

Meeting Minutes: 360 Designs

Call to order

A meeting of 360 Designs was held at the Engineering Design Suite on 9/17/2019. Attendees included Tanner Sloan, Jake Metter, Mark Jennings, Max, Philip, and Dr. Beyerlein.

Agenda

1. Introductions (if mentors are present)
2. Review Team Contract, Sign Contract
3. Project scope/ ideas: brainstorm and discuss creative idea
4. Questions for Encoder Projects Visit – need, want, wish? Project Requirements?
5. Encoder Visit
6. Commercial Art Program
7. PCL-HMI Options
8. Class schedule
9. Wiki Page
10. Draft Budget

Reports

- Heading to Encoder Products on Thursday at 5:45 am.

Unfinished business

- No unfinished business.

New Business

- We have selected to use 10” PLC HMI display from Unitronics. Size is plenty large, and it offers multitouch, which could be desired in the future. Unisteam 10.4 from Unitronics.
- Team contract reviewed and signed.
 - o Mark to scan and upload as pdf to drive.
- Tanner to create a folder on drive for meeting minutes and create template.
- Describing: create a tabletop display/device to exhibit the encoder products.

- o Ideas:
 - make it cool/fun
 - eye-catching
- Questions for Thursday:
 - o Multidirectional?
 - o what are all the specs for encoders?
 - o What is the budget in detail?
 - if we need more money, what is the process?
 - o how often should we set up meetings?
 - o Skype meetings, conference calls, or in-person?
 - o what types of uses do people/clients have for their encoders, and how big of uses?
 - o final dimensions of desired product?
 - o Ask about any ideas they may have currently, or specifics that they would like to be implemented.
 - o Will stepper motors be provided? What are our options?
- Initial budget: about \$2000 (~\$500 shop [or less], travel expenses, secondary display, sensors, motors)
 - o Jake to create initial
- Plenty of hardware and materials in the cabinet available for the future. (Max)
- Graphic design students could aid with designing certain aspects of the product, whether it be layout or logo.

Announcements

- Meeting on Thursday in the HR parking lot to head to Sagle to visit Encoder Products.
- Budget due thursday.
- Wiki page upcoming, but not pressing.

Adjournment

The meeting was adjourned.

Tanner Sloan - 9/17/2019

Secretary

Meeting Minutes: 360 Designs

Call to order

A meeting of 360 Designs was held at the Engineering Design Suite on 9/19/2019. Attendees included Tanner Sloan, Jake Metter, Mark Jennings, Dr. Beyerlein, and Nick and Trevin from EPC.

Agenda

1. Tour EPC
2. Learn about encoders
3. Discuss project scope
4. Brainstorm potential EPC ideas/concepts they would like implemented
5. Free time for discuss other relevant topics

Reports

- Initial idea of “building a table” has been thrown out, just focus on what is going on top of the table and the actual table can be purchased.

Unfinished business

- No unfinished business.

New Business

- Mark to contact UniStream referencing obtaining the PLC HMI.
 - John Anastasiades: support@unitronics.com ; 617-657-6596
 - Mention we are students at U of I working with EPC
 - Inquire the OS of the PLC, to see if we can run the programmable encoders on the same device or not.
- Toured Website
 - Sales and Service tab: watch for info on encoder industry
 - Products tab: location of data sheets, applications link provides industry information
 - Technical Support: read up on technical bulletins, including installation, etc.
- Project scope defined
 - 4 encoder technologies incorporated. Start with one at a time (would rather have one great one than 4 cheesy ones). From highest priority models to least:

- Programmable: 255P, 58TP
- Absolute: A58HE, A58SE
- Model 15
- 30M
- Design should be modular. Should allow encoders to be removed and others to be added in the future. Should allow for transportation of individual modules.
 - Each encoder should have its own motion control.
- Design should attract people to the table, then give them something to play with and explore the function of encoders.
- Footprint of the encoder
 - Should fit within an elevator and within a doorway
 - Approximate size 2.5 x 4-6 [ft]
- Tie PLC to website for additional browsing
- Could have more than one PLC

Announcements

- No announcements.

Adjournment

The meeting was adjourned.

Tanner Sloan - 9/19/2019

Secretary

Meeting Minutes: 360 Designs

Call to order

A meeting of 360 Designs was held at the Engineering Design Suite on 9/25/2019. Attendees included Tanner Sloan, Jake Metter, and Mark Jennings.

