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## sdmay19-11: MIDI Zeusaphone (Singing Tesla Coil)

Week Report 19

March 7 - March 14

### 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*

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### Summary of Progress this Report

- Ordered first PCBs
  - Received and configured Raspberry Pi
  - Integrated the keyboard into project
  - Participated in *epic* ECpE photoshoot
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### Past Period Accomplishments

- Completed and submitted first two PCB layouts
  - Met with Lee Harker and discussed best practices for PCB design. Used this to complete and submit the first two boards: transmitter and power provider/input logic. Added names and version numbers to the boards to be on the top of the board.
- Very rough draft of a bridge circuit PCB
  - Finalized the circuit diagram for the bridge circuit for the moment. We were waiting for the parts to arrive so we can test first before needing to potentially completely redesign the layout. As the parts have arrived, this PCB can be finalized the week after spring break.
- Integrated keyboard with driver and web API
  - Fixed note-on, note-off messages to match how they were being transmitted by the keyboard
  - Integrated keyboard into Web API
  - Added kill buttons for both songs and keyboard
- *Epic* ECpE Photoshoot
  - Set up and demonstrated oneTesla with custom interrupter and software, controlled from web api
  - Took lots of cool photos
  - Demonstrated the endurance and resilience of the software and hardware
  - Two glitches we need to solve:
    - Raspberry Pi randomly rebooted toward the start - memory leak? Bumped wires?
    - Tesla coil suddenly activated unexpectedly - bumped wires on interrupter? Shouldn't be an issue once the interrupter is in a case
- Integrated new "project" raspberry pi
  - Up to date with project (access point, dnsmasq, code uploaded and running)
  - This pi will stay with the project

### Pending Issues

*Nothing to report*

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## Plans for Upcoming Reporting Period

- Prototype and test bridge circuit with components we ordered and perfboard
- Use oneTesla secondary and toroid to test, until we have our own secondary built?

## Individual Contributions

Team Member	Contribution	Reporting Period Hours	Total Hours
Gunnar Andrews	<ul style="list-style-type: none"> <li>• Got new Raspberry PI from ETG and got it up to speed and set up               <ul style="list-style-type: none"> <li>◦ So we now have a team PI</li> </ul> </li> <li>• Started looking at pitch modulation output from keyboard</li> <li>• Received keyboard from ETG and got it completely integrated into the project!</li> </ul>	9	141
Leo Freier	<ul style="list-style-type: none"> <li>• Met with Lee so our PCB layouts could be finalized</li> <li>• Completed and submitted PP/IL and transmitter layouts</li> <li>• Initialized bridge circuit PCB layout</li> <li>• Helped integrate new keyboard into the full system</li> </ul>	9	141
Luke Heilman	<ul style="list-style-type: none"> <li>• Integrated keyboard into system</li> <li>• Modified keyboard software to work with new keyboard</li> </ul>	7	172.5
William Brandt	<ul style="list-style-type: none"> <li>• Researched safety standards</li> </ul>	8	129
Greg Harmon	<ul style="list-style-type: none"> <li>• Research Static Charge build-up on Acrylic</li> <li>• Verified 2nd parts order</li> </ul>	6	149
Jacob Feddersen	<ul style="list-style-type: none"> <li>• PCB component footprints and layouts (w/Leo)</li> </ul>	11.5	199.25

## Gitlab Activity Summary

```
commit dd2a24412b5cadb3d5f47b2d160e4344e9fd24e4
Author: Leo Freier <lmfreier@iastate.edu>
Date:   Wed Mar 13 17:17:02 2019 -0500
```

Copy config files to repo

```
commit 5c8e72616019ad1adf52d5fa7efee6c4453ab2dc
Author: Leo Freier <lmfreier@iastate.edu>
Date:   Wed Mar 13 17:13:26 2019 -0500
```

Small changes we made before demo

commit 48ced616969f15614230345967057c973ee1dfb5  
Author: Leo Freier <lmfreier@iastate.edu>  
Date: Fri Mar 8 17:14:20 2019 -0600

keyboard functionality

commit ff8c0d2fbbe07c7dae9beb6e1767d349246e90df  
Author: Jake <jtfedd@iastate.edu>  
Date: Fri Mar 8 15:22:50 2019 -0600

Fix to accept Note Off messages in captureMidiStream

commit 4eb4f62179f9c9de17e122be75c01fd8521255b8  
Author: Jake <jtfedd@iastate.edu>  
Date: Fri Mar 8 15:17:30 2019 -0600

fixing merge issue