

## Director Updates

### General News

This summer has been one for the record books! Thanks to the utilization of Google Hangouts, PrISUm members from across this nation have been working avidly on our vehicles. Phaeton 2 is having some final modifications before this summer's American Solar Challenge and members have been putting a lot of design effort into Penumbra, the team's 2017 Bridgestone World Solar Challenge Cruiser Class vehicle. Between both these vehicles, members have been working around the clock perfecting designs and breaking new ground. To say the least, this team's leadership has really stepped up to the task at hand and has knocked it out of the park. It is no surprise that they have all secured internships!

While all this design work has kept our electrical, mechanical, and systems teams busy, our business team has been working on rebranding PrISUm. Over the past year, a series of focus groups developed a new mission statement, branding guidelines, and long term focus for the organization. These articles will be rolled out within the following months, starting with a complete revitalization of our website. Big things are in the works, and we are very excited to share them with you! Stay posted for updates to come.

### Formula Sun Grand Prix and American Solar Challenge

If you have not done so already, be sure to check out the 2016 American Solar Challenge race route and the 2016 Formula Sun Grand Prix location! We love meeting supporters of the team, and hope to see you along the race.

2016 Formula Sun Grand Prix – Pittsburgh International Race Complex

2016 American Solar Challenge –

#### Stage 1

- **Sat, July 30:** Start at [Cuyahoga Valley National Park](#) in Brecksville, OH with a checkpoint at [Dayton Aviation Heritage National Historical Park](#), using partnership property, [Carillon Historical Park](#) in Dayton, OH
- **Sun, July 31:** Arrive at stage stop at [George Rogers Clark National Historical Park](#) in Vincennes, IN

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## Stage 2

- **Mon, Aug 1:** Depart from the [George Rogers Clark National Historical Park](#) in Vincennes, IN with a checkpoint at the [Ulysses S Grant National Historic Site](#), using partnership property, [Grant's Farm](#) in St. Louis, MO
- **Tue, Aug 2:** Arrive at stage stop at [Wilson's Creek National Battlefield](#), using partnership property, Republic High School in Republic, MO

## Stage 3

- **Wed, Aug 3:** Depart from [Wilson's Creek National Battlefield](#), MO with a checkpoint at the [Brown v. Board of Education National Historic Site](#) in Topeka, KS
- **Thu, Aug 4:** Pass through checkpoint at the [Homestead National Monument of America](#) in Beatrice, NE
- **Fri, Aug 5:** Arrive at stage stop at the [Scotts Bluff National Monument](#) in Gering, NE

## Stage 4

- **Sat, Aug 6:** Depart from the [Scotts Bluff National Monument](#) in Gering, NE and finish at [Wind Cave National Park](#) in Hot Springs, SD

## Mechanical Updates

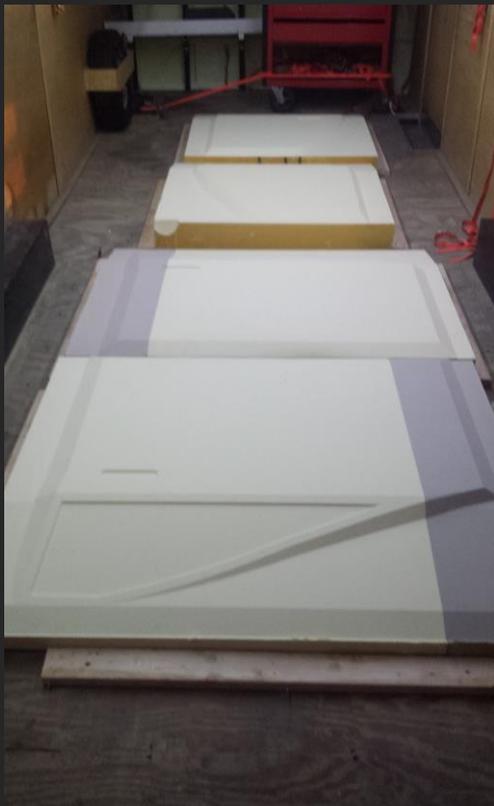
Scrutineering is just around the corner for the 2016 American Solar Challenge! It's getting down to crunch time, and the team is working hard to get Phaeton 2 ready. The new Mitsuba motor is now mounted on the rear suspension! The team had to cut a door to make changing the much larger rear tire possible, and everything seems to be working well so far. Furthermore, work continues on the active fairings. Getting these fairings just right has been a multi-year struggle, but we believe that we finally have them ready to race!

