

EEVC NEWSLETTER

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PHILADELPHIA SOLAR ENERGY ASSOCIATION JUNIOR SOLAR SPRINT 2006 A SUCCESS Oliver Perry

Each year members of the EEVC assist the Philadelphia Solar Energy Association (PSEA) in supervising the Junior Solar Sprint contest which is conducted in the "merry month of May" on a side street adjacent to the prominent Franklin

Institute. Lisa Rose Bryant, president of the PSEA, has served as the coordinator of this annual event in recent years. Saturday May 6th was the 13th annual Philadelphia Jr. Solar Sprint event.

The Junior Solar Sprint contest is a competitive solar power contest open to middle school science students across the nation.



l to r: Oliver Perry, award winners Daniel Stack and William McCauley, Peg and Ron Groening before the banner of the Philadelphia Solar Energy Assn.

Winners of local and regional competitions can advance to a National Final competition usually held in New England near the end of the school year. Each contestant who applies is provided rules and information as to where to purchase the basic

required components for their little solar powered race cars. All cars must be powered with the same size electric motor and get energy from the same size solar panel. In case of cloudy or rainy weather all cars must be able to compete with batteries. Rules dictate the over-all dimensions of the car and establish the racing parameters. All cars, for



Daniel Stack and William McCauley with Daniel's parents Chris and Leslie Stack.

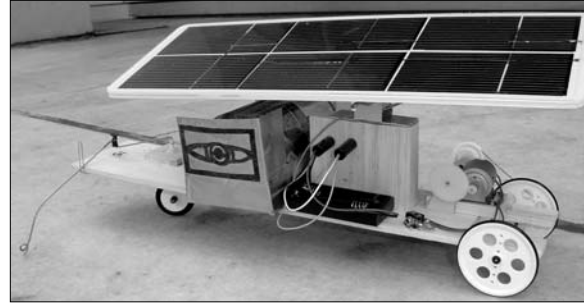
example, must run on a wire guided track. Each host location that provides competition throughout the country must meet Jr. Solar Sprint (JSS) specifications for their regional races. The Philadelphia event annually hosts 80 to 100 entries.

In addition to receiving prizes for speed the contestants are eligible for awards for technical merit. PSEA and the EEVC work together to pick out the top cars. Ron Groening and his lovely wife Peg came to our meet Saturday and helped us with this judging. In addition to helping PSEA select the top three cars for technical merit, we also present a special EEVC award to the student or student team that constructs what we call the "Over-All Best Car."

This year's EEVC Best Over-all Jr. Solar Sprint Car Award went to a team of home schooled students, William McCauley and Daniel Stack from Broomall, PA. William is a seventh grader and Daniel an eighth grader.

Last year Mr. and Mrs. Chris and Leslie Stack, the parents of Daniel, just happened to be walking past the Franklin Institute the same day we were running last year's Jr. Solar Sprint. The exciting event caught their attention and they inquired about how they might have their home schooled son become involved. As a result the parents joined PSEA. Lisa Rose Bryant pointed them in the direction for Jr. Solar Sprint preparation. Several web sites provided them with places to get tutorial help and sources for the required solar panel and motor as well as gears, pulleys, and wheels. (SolarWorld.com was one such site.)

It has long been my conviction as an edu-



The award-winning solar vehicle

cator that forming partnerships between parents and their kids to prepare for educational projects such as the JSS is a very healthy and wise thing to do. Kids should not be allowed to become lost in a nonadult world and be completely free to do their own thing in their own parent-free environment. Joint projects between parent and student are great. We have seen too many projects that were obviously totally student built without any adult supervision or adult encouragement.

The Stacks decided to get their son and his friend involved in a very worthwhile learning experience. Chris Stack, a mechanical engineer who works at the Philadelphia Navy Yard in machinery silencing technology (Run silent, run deep!) initiated the research. The team came up with a one front wheel tiller type steering, a real first in my many years as a judge in this event. One end of the tiller was attached to the track line which keeps the cars going straight down the track in their lane even if they have no steering. From observations of the race the previous year, Mr. Stack felt that if the tiller arm was attached to the track line then the car wheels would track along the line with the least amount of friction. It was a clever idea, one that came to him from boat steering. However, in reality the line on the track was looser than expected and allowed some unexpected oscillations as the car went left and right, back and forth across the track while traveling down the track.

