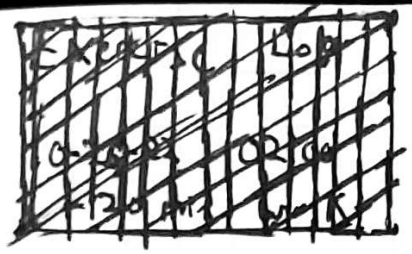


Kyle Fox Engineering Journal ← Senior Design 2023-2024

09/25: - Meeting with Dr. Brown about what system

09/19: - Group planning & discussion of work

09/21: - Solidifying Tasks, using GIT, planning Items for each of us to work on
- Find IC, ADC, Hartman for System

09/26: - IC = Rasperry Pi pico
- Need to Solidify ADC
- Use oneshot pulse generator for pulse
- Use Charge Circuit for amplifier

09/28: - Documentation [SDD SRS]
+Look into pulse amplifiers
+Look into ADC's

09/29: - Meet Dr. Brown asap
- 80 MSPS needed for ADC
- Possible expansion of more inputs
- Need Design check before Purchase of items
- Create a platform for him to send us next task
+ Design amplifier
+ System Setup, Block Diagram

+ 1/54kHz → 18.51 NS

+ 1/500kHz → 2 NS

+555 minimum PULSE 0.5 NS → 500 mS

10/03: - Wait ≈ 7.5 min to charge capacitor initially
- 15 GPIO pins for controller/display system
- Stop button flow at 11V
- Fans controlled by I2C
+ 5.6K & 3nF

+ Filter input to ADC
+ Matching impedance for ADC
+ ADC buffer chip [FPGA]
+ BNC connectors

10/05: - Presentation

10/10: - Looking over new ADC
- Timing circuit

10/12: - Discussion of future plans

10/17: - Moving things to my lab
- Discussion

10/18: - Meeting with D. [illegible]
- will use oscilloscope in future work, won't design own

10/25: - Purchase planning
- Work with oscilloscope
-

10/26: - SRS & SDD
- Purchase list cleaning
- Presentation prep

10/31: - Oscilloscope work

[CH1
- Sine wave 50Hz, 400mV

CH2
- Pulse 50Hz, 4V, 0V offset, 200ns pulse width]

- SRS & SDD Finalization V2
  2.5 & 4.3 Sections

11/02: - Presentations

11/07: - Purchasing Items
- planning RP PIO control
- Assisting with oscilloscope

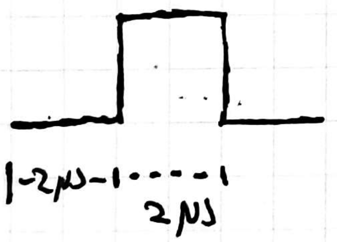
11/09: - Planning build process

11/14: - Pures arrive michael verify
- Planning & RP2040 code

11/16: - Work on RP2040 code
- Soldering timing chip/reviewing Datasheet

11/21: - Prep for pre-break items & over break items

11/28: + 2 µs pulse



$T = 2\mu s$

$f = 1/T = 1/2\mu s = 1/2E{-6} = 500\ kHz$

PIO freq = 500 KHz

Set (Pins, 0)	1 cycle
Set (Pins, 1)	2 cycle
Set (Pins, 0) [3]	3-6 cycle

- Presentation modification [ADD Rx/Tx section]
- Final Test plan Document

11/30 → 12/7: - Class presentations
- Prepping Presentation for our group presentation
- 3-min video