# EEVC NEWSLETTER

**Published by the Eastern Electric Vehicle Club**

**Peter Cleaveland, Editor** **Vol 26 No 3/4**
**Club Address: P.O. Box 134, Valley Forge, PA 19481-0134** **MARCH, 2006**
**email: easternev@aol.com. Web site: www.eevc.info**
**President: Oliver Perry, 5 Old Stagecoach Turn**
**Shamong, NJ 08088, (609) 268-0944**



Now affiliated with EAA

## PROP CAR "SHOWDOWN" AT PENNCREST HIGH SCHOOL Feb 25th, 2006

**Oliver Perry**

Each year our organization, the EEVC (The Eastern Electric Vehicle Club), presents a plaque to the student or students who design and construct what we feel is the best overall car in the electric car component of the annual Southeastern Pennsylvania Physics Olympics meet held at Penncrest High School in Media, Pennsylvania. We have made this presentation annually since the early nineties.


*Winners the 2006 Overall Best Car EEVC Award were seniors Garrett Wadsworth (left) and Andrew Fang from North Penn High School.*

This year the EEVC had the assistance of a new EEVC member, Mr. Thomas Dame (a middle school science teacher in the Penncrest area), Radnor High School physics teacher Ms. Mary Quinlan and West Chester East High School physics teacher Fran Poodry, in selecting the best overall vehicle.

Winners of our 2006 Overall Best Car EEVC Award were seniors Garrett Wadsworth and Mr. Andrew Fang from North Penn High School. The index flag on the car was used to break the laser beam at the start and finish of the ten meter run. Their car recorded the fastest time somewhere between three and four seconds. Several other cars were within tenths of a second behind them.

The electric fan (or prop car) competition required that all competitors use the same DC electric motor and propeller (supplied by Edmund Scientific) and a maximum battery voltage of 9 volts. The vehicles were

designed to race ten meters along a track several meters wide but narrowing to 1.5 meters wide at the finish line. Shortest times, measured by laser beam timers at the start and finish lines, determined the winners. Garden hoses were used for the sides of the track. Cars that jumped the hose (or were stopped by the hose) were awarded the distances they traveled in place of times, the longer distance scoring higher than the shorter.

Since all competitors were compelled to use the same motors and propellers which were limited to a nine volt maximum, the students had but three parameters to optimize; weight, friction, and straight line direction. The fan car was required to have a minimum of three wheels, all of which had to be made from a non-wheel item. Since CDs have been frequently used as non-wheel item wheels, we limited the cars to a maximum of one CD, thus forcing students to become more creative in finding items designed for something other than wheels, pulleys (which were considered wheels for this event), or CDs. The expensive roller or ball bearings for wheel and axle model cars were also banned. "The rotary inertia of the aluminum wheels may have helped to keep the car (we selected as the best all around car) on track, thus enabling it to score the best time," said Dame.

As always we look for a car that is elegant and well crafted but simple in design for our EEVC award. In addition this year we also looked for a car that was strong and crash worthy, yet able to keep a straight course. Our winning car was made lightweight but strong balsa wood. The wheels were made from lightweight metal cut perfectly in the high school's high tech metal shop. The axles of each wheel consisted of two nails, each of which were given plastic heads and glued to the exact center of the metal wheels. What made these wheels extraordinarily friction free were the positioning of the nail tip portions of the axle ends into the centers of special magnets mounted in the balsa wood frame. The students told me that these magnets were available in robotic kits for friction free wheel and axle applications.

Both Garrett and Andrew are seniors bound for college. Andrew indicated that he was considering becoming a medical doctor and Garrett was considering engineering. Both boys were very excited about wining the award and very appreciative to the EEVC for presenting it to them. As an added bonus the boys also won the gold medal award for posting the fastest time.

