

Ian Hartwig

Team B: Monkey Bots

Teammates: Ian Rosado, Stephanie Chen, Trevor Decker

ILR 06

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Individual Progress

In the last week, I primarily worked on helping manufacture parts for the designed parts of our extension and pivot functions. The rollers that go in to the transfer gearbox is challenging since we don't have a lot of design or manufacturing precedent for this part. Bringing back the exploded view of the transfer gearbox from my last ILR, we can see this part on the bottom of figure 1.

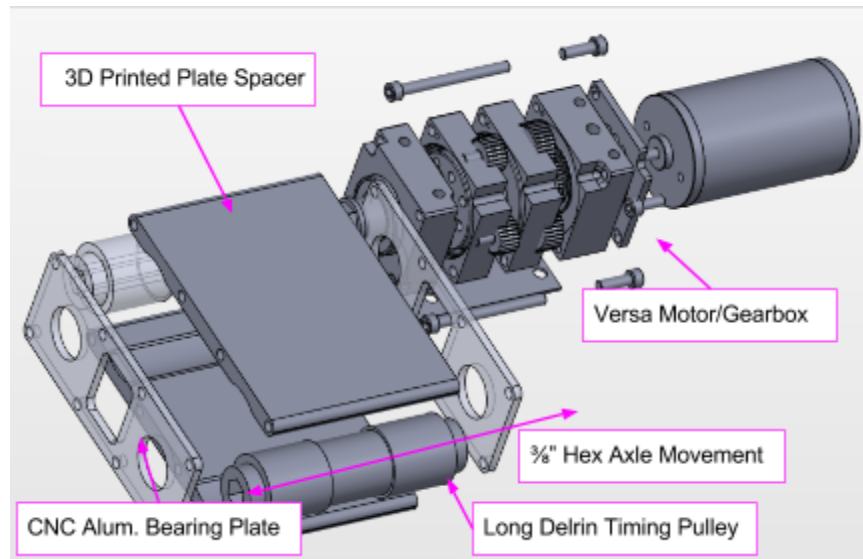


Figure 1: Exploded View of the Transfer Gearbox

I also worked on machining more parts that we had at demo. These include the bearing blocks and the laser cut and 3d printed components that form parts of the transfer and pivot gearbox. These can be seen in figure 2, 3, and 4.

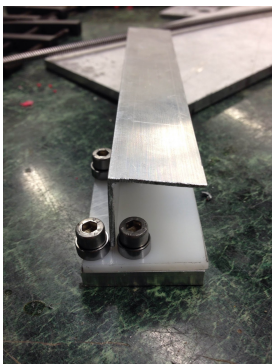


Figure 2



Figure 3

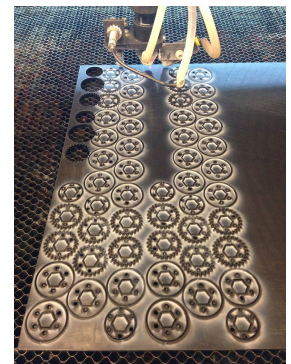


Figure 4

Challenges

The transfer gearbox pulley in figure 3 was particularly challenging since the laser cutters we have on campus (several different models) do not cut perfectly vertical or uniform lines. Since we need this part to move freely under load on the hex shaft it is imperative that the inside surface of this part is smooth. I experimented with several different methods to shave down the inside. Filing was rather ineffective. Instead, I tried to make a poor man's broach by cutting off a short piece of hex shaft so that I could run it through the hole multiple times. This was effective to get to a point where the part fit, but it was not enough to have it move freely. The best solution ended up being to heat a small piece of hex shaft with a blowtorch (that we had on hand) so that we could melt a thin layer of the inside out of the pulley. This was the part we had for demo on Wednesday.

Teamwork

Ian Rosado continued to work on the prototype gripper. He spent some time trying out different material as a gripper-window interface. None of the materials showed enough promise for use to use. We will need to face this challenge this week. Stephanie worked on machining metal components with CNC. She finished several gearbox plates and the extension arm slots. The slots are not 100% uniform over length, so we'll need to work on that. Trevor continued to work on geometry for the cleaner. I helped him make a prototype laser cut model which revealed several design inconsistencies.

Plans

We plan to machine the final components so that we can assemble the complete pivot and extension subsystems. We have a motor and motor controller on hand that should be tested with this assembled system. All of us need to continue working on the parts we are have now in order to meet this goal.