The solar panel itself was solidly connected to a metal four-way swivel that allowed the panel to be tilted in any position to catch the sun's rays perpendicularly regardless of where the sun is relative to the car's direction of travel, thus maximizing the energy from the sun. In solar and astronomical terminology this is called "tracking." There is a signifi-



Ron and Peg with their Prius in front of the Logan Circle and fountain across from the Franklin Institute (Oliver Perry wants to make your editor homesick)

cant improvement in available power when the rays hit the panel at right angles rather than oblique angles where a percentage of the rays reflect rather than absorb.

The body of the car was made of rugged balsa wood instead of cardboard. Glue was used instead of tape. Professional plug type connectors were used to hook either the batteries or the solar panel to the motor instead of tape, glue, or alligator clips. Pulleys of two sizes allowed for several different torques. Daniel Stack said that they chose to sacrifice a slower start in the beginning of the race to gain more speed at the end by connecting the belt to the larger motor pulley. Their car had a built in choice. Most cars did not have a method of “shifting gears” but constructed set gear ratios and couldn’t make adjustments for track variations. Some cars, sadly to say, had unfavorable ratios that caused their cars to stall at the start line. These students had no idea what or why their cars wouldn’t move. Better adult supervision could have helped them avoid such poor engineering choices.

The car we chose to receive the EEVC Best Overall Jr. Solar Sprint Award was clearly well designed, well constructed, and worthy of the award. Congratulations to not only the two boys, but to Mr. and Mrs. Stack for involving them in a great educational experience.

Beyond the competition

Daniel Stack says that he thinks that he will continue his interest in electronics and programming. He plans to someday become an engineer like his father. Both Daniel and William have been involved in robotic competition and have participated on a team called Driven Robotics. One part of their

team from New Jersey has the picture of a bolt on their team shirt while the Pennsylvania team wears a matching nut on their shirt. William (Bill) told me that he thinks that he would like to become a medical doctor someday. Meanwhile Bill balances out the interests of the duo by participating in swimming, diving, and soccer during the summer months.

Something to think about

Mr. and Mrs. Stack are members of the Franklin Institute, Academy of Natural Science and the Delaware County Institute of Science. They felt that educating their children from home would provide a richer and more complete education than what they would receive in the public school. Wasted time was their primary concern. Too much of a good student’s time is wasted when undisciplined students consume the teacher’s instructional time. And, Mrs. Stack said, her son was tired of being disciplined with the masses for things that he didn’t do. Sadly this is true. Wake up America, your kids are last in math and science because of a lack of public school discipline at all levels.

(And where were the *Philadelphia Inquirer*, Channel 10 and KYW News when we needed them to recognize the efforts of those who are trying to make a difference in science by participating in the Junior Solar Sprint? They can continue to broadcast that we are failing in math and science but can they help us make a change for the better by encouraging the parents, students, teachers, and PSEA sponsors who are trying? Our news media has to share part of the blame for educational failure. Headlines reward effort and set trends.)

One more for the road!

A comment was also made in regard to home schooling that some parents who home school possibly feel that the teachers in the public schools are not as sharp and as well educated as they the parents are. Therefore the public school teacher is not deemed as qualified to teach their child as they the parents are. In some cases this is true, especially in the fields of science and engineering. However, in many cases the lack of authority of teachers to discipline those who have little

respect for teachers, or education in general, is the main reason our students are not maximizing their opportunities in the classroom, not deficiencies in the teachers' educational experience.

Enough said for now. The Stack family and Dan's friend William have given us all something to think about. We cannot argue over this year's superior product, both car and the students. It was a car well done and students well taught. If we have created a stir between public and home school, let's settle it on the track; the Jr. Solar Sprint track, next May! Let the parents of both home and public schooled students team up with their kids and build winners! And let's hope the press and news teams will be present to cover the event.