Agenda

1. Review draft of PRD.
2. Look ahead at schedule and first meeting with Trevin via Webex.

Reports

- None

Unfinished business

- None

New Business

- PRD draft reviewed and approved for initial release. Tanner will submit to group email for commenting.
- Will create a PowerPoint for next Thursday (10/3) meeting with Trevin.
- Come up with three (3) ideas each for next week's Wednesday meeting that could be applied to the design. Best ideas will be presented to Trevin on Thursday.

Announcements

- No upcoming submissions due (except for Thursday PRD).

Adjournment

The meeting was adjourned.

Tanner Sloan - 10/10/2019

Secretary

Meeting Minutes: 360 Designs

Call to order

A meeting of 360 Designs was held at the Engineering Design Suite on 9/17/2019. Attendees included Tanner Sloan, Jake Metter, Mark Jennings, Max, Philip, and Dr. Beyerlein.

Agenda

1. Call to Order
2. PowerPoint
 - a. Parts Update: Unitronics HMI+PLC, motors (3min) - Mark
 - b. Product Requirements Document (5min) - Mark
 - c. Programmable encoder display ideas from each student (10min) - All
 - d. Questions for Encoder Products Company (2 min) - Mark
 - e. Schedule (3min) - Mark
3. Future expectations, discussions (5min) - All

Reports

- Mark reviewed parts update with Trevin via phone during the meeting.
- No luck with donated motors yet. May need to buy motors, but be careful not to spend too much and cut in to our budget.
- Gave updated PRD to Trevin. We will be adding to and clarifying section 4.1 and section 5.3 when details become available.
- PLC HMI on the way.
- Trevin: industry applications of the 25SP: ink printing process (will forward to us) for specialty inkjet systems.

Unfinished business

- PRD has been drafted since last meeting and submitted to Trevin and Dr. Beyerlein.

New Business

- Trevin will review the current document and give suggestions shortly.

- Ideas for Programmable encoder:
 - Mark: “measure to cut” idea. Use a whiteboard and allow for programming of different sharpie lengths.
 - Tanner: rotational game. Less practical, more fun-oriented. Random generated number, time trial with the player. Dr. Beyerlein: roulette wheel
 - Jake: safecracker (would be near impossible to open the lock manually), highlights the high resolution of the encoders
- As a team: go with pros and cons, use to make a decision on which idea (or combination) to present to Trevin and Nick in a couple of weeks.
- Before decision can be made, we need to play around with encoder.
- Download the PLC HMI software from Unitronics before arrival. “get our feet wet”

Announcements

- Project schedule due 8th of October
- Logbooks due 10th of October
- First snapshot October 15
- Things from Trevin: texting between 7-3:30 is more efficient than emails, since he isn't always at his desk.

Adjournment

The meeting was adjourned.

Tanner Sloan - 10/3/2019

Secretary

Meeting Minutes: 360 Designs

Call to order

A meeting of 360 Designs was held at the Engineering Design Suite on 9/17/2019. Attendees included Tanner Sloan, Jake Metter, Mark Jennings, Max, Philip, and Dr. Beyerlein.

Agenda

- 1.

Reports

-

Unfinished business

-

New Business

-

Announcements

-

Adjournment

The meeting was adjourned.

Tanner Sloan - 10/10/2019

Secretary

Meeting Minutes: 360 Designs

Call to order

A meeting of 360 Designs was held in Dr. Beyerlein's office on 10/17/2019. Attendees included Tanner Sloan, Jake Metter, Dr. Beyerlein, and Trevin (EPC) via Webex.

Agenda

1. Call to Order
2. PowerPoint
 - a. Snapshot Day (5min) - Mark
 - b. Portfolio Documentation (1min) - Mark
 - c. Refining the Programmable Encoder design (5min) - Mark
 - d. Lead Screw/ stepper motor precision concerns (3min) - Mark/ Tanner
 - e. Stepper Motor Driver concerns (1min)
 - f. Revised Schedule (2min) - Mark
3. Future expectations, discussions (5min) - All

Reports

- Lead screw design has been decided (communicated last week to Trevin/EPC)
- Snapshot was two days ago, went well.
 - o Demonstrated animation of lead screw to visualize our design idea.

