

sdmay19-11: MIDI Zeusaphone (Singing Tesla Coil)

Week Report 7

October 10 - October 17

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

- Driver program reads from socket and outputs correct frequency
- Complete MIDI Keyboard interfacing
- Finished logging in C++
- Researched streaming through TCP sockets and/or the need for multi-threading
- Updated website and started project description

Past Week Accomplishments

- Wave Program Update - Leo Freier
 - The wave program can now read from a socket and, more importantly, outputs the correct frequency based on a specific note input. Jake and I will need to work on the program to make sure the MIDI messages being put in the socket will match what the wave program is expecting, or vice versa.
 - It currently runs on two threads, which isn't working, but it reads and outputs correctly. More work will need to be put in order to get the socket to be constantly outputting a wave while it waits for a new note.
- Parts Analysis - Luke Heilman
 - Reviewed parts on sample part lists
 - Attempted to find parts from different vendors - unfortunately many were obsolete
- Logging in C++ - Gunnar Andrews
 - Successfully figured out how to create and append on demand .log files that I can implement with test scripts in the future
 - Still need to go through and actually add the logging logic from my code to our code to be tested
- Researched stream through TCP sockets - Gunnar Andrews
 - Researched possibilities of streaming bits through a TCP socket and handling the information in real time
 - Basically trying to finalize if we need threads or not
- Website Updating - Gunnar Andrews

- Updated status report section
- Rough draft of project description for team website
- Automated Testing and Builds - Jacob Feddersen
 - Researched automated CI runners on GitLab
 - Configured a remove build runner and created build script
 - Start building a framework for unit tests
- Tesla Coil Kit to Purchase - Greg Harmon
 - Researched different options of Coil kits to purchase
 - Found a reputable supplier that is knowledgeable and whose Employees have a background in Electrical Engineering.
 - Reviewed the options of purchasing just one driver board or a whole kit.
 - Decided on the oneTeslaTS from oneTesla.com

Pending Issues

- Threads not working as expected on Raspberry PI

Plans for Upcoming Reporting Period

- Gunnar Andrews
 - Start trying to write test scripts(python)
 - Implement successful logging to .log file for checking with tests
 - Add project description to website
- Leo Freier
 - Continue to work on the wave program: Work with Jake to get the two software pieces working together.
 - Test the wave program extensively to make sure it doesn't crash, works in real time, etc.
- Greg Harmon
 - For oneTesla's oneTeslaTS Zeusaphone:
 - Research the schematics
 - Look at already available specs on size of coil and size of sparks.
 - Research available safety documentation from oneTesla.
- William Brandt
 - Continue working with Greg
- Jacob Feddersen
 - Write unit test scripts (python) for existing programs
 - Complete the automated test build system
 - Study the current state of tesla coil design
- Luke Heilman
 - Unit testing
 - Meet with other CPREs to combine code

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Gunnar Andrews	<ul style="list-style-type: none"> ● Finished logging logic in C++ 	6	34

	<ul style="list-style-type: none"> ● Researched streaming through TCP sockets ● Updated website ● Rough draft for project description on website 		
Leo Freier	<ul style="list-style-type: none"> ● Modified the circuit driver to read off of a socket ● Looked more at the circuits we are using for the coils 	6	34
Luke Heilman	<ul style="list-style-type: none"> ● Attempted to find items on the part list 	7	39
William Brandt	<ul style="list-style-type: none"> ● Investigated benefits of various drivers circuits ● Compared costs and benefits of buying premade parts 	6.5	28
Greg Harmon	<ul style="list-style-type: none"> ● Looked at potential options of tesla coils kits. ● Chose a potential tesla coil kit that will allow us to test, reverse engineer, and/or modify. 	6	39
Jacob Feddersen	<ul style="list-style-type: none"> ● Project build script ● Test framework ● Automated GitLab CI runners 	6	41