OUTRAGEOUS PENNSYLVANIA AUTO INSPECTION

EEVC Treasurer Tullio Falini reports a new governmental screw-up:

"I received a phone call from Scott Klinedinst from York, Pennsylvania a few minutes ago asking me for assistance in finding a way to pass motor vehicle inspection with his electric vehicle. According to Scott the state of Pennsylvania mandated a new and improved motor vehicle inspection this year, but the system is not electric vehicle friendly. In fact it does not recognize that electric vehicles do not need pollution control equipment. Scott has recently converted a 1985 S-10 Pickup to electric power. He has been driving it for several months and now is required to pass the latest safety motor vehicle inspection. Scott is frustrated because he has stopped in at three different inspection stations in his area and been told that before they can check his vehicle out for safety his vehicle must first pass the pollution control test. The first inspector called his supervisor and asked for advice as to how to deal with an electric vehicle. He was told that under the newly passed Pennsylvania mandate that under no circumstances were they to pass any vehicle that did not have the required pollution control devices on the vehicle and in working order. When the supervisor (at the state level) was told that the car in question was electric the reply back was that it did not

matter. If any vehicle, including an electric vehicle, did not have the pollution controls required for that particular vehicle it was not to be inspected and could not be state approved.

"Scott Klinedinst proceeded to two more inspection stations in his area and was told the same thing. Each station was afraid to violate the mandate for fear of losing their license and receiving a fine."

Dave Goldstein, EVA/DC president, has some suggestions:

"I would first try to contact the director of your DMV. First call, then send a certified letter with a cc to your PA State Representative and/or Senator, and be sure to include all relevant phone numbers so that you can be contacted and be sure to double check your spelling!

"I would then wait no more than two days to contact your state representative directly, asking to speak to a legislative assistant familiar with transportation issues, explain your predicament — and raise a little gentle hell about how important it is for PA to encourage alt fuel vehicle programs, especially at a critical time like this!

"Mention the lack of meaningful response from your DMV, and request their direct intervention.

"I'll bet that you will get some results.

"It is possible, however, that there is some sort of legislative rule that has been passed recently that has caused confusion or inaction at your DMV, so be prepared to hear such an excuse, nod appreciatively, and continue to demand that further action be taken to resolve this situation immediately."

ZAP MAKING HAY FROM HIGH GAS PRICES By California Pete



While most people are suffering from today's high fuel prices (about \$3.35 in downtown San Francisco), electric car maker ZAP in Santa Rosa is celebrating. On May 9 local news station KCBS (the Bay Area equivalent of Philadelphia's KYW)

and local NBC-TV affiliate KNBC both broadcast stories on ZAP and its little four-passenger Xebra EV, with interviews with CEO Steve Schneider. The Xebra is “the only electric car available to the public,” says Schneider. Range using lead-acid batteries is 40 miles at 40 mph, he says, and optional lithium ion batteries will increase that four-fold. “We’re probably one of the few companies that are doing the Snoopy dance every time the prices go up at the pumps,” he added.

When asked about safety Schneider talked about the built-in roll cage on the Smart, but kept quiet about the Xebra.

Both broadcasts were pretty favorable; the TV one showed some man-on-the-street reaction, which was also favorable. ZAP anticipates being able to sell all 12,000 slated for production this year at a sticker price of \$8900.

While I haven’t tried the Xebra, I wonder how its performance compares to the Comuta-Car — and that had four wheels and was registered as a car, not a motorcycle.

NEWS UPDATE

Hybrid truck for the military



(Photo: Business Wire)

On February 16 Oshkosh Truck Corporation announced it had developed the next generation of its Heavy Expanded Mobility Tactical Truck (HEMTT) for the U.S. Army. Known as the HEMTT A3, it features hybrid-electric drive, an enhanced load handling system and independent suspension.

The HEMTT A3’s ProPulse[®] diesel-electric drive system increases fuel economy by at least 20 percent but also allows the vehicle to export up to 200 kilowatts of AC power.

Equipped with adjustable-height indepen-

dent suspension and a load handling system, the HEMTT A3 is the first tactical truck capable of directly unloading cargo from a C-130 aircraft without the assistance of material handling equipment.

Electric-motor-driven axles provide the truck with capabilities that meet or exceed those of earlier HEMTT configurations. This version can climb a 60-percent grade while carrying a full payload. It is also 3000 pounds lighter than its predecessor while maintaining a 13-ton payload capacity and improving reliability through the use of lightweight, high-strength materials. This allows the new truck to carry cargo while in transit on a C-130 aircraft.

Aluminum fuel cell



Hitachi Maxell, Ltd. has developed a fuel cell that generates hydrogen by the reaction of aluminum and water. The company has developed 10 W class fuel cells for mobile power sources that could operate a laptop

computer.