Unfinished business

- None

New Business

- Issues with hysteresis and repeatability of lead screw... need to make sure we have the correct lead screw that can allow us to measure accurately and repeatable.
- Mark has been checking out stepper drivers and motors
 - o May need one driver per motor

- Reviewed revised schedule
 - No meeting thanksgiving break
 - Visit EPC first week of december to present final 25SP design.
 - *CORRECTION*: not needed to visit epc, use Webex to display prototype(s)
- Have a “randomised success routine” so that not everyone that sees the module doing the same thing every time. Random “reward for success,” to keep it exciting
 - Roulette wheel spins upon length reached
 - Light bulb
 - Dunk tank
- Coarser lead screw may be better
 - Finer may be too accurate at a lower resolution
- Need to buy a linear actuator/lead screw asap and begin prototyping.
 - Refine the design later
- Trevin would like us to present a formal design review before our finalized project. Design review date can be flexible.
- Next meeting : discuss when EPC shall send the next encoder model.

Announcements

- None

Adjournment

The meeting was adjourned.

Tanner Sloan - 10/10/2019

Secretary

Meeting Minutes: 360 Designs

Call to order

A meeting of 360 Designs was held in the Engineering Design Suite on 10/24/2019. Attendees included Tanner Sloan, Jake Metter, Dr. Beyerlein, Philip, and Max.

Agenda

Old Business

1. Review WebEx Meeting 2 with EPC.
2. Review Snapshot Day
3. Review/ discuss Engineering Notebook comments

New Business

1. Parts Ordered
 - a. Amazon Update
 - b. Unitronics Update
 - c. 58TP selection - 1/4in bore to fit onto 6.35mm shaft? - look at catalog selection
 - d. Switch from PLC to Computer for quick programming and then running
2. Random success routine ideas - brainstorm
3. Upcoming class deadlines
 - a. Turn in Design Validation Plan.**
 - b. Project Value Proposition: Due by Oct 31, 2019
 - c. Draft Wikipage: Due by Nov 7, 2019
4. Future plans and expectations

Reports

- Purchased linear actuator and stepper Motor via amazon on Wednesday the 23.
 - o Due to be delivered Friday the 25.

Unfinished business

- N/A

New Business

- Ordered Stepper motor has a shaft out the back. The 58TP programmable encoder could attach directly to the stepper, without a coupler.
 - Mark to email Trevin the exact model we need on Thursday night/Friday morning.
- Unitronics delivery due next Wednesday.
- We are presented with an issue of unplugging the encoder adapter cable constantly to program/run the encoder.
 - Buy a splitter? Rewire our own cable? Mark to contact EPC for ideas/help/more cable.
 - Needs to wait until we have the PLC from Unitronics.
- Randomized success routines need to be implemented (discussed by EPC last meeting)
 - 3-5 routines, 5 preferred
 - Distinctly different routines, or 1 routine with random outcomes like a roulette wheel
 - Tanner: guess a length and get a grade depending on the time it takes. Low resolution could provide a value to 1 sig fig, raise the resolution to get the next sig fig, and so on.
 - Mark: hit an exact distance (electrical contact), lower resolutions may be impossible, raise resolution to increase accuracy.
 - Discussed roulette table as well as flashing different colored lights and playing different congratulatory sounds
- Upcoming dates:
 - DVP submitted to Beyerlein in paper form.
 - Wikipage workshop next Tuesday.
 - PVP Due Oct 31

Announcements

- Mark will be out of town next Wednesday.

- Dr. Beyerlein will be out of town next Thursday, may or may not call in. Meeting location TBA, will need a laptop with a cam.
- Going to try to meet early next week to set up the linear actuator and motor and play around with it.

Adjournment

The meeting was adjourned.

Tanner Sloan - 10/10/2019

Secretary

Meeting Minutes: 360 Designs

Call to order

A meeting of 360 Designs was held in the BEL 211 office on 10/31/2019. Attendees included Tanner Sloan, Jake Metter, Mark Jennings, Max, Nick (EPC) and Trevin (EPC) via Webex.

Agenda

1. Call to Order
2. PowerPoint
 - a. Mia Culpa (2min)
 - b. Review Mark's Purchases: approve/ disapprove (5min)
 - c. Feedback Options: physical button v. 2nd encoder v. other (5min)
 - d. Project / Parts Status (3min)
 - e. Additional Parts To Order? (3min)
 - f. Relay Design Review (3min)
 - g. Revised Schedule (5min)
3. Future expectations, discussions (2min)

Reports

- Jake is the treasurer and all financial communications with the client need to go through him.
- Jake and Tanner met with Max and drilled a 1/4" whole in the shaft in order to fit another encoder for "measurement comparison."