It is always fun to watch these events. There were about twenty cars that competed. Some cars used simple lightweight cardboard for the bodies, McDonald's soda straws for axles and soda container plastic lids for wheels. The magnet bearings on our selection for best car may have seemed very high tech, and they were, but it was surprising how well other cars with conventional "cheap" toy technology worked. Keeping a lightweight propeller driven vehicle on a straight line course is quite a feat. The thin straight and true metal wheels of the North Penn car, with the nail axles suspended on magnetic bearings, seemed to do the trick quite well. But other cars with more common technology did succeed in maintaining a straight course too. There were a number of creative designs that were simple and took little time to make. Several were considered because of their clever simplicity. In a short time period for evaluation is always difficult to decide which car is the best overall. In the end it was our feeling that the best overall car was the higher tech car from North Penn High School that scored the best time. Congratulations to Garrett Wadsworth, Andrew Fang and their physics teacher, Mr. Chris Young, who also works with the North Penn robotic team, for producing an excellent prop car.

**Penncrest High School Wins the 2006 PSE&G Electric Car Team Racing Cup**

*(l to r) Randy Kreider, Roxanne Spina, James McMullen, Andrew Woerhide, Daniel Walls, Sam Kantor, Greg Karwaski, Brandon Marabella, Shane Carlson, Alexander Krynski.*

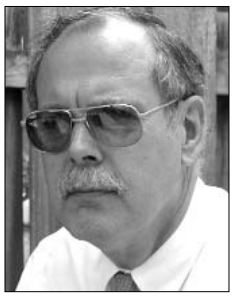
PSE&G electric and gas utility, located in New Jersey, made available in 1998 a special award for the Physics Olympics League to give annually to the high school that does the best in electric car competition from the "team" standpoint. The "Racing Cup" is passed on each year to the electric model car racing team who scores the highest in team points in the electric car racing event. The team who wins this cup gets to engrave the name of their high school on the cup and keep the trophy for a year. This award is somewhat analogous to the "Stanley Cup" in hockey.

The students are seen holding up three fingers to represent the last three sequential years that Penncrest has won this prestigious cup. They are the first to win three times in a row. In all I believe that four different high schools have had the honor of winning the cup at least once.

This year featured electric prop cars. Although Penncrest did not have the single best car they did have the best over-all time out of five trials. The scoring favored teams that raced multiple cars.

## SEASONAL DOINGS ON THE LEFT COAST
## By California Pete

**California vs greenhouse gases**



The state of California has embarked on a new plan to curb emissions of greenhouse gases, with a goal of cutting them by 25% by 2020. What's unusual is that the legislature, famous partly both for being liberal and for vigorously opposing anything Governor Schwarzenegger proposes, is in rare agreement with the governator on this one.

**100 years ago this month**

April 18 will be the 100th anniversary of the great San Francisco earthquake, and commemorations are taking place all over; what's perhaps more relevant is the steady drumbeat of advice about preparedness. Everyone knows that it will happen again, we just don't know the date. With an eye on not only what happened in 1906 but in the results of hurricane Katrina, we're all urged to keep an earthquake kit at the ready with enough supplies to sustain us for 72 hours. How many people are truly ready is unknown, but there are a lot of homes with boxes conveniently placed with bottled water, food, first aid kit, flashlight, portable radio and so on. The nagging worry is always, "is what I have enough?"

**It's cold and it's damp**

This year's rainy season in California is a little rainier than normal. San Francisco is currently at 135% of normal rainfall and set a new record at 25 days of rain in March, with temperatures well below normal. The snowpack in the Sierra Nevada, which supplies much of the water for the state during the dry season, is both deeper and wetter than normal, and the reservoirs are already well above normal — in fact they're dumping water to make room for the expected runoff.

Fresno, in the agricultural Central Valley, has had 130% of normal rain and the fields are too wet to enter; crops like strawberries and greens planted earlier are drowning.

The *San Francisco Chronicle* is running articles on how to cope with the psychological effect of all the dreary weather. So much for Sunny California.

## TOUR DE SOL SET FOR MAY

The 18th annual Tour de Sol will be held at New York's Saratoga Spa State Park and Spring Auto Show May 10-14, 2006. The theme of this year's event is "Driving Toward Zero Carbon Emissions."

