

sdmay19-11: MIDI Zeusaphone (Singing Tesla Coil)

Week 6 Report

October 3 - October 10

Client

Joseph Zambreno

Advisor

Craig Rupp

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

- Continued work on the coil driver program on the Pi
 - Complete MIDI Keyboard interfacing
 - Researched MIDI parsing options
 - Continued to work with logging capabilities
 - Updated biographies and pictures of team members
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Past Week Accomplishments

- Continued work on wave program - Leo
 - Determined how the program should actually be implemented. One thread will need to be watching the socket and notify the other thread, which is pushing the wave to the pin.
 - Created a new program that will be the actual wave program. This just has some basic code setting up threads and the socket, but doesn't do anything as of yet.
- Studied our current coil circuits - Leo
 - Gained a better understanding of how each circuit component connects together.
 - Also learned that the music modder circuit is better implemented in software.
- Keyboard App - Luke Heilman and Jacob Feddersen
 - Found a C++ library for real-time midi messages
 - Interfaced with keyboard
 - Output events into socket to be read by driver or emulator
 - Program limits output to just two frequencies
 - Uses the RtMidi C++ library
- Logging in C - Gunnar Andrews
 - Tried a bunch of different logging options in C with little luck
 - Ended up getting the code to log to console but am still working on getting it to log to a file
- MIDI parser - Gunnar Andrews
 - Researching possible MIDI parsing options for when we have live stream input (keyboard)

- Website Updating - Gunnar Andrews
 - Updated bios and pictures for members of the team
 - Updated status report section
- Automated Testing and Builds - Jacob Feddersen
 - Researched automated CI runners on GitLab
 - Not possible to set up with our current server configuration
 - Not worth setting up a dedicated server

Pending Issues

None to report this week

Plans for Upcoming Reporting Period

- Gunnar Andrews
 - Try to successfully implement logging to a file
 - Implement a MIDI parsing file
 - Add project description to website
- Leo Freier
 - Continue to work on the wave program: Pull from socket, and experiment with channels
 - Work with Jake on bringing the two software pieces together
- Greg Harmon
 - Determine with William if we should purchase or build the driver circuit
 - Determine cost of building the secondary coil
- William Brandt
 - Work with Greg on deciding design directions on project (buying vs making)
- Jacob Feddersen
 - Work with Leo to make the midi software work with the tesla coil driver
 - Research unit testing frameworks and begin writing unit tests
- Luke Heilman
 - Work with Jake to begin unit testing for software
 - Work with Greg and William to determine parts needed for the Tesla Coil

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Gunnar Andrews	<ul style="list-style-type: none"> ● Worked with logging in C (works to console not to file) ● Researched MIDI parsing libraries to work with streams of input ● Updated bios/pictures on website ● Updated status reports on website 	6	28
Leo Freier	<ul style="list-style-type: none"> ● Studied our current circuits and their functionalities ● Worked more on the circuit driver 	6	28

Luke Heilman	<ul style="list-style-type: none"> Created program to record MIDI events from keyboard Program interfaces with driver emulator 	6.5	32
William Brandt	<ul style="list-style-type: none"> Continues investigation of circuits beneficial to project <ul style="list-style-type: none"> 555 timer General tesla coil design 	6	21.5
Greg Harmon	<ul style="list-style-type: none"> Worked on parts list for Audio and Driver circuit. Researched how different components of the circuit work. 	6	33
Jacob Feddersen	<ul style="list-style-type: none"> Keyboard MIDI C++ library GitLab Automated CI Research 	6	35

Gitlab Activity Summary

commit eb9118e81f3dcedc5ea0f66a03dca32caed1a6b6

Author: Luke Heilman <lheilman@iastate.edu>

Date: Wed Oct 10 18:18:03 2018 -0500

Add midi-keyboard-app readme

commit 51f49a337323d13ebb67a4980bd72fef97484622

Author: Luke Heilman <lheilman@iastate.edu>

Date: Wed Oct 10 17:58:56 2018 -0500

Move captureMidiStream

commit 5aaa8794d89e15dae56be6226fe5089c8eac729c

Author: Jake <jtfedd@iastate.edu>

Date: Wed Oct 10 17:26:07 2018 -0500

Fix bug in updating channel info

commit de90968e77a3ce8db6d23b469d3099da27ceb21c

Author: Jake <jtfedd@iastate.edu>

Date: Wed Oct 10 12:21:07 2018 -0500

Add captureMidiStream.cpp

commit b4ee91c743396872e563c6cb0f459f7cb909639e

Author: Jake <jtfedd@gmail.com>

Date: Wed Oct 10 09:59:44 2018 -0500

Fix syntax

commit ed2dc95e88e652d26c9e9359567020a4c063db10

Author: Jake <jtfedd@gmail.com>

Date: Wed Oct 10 09:58:05 2018 -0500

Add a test build script

commit 483110565fc6aba27625e215fef0d1203a19127b

Merge: f7184cb 4733dcb

Author: Jake Feddersen <jtfedd@iastate.edu>

Date: Wed Oct 10 09:52:20 2018 -0500

Merge branch 'midi-file-player' into 'master'

Midi File Player

See merge request sd/sdmay19-11!3

commit 4733dcbc70b8ab97c5897c3351c3d3f2695ddba8

Author: Jake <jtfedd@gmail.com>

Date: Wed Oct 10 09:51:25 2018 -0500

Update README.md

commit 9c713f63e78b741c25d615b40d880f07d16d26dd

Author: Jake <jtfedd@gmail.com>

Date: Wed Oct 10 09:50:33 2018 -0500

Update README.md

commit 61c8899eb53d59a802054625407d852527a4c979

Author: Jake <jtfedd@iastate.edu>

Date: Sat Oct 6 15:51:37 2018 -0500

Real time midi messages - proof of concept