1. PROJECT IDENTITY:
HEAD & ARM MOUNTED ART DESIGN SYSTEM
Week 5
2/26/2007
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2. WORK COMPLETED

During this past week the fiber optic blink switch and compass arrived in the mail. We measured that the instance of the eye blinks switch to approximately 1.5cm away from the pupil. There is actually a self calibration mode for the eye blink sensor which will allow for the user to have a safe sensing range, in case they move the classes. There are no lenses on the glasses, just the frames; this is an advantage because we do not have to worry about lens maintenance or having the users with different sight issues. On the left of figure 1, one can see the secret sensor.

My team now regularly meets on Sunday, Monday and Wednesday to continue our work on the project. At our Monday meeting, Dr. Enderle suggested that we should think of using a microcontroller instead of a relay switch. Bill also said that we should not put a We are still investigating the two options in order to determine the best method for our project but it seems that we are leaning towards the relay switch. We had planned to create the aluminum coupling system between the motor head and the speedometer tube. This system was constructed in the machine shop. Three set screws were used in total, two to hold the motor head to the spool and one to hold the speedometer cable to the aluminum spool. I was concerned about bimetallic corrosion but after Becky
talked with the machine shop people, they said this part should last for about ten years and since it’s a sealed region no water should get into the area.

We have been searching for our new gooseneck. I found two options but my partner is going to IKEA this weekend to find one in the store. We tried calling various gooseneck manufacturers but unfortunately nothing weights less than 2 pounds for the 36 inches of greater length that we are searching for. This lighting store named Pegasus said that they have a 48 inch long gooseneck lamp which hangs from the ceiling. Unfortunately no information of the inner diameter was available so the best idea is to purchase the item and return it if it is not what we were looking for. Four tests were done with the motor on and the compass to see how to create a better drawing simulation. Using pull ties my group attached the compass to the speedometer cable and powered to motor to see if the system worked. Initially we tried to attach the motor to the top of the speedometer. This did not work well, because there was unequal weight distribution and the pen just wobbled around. The point on the compass was also causing the pencil to jump and not create continuous lines. I decided to move the pull ties to attach to the actual arm of the compass. This permitted for a much more uniform action; I also removed the pin and created a contact surface between the arm and the paper. The system started to draw better but the pencil line was not very dark, it seemed that more pressure had to be added to create a darker line.

I decided that it would be a good idea to use the mechanism of a rolling ball like that one found in a mouse to replace the flat compass arm where the point used to be. It is possible that the ball can also have multiple weights so that they can be counterbalanced and interchanged when a different utensil is used. For example to balance a thick heavier marker, the user can use a heavier ball on the other side so that the whole compass will be level. Even maintenance of surface to utensil contact can be user determined with this mechanism.
I did quite a bit of research on the relay switches during the past week. Our group had a bit of confusion because one advisor told us that relays were not reliable, and the other said that relays are perfect to function in our project. I found that relays are a common source of motor failure because the rest of the motor tends to be more reliable than the relay itself. Apparently the addition of a resistor across the capacitor will increase the life of the relay.

This week I will also have to go to the machine shop in order to remove the current set screw ring on the side of the compass arm. Once this part has been removed, I will file the surface and determine a way to attach a new mechanism which will permit for different utensils varying in size to be securely attached to the compass.

### 3. Future Work

By next week we will know for sure if we plan to use to relay or microprocessor to reverse the tash motor. The order for the gooseneck will be put in first thing Monday morning in hopes of receiving our gooseneck before spring break starts. Once that arrives we will be able to decide whether or not guiding beams are required to stabilize the tube. By next week we also will have determined the type of mechanism to use to attach utensils with various circumferences to the compass.

### 4. Project Review

Our team is back on tract this week with the arrival of our fiber optic eye blink switch. We are extremely motivated to work hard and finish this project as soon as possible. By spring break we plan to have all schematics and circuit logic configured so that the only thing left over to do will
be testing and improving. We expect the neoprene fabric to come in soon as well so we shall be done with creating the physical structure of the arm.

5. Hours Worked
In Lab: 6 + Outside Lab: 8 = Total: 14 hours