ECE Senior Design Weekly Report

Engineer’s Name: Jake Jabbora Date: 4/27/17

Team Name: The Globetrotters Lab Section: 4

Week’s Task: Map out the hall effect voltages from the PCB. Look into rotation. Wheel and assembly for rotation and how much power we will need.

Results:

Last week Rence and I did the hall voltage mapping test that Hugh suggested. We took the whole assembly and flipped it upside down so the levitating magnet would stay securely in place. The distance between the magnet and the base was approximately 1 5/8th inches. We used graphing paper to move the magnet in four directions with three steps in each. Each step was measured to be ¼ inches. The magnet was stable in the center position and around the center point ½ inch radius. However, it became unstable at the 3rd graph box or at ¾ inches. The hall voltages seemed to be what we were expecting. When the levitating magnet gets displaced, three of the hall voltages will decrease while one of them increases. The one hall effect sensor that increases in the hall effect sensor that is closest to the levitating magnet. For example, if the magnet moves towards the north hall effect sensor, then the north hall effect sensor will increase while S,E,and W will decrease their values.

In addition to the levitating, we still want to have something to show for rotation, even if we can’t implement it fully. I designed a simple wheel for rotation. The motor will connect to the wheel which is attached to the globe at a 10 inch diameter. This way the wheel will be lower and closer to the magnet and require less torque. I have two designs that both could work. One is more secure but weighs a little more, and the other is weaker but it is lighter. The lighter design is what I am hoping to use as long as it’s strength can hold up. The wheel will take approximately 6 V with 40mA, no load and 360mA at stall.