

Electric motorcycle team races to next level of worldwide competition

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A team of Virginia Tech College of Engineering undergraduate students this week will take its self-built electric-powered motorcycle to the third-round race of the North American TTXGP eGrandPrIx competition. If the team finishes in one of the top slots as it did at the second round in late June, the Battery Operated Land Transportation team could be on the path toward a world champion race at Daytona International Speedway this fall.

The team's placement so far in the Time Trial Xtreme Grand Prix competition, the world's first "zero toxic emissions" [motorcycle race](#) series, already is thrilling and winning prizes. It is the only university student-led team in the entire competition, going up against professional bike-building teams such as MotoCzysz and others from across North America.

During the June 23-24 TTX75 Award race at Portland International Raceway, the team – comprised of mechanical engineering students under the direction of Associate Professor Saied Taheri – came in second against seven teams overall, behind only professional electric vehicle company Brammo Inc.

The Portland race was the team's first time officially racing the bike, which was completed only a few months prior. The roughly 385-pound bike -- a 2009 Honda CBR600RR – is completely electric powered, and was designed, built, and painted by students inside the Joseph F. Ware Jr. Advanced Engineering Laboratory. (One important note: The bike is

not piloted by a student for insurance reasons, but by Matt Kent, an engineer at Goodyear Tire & Rubber Co. and professional racer. Many of the students on the team either own personal street or race bikes.)

“It is definitely a thrill but most importantly we are just happy to be able to participate in the TTXGP and help forward electric vehicle technology,” said John Marshall of Round Hill, Va., a senior majoring in mechanical engineering and the 2012-13 team leader. “If we come home at the end of the day with some trophies it is just icing on the cake. That being said this is a race team and we are out there to win, every stop will be pulled out in order to achieve this.”

The upcoming Round Three of the TTXGP race series begins Friday, July 27, in Monterey, Calif., is a joint competition with FIM Epower, another series of races involving electric bikes. TTXGP, begun in 2008, was once a competitor of FIM EPower, but the two series joined forces. If BOLT finishes well at this race, the team will move onto another race at Salt Lake City, and, then pending a top or near-top finish, the world eGrandPrIx finale in Daytona, Fla., in mid-October.

The Daytona race would pit the Virginia Tech team against professional race teams from North America, Europe and Australia, the three regions that make up the worldwide TTGP series. That’s the same race track where students from Virginia Tech’s Robotics and Mechanisms Laboratory debuted the second-generation Blind Driver Challenge vehicle in January 2011, during the famed Rolex 24 race.

“The races will always become more difficult,” said Marshall. “As our rider has said, ‘If you don’t get faster over a weekend of riding you have failed.’ Every team will be getting faster at every race. Daytona is the absolute world final for 2012.”

This is the second electric motorcycle team effort overseen by Taheri,

himself once a motorcycle sports participant and enthusiast. The first team finished in the 2009-10 year, but due to finances was unable to compete in the worldwide finale of the TTXGP event in Spain after doing quite well stateside. The chief sponsor of the motorcycle took the vehicles once the competition was finished, added Taheri.

The bike has been several years in the making, under various senior design teams. Many parts of the re-engineered CBR600RR were donated or sold to the team at a reduced rate to save on preparation costs. The motor is a custom made AC permanent magnet. It and a specifically programmed controller for the bike were donated by Kollmorgen's Radford, Va., location, roughly 20 minutes from Blacksburg. The bike's 7.5 kilowatt lithium polymer cell batteries were purchased at a discount rate from Dow-Kokam.

In addition to several Hokies on staff in Radford and serving as technical advisers for the bike team, plus donated parts, Kollmorgen just hired a member of the 2011-12 team. Christian Probst of Blacksburg, graduated in May from Virginia Tech with a bachelor's degree in mechanical engineering, and started in mid-June with Kollmorgen.

“There are a lot of great memories that I have with working with the bike, but I think that the best memory that I have is seeing our rider, Matt Kent, going around the track for the first time,” Probst said of his time on the team. “It was a great moment that made all the late nights and long hours spent working on the bike worth every minute.”

Other team sponsors include Areva Group North America, Boeing, Dunlop, General Motors, Lockheed Martin, Penske, Solutia and a dozen others. Virginia Tech's Student Engineers Council has donated several thousand dollars to the project during the past few years, as has the Ware Lab.

“Through hard work and dedication, [Battery Operated Land Transportation team] represents to the world the best Virginia Tech’s College of Engineering has to offer,” said Dewey Spangler, manager of the Ware Lab.

A new bike for the incoming 2013 team already is in the planning stages, said Marshall. That bike also will be a newer model Honda CBR600RR. “There are some potential pack, and controller numbers on paper,” Marshall said. “Our challenge this last year was modeling the complex frame that we have, we’ve still got to find a better way to do that.” The ultimate goal, Marshall said: Race the bikes together.

Provided by Virginia Tech

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