
To: Dr. David Willy

From: 21-Spr01-GA

Date: 4/23/21

Re: ME 476C Final Prototype Summary

In this prototype, the General Atomics (GA) Team was attempting to use a lead screw to move a mass in two dimensions. The goal was to learn about whether the satellite translation system would work as expected and discover any potential issues that may arise. Using this prototype, the GA Team found that a lead screw system would be able to move the weight required without risk of binding or overloading the power screw. This prototype also served to help define the tolerances that will be needed for future iterations and the importance of CNC manufacturing for some of the parts that will require tighter tolerances. For this prototype, some improvisation was required as some 3D printed parts were too large, and store-bought parts scraped the board above it, but the prototype was sufficient to give the group a general idea for the tolerances that will be necessary and the types of manufacturing that will be required for future iterations as well as inspire confidence in the functionality of the power screw system.

The next prototype will be focused on the implementation of motors as well as a higher-quality machined base plate setup. The team has already done an analysis on which motors should be used. However, it is prudent to check those calculations with real world application. Over the coming summer semester, the group intends to perform research and get estimates for manufacturing costs for some of the parts that are beyond the scope of what we can manufacture ourselves, particularly anything that will involve CNC machining that is either too large for the CNC mills available at NAU or will require tools such as a CNC plasma cutter that is not available at the Fabrication Shop. After this is done and the motors are purchased, the process of developing code to control the motors will also be explored. This includes receiving and interpreting input signals, calculating the required satellite position, and outputting signals to the motors using a suitable control algorithm.