Project Identity
Modified Communication System for Client with Disabilities
Week 6: 10/1/06 – 10/7/06
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Work Completed
This week we finally got the joystick to work properly with a computer. As long as the computer detects the joystick through the USB port, it will function properly. Our problem with it in the previous two weeks was that we were unable to get any computer to recognize the joystick as a mouse controller. We also had issues with the computer recognizing the joystick as an operable device. After much testing and delicate handling of the joystick and USB wiring, we were able to determine that part of this problem was due to a loose wire connection, as we have not yet hard-wired the USB cable into the joystick’s USB board.

Once this issue was solved, we continued to work on the problem related to the joystick’s actual purpose of functioning as a mouse. Since we do not have access to computer device settings on the computers in the design lab, we performed out testing on Steph’s laptop computer. Upon opening up the program to change the computer’s mouse settings, we noticed that the computer was not detecting the joystick at all as a mouse device. After a lot of tedious browsing through computer setting options, we realized, mostly through trial and error, that the computer was not detecting the joystick as a mouse because it had recognized it as a game controller instead. There’s a test feature for game controllers to see if they’re compatible with the computer and hooked up correctly. We were able to use this program to test the joystick, as shown in Figure 1:
The display box on the computer screen shows the device test. The small box with the cross in the middle shows the movement of the joystick along its x- and y-axes. As the handle is moved in various directions, the small cross follows the motion of the joystick as it moves. We both took turns testing out the motion of the joystick, paying careful attention to not upset the USB wire connections, and the test was successful each time. The display also shows four button controls, one of which is shown highlighted. Whenever a button is depressed, the corresponding button control in the display box becomes highlighted. When this photograph was taken, the front button was depressed. It was found after testing both joystick buttons that each button on the top of the joystick functions as a separate control and we figured out the correct configuration to wire in the mono jack for the addition of the Specs switch. We will make each of the buttons work for the same function and as well as the Specs switch. To ensure all three buttons function the same way, we will have the common red wire connect to all three buttons as well as either the yellow or green wire. Figure 2 shows a test run of the integration of the Specs switch into the joystick circuit.
The wiring of the Specs switch to the USB digital terminals is shown in Figure 3:

This week, we also made a to-scale model of the screen enclosure and decided to adjust some of the dimensions before making a final order of the ABS plastic. The exact dimensions are indicated in the Visio drawing shown in figure 4. The ABS will be 0.25 inches thick and will be bonded with IPS Weld-On 2354 glue specifically made for the strong
adhesion between ABS pieces. Following the construction of the scale model of the screen casing, we were able to determine that the biggest piece of ABS needed is a 12” x 24” sheet. We will also be including ventilation slits in the case to allow for the microprocessors to breathe. Figures 5 and 6 show the cardboard scale models of the screen casing.

Figure 4: New Screen Casing Dimensions in Inches

Figure 5: Back View of Scale Model of Screen Casing
**Future Work**

We will continue to complete the electrical connections for the LCD screen, battery pack, and charger, so that we can begin to test the system and construct an encasement for the screen. We can order the ABS glue and the glue applicator from TAP Plastics as soon as we know if the ABS will be donated to us from Stephanie’s father. We can also begin to make the final connections of the joystick now that we are sure that it works properly and no device drivers are necessary or additional adjustments are needed. Also, Now that there seems to be more than one option for possible functions for the joystick, we can implement this joystick for a number of other functions. As our client has permanent physical limitations, it should come as no surprise that he would want more effective ways to complete many tasks, such as using a computer or playing video games like any other boy his age. Due to his involuntary movements, he is unable to use a regular computer mouse, and his lack of dexterity makes it impossible to use a standard game controller. As we’ve discovered this week, it will be possible for him to use his joystick as a game controller. If we are able to get the computer to recognize the joystick for mouse function as well, he will be able to operate any computer with a USB port (which includes most modern computers). We have sent a follow-up email to our new contact with P-Q Controls to see if he can aid us with this problem.

**Project Review**

Our project is progressing well. We are making all the proper connections and testing all of the components. We know that our joystick is a functioning PC compatible device and based on the settings available
on the DynaVox™, we anticipate that it will also be compatible with the DynaVox DV4™ and getting it to function correctly would just be a matter of changing the controller settings. All parts are working properly and the final connections will occur very soon. We only need to order the mounting systems from 80/20 and the ABS glue. The remaining money in our budget is $219.95, leaving plenty of money for the last orders in our project. Our timeline is on schedule and everything should be completed by mid November.

**Total Hours worked: 18**
Phil: 9.5
Steph: 8.5