Electric Auto Association

CURRENT EVENTS

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LESSONS IN ELECTRIFYING A BOAT

By Myles Twete, © 2003, OEVA Member

Since converting my 26-ft, 4000-lb wooden flat-bottom scow to electric, I've learned a few things:

First, given a hull, the biggest efficiency factor to consider is propeller selection and prop speed for a given max hull speed. In my case, I skipped this step in favor of getting something together quickly. Thus, I chose to use my existing old 1980's Tohatsu 25HP 2-stroke outboard w/o powerhead and keeping the existing prop. This is a recipe for poor efficiency. I probably don't get better than 35% prop efficiency with this arrangement. This compares to an optimum of around 70% efficiency with a larger, steeper pitch slow-turning prop.

Nevertheless, despite using the existing inefficient hull, prop and outdrive, the energy usage and range as an electric conversion is already worth it. With two 36v T-105 battery strings onboard, I estimate I have about a 40+mile range (9+hrs) at 4knots and about 27miles(4.5hrs) at 5knots, which is the max speed with the current setup. This compares to a range/speed of about a 20mile range/tank and 7knots (hull speed is about 5.9knots) with the original gas engine on the same outboard lower unit.

To optimize prop size/pitch for a boat is no easy matter. One method used and documented by UK's Steam Boat Association is to use "Troost Charts." I had a friend mail me a set of these. They are directed at low-RPM prop speeds (under 1200rpm or so) and are pretty difficult to understand initially, but by playing with the equations and charts, an optimum prop diameter and pitch for a given hull and prop speed can be identified.

There are also some rules of thumb people uses for optimum props. For low-RPM craft (e.g. steamboats and high-eff. electrics), pitch is typically chosen as 1.5*dia. for light prop loading and max RPMs near 300-500. For higher RPMs or with heavier prop loading, a pitch nearer 1.0*dia. is used. For example, my lightly loaded fantail hull steamboat (20ft x 5ft x 6inch) "Oly" uses a 13-inch prop w/20inch pitch (1.54:1). So, perhaps w/15% slip, at 300RPM, the boat should go (20/12)*(300/60)/1.15 ft/sec, or 7.25 ft/sec (5mi/hr)—which is about what I see when it's clipping along at max-engine-rattle speed (5cycles/sec).

Electric ADC motor mounted to the existing outboard housing

Once you've chosen a prop (outboard or inboard), there's the task of coupling the motor to the load. Series DC motors as I'm using (ADC AC4-4002 ex-Tropica motor) are best run at higher speed/lower torque rather than low speed/high torque (and current). This argues against direct coupling of the motor to the outboard splineshaft if an optimal large diameter/pitch prop were used. In such cases, a reduction is required.

In my case, using the original inefficient prop and outdrive meant that ideally the top shaft speed would be about 4000RPM. This target top RPM was well within the max range of the motor and yet high enough to make direct coupling look good. So, in the interest of simplification, I opted for direct coupling to the existing lower unit splineshaft. Consequently, the motor ran quite warm at cruising speeds (2500RPM).

Third, and perhaps most important for energy efficiency is to provide enough batteries to ensure that the Peukert effect isn't going to kill your efficiency. In my case, this was the PRIMARY factor I had to twiddle with since I wanted to use my inefficient existing outdrive and prop and chose direct coupling. By adding a battery string to my

continued on page 11

IN THIS ISSUE

COVER STORY

Photos provided by various sources - see links at end of article

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How to Properly Promote EVs

By David Roden roden@ald.net

Brad Waddell wrote:
> I don't know about [EVs not being
> practical] - I use my GEM every single
> day, and people love it and are always
> commenting on it.

I hate to say it, gang, but Brad isn't typical. I'm not. You're not. I've watched enough cycles of interest in EVs to see this.

In every cycle, few people have more than casual interest. I've had many positive comments on my EVs too, but those comments don't translate into purchases. EVs are always a good idea - for someone else.