As for Penumbra (P14), regulations for the 2017 World Solar Challenge were finally released early this June. We were pleased to find that we already meet or exceed all of the major mechanical requirements. Additionally, the maximum size of the solar array for cruiser class has been reduced from 6 square meters to 5 square meters. This benefits PrISUM quite a lot because we would not have been able to fit the full 6 square meters on Penumbra, so we will be able to perform much better relative to other teams. Additionally, cruiser class teams are allowed to have any size battery pack they want. It will be up to the Electrical and Strategy Teams to decide how large we want our battery pack to be. This decision will drastically affect the final weight of the vehicle, which could affect loading situations for the Structures and Dynamics teams. Overall, the Mechanical Team likes the rule changes and look forward to racing in WSC '17!



Phaeton 2 Rear Tire Door

In other Penumbra news, molds are finally being machined, thanks to our new sponsor Morgan Meredith Inc. All four door molds are home in Ames, and they look great! We plan to proceed with carbon fiber layups as scheduled, beginning in late August. As for the Dynamics Team, they are continuing work on optimizing suspension components, and are nearing the fabrication phase. The Structures Team is also nearing the fabrication phase and has been having conversations with our welder at Sinned Customs. All that's left for the tube frame is simple optimization, and it is ready to go! As for a possible monocoque chassis, we recently



**Penumbra Door Molds**

received a shipment of brand new carbon fiber from Axiom! The R&D Team will be performing tensile and bend tests on samples of this new carbon to verify its mechanical properties. If those mechanical properties line up with our computer simulations, the team will be able to push forward with a monocoque chassis. All in all, the Mechanical Team is keeping very busy this summer. The entire team has been doing a really great job getting Phaeton 2 race ready and Penumbra ready to build!



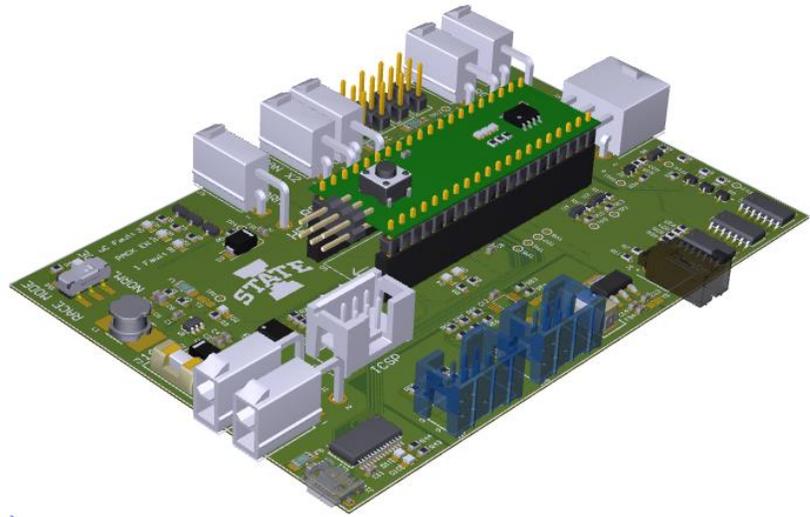
## Electrical Updates

As the race rapidly approaches, the electrical team has become busier and busier. However, an unbelievable amount of work has gotten done in the past few weeks thanks to some very dedicated members. Circuit boards have been fixed, wiring has been cleaned up, and the new motor has been installed. Furthermore, the team has made significant headway on the design of Penumbra's electrical systems.

In the past month, we have diagnosed, redesigned, and re-manufactured several electrical systems on the car that were not race ready. In order to do this, electrical members have made their way to Ames nearly every weekend this summer to work on the car. A full new set of module boards have been manufactured, which will significantly increase the reliability of the new pack and prevent breakdowns on the race. Progress has been made on the powerboard, and it is on track to be ready for the race. At this time last year, the car did not have a working current revision of the powerboard. Every circuit board in the car has been either redesigned or manufactured in the past year, so even though things are coming together at the last moment, the electrical team understands the systems inside and out. Should any electrical issue come up during the race, the electrical team will be more prepared than it ever has to diagnose and repair it quickly and efficiently.

Another major change to the car electrically is the installation of the new Mitsuba motor. This process went very smoothly from the electrical side, and the new motor has been very impressive thus far. The Mitsuba motor will provide the race drivers a much more consistent delivery of acceleration and regenerative braking, making the car much more predictable. The first test drives of the car with the new motor were nothing short of breathtaking. The loud rattles of the old NGM motor are replaced with an eerie space ship like whir from the Mitsuba. This motor will give the team a serious competitive advantage at the race this summer.

