

Group number: 18

Project title: Radio Frequency Readout Device (RFRD)

Client &/Advisor: Dr. Qiao

Team Members/Role: Brandon Baxter/Team Leader, Vaughn Dorsey/Team Webmaster, Luke Myers/Team Communication Leader, Kurt Turner/Team Key Concept Holder, Aaron Haywood, Robert Buckley, Mehdy Faik, Kellen Yoder, Michael Miller

o Weekly Summary

This week we conducted a number of tests with the schmidt trigger on the tag and amplifier circuit on the reader. Vaughn did further work on the UI and Robert did some updating of the model IC in Cadence. Luke organized the material for the design document so we can begin updating it for this semester.

o Past week accomplishments

- Brandon Baxter: Prepared for board soldering
- Vaughn Dorsey: Continued UI Work on software related to viewing all bolts on one lamp post and adding new bolts to the system.
- Luke Myers: Conducted further testing on modulation. Helped Aaron with testing of the amplifier circuit. Did more work on the design document.
- Kurt Turner: Assisted with modulation testing. Tested possible Schmitt Trigger circuit for IC prototype.
- Aaron Haywood: Finished amplifier improvements and tested
- Robert Buckley: Continued work on replacing ideal parts of Cadence design with real parts. Attempting to fix problems with capacitor sensor, but have not found a solution.
- Mehdy Faik: More antenna experimentation. Concretely ruled out possibility of using completely different geometries to improve RF coupling - most significant factor is easily spacing. Picked out copper sheeting and asked Lee for ordering.
- Kellen Yoder: Worked on the poster
- Michael Miller: Tested different designs for schmidt triggers

o Pending issues

- Brandon Baxter: None

- Vaughn Dorsey: None
- Luke Myers: None
- Kurt Turner: Still waiting on initial PCB for IC prototype. Need faster op amp/comparator for schmitt trigger.
- Aaron Haywood: Poster and design/planning document
- Robert Buckley: Capacitor sensor broke when the static capacitors were extended to have them be a value read off chip. Have not found the fix.
- Mehdy Faik: I can experiment with the antenna coupling more, but it's too easy to sink a lot of time into that. This week it's urgent I find out how I can improve the rectifier's operation in practice before I re design and re order it.
- Kellen Yoder:
- Michael Miller: Need to debug

o Individual contributions

<u>NAME</u>	<u>Individual Contributions</u>	<u>Hours this week</u>	<u>HOURS cumulative</u>
Brandon Baxter	Meetings/Soldering prep	2	37
Vaughn Dorsey	UI Development Meetings	3	27.5
Luke Myers	Modulation testing, amplifier testing, and design document	5	44
Kurt Turner	IC prototype testing	4	60
Aaron Haywood	Amplifier test	3	41
Robert Buckley	Working on cadence design and simulation, especially Cap Sensor.	4.5	63.5
Mehdy Faik	See above	2	53.5

Kellen Yoder	Poster design	4	37.5
Michael Miller	Meetings Schimdt Trigger	5	38

o Comments and extended discussion

o Plan for coming week

- Brandon Baxter: soldering ASAP
- Vaughn Dorsey: Assist with design document preparations and with the poster if necessary. Continue working on the software as much as possible.
- Luke Myers: Hopefully help with integration of IC and reader parts once we have our PCB. Also need to continue work on the design document and poster.
- Kurt Turner: Expecting PCB at any moment, will build and test immediately.
- Aaron Haywood: Work on the poster design
- Robert Buckley:
- Mehdy Faik: Order a new rectifier board.
- Kellen Yoder: Continue on poster design, and assist in any IC or Reader work
- Michael Miller: Continue on developing schmidt trigger IC

o Summary of weekly advisor meeting

Meeting with Advisor on 4/28/17

Dr. Qiao, Dr. Song, and Nine Members Present

We discussed the setback we have run into with the PCB not being ordered until last week due to confusion in the ordering process and the fact that we had ordered more than one PCB. We then showed the video of our successful modulation and data transmission.

We discussed issues relating to the power delivery from the antennas and the need to utilize a capacitor on the IC for power storage to provide for the transients for the switching of the transistors in our IC.

Kurt went over his updated version of the PCB. It is a bit bigger with the addition of the modulator and schmitt trigger.