Most fuel cells for mobile applications are the direct methanol type or polymer electrolyte fuel cells that use hydrogen. The new unit from Hitachi Maxell uses a new aluminum particulate conversion process to generate hydrogen, producing 1.3 liters per 1 gram of aluminum at room temperature.

The company hopes to advance to 100W class power sources.

Nissan to sell the Altima Hybrid in only eight states

DOE’s *Energy Efficiency and Renewable Energy News* reported on April 26 that Nissan is preparing to enter the U.S. hybrid vehicle market for the first time, but the company will limit the sales of its Altima Hybrid to the eight states that have adopted California’s emissions standards: California, Connecticut, Maine, Massachusetts, New Jersey, New York, Rhode Island, and Vermont. When it goes on sale early next year, the Altima

Hybrid will feature a 2.5-liter, four-cylinder engine and a continuously variable transmission. It will be assembled at Nissan's manufacturing plant in Smyrna, Tennessee, making it the first hybrid vehicle from a Japanese company to be built in the United States.

Currently, only Ford's hybrid vehicles are built domestically.

Portugal getting big in alternate energy

On May 4 *Business Week Online* ran a report by Carol Matlack on alternate energy in Portugal, which is making some big strides.

GE Energy Financial Services and Berkeley, CA-based PowerLight are teaming up to build the world's largest photovoltaic-generation project. The \$75 million, 11-megawatt system will start operating next January.

The Portuguese government is expected to award a contract this summer for the construction of more than \$1.3 billion worth of wind turbines around the country, enough to provide power for 750,000 homes. And the world's first commercial "wave farm," which will generate electricity from ocean waves, is expected to start operation later this year off Portugal's northern coast, using cylindrical floating generators built by Ocean Power Delivery, and expected to provide enough power to supply 1,500 households.

There is also a new hydroelectric dam planned on the Sabor river.

Auto companies cooperating on hybrids

The online publication *gizmag* reported on April 28 that General Motors, Daimler-Chrysler and BMW have shown a new two-mode hybrid drive system. The unit integrates electric motors with a fixed-gear transmission with low- and high-speed electric continuously variable transmission (ECVT) modes. During the two ECVT modes and four fixed gear operations, the hybrid system can use the electric motors for boosting and regenerative braking.

COMING EVENTS

5th EVer EAA Chapters Conference

May 12-14, Chicago area, hosted by Fox Valley EAA, <http://fveaa.org>.

NEDRA High Voltage Nationals

May 13, Joliet, IL, part of the Midwest Alternative Fuel Expo, organized by the Fox Valley EAA. See <http://fveaa.org>, e-mail: john.emde@fveaa.org

Electric Vehicle Expo 2006

May 13, Ottawa, ON, hosted by the EV Council of Ottawa. http://evco.ca/EV_Expo.

Advanced Battery Conference

May 17-18, Baltimore. www.advancedautobat.com.

6th Annual Power of DC 2006

June 6, Mason-Dixon Dragway, Hagerstown, Maryland. Contact Chip Gribben at futurev@radix.net, www.nedra.com.

Fuel Cell 2006

June 6-7, Raleigh/Durham, NC. Contact Marsha Hanrahan, marshah@infoweb.com.

Michelin Challenge Bibendum 2006

June 9-12, Paris. Contact at <http://www.challengebibendum.com/challenge/front/affich.jsp?codeRubrique=45&lang=EN>, or go to www.challengebibendum.com.

Hydrogen 2006

Sept 11-13, Vancouver, BC. Contact Doug Sanborn, 207-781-9618, dsanborn@intertechusa.com, www.intertechusa.com

AltWheels — Alternative Transportation Festival

Sept 22-24, Boston, MA. Contact A. Sander, 800-510-6484, sander.alison@aol.com, www.altwheels.org

Convergence 2006

October 16-18, 20, Detroit, MI. Check www.sae.org.

Hybrid Vehicle Technologies Symposium - 2007

February 7-8, 2007, San Diego. Check SAE at www.sae.org.

MEETING SCHEDULE

Meetings are held in Room 35, Plymouth-Whitmarsh High School, 201 East Germantown Pike in Plymouth Meeting, PA, and begin at 7:00 p.m.

June 14

July 12

August 9

September 13