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, I spent a significant amount of time attempting to get the joystick to function properly as a computer controller, to test its functionality. 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, I was 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, I 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 my 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, I 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. I was able to use this program to test the joystick, as shown in Figure 1:

![Figure 1: Game Controller Testing Display](image-url)
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. Both Phil and I 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 performs a different selection. We also temporarily wired the Specs Switch into the third USB digital terminal and saw that the third button indicator was highlighted when the Specs switch was depressed. We then wired the Specs switch into the same digital terminal as the first button and saw that the first button indicator highlighted when either the Specs switch or the first button were depressed. The wiring of the Specs switch to the USB digital terminals is shown in Figure 2:

Figure 2: Specs Switch Wiring to Digital 1

My hypothesis as to why the computer did not recognize the joystick as a joystick control, but as a dual-axis game pad with four buttons, was that the USB board was configured in such a way that it must be more similar to this kind of game controller than a typical computer joystick control. This makes sense, as a game controller of this
sort would work in a similar way, moving the “cursor” in the desired
direction then using a button to select a desired option.

**Future Work**

The fact that this joystick can be recognized in this fashion adds a
new perk to our design. By equipping the joystick with a standard USB
connection, we have already designed it to be easily connected to any
USB device, however it’s main function was meant to be to work the
DynaVox DV4™. Now that there seems to be more than this option as
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 recognized the
joystick for mouse function as well, he will be able to operate any
computer with a USB port (which includes most modern computers). I
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 now have the majority of all our
working parts and have been making progress in putting some of them
together. 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. We also now have a completed case design for the
LCD monitor and a basic design for the mounting for the monitor as well.
At our current rate, we should be completed with our project on
schedule.

**Hours worked:** 8.5