17 March 2016

TO: Casey Howard
FROM: Ryan Brody, Anthony Caffaro, Ava Mistry
SUBJECT: Milestone 3 Memorandum

The completion of Milestone 3 required more technical skills than the previous two milestones. It differed greatly from technology in the last two milestones, which was highly CAD-based. Only one CAD part was created in Milestone 3: the Arduino mount.

Something that made this milestone unique was the fact that the tasks performed were more individualized and several more skills were acquired prior to working on any equipment. The first two skills acquired were soldering and creation of wire harnesses which were used to wire the Arduino and motors. Once these wire harnesses were made, the next step involved installing end stops to each motor to act as a switch and force the motor to stop. The Arduino was then mounted onto the 3D printer and wired with the help of a RAMPS 1.4 Assembly Guide

The next few sessions were spent downloading and installing several pieces of software onto each team member's computer. These included vim, python, Anaconda, Arduino IDE, and Git. Optional packages installed for ease of use in the command line include vimrc, pathogen, nerdtree, and vundle. This step was simple for some, especially Mac users who have a built-in unix bash shell. Crew members with Windows, however, needed to install VirtualBox and create an Ubuntu VM in order to proceed with installing all of the packages required. The next skill acquired was the use of Git, which introduced the concept of version control.

Once Git was installed, each crew member cloned a private GitHub repository onto their local machines, which included the configuration files used to drive the printer. After everything was installed, it was time to test the printer. The initial drive did not run as smoothly as anticipated. The first major issue we faced was the fact that the two steel threaded rods were not aligned or leveled, causing a grinding sound when driving along the z-axis. After the rods were realigned, the motor showed to be faulty, unable to drive the bed back up in the positive z direction. After the motor was replaced and everything appeared to be aligned, the crew began to face new challenges. When connecting the Arduino to the motherboard and to the computer, it was unable to connect at all. After several attempts in changing the Arduino and USB cables twice, it took more troubleshooting to discover that it was actually the motor connectors that were faulty. Thankfully, this was the final change that needed to be made.

The final assessment will occur on Thursday, 17th March, when each individual crew member will drive the printer from his or her own individual laptop computer, as well as correcting a "broken" configuration file in order to drive the printer. This will be the completion of Milestone 3.

Thank you,
Team 4, Green Crew