Gitlab Activity Summary

commit 6e8528aee931e55cfbf1c66a28dcf2cfa2d85896

Author: Jake <jtfedd@gmail.com>

Date: Wed Oct 17 17:21:02 2018 -0500

Add super simple test midi file

commit 01c8aba4c0493d4ebf199b76d99553fa37b04374

Author: Jake <jtfedd@iastate.edu>

Date: Wed Oct 17 17:18:38 2018 -0500

Add first test file

commit 50c1d9dfbc2e63432255f01af9e30a1c37eab2d8

Author: Jake <jtfedd@gmail.com>

Date: Wed Oct 17 14:24:18 2018 -0500

Try changing order to see if that works better for build

commit bf2f6172eb7a973ed744f40a4df5ae03c019f20d

Author: Jake <jtfedd@gmail.com>

Date: Wed Oct 17 09:01:19 2018 -0500

Re-add steps to install build tools

commit 16f6328f1b235de0f3537dd3037032461618dff3

Author: Jake <jtfedd@gmail.com>

Date: Wed Oct 17 08:56:54 2018 -0500

Add badge to readme telling about build state

commit 372f180a2ce8b404b873afb78c591bbaa1cbd08b

Author: Jake <jtfedd@gmail.com>

Date: Wed Oct 17 08:54:31 2018 -0500

Try removing before stage

commit 1536eb06df1713854b2c5931569456fe275f8920

Author: Jake <jtfedd@gmail.com>

Date: Wed Oct 17 08:32:30 2018 -0500

Say yes to prompt

commit 578e94f81f7a3d34a6ac1fa9d2cbb0149863d579

Author: Jake <jtfedd@gmail.com>

Date: Wed Oct 17 08:22:45 2018 -0500

Try updating package lists

commit a999dfd35c506e16cd92674e32bed2555063000c

Author: Jake <jtfedd@gmail.com>

Date: Wed Oct 17 08:21:27 2018 -0500

Fix formatting again

commit a42b18648a30630bbfd8d7f8ac27cb7aad3420b7

Author: Jake <jtfedd@gmail.com>

Date: Wed Oct 17 08:20:15 2018 -0500

ensure build tools are installed before script

commit 5acbf291e9187596fc4b52280ee21e947ab82295

Author: Jake <jtfedd@gmail.com>

Date: Wed Oct 17 08:16:08 2018 -0500

Fix file format

commit 47cb77c8e7c028a8ef67c1c9823abe0b307f4d14

Author: Jake <jtfedd@gmail.com>

Date: Wed Oct 17 08:14:31 2018 -0500

Add Gitlab CI File

commit 51866fc78a3d53d6551b3373d7ea7f848b51ac87

Author: Leo Freier <lmfreier@iastate.edu>

Date: Tue Oct 16 23:19:51 2018 -0500

Wave threads working

commit 9abb5bf9ae66f81b61aec7d58c28ea8b7b2c9969

Merge: 97bafc6 7eb4357

Author: Jake Feddersen <jtfedd@iastate.edu>

Date: Tue Oct 16 21:23:36 2018 -0500

Merge branch 'build-script' into 'master'

Build Script

See merge request sd/sdmay19-11!5

commit 7eb43573d251721051ba880446a22df831d7bbaa

Author: Jake <jtfedd@iastate.edu>

Date: Tue Oct 16 21:22:31 2018 -0500

Add more info to README.md

commit c998097db1b6f966af74c759aa2314ecba707fc3

Author: Jake <jtfedd@iastate.edu>

Date: Tue Oct 16 21:20:58 2018 -0500

Add information on how to build and run each program from project root directory

commit 9bbc61f1f2a688434b45203114987d65f6bb0452

Author: Jake <jtfedd@iastate.edu>

Date: Tue Oct 16 21:13:17 2018 -0500

Add script to build all files and put them in bin folder

commit 97bafc680a37d8daf43716dfa3c51ced1780fa3f

Merge: 4831105 75dc37d

Author: Jake Feddersen <jtfedd@iastate.edu>

Date: Tue Oct 16 20:59:41 2018 -0500

Merge branch 'midi-keyboard-app' into 'master'

Midi Keyboard App

See merge request sd/sdmay19-11!4

commit 75dc37dab3e65210dbefb4194d325dfb2c569526 (HEAD -> midi-keyboard-app, origin/midi-keyboard-app)

Author: Jake <jtfedd@iastate.edu>

Date: Tue Oct 16 20:58:50 2018 -0500

Add comment about opening hardcoded midi port

commit 9023c82a2db5e43869d202247136331cb4d255aa

Author: Jake <jtfedd@iastate.edu>

Date: Tue Oct 16 20:56:43 2018 -0500

Add makefile for easier compiling

commit f022dac32e16d3d6e2941ef5c8532a25ff577c6c

Author: Jake <jtfedd@iastate.edu>

Date: Tue Oct 16 20:53:31 2018 -0500

Add folder-specific .gitignore

commit e30f06ed07ff73c889e3240ec5b122a57eabf6d3

Author: Jake <jtfedd@iastate.edu>

Date: Tue Oct 16 20:52:10 2018 -0500

Remove executables and undo .gitignore changes

commit 7638474e04c7e7a9b10ba5700428dc17d497d3f4

Author: Jake <jtfedd@iastate.edu>

Date: Tue Oct 16 20:49:16 2018 -0500

Remove hidden files that are not necessary

commit 82ae87e714721cfbd06d09476fec305a38de03d8

Author: Jake <jtfedd@iastate.edu>

Date: Tue Oct 16 20:48:49 2018 -0500

Modify .gitignore to try to exclude executables with no extension