Retro Electronics Club

Spring 2020

Project Ideas Document

- Members in attendance: Jorian Bruslind, Mack Hall, Zach Bendt

- **Task 1 - Determine new project ideas to pursue for the SP20 term**
- **Task 2 - Democratically select idea to work on**
- **Task 3 - Determine details of idea as they apply to technical skills**

Task 1

Jorian Ideas:

- FM crystal radio
- Mechanical Keyboard (old styled)
- Audio Spectrum Analyzer

Mack Ideas:

- Nixie Tube Clock
- Music synthesizer
- CRT Monitor

Zach Ideas:

- Walkie talkie set
- Geiger counter
- Vintage Analog Guitar Pedal

Task 2

Easiest ideas for a 1 term project:

- Nixie Tube Clock
    - Good value for a retro project
    - parts aren't too expensive
    - looks cool
    - electronics can be made quickly.
- Walkie Talkie set
    - Very practical device

        - possible to expand range to larger radius for across town comms
        - electronics can be somewhat difficult to tune/manufacture
        - members don't have much experience with FM/AM transmission
- Audio Spectrum Analyzer
        - Very simple project overall
        - Probably won't take the full term time
        - Can be made to look very cool (LED response system)
        - Not exactly a "retro" design

Nixie Tube Clock looks to be the overall winner for all members. Project has the capacity to be realistic to achieve, easy to build, retro in theme, and aesthetically pleasing.

Task 3

What technical ideas can we incorporate into this project?

Nixie tube clock could be powered through renewable energy. Solar panels on the back could provide the main source of power and be efficient. Relevant technical skills - Power electronics, Power management, "Smart" circuitry.

The design could use an FPGA for switching characteristics and a state machine for dynamic response. Relevant technical skills - Digital Logic, FPGA design/programming

Better to include a microcontroller than FPGA. Still can implement low-power usage design but easier to program than System-Verilog

Design could focus on power efficient use of the nixie tubes. Determine simple switching techniques to reduce power consumption of the tubes themselves. Relevant technical skills - Power electronics, Logic gate design

Relevant starting points:
https://www.instructables.com/id/simple-user-adjustable-DIY-Nixie-Clock/
https://gra-afch.com/how-it-works/how-to-drive-a-nixie-tubes/
http://www.tube-tester.com/sites/nixie/74141-NDT/74141-NDT.htm
https://www.instructables.com/id/How-to-Control-a-Nixie-Tube-with-an-Arduino/