Finally, the electrical team has made notable progress on the design of systems for Penumbra. The size and cell manufacturer for the next battery pack has been decided and hardware design for the BPS is nearly complete. Research has been done on designs for the next powerboard, and many new systems for the cruiser car such as headlights and interior features have been planned. The electrical team's goal is to have most of the design work for Penumbra done by the start of the school year, so that the first round of testing can begin early in the fall.

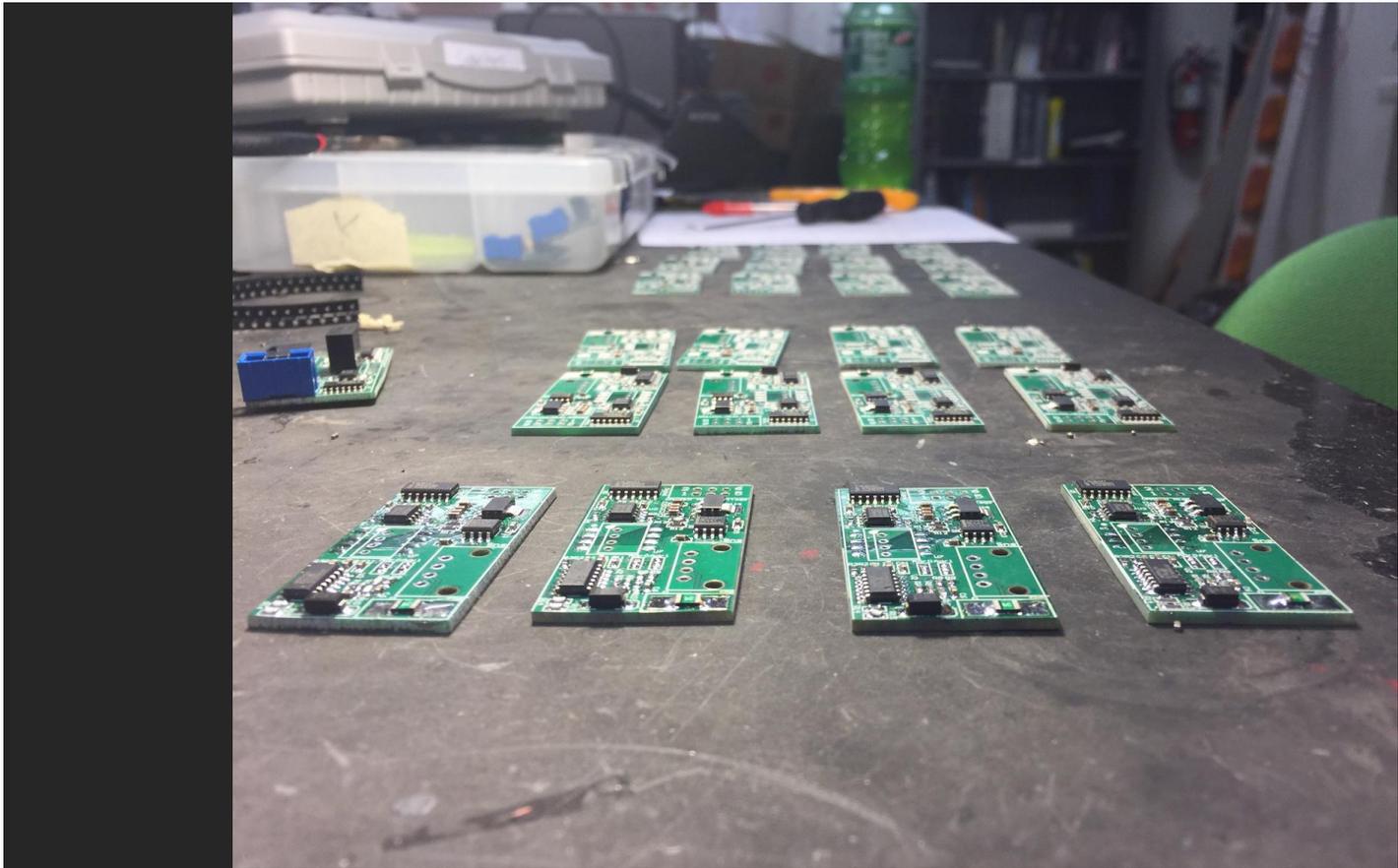


In conclusion, the electrical team has worked extremely hard the past few months, and will continue to work hard through the finish of the race.



### Hardware Design for Penumbra BPS

The dedication of some of the members on the team is truly amazing, but the things that we have accomplished are just the same. In addition to team members' dedication, we could not do what we do without the dedication of corporate sponsors. We would like to thank our new sponsor [AA Portable Power Corp](#) for donating auxiliary battery packs which will be crucial to our success this summer.



Reflowing New Module Boards for Phaeton 2

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