Unfinished business

- None

New Business

- Mark shared preemptive purchases of electrical components for the design. All purchases reviewed and approved by Trevin for the budget.
- Ideas for model "success" measurement

- o Physical “push button” is black and white, may be too simple and not showcase the resolution changes of the programmable encoder.
- o 2nd encoder attached on opposite end of ball screw
 - Would require a programmable encoder on the end because we need a high accuracy encoder
 - Option: box in the second encoder so that it its not visible to the eye
- o Parts to potentially buy
 - LED array to display success/failure and degree of success/failure
 - Speaker for success/failure?
- o Mark displayed initial relay design for commenting from EPC
- o The schedule has been revised. Two options to present programmable design to EPC: Thurs Nov. 21, week Dec 2-6.
- High speed inputs: 8. Does each encoder need its own HS I/O? Mark can contact Unitronics in the future if we need more I/O.

Announcements

- Mark shared the PLC HMI which just came in recently. Many ports and input/outputs. Mark shared the other obtained hardware and the stepper.
- Jake has got the Wikipage started and will be working on it this weekend.
- Next steps:
 - o Getting feedback loop working (is it on/off)
 - o Getting Unitronics to drive stepper
 - o Finish physical apparatus
 - o Get switch design up and running before pursuing attaching the second encoder
 - Would want a 58TP
- Can we get original source code from program and copy-paste in to Unitronics?
 - o Other option: relatively inexpensive Windows 10 tablet/laptop.

- o Have OS spec before design review.

Adjournment

The meeting was adjourned.

Tanner Sloan - 10/31/2019

Secretary

Meeting Minutes: 360 Designs - # 9

Call to order

A meeting of 360 Designs was held in the Engineering Design Suite on 11/7/2019. Attendees included Tanner Sloan, Mark Jennings, Max, Phillip, and Dr. Beyerlein.

Agenda

1. Review EPC Meeting 3
2. Design Status
 - a. Programming
 - b. Program Block Diagram
 - c. Success ideas
3. Class Work Review
 - a. Wikipage
 - b. Project Value Proposition
4. Upcoming deadlines
 - a. Portfolio - Due November 14th
 - b. Logbook - Due November 14th
5. Visit Sagle: Nov 21st vs Dec 2-6
6. Future plans and expectations

Reports

- Last week, the schedule has been revised to create options for the final design proposition (traveling to EPC).
- For Jake: Beyerlein wants us to maintain a spreadsheet (use template on Mindworks). Please stop by Beyerlein's office and he will provide an example.
- Reviewed last week's minutes with Dr. Beyerlein. Updated Beyerlein with the status of parts.
 - Mark needs to submit a request for refunding for the relay, button, etc.
 - See Margaret Baker.
- Confirm that Jake emailed Swenson and Ankit the link to our wiki page.

Unfinished business

- Last week, we met with EPC and discussed our progress. Trevin and Nick wanted us to brainstorm more “success routines” for this week.

New Business

- We would like to schedule the final design proposition for Thursday, Dec. 5. Mark will handle communicating with EPC whether or not this date works.
- Mark reviewed programming block diagram.
- Aim to have physical contact with design routines fully functional by design review and second snapshot.
- Ideas for success routines:
 - Beyerlein: have a fact about EPC or their industry pop up
 - A box opens, dispensing candy, a pen, etc.
 - Pop up flag
 - Unraveling large poster, manual or automated?
 - LED lights flashing with an LED strip hooked up to speakers playing The Price is Right
 - Red/orange/yellow/green LED when you're not within 1 sig fig/within 1 sig fig/within 2 sig fig/within 3 sig fig (target)
 - Dartboard/archery target (increase accuracy when you're closer to the target)
 - Bell rings faster or slower when you're closer to the target. Green light flashes when the target is reached.
 - Display all the possible success lengths above the actuator, the resolution must be changed to achieve certain lengths.
- Project Value Proposition
 - Resubmit to Beyerlein with edits

Announcements

- Team member citizenship before Thanksgiving
- Logbooks and Portfolios due the 21st of November, collect the next day (Friday before break)

Adjournment

The meeting was adjourned.

Tanner Sloan - 10/31/2019

Secretary

Meeting Minutes: 360 Designs - #10

Call to order

A meeting of 360 Designs was held in the BEL 216 on 11/13/2019. Attendees included Tanner Sloan, Mark Jennings, and Jake Metter.

