sdmay19-11: MIDI Zeusaphone (Singing Tesla Coil)
Week Report 16
February 14 - February 21
Client/Advisor
Joseph Zambreno
Team Members
Gunnar Andrews — *Webmaster*
Leo Freier — *Interrupter and Micro Controller Lead*
Luke Heilman — *Technical Architect*
William Brandt — *Pulse Width Modulation Expert*
Greg Harmon — *Tesla Coil Construction Expert*
Jacob Feddersen — *Communications Specialist*

Summary of Progress this Report
- Built initial PCB layouts
- Built low-voltage prototype tesla coil
- Simplified keyboard options

Past Period Accomplishments
- Built initial PCB layouts - Leo
    - Updated ModelSim circuit diagrams and ported the power provider and transmitter circuits to Ultiboard with
    - Had to research sizing and build a custom footprint to create the layouts
- Built low-voltage prototype tesla coil - Jake and Luke
    - We have sparks and music from entirely our own circuit design and construction - Yay!
    - Implemented circuit using components we ordered, as well as parts scavenged from class kits
    - Created a prototype gate driver transformer - final version will need some tuning
    - Limitations
        - 60V max input voltage (from voltage sources)
        - Using voltage generators instead of our own transformers and regulators
- Finding Keyboard Options - Gunnar
    - Realized the issue of having a keyboard that is USB powered
    - Started compiling options for keyboards (to be finalized next week asap)
- Sketched out API design - Gunnar
    - Sketched out ideal locations for things on the final API
    - To be finalized next week

Pending Issues
   Nothing to report

Plans for Upcoming Reporting Period
- Finalize keyboard purchase
- Finalize API design and start importing libraries for final design

- Start case designs for the raspberry pi/transmitter circuit and the tesla coil module
- Complete other PCB layouts as much as possible
- Ask Lee Harker to review the designed layouts
- Ask Lee Harker for advice on machine shop options for tesla coil construction
- Order parts for h-bridge.

Individual Contributions

Team Member	Contribution	Reporting Period Hours	Total Hours
Gunnar Andrews	- Started researching / working with pitch modulation - Worked with options for keyboards - USB powered issues - Pitch bending options and octave switches # of keys - Started designing final API look	7	115
Leo Freier	- Built initial PCB layout designs - Updated MultiSim circuit designs - Helped test prototype coil	8	115
Luke Heilman	- Refined parts lists for the PCBs - Created low voltage coil circuit with Jake - Researched and created test circuit for gate drive transformer tuning	11.25	144
William Brandt	- Research bridge circuits - Most time spent on half bridge - Discussed alternative parts with Greg - Designed schematic for bridge circuit	12	107
Greg Harmon	- Theory of SSTC - Advantage of SSTC over others - Disadvantage over others. - Source Power parts - MOSFET - Capacitors - Circuit Protection	18	127
Jacob Feddersen	- Researched bridge components w/ Greg - Built low voltage, prototype tesla coil circuit using mini coil from break	9	171.75

Gitlab Activity Summary

None to report