Events at this year's event will be:

- Wednesday, May 10: Technical testing for Championship vehicles
- Thursday, May 11: Press and fleet-only events will include ride 'n drives in advanced vehicles and presentations at the Saratoga Technology and Energy Park
- Friday: May 12: A "Student Day" will bring 1000 students and government officials to a sneak preview and guided tours of vehicles in the Tour de Sol competitions and of the Saratoga Automobile Museum.
- Saturday, May 13: America's only "green car show" will be held at Saratoga Automobile Museum's Spring Auto Show

and attract thousands of consumers.

The event will include three competitions:

The Monte Carlo-style Rally and High-Mileage Challenge offer advanced vehicle owners an opportunity to showcase their high-mileage driving skills in hybrid and bio-fueled vehicles in a one or two-day competition.

The Tour de Sol Championship challenges students, independent teams, and auto manufacturers to build one-of-a-kind or production vehicles that aim to reduce gasoline use and work toward zero climate change emissions. This five-day event involves multiple comprehensive events and activities.

The Around-Town Vehicle Competition challenges students and others to build electric bikes and neighborhood vehicles as well as off-road vehicles, and demonstrate their vision of auto-free communities in a one or two-day event.

The Junior Solar Sprint and H2Help competitions challenge middle and high school students to build model solar and hydrogen fuel cell vehicles, and compete in a one-day competition.

For more information see www.nesea.org.

## REPORT FROM PETE GRUENDEMAN

I have been reading a few too many doom & gloom books. Most notably "The Long Emergency" by Kunstler and "Collapse" by Jared Diamond. This has motivated me to do another electric car. Not a battery electric but much more likely some version of plug-in hybrid. I have a new, 25 horse Kohler 2 V twin water cooled engine and some dandy PM alternator technology. These were both intended for use as a gen-set for our off-grid house but Chris put the stop to anything off-grid. She didn't want any batteries around the house. And even though we are way out in the country and have seen significant power outages in the US in 2005, she doesn't want to have any version of backup power here. Head in the sand mentality, I think.

But putting a gen-set in a car would be another matter. And if that energy was stored in a pair of used Prius batteries powering a battery EV, well that might be OK. Two Prius batteries would store about 6 kWh. They seem to be durable and show up often enough on E-bay. I have one now ($700) and need just one more. If two Prii batteries were split up and re-combined into 5 parallel strings, then the 272 volt nominal battery pack would be about 108 volts and 400 amps max discharge rate. Just about right for the old controller, motor, etc. from my 1996 adventure. And with the Kohler delivering about 120 amps to the battery pack, I might just have enough power for continuous operation. As a minimum, I could operate on the battery pack as much as possible and use the Kohler when power or heat requirements dictate that I run the engine.

This would be a series hybrid as the engine would not drive the wheels directly. I am sure this would be a simpler project than a parallel hybrid. A "connect through the road" hybrid might not be too bad of a project but it's not for me.

## IS GM UNRAVELING?
### Oliver Perry

This is the Hot Topic question asked by the *Wall Street Journal*, April 8, 2006, on page A7: "General Motors Corp, sold off a majority stake in its finance arm last week — the latest sign that the country's largest auto maker is struggling for air."

"Last month, GM announced one of the largest corporate buyouts in history by offering 131,000 employees (both of GM and its largest parts supplier Delphi Corp), offering money in exchange for early retirement."

We have all read about the high costs of providing health care and pensions for the US auto worker.

Workers at GM earn an average hourly wage of approximately $26, about 70% more than the average manufacturing wage. When health-care and pension costs are included, the average hourly wage increases to nearly $70. (Chinese manufacturing hourly wages don't come close to this figure.)

"But even without retiree and health-care costs, GM is a high cost producer. It takes GM about 23 hours to build a car, versus approximately 18 hours for Nissan Motor Co. Also GM has about 7500 workers in its Jobs Bank program who remain on the payroll even though they no longer work for the company."

"In 1995 GM claimed 33% of the US auto sales market. In 2006 they have 26 % and are falling."

