Travel Computer Mount

We had the release form for the computer mount signed by the Stenglein’s this week, and presented them with the computer mount. We installed the mount in their car with Sean’s Dynavox Vmax. The family was thrilled with the mount, as seen in figures 1 and 2 below. The only work left is to finish the user manual and NSF report.

Figure 1. Completed travel computer mount with Sean’s Dynavox Vmax.

Figure 2. Sean using his Dynavox Vmax in the car, utilizing the travel computer mount.
**Assistive Jumping Device**

At the start of this week, we began brainstorming ways to support the vertical rail. I determined with mechanics of materials analysis that even a small square/rectangular rod would significantly reduce the bending of the rail to a negligible amount. A square rod would be inexpensive, easy to install, and mechanically efficient. Additionally, an aluminum rod would offer low weight and corrosion resistance. Kelly and I found a suitable support bar for our vertical rail in the UConn machine shop; it was a 2” x 2” x 1/16” aluminum tube for approximately $25.

Once we obtained the rod, Kelly and I drilled ¼” holes through the tube corresponding to the holes already drilled through the vertical rail. The bolts firmly secured the tube to the vertical rail. I then created a new safety stopper to keep the harness from going off the rail. I made the stopper with an 8” piece of the same square tube. At this point, the rail was ready for more testing later in the week.

On Friday we went to the Health Center to continue testing with the gantry crane in the biodynamics laboratory. During the previous session at the Health Center, we realized that the rail was significantly bending at the unsupported end. We attached a square aluminum rod along the back of the rail to reduce this. The rod was able to significantly reduce this effect; however, we decided that we should move the support rod up to support higher along the top of the rail and leave about 6” at the bottom of the rail un-supported, as opposed to vice-versa. We will have to drill some new holes in the rail to accommodate for this adjustment, but it is not a major task. Figure 3 shows the system with the added support tube.

![Figure 3. Assistive Jumping Device with added square tube to prevent bending in the vertical rail.](image-url)
Once the bending of the vertical rail had been nearly eliminated, we felt comfortable with having Kelly get in the harness to test jumping with the system. We noticed that the crane trolley was moving a significant amount because it was not properly tightened down along the I-beam of the crane. The load was also not placed in the center of the trolley, which caused additional rotation. We believe this problem will be eliminated by simply centering the load in the middle of the trolley. As long as the center of mass of the Assistive Jumping Device lies along the midpoint of the crane trolley and the center of the I-beam, the system will tend not to rotate. When the rail was vertical, Kelly found it very easy to jump. However, there was significant friction when the crane trolley was tilted. Therefore, it is essential that we figure out how to reduce swing of the crane trolley along the upper beam of the crane. The rest of the system seemed to work very well. Kelly found the harness comfortable even while jumping. Figure 4 shows Kelly jumping with the AJD.

![Figure 4. Kelly in the Assistive Jumping Device.](image)

This coming week, we have to make few minor adjustments to the AJD. First we need to reposition the support rod so that it goes higher up on the rail, nearer to the crane trolley. We also need to install the double-hook mechanism that we will be adding to make it easier to get Sean into the harness. One hook will be permanently attached to the harness and the other hook can be clipped to the safety stopper. The two hooks will be attached with a bungee. Without the hooks Sean’s parents would have to lift him up to
get him into the harness, because the bungee cords are not fully loaded and distended at this point. This will allow Sean’s parents to pull down the harness and hook it into place so that they will be able to get Sean in and out of the harness easier. Once Sean is secured in the harness, the harness can be unclipped from the safety stopper, so Sean can jump freely.

Additionally, we need to follow up with the Steinglein’s and the concrete/crane contractors to ensure that installation appointments have been made. We expect our testing at the Health Center to be complete by the end of this week. Therefore, once the cement and crane are installed, we can begin installing the Assistive Jumping Device at the Stenglein’s home.

I spent 16 hours working on the project this week.