security Terminal - Needed a secure method of controlling the system

Electromagnetic Simulation:



Final Design:



Summary, Conclusions, and Recommendations:

Due to the time restrictions we were unable to implement all of the desired features. Future improvements could be made by integrating:

1. Multiple node sets (use a relay to switch the current between the different sets)
2. Heat sensors in security terminal for monitoring
3. Motion sensors to reduce excess power usage
4. Speakers to audibly warn of system activation

Acknowledgments:

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