sdmay19-11: MIDI Zeusaphone (Singing Tesla Coil)
Week Report 8
October 17 - October 24
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 outputs midi file waves onto GPIO pin correctly
- Fixed up some issues with the above program
- Researched schematics and assembly of the OneTeslaTS
- Updated website with project description and images as well as status reports
- Implemented auto build and test on gitlab

Past Week Accomplishments
- Wave Program Update - Leo, Jake, Luke, Gunnar
  - The wave program can now interact with the midi file app to port midi files onto the Pi's GPIO pin.
  - It can only play one channel at a time that has to be changed from the code, and should maybe be changed to a command line argument.
- Wave Program Update 2 - Leo
  - Fixed the above program so rests now function properly.
  - Attempted to implement a simulated two channel player on one pin. This did not work nearly as well as I thought, and it's probably worth scrapping for right now.
- Test-Framework Research - Luke Heilman
  - Found different possible frameworks for C/C++
  - Cppunit, Catch, Gtest
    - cppunit - better with older compilers common in embedded systems
    - Catch - simple and easy to use, but less feature rich
    - Gtest - feature rich, well supported
- Website Updating - Gunnar Andrews
  - Updated status report section
  - Added a description and basic image to the front page of the website
- OneTeslaTS research - Gunnar Andrews
  - Looked at videos of people assembling the OneTeslaTS
  - Read forums on common problems and tuning concerns

- Automated Testing and Builds - Jacob Feddersen
  - Configured automated build runner on git push
  - Created test framework for app testing
  - Implemented tests for midi_file_app
- Tesla Coil Kit Purchased - Greg Harmon
  - Purchased the oneTesla Tesla coil for testing software and safety
    - Began constructing test cases for our software
    - Began constructing controlled cases to test for safety

Pending Issues

- Changing Format of team pictures on website so the don't look distorted?
  - What I think I need to edit I'm not sure if I should be editing

Plans for Upcoming Reporting Period

- Gunnar Andrews
  - Finish updating team bios on website
  - Soldering workshop
  - Continue to learn about OneTeslaTS and its software
  - Continue working with other team members on wave program
- Leo Freier
  - Work with the EEs on learning more about the circuit aspect.
  - Learn more practical knowledge on building the circuit.
  - Possibly continue some experimentation on simulating multiple channels.
- Greg Harmon
  - For oneTesla's oneTeslaTS Zeusaphone:
    - Research available safety documentation from oneTesla
    - Create test cases for the interruptor and driver circuit
    - Simulate the driver circuit
- William Brandt
  - Design test cases
  - Work on design for control circuit
- Jacob Feddersen
  - Continue writing tests for our apps to verify functionality
  - Research timing to implement two sound channels in one waveform
  - Learn how to solder
- Luke Heilman
  - Implement test cases in the new test framework
  - Meet to go over circuit design interrupter

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Gunnar Andrews	- Helped with updating files to play midi through GPIO pins - Researched OneTeslaTS construction and	6.5	40.5

	common problems ● Researched soldering tips and tricks ● Updated website front page ○ Added description and image		
Leo Freier	● Combined programs so a midi file can play onto the Pi's GPIO pin ● Attempted to simulate multiple channels for the program unsuccessfully ● Fixed the rest functionality for the above program	6	40
Luke Heilman	● Researched c/c++ frameworks	6	45
William Brandt	● Investigated capabilities of other driver and interrupter circuits	6	34
Greg Harmon	● Made a purchase of oneTesla's oneTeslaTS Tesla coil Kit ● Began creating test cases to be conducted once we construct the kit ● Analyzed the driver and bridge circuit of the kit	7	46
Jacob Feddersen	● Help getting waveform output to work ● Python Test framework for c programs ● Complete gitlab auto build configuration	6	47

Gitlab Activity Summary

commit a9fee0f373765eb193a8bd8d775ccbabd578f602 (origin/make-tests)
Author: Jake <jtfedd@iastate.edu>
Date: Wed Oct 24 19:18:47 2018 -0500

