ECE Senior Design Weekly Report

Engineer’s Name: Andres Martinez Paz Date: 04/27/2017

Team Name: Globetrotters Lab Section: 4

Week’s Task: My main task this week was to, yet again, design the PCBs for the levitation system. My tasks this week were to design revisions for the levitation PCBs, as well as creating a new PCB for our power distribution.

Results: I designed two revised PCBs, one with all the traces to connect the main components of the system, and another one to solder and hold in place the hall-effect sensors at the top of each of the electromagnets. Both PCBs had the same mounting holes in order to hold them together tightly. They both also had holes for the cores of the electromagnets to go through, and sit flush with the surface of each PCB. Both PCBs are connected together through a newly created 10-pin header. Two pins connect the Vdd and Gnd to both PCBs, and the other 8 connect the output from the hall-effect sensors to the system below, as well as providing power to four LEDs at the op which will be controlled by the PIC microcontroller. These LEDs were added to Revision B in order to provide visual feedback on the stability of the system. Another important aspect of the PCB design was creating a big enough trace to let the current flow between the coils and the H-bridges. To do this, I designed the traces to be 100 thousands of an inch, and I filled these traces with solder, to increase the thickness of the traces. The main changes to the bottom PCBs were removing the differential amplifiers from the system, as well as providing breakout pins for the microcontroller, and including the programming interface for the microcontroller. I also moved the microcontroller closer to the inputs from the Hall-effect sensors, to try to remove noise.