In 1955 GM became one of the first US companies to post a $1billion dollar net income. In 2005, it came in third in the Fortune 100 ranking of the nation's largest companies, behind Exxon Mobil Corp, and _____? (Answer, end of article)

But one year later, even as this article is being prepared, knowledgeable business people are asking if GM funeral arrangements are now in the making. President of EVADC, Dave Goldstein, I am sure is one person who believes that GM's "Day of Judgment" is close, if for no other reason than they turned their back upon their responsibility to the environment. Lobbying to prevent CARB regulations from becoming the law of the land, GM angered those who expressed concern for cleaner air.

Opinion: *Wall Street Journal,* April 8, 2006 Editorial page A8: "Review and Outlook"

"As for GM its management mistakes are legion and its weak product line well known. But the root of its problem is that it long ago became a corporate version of the welfare state, with the same entrenched union interests. Yes as a private company it had to answer to shareholders. But the size of its market dominance going back to its heyday 40 years ago allowed its managers to avoid confronting its uncompetitive wages, benefits and work rules even as they saw Toyota and Honda gaining in the rearview mirror."

"Even now at auto-parts maker Delphi-which is already in Chapter 11 — the UAW is declaring it will take a strike that could destroy both Delphi and GM rather than agree to Delphi's proposed job cuts and work changes. As in France and New York, these union leaders would rather sink the company than make concessions that would reduce their own power".

The *Wall Street Journal* editorial continues with, "Even amid GM's decline and France's economic turmoil most of America's liberal elites refuse to draw the right lesson. They cling to the belief that if only the Democrats can retake Congress, or the union movement can once again organize more of the American work force, the old-economy of union-backed job security and égalité will return. Or worse, they propose seceding from global competition via protectionism. It is still all a delusion."

All things are political, car manufacturing included. Whoever is president at any time will be bashed by those unhappy with opposing political views. Clashing socio-economic politics will always exist as long as people exist. Even in the comedy play "Pippin," the writer portrays the young Pippin as one who is delusional. (Pippin thought he had better political solutions than his father but saw differently after he took over his father's throne. Politics did not provide a solution for Pippin's needs.)

"So there it goes,"

"Our hopes and woes."

"Who is right, who is wrong?

"Those who don't care, don't belong!"

"Come debate with us and sing our song!"

We all tend to believe that some form of government, perceptive government leaders, or enacted legislation can solve every problem. Yes, maybe. But not everybody can agree on what constitutes a problem, let alone a solution.

EEVC members have long clamored for more electric and hybrid cars on the highways. We tend to blame, and for good reason, the major auto makers for holding back EV progress and thwarting our efforts. When things go badly for the auto and oil companies we tend to feel that "our turn" is next. For better or for worse our economy has been based upon fossil fuels, the automobile, and highway systems. When you jiggle the plug on one facet of the economy, in this case GM, it can affect the whole economy. There are a lot of clashing views regarding what is best for the US in regard to GM's future.

I believe we all have compassion for the GM assembly line worker (although I honestly find it difficult to do so). I believe that we all have concern for the well being of US industry and corporate businesses as we shop Wall Mart (which thrives on Asian labor). I believe that we all want to own and drive a GM ???? except that we can't get one in electric or hybrid form. I believe that we all live lives filled with some contradiction. We all have delusions of one kind or another. But to us our delusions seem to more realistic than those of our opponents'? I guess we all think

that our delusions are not delusions. That is why I keep stressing that we ought to explore fully both sides of any debate before drawing conclusions. It is not wise to always think and vote strictly by party lines, to cross into green country and hurl stones at Bush. It is a big world out there and there are many forces at work, both seen and unseen. We should try understand all of the forces involved before we leap.

For all of their mistakes, greed and selfishness, the major automotive companies have designed and engineered marvels. Those who developed our gas guzzling, high powered air polluting engines made marvelous machines that make even gifted engineers stand in awe. The low cost of such a precise wonder is even more amazing. The ladder may have been leaned against the wrong tree, but it is still a wonderful ladder! Not perfect, but cost effective. We ought to recognize the marvels that were created and to offer respect to the talented engineers and financiers who created them. Even if the benefactor committed many abuses and could have conducted business differently not everything he did was necessarily evil or foolish.