   Remove whoami

commit c3f7219375acafd32b1f50551951754b007aec68
Author: Jake <jtfedd@iastate.edu>
Date: Wed Oct 24 18:21:37 2018 -0500

   See who is running the gitlab runner

commit 1cd5a6d03bc0619fc31a9bd72dcab98864967c39
Author: Jake <jtfedd@iastate.edu>
Date: Wed Oct 24 18:16:17 2018 -0500

   Remove sudo

commit 9f411d1a89e025b87b851d9bd60fc8e9fe0ddcb5
Author: Jake <jtfedd@iastate.edu>

Date: Wed Oct 24 17:47:52 2018 -0500

    Make script return 1 when tests fail

commit bdc2300b88730b035f40f3b84cf67e7b0b6bbb99
Author: Jake <jtfedd@iastate.edu>
Date: Wed Oct 24 17:39:23 2018 -0500

    Try running test script as superuser

commit 9b0322b74497541022e61c93c120811486d9d78e
Author: Jake <jtfedd@iastate.edu>
Date: Wed Oct 24 17:34:36 2018 -0500

    Add testing script to automated runner

commit 77b97e50451a0ed9fffd0575483bccb5393279d6
Author: Jake <jtfedd@iastate.edu>
Date: Wed Oct 24 17:34:18 2018 -0500

    Add testing script and documentation

commit c1292b545b87cc0fc7edc8f7c51edd682d758608
Author: Jake <jtfedd@iastate.edu>
Date: Wed Oct 24 17:33:55 2018 -0500

    Add testing utilities

commit e3db811e6fccb31afa51a2b5380779c536e72301
Author: Jake <jtfedd@iastate.edu>
Date: Wed Oct 24 17:33:24 2018 -0500

    Add some basic tests for midi file app

commit c0bdfcc082b89a67f9d183d7a1bdced30b049907
Author: Jake <jtfedd@iastate.edu>
Date: Wed Oct 24 17:33:00 2018 -0500

    Add .gitignore for python

commit 6fabd1d2bb8bfba05627da3b4d9f2260a6514347
Author: Jake <jtfedd@iastate.edu>
Date: Wed Oct 24 17:32:29 2018 -0500

    Less verbose output from midi file app

commit 8a24bf22ab3e25581f59e76c1d5cbb9fa2eabf37
Merge: 6e8528a 3d2a61f
Author: Jake <jtfedd@iastate.edu>
Date: Wed Oct 24 16:06:10 2018 -0500

    Merge branch 'master' of https://git.ece.iastate.edu/sd/sdmay19-11 into make-tests

commit 3d2a61f744f64358e80f57c16ba275a150b9231f (origin/master, origin/HEAD)

Merge: 9abb5bf b69c27f
Author: Jake Feddersen <jtfedd@iastate.edu>
Date: Wed Oct 24 15:14:31 2018 -0500

    Merge branch 'automated-builds' into 'master'

    Automated builds

    See merge request sd/sdmay19-11!6

commit b69c27f7434d225d1acc919e1958eddb555fa5f7 (origin/automated-builds)
Author: Jake <jtfedd@iastate.edu>
Date: Tue Oct 23 18:22:58 2018 -0500

    Delete apt-get calls since they are not needed for this runner

commit 5d21168ec21404bb1cfc9820d74ee9e643ccb740 (origin/pi_generate_wave)
Author: Leo Freier <lmfreier@iastate.edu>
Date: Sat Oct 20 17:30:53 2018 -0500

    getting files back

commit 9de80e426cd38b3662361daceb2b9ee86f1c6c72
Merge: 51866fc 9abb5bf
Author: Leo Freier <lmfreier@iastate.edu>
Date: Sat Oct 20 17:24:08 2018 -0500

    Merge remote-tracking branch 'origin' into pi_generate_wave