Executive Summary

The concept for this project can be summarized by a few key traits that characterize our motor controller design. These traits are for it to be reliable and, most of all, for it to be safe. To better accomplish this we will be using the MSP430f2012 for the control aspect given its history of reliability. To combat electrical noise and enhance safety, a Hall Effect current sensor was included for better system monitoring explained on pages 18-19.

Here are some important accomplishments that should be noted. The construction of the project is mostly done as to date this can be seen in the schedule on pages 30-31. The testing phase will be underway shortly. By starting testing at this time we believe we will have time to make adjustments to the design if necessary. Our estimations indicate that the product will be completed by early April. After the completion of the product we will present our accomplishments at the Undergraduate Research and Design Symposium on April 27th.

The requirements of the project (pages 14-16) remain unchanged so we feel the original design, with a few exceptions, still fulfills these needs. These exceptions include the MSP and Hall sensor. The pulse width modulation will now be handled through the use of the MSP microcontroller. Along these same lines, there will be some necessary circuitry to accompany the MSP. These changes are reflected in the updated schematics. The Hall Effect sensor will directly replace the current shunt from the previous model. We also isolated the power components from the microcontroller, like we had discussed.

Since our design has changed, the budget now has some additional expenses as can be seen in the Budget section on page 29. The added costs are the result of the aforementioned parts and a few other components that will save energy and protect against noise. The budget is

now about $325. Please note that this does not include those items that are provided by Northern Arizona University.

It is our intention that the fruit of our labors will yield a safe and well built motor controller. The following report goes into great detail into each aspect of the project. The minor changes you will find result from a desire to reduce power consumption and troublesome noise.