Agenda

(Old Business)

1. Visit EPC Thursday, Dec. 5
2. Ideas for success routines
3. Determine Date for Team member citizenship before Thanksgiving
Review Snapshot Day
Review/ discuss Engineering Notebook comments

(New Business)

1. Jake Update
 - a. Budget
 - b. Wikipage
2. Mark Update
 - b. HMI+PLC Functionality
3. Tanner and Jake report - success ideas / purchase ideas
4. Upcoming deadlines
 - a. Schedule Concept Design Review? Due by Nov 22nd? (ask Beyerlein)
 - b. Portfolio - Moved to November 21st
 - c. Logbook - Moved to November 21st
5. Future plans and expectations

Reports

- Turn in citizenship forms next Thursday
- Turn in portfolio and logbooks next Thursday
- Wiki page is going well, per Jake. For future process, Jake will send Mark and Tanner items for editing before uploading to the wiki.
- Jake got the spreadsheet going with Beyerlein

- o Will upload to Drive by the end of the week
- o Will upload to Wiki as well
- Mark is dealing with Margaret for reimbursements for electronic components

Unfinished business

- Jake and Tanner were put in charge of brainstorming and researching solutions for success routines

New Business

- Going to simplify the process for success, but what happens upon success is what changes
 - o User visual (LED/unitronics display) upon how close the user is to the actual distance
 - o Random success routine initiates once the user hits the exact distance
- Have several “things” to measure (i.e. diff colored rods, lizard, etc.) that have a predetermined length, and the user tries to guess the length of the “thing” they have chosen. Success routines will still randomize regardless of which “thing” is chosen.
- Will be purchasing the food dispenser and the speaker.
- Mark purchased a 32GB micro-SD for the Unitronics
- Mark introduced the “demo” Unitronics code. Custom visuals and sound output are supported.
- Mark created a basic on/off test program.

Announcements

- Need to ask Beyerlein what a Concept Design Review is tomorrow, and the requirements.

Adjournment

The meeting was adjourned.

Tanner Sloan - 11/13/2019

Secretary

Meeting Minutes: 360 Designs - #11

Call to order

A meeting of 360 Designs was held in Dr. Beyerlein's office on 11/14/2019. Attendees included Tanner Sloan, Mark Jennings, Jake Metter, Dr. Beyerlein, and Trevin and Nick from EPC.

Agenda

1. Call to Order
2. PowerPoint
 1. Success Ideas Overview
 2. Programming / HMI+PLC Demo
 3. Control Flow Diagram
 4. TR2
 5. Wiki page Update
 6. UI Business
 1. Schedule Concept Design Review
 2. Citizenship Meeting
 7. Revised Schedule
3. Future expectations, discussions

Reports

- N/A

Unfinished business

- Confirmed that we are turning in portfolio, logbooks and citizenship forms to Beyerlein next Thursday, Nov 21.
 - Physical copy of the citizenship forms preferred.

New Business

- We will be simplifying the routine to win, but the success routines will be randomized, making the experience different for each user.
 - Buying a speaker for the audio output
 - Price is Right theme song and visuals

- Purchase programmable LEDs for a sequence for the success routine (change colors as you get closer to the target, light up patterns when you win)
- Purchase a food dispenser for success routine
 - Potentially have three dispensers to enable more random success routines, but get one up and running for now.
- Mark showed off the HMI/PLC demo program to Nick and Trevin.
- Mark shared on/off program within Unitronics.
- Mark shared control flow diagram.
- We need the TR2 and the associated rack (21" length preferred)
 - We will need to cut 2' length to 21" w/ horizontal band saw
- Send wiki page link to Trevin and Nick by end of semester
 - Dr. Beyerlein will check and give feedback for us
- Confirmed Design review for 8:00-10:00 December 5 at EPC. Will bring a proof of concept prototype.
- Trevin: put together a PowerPoint before December 5 for a preliminary design review so we can have feedback on what we are going to present.

Announcements

- Attend 2 design reviews from other teams, bring forms to fill out.

Adjournment

The meeting was adjourned.

Tanner Sloan - 11/14/2019

Secretary

Meeting Minutes: 360 Designs - #12

Call to order

A meeting of 360 Designs was held in the Engineering Design Suit on 12/12/2019. Attendees included Tanner Sloan, Mark Jennings, Jake Metter, and Dr. Beyerlein.

Agenda

1. Snapshot Day #2
2. Project Challenges
 - a. High-Speed input/output module coding and validation with oscilloscope
 - b. Interfacing High-speed input/output to stepper motor driver
 - c. Reading the encoder output using the highspeed input capture
3. Tanner and Jake's machine shop progress
4. Revised Schedule (discuss EPC January visit)
5. Class schedules for Spring Semester

Reports

- Haven't recorded meeting minutes in a few weeks because most time has spent working and all meetings have been brief and/or not full of substance.

