Travel Computer Mount

The travel computer mount is now complete. We brought the mount with us to our meeting with the Stenglein’s on Friday the 13th. The mount stayed in place and held the Dynavox in place very well. However, Sean’s mother requested that we shorten the L-bars by two inches to make sure that Sean will not be able to kick the computer. This will be a very simple modification that can be made with one trip to the machine shop. We hope to obtain a release form for the mount this week so we can drop off the final product with the Stenglein’s before our next meeting. Figure 1 shows the completed model.

Figure 1. Completed computer mount.

Assistive Jumping Device

I focused my efforts this week into the design and construction of a bracket that would attach the harness to the trolley of the vertical track. I began by brainstorming ways to attach the bracket that would utilize the threaded holes already made in the seat. Originally, I intended to use the threaded holes along the side of the chair to attach the bracket and trolley, but these holes ended up being too low on the seat. Instead, I decided that I could still use these holes, but the bracket would also have to attach to the top of the chair as well.

Before I made any alterations, I consulted the machine shop to see what scrap metal I could use to build a bracket. I was able to take a small sheet of steel, a
rectangular prism of aluminum, and two thick aluminum rectangular pieces. From these pieces I designed a bracket. The sheet of metal would be folded around the contours of the chair and bolted into the threaded holes along the side of the chair. The sheet would connect to the two aluminum rectangles which would also be bolted to the top of the chair frame. After laying out the pieces, I realized that the bracket was slightly slanted, so I incorporated the rectangular prism into the design to level the height of the bracket. With this design, the trolley could be bolted directly to the aluminum rectangles.

First, I cut away the covering and foam from the top of the chair to expose the metal frame. My initial plan was to drill two threaded holes into the frame. As I made the holes I realized that the frame was a hollow cylinder. Therefore, I would not be able to create threaded holes. Instead, I would have to drill all the way through the cylinder and put a nut on the other side, inside the chair. Figure 2 shows the bolts secured through the upper frame of the chair.

![Figure 2. Upper bracket secured by two bolts secured through the metal frame through the top of the chair.](image)

I then drilled holes in the two aluminum rectangles in order to attach them to the top of the chair, the vertical trolley, and the height adjusting prism. I drilled one quarter inch diameter hole at the top, and two at the bottom of each rectangle. I also drilled two 6mm holes in each of the rectangles for attaching the vertical trolley. I utilized the four threaded 6mm holes in the trolley for attaching to the bracket. The rectangles support the trolley so that it is level and straight. However, without an additional height adjusting piece, the aluminum rectangles would slope downward at the base of the chair, and would thus misalign the trolley. I lined up the bottom holes of the aluminum rectangles along the height adjusting piece, and drilled the corresponding holes straight through either side. The last step was to prepare the lower bracket attachment. I first folded the sheet of steel to fit the contours of the seat. I drilled holes in the sheet along each side of the chair so that I could bolt the bracket to the threaded holes along the lower portion of the chair. Finally, I drilled 4 additional holes in the sheet so that I could pass 4 bolts through the plate, the height adjusting piece and the two aluminum rectangles to secure everything into place. Figure 3 shows the complete assembled bracket.
Blaine and I assembled the bracket and adjusted some of the holes on Friday. We ended up having to make a lot of adjustments. When we finally got everything assembled, we tested the sliding ability along the rail. The chair did not glide as smoothly as the trolley did before being attached to the bracket. After reexamining the set-up I noticed that this was probably due to the fact that the bracket was slightly bending the trolley. This slight bend was enough to slightly misalign the trolley, and prevent smooth gliding.

At this point I disassembled the entire bracket and tried to reassemble several times. Each time I made slight changes to the setup in order to correct the problem. After several tries, I finally realized that the trolley had been installed incorrectly. After correcting this mistake, I reassembled the entire bracket assembly once again. This time the harness moved up and down the rail much more smoothly. This will allow Sean to jump up and down with ease. Figure 4 shows the harness sliding along the vertical rail. Figure 5 is a close up of the trolley fitting along the rail.
Friday evening we went to visit the Stengelein family to watch Sean jump on a trampoline. We hoped to see how well Sean could jump and how much support he would need to jump safely. Sean was secured in his LiteGait harness that he uses to walk on a treadmill, and was asked to jump on a small aerobics trampoline. This was the first time Sean has ever been on a trampoline. He was very excited and made rapid progress. He was unable to jump very high, but we expect that he will do better on a larger trampoline where there is a greater surface area for jumping. He seemed to have adequate head
support. He actually preferred head freedom so he could look down and watch his feet. As he looked down he improved his jumps.

In this coming week we will be working on several different tasks. First I will be working to reupholster the seat. I had planned to get this done this week, but after consulting a friend I realized that a standard sewing machine will not be up to the task. Instead I will be re-upholstering the seat by stapling and gluing the vinyl, and I will need a heavy-duty leather sewing kit to reattach the seatbelt straps. We would also like to: begin designing a bracket to attach the vertical rail to the horizontal trolley, and figure out what bungee cords we will use to support the harness. In addition, we will review the video of Sean jumping on the exercise trampoline to determine whether he will need more/less support while jumping.

I spent approximately 18 hours working on the project this week.