Hello Buckeye Current friends, family, and alumni! This newsletter roughly marks the halfway point between the 2016-2017 academic year (otherwise known as the start of our build cycle). We’re happy to present to you the first official correspondence from the team for this race season. It’s been a long time coming, and it conveniently lines up with our official invitation into this year’s Pikes Peak International Hill Climb! This newsletter contains a number of updates: from new technical components to revamping the team’s space in the student project building at CAR.

Race in Review

This past June, we raced at the Pikes Peak International Hill Climb for the 100th anniversary of this historic race. Our friend and IOM TT rider, Rob Barber, was back to join the team. The competition was fierce, with entries in the electric class from MIT, Hollywood Electrics/Zero Motorcycles and Victory. As is common in a prototype vehicle, technical difficulties arose in the practice days leading up to the race, culminating in a complete motor controller failure 48 hours before our start. Our bike, RW-3x, was disabled for the last day of practice and kept the team from setting a qualifying time. After dismantling the motor inverter, a Tritium Wavesculptor, we located two blown fuses, then repaired and reassembled. While the bike was again ready, the night before the race a storm covered the upper section of the course in ice and water. The electric bikes were the first competitors scheduled to run, but race officials allowed very little time for the course to be cleared. RW-3x went up the mountain with uncertain and dangerous course conditions and no practice runs on the bottom section.

The team successfully completed the hill climb with a time of 11:16 and a number of accolades: 3rd in the electric class, 14th overall in a field of over 30 motorcycles, and 2nd fastest rookie rider. Although these results were not exactly what we were hoping for, we were still happy Rob finished safely and with a competitive time. In addition to the quantifiable achievements, this race also marked the first time in the team’s history that the motorcycle completed its competition without any notable technical errors limiting performance.

Continued on page 2…
There were no overheating powertrain components. There were no busted battery modules. There was only a course covered in ice. With this in mind, the team has decided to make small refinements to the RW-3x system this year, only changing what is necessary to make RW-3x even more competitive at Pikes Peak. Buckeye Current has officially been invited to compete in the 2017 race, and we're ready to conquer the mountain.

Looking Forward

In past years, the design/build cycle has typically been on a fairly traditional schedule, with design iterations happening through fall semester and the build commencing midway through the year, followed by more rigorous testing. With an already (mostly) functioning bike, we chose to approach this year in a more agile way: incremental sprints. Separating the design/build cycle into time-bound sprints allows the team to focus all of their efforts on a few improvement projects at a time, while still allowing the team to perform testing with a functioning bike between these focused efforts. Testing may then reveal additional iterations necessary to add into the next time box.
Paddock Revamp

For the first time, the team did a complete overhaul on the allotted paddock space in the student project garage at the Center for Automotive Research. Honda R&D Americas, Inc. generously donated $5,000 to each of the student project teams working out of the Center for Automotive Research to revamp each area and make the entire student project building look both more professional and more organized. The team was more than excited, and promptly designed the paddock of our dreams (within budget, of course) and purchased new toolboxes, workbenches, general organizational equipment, and more. Highlights of the upgrade include:

• 1 Milwaukee 46" 16-Drawer Tool Chest and Rolling Cabinet Set

• 2 Milwaukee 60" 11-Drawer Mobile Workbenches with Variable-Height Pegboard Back Wall

• 2 Maple Butcher Block Workbench Tops

• 2 8' Workbenches

• 4 4' x 4' x 2' Pallet Rack Bins
Industry Trips

In October of 2016 and January of 2017, Buckeye Current visited two of the team’s biggest sponsors: Bosch Engineering Group in Novi, Michigan and Harley-Davidson in Milwaukee, Wisconsin. In both trips, 12 team members carpooled up to the locations and participated in a day filled with technical presentations (from both Current and the sponsors), as well as informational recruiting opportunities from the HR departments. The team has forged a strong relationship with both Harley-Davidson and BEG over the past two years, so it was exciting to get a chance to tour the facilities, learn about the companies, and meet the engineers. Some of the highlights from the trips included: seeing the recent hires at BEG from Buckeye Current, the team’s technical overview presentations, and meeting with Harley-Davidson’s team behind the LiveWire, HD’s prototype for their first electric motorcycle. The team is extremely thankful for the opportunity to visit its sponsors, and looks forward to the opportunity to do so again.
After four major races with the Tritium Wavesculptor 200 motor inverter, and an additional year of testing and usage for an ECTA timing record, the team is finally moving onto other options. This was decided based on the failure leading up to the 2016 PPIHC competition and the technical limitations the team has identified with the unit over the past few competitions. The team started this year by evaluating two options: Mission Motors MC600 inverter versus an inverter from Rinehart Motion Systems. The MC600, while already in the team’s possession due to a donation, required a high-risk tuning operation to the motor and comes with no technical support from Mission Motors. The team dug into options from RMS, deciding on an RMS PM150DZR inverter. Though the MC600 unit is an advanced, lightweight and high-power option, learning and optimizing the tuning process would likely exceed the time allotted for this motorcycle’s build.

The PM150DZR met our requirements while being a lower risk option to implement in a short time. The team is working closely with Rinehart to customize the inverter for specific application to the RW-3x motorcycle, including component weight reductions and custom packaging to be designed by the team.

Acquiring the RMS inverter also places both CAR and Rinehart in a unique marketing position, as all of the student projects designing electric vehicles will be using RMS inverters. We are looking forward to working with such an incredible company and implementing our first inverter advancement in years.