Unfinished business

-

New Business

- Trevin needs us to email him responding to: "An email explaining where you're at, how snapshot was, questions you have, action items over the next month etc. and we will get back to you."
- We would like to move our weekly meetings to Thursdays @ 9:30 AM
 - Verify with Beyerlein and Trevin

- Beyerlein recommended trying to get the motor to turn without the complex code that we will be using in the future, just to get us started.
- Have a Webex on the 23rd of January
 - Plan the design review at EPC during that meeting, keeping in mind at 8:00 AM meeting allows us to return to campus by noon.
- Jake and Max will meet next Monday or Tuesday to finish the machine shop work on the plate.

Announcements

- Wiki site updated
- Portfolio will be turned in tomorrow

Adjournment

The meeting was adjourned.

Tanner Sloan - 12/12/2019

Secretary

Meeting Minutes: 360 Designs - #13

Call to order

A meeting of 360 Designs was held in Dr. Beyerlein's office on 1/21/2020. Attendees included Tanner Sloan, Mark Jennings, Jake Metter, Philip and Dr. Beyerlein.

Agenda

Old Business

1. Review project progress from last semester
2. Talk about things we liked / didn't like from last semester
3. Review final summary sent to EPC at the end of last semester (attached at the bottom of this email).

New Business

1. Confirm future meeting times work with peoples' schedules - work with Phil and Max on a different day if need be
2. Upcoming Class Deadlines
 - a. Design Expo Registration -- Tuesday 1/28
 - b. Apply for Spring Graduation (if applicable) -- Wednesday 1/29
 - c. GENERAL SESSION #1 -- Today! -- Tuesday 1/21 -- 3:30- 4:45pm
3. Wikipage status / review
4. Programming status update
5. Make a spreadsheet of incremental, testable goals to help the design process
6. Semester expectations: revise schedule
7. Brainstorm additional ideas

Reports

- We are going to shoot for 2 solid, finished designs to have for Expo.

Unfinished business

- N/A

New Business

- For Thursday's WebEx with EPC:
 - Mark is hoping for breakthroughs by then to present

Meeting Minutes: 360 Designs - #14

Call to order

A meeting of 360 Designs was held in Dr. Beyerlein's office on 1/23/2020. Attendees included Tanner Sloan, Mark Jennings, Jake Metter, Max, Philip and Dr. Beyerlein.

Agenda

1. Call to Order
2. PowerPoint
 - a. Revised Schedule and Project Expectations
 - b. Coding Update
 - c. Hardware update
 - d. Visit EPC rescheduling

Reports

- We are going to shoot for 2 solid, finished designs to have for Expo.
- Mark and Phil have worked to produce a pulse signal which will be used to drive motors.

Unfinished business

- N/A

New Business

- Need to voltage divide down to 5 volts in order for stepper motor to read
 - Can buy a potentiometer to decrease voltage
 - Do we need the ability to modify our voltage or have an exact resistance that will modify our voltage to exactly 5V?
 - Could potentially purchase a stepper that can accept 9V
 - We're hoping to have a finalized design that we can present in February.
- Microstepping

- Once Mark has stepper working, Tanner and Jake will work with the feedback system to measure microstepping.
- Lets see if theres enough torque to microstep. If not, switch over to a servo or “beef up” our stepper.
- Check out Nick and Trevin’s flowchart.
- Repeatability concerns
 - We will likely have limitations as far as how accurate we can provide repeatable results. May not hit full resolution capabilities of the 58TP.

Announcements

- Goals for next week:
 - Jake and Tanner: Finish mounting plates and rack to the linear actuator.
 - Finish power output modifications to the stepper to allow us to begin testing, or decide what new hardware we need.
- Goals for before next Webex meeting in two weeks:
 - Create a model to share with EPC on our finalized bracket/plate mounting.
 - Create models that can show all of our success routine ideas/mounting, EPC logo laser engraving on toplate, etc.
 - Get stepper working as fast/slow in whatever direction is desired.
 - Stretch goal: get encoder to read an input.
- From Trevin: don’t rush this display. If it is the only one we get done by May, its ok. Focus on creating a quality product.

Adjournment

The meeting was adjourned.

Tanner Sloan - 1/21/2020

Secretary