



GIS
Winter 2008



Topcon GIS receiver key to solar car win



InsideGNSS magazine's September/October cover

When the University of Michigan set out to win the North American Solar Challenge in 2008 with its solar car, Continuum, the university contacted Topcon Positioning Systems.

"Our contact at the university explained their strategy of wanting to determine the best way to run their car on the race route by performing a survey using GPS receivers," Dominick Auletto, TPS vice president, said.

Auletto, who heads up the Topcon University Education program, said, "The event is designed to inspire young people to pursue careers in science and engineering. We saw the race as an investment in developing technology and support for future leaders. TPS was honored to be part of the process."

"They had already created a software program that the data points would be loaded into and they needed our equipment to mark landmarks, and points that they would use to determine optimal speed to race the car, taking into account the charge of the battery and incoming solar radiation."

The race was scheduled for July starting in Plano, Texas and ending in Calgary, Alberta, Canada for 10 days, 10 hours each day with Topcon signing on as a Gold sponsor.

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Company: University of Michigan

Location: Ann Arbor, Michigan

Project: North American Solar Challenge

Location: Beginning in Plano, Texas and ending in Calgary, Alberta, Canada

Scope: 2,400 miles in 10 days

Topcon Products:

GMS-200

Topcon Dealer:

Topcon University Education

AT WORK

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'With the help of the Topcon GPS equipment, we knew what terrain lay ahead of us, and we could budget our energy better.' – Alex Dowling



ABOVE: A support vehicle carried students who ran route simulations with data collected using Topcon equipment.

LEFT: The University of Michigan Continuum Team escorts their winning vehicle across the finish line. Continuum finished first in 51 hours, 41 minutes and 53 seconds.

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Preparation is key

Two months prior to the race, students drove the 2,400 route in a vehicle equipped with two donated Topcon GMS-200 receivers and an OmniSTAR HP subscription. On the race course, they marked data points -- latitude, longitude, quality of the GPS signal, the locations of hills, traffic lights, and traffic conditions.

Data from the receivers was output over an RS-232 (serial) connection to a laptop, where software developed by the team recorded the GPS data to the hard drive and post-processed the information. The head strategist was able to use the information to recommend a vehicle speed conducive to making the most efficient use of the available sunlight.

Budgeting energy

Traveling the right speed at all times was a key to winning the race. If the car would travel fast under clouds, for example, it risked drawing down too much battery power. On the other hand, running fast under clouds – say, at the speed limit – could help win the race, and move the

car into sunny weather faster, where it could gather energy. There was not enough solar energy to permit the car to drive the entire race at the speed limit.

"With the help of the Topcon GPS equipment, we knew what terrain lay ahead of us, and we could budget our energy better," said Alex Dowling, head strategist for Continuum. "The Topcon equipment performed as expected."

The win

Continuum finished first in 51 hours, 41 minutes, and 53 seconds, an average of 46 miles per hour, beating the second place winner by 10 hours.

Fifteen solar cars from universities in the United States, Canada, and Germany completed the 10-day race. Auletto said, "We were happy to help the students in such an important endeavor and what's even better, their preparations and foresight in using GPS technology truly paid off - by 10 hours!"

To read more about the race and Continuum, www.americansolarchallenge.org

To read other Topcon At Work stories go to www.topconatwork.com

Topcon's GMS-200 GIS Mapping and Navigation System

The Topcon GMS-200 is a modular high accuracy real-time solution well suited for both navigation and building and maintaining a high accuracy GIS database.



With an unparalleled number of real-time correction services available in just one device, this system is super flexible without the mess of external cables and batteries. Use the dual frequency RTK capabilities for real-time centimeter accuracy. The OmniSTAR HP service is available for subfoot real-time mapping and the WAAS/EGNOS correction capability is available for submeter accuracy. The Topcon tradition of accuracy, productivity and innovation is alive in the GMS-200 system.