This week, additional tilt sensors were considered for the project. After making a phone call to the company, Mouser Electronics, and speaking to one of the technical service representatives, two contact rolling ball switches were decided upon. The way that the sensors work is by a small ball located inside the sensor. Also inside are contact points which will complete the circuit depending if the ball is making contact with them. The contact aspect to the sensors is expected to make their integration into the circuit relatively simple. The first type, 107-2010-EV seen in Fig. 1, contains two leads and has an operating angle of ±30°, Fig. 2. The disadvantage to this style is that the device would require two sensors for the two different directions in which the device could be tilted. However, the advantage is that it seems to be very simple in that it can recognize a slight tilt and the device would be programmed to function at 0°.

![Figure 1: Contact Rolling Ball Tilt Switch 107-2010-EV](image)

![Figure 2: Operating Angle Diagram of 107-2010-EV](image)

The second rolling ball contact switch is the RBS151100, Fig. 3. The operating angle is 15° and this sensor is bidirectional, see Fig. 4. Therefore, a quantity of one will satisfy the requirements by the device. However, it may present a more complex design. The company does not provide any directions on integrating the sensor with a circuit so tests will be necessary to observe the operation.
With extremely low costs of each of the sensor, it was decided that both contact tilt sensors would be ordered. Additionally a couple of each were ordered in case there is trouble when first beginning to work on integrating the sensors with the circuit.

A case for the device was also ordered this week. After observing various sites and speaking with the team members, it was decided that it would be best to order a basic case that can be further modified later in the semester to visually appeal to users. It seemed necessary to start building the parts around a specific case instead of trying to fit them in further down into the semester. A picture of the device case can be seen in Fig. 5. A free sample was ordered and shipped by the company, saving the team the approximate $96 the same case would have cost.
Future Work

The future work of this project will again be focused on the voice recognition and output devices. Since they have still not been received, they are expected to come in this week. Also, with the confirmation of shipping be provided by the company, I will start building a 3D model in AutoCAD this week, awaiting the arrival of the voice hardware.

Project Review

Unfortunately, without the voice hardware, this week was not as accomplishing as previously hoped. However, the team has overall contributed to moving the project along with time schedule. A few additional parts were ordered on my part and the research that was done during the time expected to have been reserved for the voice hardware was fully utilized.

Hours Worked

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