If GM had pursued the EV-1 and developed a hybrid, would they have been better off than they are now, as some claim?

That is a good question.

"Some say yes, others say no."

"And everybody thinks they are right, By JOE!"

But whether they would have been better off or not, had they been more environmentally friendly, and in spite of disagreements among us surrounding the past, present, and future of GM, there still seems to be one shared feeling among EV enthusiasts. There is wide spread mutual joy over the apparent doom of GM. If and when the "Mighty Ship" does go under, there will be cheers from EVland. GM's demise will be perceived among electric car enthusiasts as revenge for "The Crushing of the EV-1."

Others, as the *WSJ* stated, tend to feel that GM's failure to adjust to realistic costs of production in a global economy is what has killed GM.

Does disloyalty to the public and a breaking of moral law play a part? Dave Goldstein implied a number of months ago, that justice was going to be served to GM for ignoring the "Green Movement" and violating health standards! In light of Dave's prediction it is getting very interesting to read the business section of the newspaper these days.

What do you think? What do you forecast the outcome of GM will be? Drop us a line and we will include it in the next newsletter.

Answer to blank above. "Wal-Mart Stores"

## NEWS UPDATE

**Carbon fuel cell runs cool (sort of)**

An article by By Jan TenBruggencate in the February 26 issue of the *Honolulu Advertiser* reports that a Dr. Michael Antal of the University of Hawaii has developed a working fuel cell that runs on charcoal and operates at temperatures much lower than most direct-carbon systems.

The system, which Dr. Antal calls an aqueous alkali biocarbon fuel cell, operates at about 400°F, compared to the 1500° of other cells. "The key to his cell's operation," says the article, "is the very chemically reactive property of charcoal, which has a large surface area and burns at relatively low temperatures." Dr. Antal, the article continues, feels the system "might be capable of running an automobile."

The electrolyte is alkaline potassium hydroxide, kept under pressure to prevent boiling. The cathode, which acts as a catalyst, is made of nickel and silver or platinum, while the positive anode is a porous ceramic column filled with charcoal powder. A piston keeps it pressurized and serves at the attachment point for the electrical connection.

Dr. Antal is currently working on improving the efficiency of the system

**Stop me before I pollute again**

A column by Amanda Griscom Little in Daily *Grist* for April 6 reported that on April 4 during an all-day Senate conference on global-warming policy executives from energy and utility companies urged congress to establish caps on carbon emissions.

"The Energy and Natural Resources Committee," said the column, " heard statements from leaders representing eight big energy companies, including General Electric, Shell,

and the two largest owners of utilities in the U.S., Exelon and Duke Energy. Six of the eight said they would either welcome or accept mandatory caps on their greenhouse-gas emissions.

"Wal-Mart too spoke in favor of carbon caps. The two outliers from the energy sector, Southern Company and American Electric Power, delivered pro forma bids for a voluntary rather than mandatory program, but they, too, broke with tradition by implicitly acknowledging that regulations may be coming, and offering detailed advice on how they should be designed."

The reason for all this sudden environmental awareness, says *Grist*, is the appearance of state and regional climate regulations that vary from area to area and make compliance a difficult matter for multi-state or multi-regional firms.

**New Li-Ion Battery for Hybrid Cars**

Lithium Technology Corporation (Plymouth Meeting, PA) has delivered, through its wholly owned German subsidiary GAIA Akkumulatorenwerke GmbH, a Li-ion battery for a hybrid vehicle that is being developed by UK based automotive technology specialists Zytek Systems as part of the Energy Saving Trust's Ultra-Low Carbon Car Challenge (ULCCC).

In March 2005, Zytek was awarded grant funding from the Energy Saving Trust for the second phase of their ULCCC project to develop a new high efficiency, dual mode hybrid vehicle. The vehicle is based on the new Smart forfour and will have a hybrid powertrain based on 1500 cc, 3-cylinder turbocharged diesel engine coupled to two permanent-magnet motors.

