**Week 12**

**TEAM MEETING**

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## Notes from meetings throughout the week

**Electronics**

For this week, I had test the touchscreen. First, I power the touchscreen and drive it by hand and magnet. However, the magnet can drive the touchscreen randomly and not precise which might need to apply conductive foam and reduce friction at the same time. Second, for the touchscreen sensor, I used oscilloscope to specify four pin of the sensor which is 5V, SDA, SCL, and GND, and order FFC and break out board to get the data and analyze the position. Also, I had contact to SunFounder company for the sensor's datasheet and protocol of the sensor they response need some time to organize the datasheet. For next week, I will focus on the touchscreen to get position data from raspberry pi and try the motor and gearbox. We also need one more Odrive and three encoder for the Alpha design.

**Software**

Started converting modern robotics library into cpp, achieved promising 2k hz rate with cop implementation.

**Magnet**

Worked on air bearing improvements, ultimately decided to move forward with thrust bearings due to complications with air bearings. Designed setip to test different magnets. Sorted current magnet inventory.

**Mechanical**

Alpha2 Design completed. Waterjetting was completed aside from 1" links. Finished machining outer links, and started to make drawings for the parts that do not have them. Should be able to have most of Alpha completed by end of week 3, and finished early week 4

# Meeting with Professors

## 

**Embedded**

* We have chosen microcontroller
* Modern robot library to cpp embedded system
* Will us MR library for kinematics and statics
* Worried about friction?
* Paper by Pratt, “series elastic actuator”
* Pratt uses feedforward control: velocity of output, feed it to the motor as a comman(with slight de-rating). Or measure the deformation of spring, do closed-loop
* If we want to move freely, what control algorithm? In free mode, the robot should probably just track the finger using screen position information.
* Start by implementing a virtual spring between robot and user
* Could also start by making the robot be a haptic device that lets you move along a line.
* Start with a touchscreen connected to host, passing back information to the microcontroller.
* Might be worth looking into touchscreen alternatives.

**Electronics**

* We need to figure out the grounding
* Might have to live with delay,
* Try to find libraries to do touch screen natively, will probably alright

**Magnet**

* Current prototype reduces friction, but with the new material just doesn’t work for what we need
* We will keep the thrust bearings
* Introduce a bit of conductive foam - but didn’t really work
* We need to try and grounding it
* Ground the metal case of the tablet
* How small can we get in terms of puck is our focus now
* Stiffness of interface and static friction - we need to add stiffness to our measurement
* Search for thrust bearing alternatives - or circular ball caster? Something more closed designed to our application
* Materials with lowest coefficient of friction with glass
* Look for materials used on pens for touching touch screens

**Manufacturing/Mechanical**

* Replace long screw connections with spacer piece with holes-some kind of torque transfer component to it
* ~~Move bearing from bottom of arm to bottom of green pulley~~
* Change Thick Link To fit new changes->remember to change weird chamfer on bearing holes?
* ~~Bottom spacer should be on the inner race of both bearings. Just cylinder-shaped~~
* ~~Some way to space out bearings, so as not to rely on press fit. Would like to leave a lip in that hole~~
* ~~Change distal link to ⅜”~~
* ~~Change distal link to clamp~~
* Snap Rings in the top of long Shaft
* ~~Find an alternative for little shaft stock~~
* ~~order a broach~~
* ~~order more bearings-> probably just in case~~
* Also still add limit switches