Project Identity
Modified Communication System for Client with Disabilities
Week 4: 9/17 – 9/23/06
Stephanie Santos

Work Completed

So far this week, we have been continuing in our search for the proper case for the LCD monitor for our system. We have reviewed available catalogs from Digikey, but no suitable case has been found. We have also begun to look into plastic materials, should we need to build our own case instead. We had originally considered the use of stainless steel casing, however stainless steel is not a very light material, and after consulting with Dr. Enderle, we have determined that it would not be very strong in this application. Plastic materials are more desirable for this application, as they are usually strong and lightweight materials, and generally more aesthetically pleasing as well. We have taken into consideration the use of Kydex®, a light and strong plastic material used in many practical applications. It is a very durable acrylic-PVC alloy used for many applications, such as medical equipment, housings, tables, fixtures, etc. After doing some searches on this material, we have found some places where we could purchase sheets of Kydex® plastic, with a selection of colors, at a reasonable price. Interstate Plastics.com offers a variety of Kydex® sheets ranging in thickness from 0.060 in. to 0.25 in. sized from 12x12 in. to 48x96 in.

Figure 1: Kydex® Sample Sheets

For the purpose of making this casing, we should need no more than a 12x24 in. Kydex® sheet. We will continue to search for pre-made casings, but will keep this in mind in the event that we are unable to find a suitable case and need to make our own.
We have started testing out the joystick we received from P-Q controls this week. The USB wiring setup is that of a standard USB device. The Setup on the joystick can be seen in the following figure:

![Joystick Wire Set-up](image)

**Figure 2: Joystick Wire Set-up**

We have not currently hard-wired a permanent USB cable to the joystick, as we are still deciding if we should wire the cable directly to the joystick or if we should wire in a cable clip so the wire can be unplugged and replaced if ever necessary. So far we have attempted to use the joystick with PCs running Windows© XP software by temporarily fitting a USB cable into the wire slots. The joystick should be preprogrammed to work with all current Windows© operating systems, however, we had some difficulty in getting the joystick to function in place of the mouse and control the cursor.

Several times, the computer was unable to recognize the device once it was plugged in, and we tried various methods through the device manager to get the joystick to work. We were unable to install a device
driver, and we are unsure if the problem is due to the lack of a driver, incorrect computer settings, or the fact that the cable is not yet securely wired to the joystick. If the problem is related to the lack of a device driver, since this joystick is a custom device manufactured by P-Q Controls, there may not be a publicly available driver, in which case, we will need to contact P-Q Controls for further assistance.

We have also determined the wiring setup for the buttons on the rocker-switch of the RGS grip and have drawn up a basic schematic for wiring in the head-switch. The basic circuit is shown in the following figure:

![Figure 3: Selector Switch Schematic](image)

The green and yellow wires correspond to the rocker switch buttons, both of which are wired into the first and second digital ports on the joystick’s USB board. This can also be seen, though not very clearly in Fig. 2. The red wire runs to the common port. All three wires can be seen in Fig. 2 as well, but their connections are not all visible. This diagram, however, shows the connections much more clearly. We have also added the connection for the Specs® Switch by adding a mono-jack connection to the original circuit, which is shown in Fig. 3.

**Future Work**
Our work for the next couple of weeks is gradually being laid out before us as our parts are now beginning to arrive. As our parts come in, we can begin some preliminary testing phases with the LCD monitor to DynaVox™ setup, as we continue to work on our casing and mounting designs. We are still in the process of determining the practicality of wiring the monitor to the wheelchair power. It was decided that the best way to find the most accurate information was to get manufacturing and model information on the client’s wheelchair from the client directly, however they have not yet replied to us in regard to this information. So this consideration is still in progress, but must be put on hold for the time being. In the mean time, Phil and I will both try and coordinate our schedules to find a good time to visit Student Disability Services to see if they can offer us any help regarding this situation.

Our most major concern currently, to be addressed within the next week or so, is to get the joystick to function properly with a working computer. We will be in contact with P-Q Controls some time in this next week to get whatever information we need to install a device driver if necessary. When this problem is taken care of, we will test the working joystick with the old model of the client’s DynaVox™ which was lent to us for this purpose. We will also continue our search for pre-made casings for the monitor along with further consideration on plastic materials for the possible fabrication of a case. We will also finalize our designs for both the joystick and monitor mounting setups. These designs, however, will depend greatly on the information which we are waiting for our client to provide.

**Project Review**

Our timeline has again shifted back, due to the lack of parts available to us to work with, however they are gradually coming in and it looks like we will be able to begin testing and assembly of our system within the next week or two. We do have the joystick, which was an essential part of the project and we are in the process of testing and troubleshooting the device. Once the other parts arrive, the project can finally be fully underway. Our project timeline has been adjusted accordingly and should be finished by the end of November.

**Hours worked:** 6.75