1. PROJECT IDENTITY:
HEAD & ARM MOUNTED ART DESIGN SYSTEM
Week 3
2/2/2007
Nemi Kotadiya

2. WORK COMPLETED

One of the most important tasks to do this week was to get the website running and that required a lot of help from the people from the help desk in E2. I learned how to upload our files in a new way. This made it easy for all our documents that needed to be uploaded. By now the week 1 and week 2 reports and presentations for all team members had been uploaded.

Another task that needed to be completed this week was removing the other end of the gooseneck that we will be using on the arm. I tried to do that myself by clamping one end of the gooseneck and using a wrench to turn the other side. However, there was not much force on the clamping end and this caused the whole gooseneck to rotate. Therefore, I made a visit to the machine shop. Over here, one of the professionals readily agreed to help me. They used a clamping machine which tightened the end to be removed. Using a vicegrip they tightened the gooseneck itself and turned in a manner that is similar to opening a screw. Fortunately, the end slowly started loosening up and was finally removed!

![Figure 1: Arm Gooseneck with both ends removed](image)

After examining the speedometer cables I soon realized that the pieces of cam that we were going to use would be too heavy to be held up by the “slinky” inside the speedometer
cable. This is because the “slinky” would not only have to bear the weight of the cam itself but also the set screw on it and a drawing utensil. Also, the drawing utensil will be away from the center of the cam making it even heavier! Therefore, I thought of a way to reduce the weight and make the design more compact and less heavy. This thought resulted into a diagram that is shown below:

![Figure 2: Proposed New Design](image)

Since we received our motors this week, one of the more important analyses that needed to be done was testing the motor. First, the power supply in the lab was used to step down the voltage to 0 volts. This is because I never wanted to damage the motor by applying excess voltage. Proper connection was made from the motor to the power supply and the voltage on the power supply was slowly increased to 12 volts. At this time, it was seen that the motor ran at approximately 200 revolutions per minute.

To test whether the motor could turn the speedometer cable with a weight attached to its end, I used a shrink wrap to secure one end of the speedometer cable with the only end of the motor. On the other end of the speedometer cable, I attached a small weight to simulate our drawing utensil holder. I attached the weight using pull ties to the cable. The motor was then turned on and it actually turned the weight. This was a positive result and the whole procedure was repeated for the second motor.

After this test, I decided to open the motor up to see whether I can attach the “slinky” from the speedometer cable directly to the motor. However, I soon realized that opening some parts of the motor would result into damaging it. While closing the motor, I experienced some problems...
with the gears. They had fallen apart. I slowly tried to put them back together but the task seemed impossible since they required a lot of precision. I decided to carefully open the second motor to see how the gears were set-up and this helped me to set up the gears of the motor that I was fixing. Finally I was able to fix and screw in both the motors and they were operational.

![Image of the motor](image)

Figure 3: Testing the motor

### 3. Future Work

One of the most important tasks that need to be figured out is how the gooseneck is going to be attached to the headpiece. This is important and should be figured out as soon as possible. It is also important to realize that the speedometer cables that we have are the same sizes as the long gooseneck. This means that we will not be able to have the motor located near the ground (which is one of the main criteria we had wanted). Therefore ordering a long gooseneck can be and should be done very soon. While awaiting the fiber optic eye blink switch, we should also start doing research on how it will interface with the current motor system.

### 4. Project Review

As of now, I feel that our team is utilizing the time that is provided to us very carefully and is very much up to schedule. Apart from that we are also taking preventive measures in terms of ordering the parts. For example, we did a lot of research before we ordered the fiber optic eye blink switch. Since, both my team members are machine shop
certified, they will be taking the speedometer cable to machine shop to make it in a way to fit into the gooseneck.

5. **HOURS WORKED**

In Lab: 6 + Outside Lab: 4 = Total: 10 hours