Zytek has ordered three Li-ion batteries with output of 288 V, a capacity of 7.5 Ah (about 2.2 kWh of energy) and with a capability to deliver 25 kW of power. The batteries can be charged by either the ICE, by regenerative braking, or by household mains, and will have a modest all-electric range.

**Quantum buys stake in Li battery maker**

Quantum Fuel Systems Technologies Worldwide, Inc. announced on April 3 that it has acquired a 19.9% stake in Vancouver, British Columbia-based Advanced Lithium Power Inc. (ALP), a newly formed company developing leading-edge lithium ion and advanced battery control systems whose primary asset is intellectual property. ALP is developing state-of-the-art lithium ion battery and control systems that control state-of-charge and provide for thermal management, resulting in high-performance energy storage. ALP's technology has opportunities and applications in hybrid electric vehicles, fuel cell vehicles, uninterruptible power supplies, and energy storage for renewable energy, such as solar photovoltaic applications.

ALP's advanced lithium ion battery packs are designed to be smaller and lighter than current nickel metal hydride batteries used in hybrid electric vehicles. Working in concert with ALP, Quantum will utilize its skills in packaging, integration, and manufacturing expertise to develop integrated advanced lithium ion battery packs for near-term applications, including hybrid electric vehicles, uninterruptible power supplies, and solar photovoltaic energy systems, as well as emerging fuel cell vehicles.

## COMING EVENTS

**IEEE light dinner buffet meeting**
April 20, Arlington, VA, on the Ballston campus of Virginia Tech. Featuring a presentation by Charlie Garlow on EV racing, including Power of DC and Junior Solar Sprints, and PHEV update. Free for IEEE members, $10 for nonmembers. Registration/information: Fred Pearson, (571) 227-3259, frederick.a.pearson.iii@saic.com http://www.ewh.ieee.org/r2/capitalarea/eSCANNER/

**Clean Cities Congress and Expo 2006: Fueling Clean Transportation**
May 7-10, Phoenix. Contact the Alternative Fuel Vehicle Institute, 800-510-6484, www.afvi.org/PhoenixCongress2006/

**18th annual Tour de Sol**
May 9-14, Saratoga (New York) Spa State Park. Contact NESEA, www.nesea.org, or www.TourdeSol.org, or call 413-774-6051.

**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 Val-

ley 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.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.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, sanderalison@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-Whitemarsh High School, 201 East Germantown Pike in Plymouth Meeting, PA, and begin at 7:00 p.m.

May 10

June 14

July 12

August 9

September 13

## ADVERTISEMENTS

***FOR SALE***


1992 Dodge Colt with 18,000 miles. (Yes, you read correctly. There is minimal wear and tear on it.)

First-generation fully electric vehicle, converted for my aunt and uncle, Quakers who have been on the cutting-edge of the EV movement. The car is a fully-functional, fully-approved vehicle for use on all roads, with current PA inspection.

20 hp motor, multi-speed transmission (regular gear shift with no clutch)

Range of 20 miles. Goes up to 40 mph quite comfortably. Goes up to 60 easily, but has little power at higher speed, so highway driving is not recommended.

110-220 V Lester charger, off board. Using 110 takes about 5 hours for full charge Was purchased in 4/95 and has been repaired several times. You need to be able to park it fairly closely to an outlet.

Present Deka batteries were bought 9/03. #8C12 battery.wet (weighs 928 lbs) from East Penn Manufacturing Co. 12 V. six in back, two in front

No air conditioner (removed, since added weight)

Ideal buyer would be interested in tinkering, and in the technical aspects of the workings of a fully electric vehicle.

It is quirky, but any decent mechanic will be able to perform maintenance on most of it. Indeed, we have found that most mechanics have fun with it!

We are asking $2,500.

Interested? Tom Hoopes, Wayne, PA, 610-688-1522, eithercoe@comcast.net.