Project Identity
Monitor Lift & Paint Cap Remover Project
Progress Report #5- Katie Zilm
Week 5: October 11- October 18

Work Completed
Monitor Lift Project

On Friday we were notified of which type of monitor our sponsor would be investing in. Our sponsor has ordered a new Samsung 275T monitor to replace the old bulky one that we had originally designed the lift for. With this information we were able to look up this model online and find the specific dimensions we are now working with. This monitor has a 27” screen just as the previous monitor. However, it is much lighter- only 22.9 lbs. The width of the monitor is 24.8 in and the height is 19.1 in. It is a flat panel monitor so the depth is also much shallower than that of the previous monitor.

We searched through the closet in the senior design room and found an adapter that is suitable for powering the monitor lift. The AC adapter most suitable for our actuator from the available selections is a two prong adapter made by CUI Inc. It is switch-mode power supply model # 3A-161WP07. The input is 100-240V ~, 50-60 Hz, 0.6A. The output is DC 7V, 2.14A. The linear actuator can use up to 12V and 5A so this adapter is a good choice. The output is high enough to supply sufficient power yet low enough to not overload or bum out components. This adapter can be plugged into any wall socket and we will attach it to the cord of the actuator. We successfully tested this in the lab.
The linear actuator is rated to work with 400 lb loads. However, we wanted to know how it would behave under moment force conditions – we wanted to make sure that we will not run into any binding issues from the actuator. To do this we secured one end of a 3 foot long piece of wood to the bracket on top of the actuator. The wood hung parallel to the floor. We then secured various objects to the wood at different positions to create a variety of moment situations and examined how the actuator behaved under each of four sets of conditions.

**Situation #1:**

Only wood → 2.8lb load, 18” away → 50.4 lb-in moment

**Situation #2:**

Wood + 2 ‘superstruts’, 30” away → 50.4 lb-in + 2*3.6lb*30” → 266.4 lb-in

**Situation #3:**

Wood + motor, 7” away → 50.4 lb-in + 22lb*7” → 204.4 lb-in

**Situation #4:**

Wood + motor, 7” away + 2 ‘superstruts’, 9” away → 204.4 lb-in + 2*3.6lb*9” → 269.2 lb-in

The linear actuator raised and lowered both effectively and smoothly under all of these conditions. Even if the monitor were directly attached to the actuator and no support rails were used, the moment force generated by a 23lb monitor approximately 6” away is far less than most of the above situations (only 138 lb-in). However, the guide rails that will be incorporated into the design of the lift are each rated for 400 lb loads. The ‘superstruts’ are an idea of what we can secured the rails to. With the rails secured to pieces such as the ‘superstruts’ (which are square tubes of metal with only 3 faces), the actuator should not feel any of the moment force as it would be redistributed onto the guide rails.

The platform was secured to the motor base this week. A 2’ x 2’ piece of aluminum was bolted to the motor base. One bolt was used in each corner. The bolts sit flush with the bottom of the platform so there is no instability.
Paint Cap Remover

Last week we secured the motor to the tube holder. This week the wall and base were constructed. These pieces were made of aluminum.

The wall will be secured to the base with three pins. The piece that can be seen being held against the wall will be where the motor will sit and the power supply will be below.

Future Work

Monitor Lift

Decide if we will use only one guide rail or both.
Decide where and how we will attach the guide rails.
Permanently attach the adapter to the actuator cord.
Design/create a housing unit for the switch.

**Paint Cap Remover**

Continue building the base and holding unit for the motor.

**Project Review**

**Monitor Lift**

Now that we know the dimensions of the monitor, the project is moving along very well and we have made much ground.

**Paint Cap Remover**

The paint cap remover project is progressing well. We have received all of our parts for it and are on track to get it finished.

**Hours Worked** 12