The original post mentioned GEMs abandoned by a police department. This represents a different situation, one where the users don't have to purchase an EV, but rather get to try one on somebody else's coin.

And it still doesn't work. We could analyze the reasons to death - but the fact remains that (with few exceptions) Joe Sixpack, whether he's a UPS driver or a police officer, is: (1) mainly interested in getting his job done and going home, and (2) doesn't really want to try anything very different from what he's used to, as it might interfere with #1.

EV manufacturers and support organizations used to frequently arrange pilot programs with large organizations that ran up a lot of vehicle miles. The idea was that they'd get some real-life experience from real-life drivers and the vehicles would get some public exposure. The pilot programs got funding, bought or leased the EVs, and placed them. But too often the organizations then moved on to other projects, neglecting to educate the drivers and mechanics on the vehicles or to provide ongoing support.

Even when these were provided, acceptance was iffy. And with little or no ongoing education and support, the outcome was what you'd expect. The EVs were driven a few times by a few vaguely interested people. The EV limitations were quickly evident. Nobody was there to point out the virtues of the EVs, or how to overcome the perceived limitations, so in short order they were just parked.

And it's still happening.

With luck, a few years later one of us, a person who cares about EVs, will get to buy the half-dead EV for a fraction of its original price. Without luck, the vehicle will go to a recycler who (if it's a conversion) will strip it for salable body parts and probably junk the EV drive system. The good news here is that the popularity of Ebay has made the first outcome more likely than it used to be.

Free market advocates say that EVs can't succeed unless they do so on their own merits. Trouble is, consumers don't give a hoot about their merits, and they DO care about their DEmerits.

Education and support help, but even with those, only very unusual users - like us - are interested in them.

What are needed are deliberate new merits for EV (such as making them the only vehicles permitted in some situations), new DEmerits for gassers (fuel being horribly expensive and almost unobtainable), or just plain coercion (legislation requiring EVs).

But conservative free market purists reject such solutions. And right now, they pretty much own the government here in the US. So for the foreseeable future, we're going to carry on converting gassers to EVs. And what EV pilot projects can be generated (given the paucity of available EVs) aren't likely to produce any better results than they did in the 1970s.

Next EV Convertion

By Steve Clunn 1sclunn@msn.com

I may have a buyer for one of my conversions. So I'll have money to do another EV project. I need to spend this money (around $6k) on EV parts as fast as I can before it evaporates. I have 3 plans or paths I can take. I'll be doing this to sell (I know nobody in there right mind would do this to make money at this time but as I've made a killing in the lawn mowing biss I can afford such a fun and exciting hobby).

1. The Plan Jane
componient pricing (plus shipping, etc):

9" net gain motor	$2k
Curtis or small Zilla controller	$1.5k
20-24 golfcart batteries/cables	$1.5k
PFC charger	$1.5k

Looks like we ran over budget already :-(

Pickup /car with blown motor	$500
Steel adaptor plate	$100

Should end up with a sale price of $9k

2. Boys Toy
Paul (http://paulsexotics.com), who I helped do the Porsche 959 conversion, has a Porsche 912 conversion which he got from the west coast. It has a 8" motor in it right now, he isn't doing much with it, as his EV 959 is much faster and looks better, etc. The 912 needs some upgrading to make him happy (that's where I get my foot in the door). I am really hot to try the 2-motor thing. The voltage drop on the motors x amps = power. With 2 motors in series, the v drop will be double at same rpm, so twice the power to the wheel. Can be done with the same controller, until the controller comes out of current limit, and then motos go parallel.

8" net gain motor to add to existing	$1.5k
dcp t rex 336v/1000 controller (have)	
10-15 excides (the car has 10 now)	$1.5k
PFC charger	$1.5k
contactors etc.	$1k

I've talked to Paul about this and he would put his new body on it (http://paulsexotics.com/GT1.htm), which looks very nice. The finished price would be a lot more that the "Plane Jane", probable over $30k . I'd get to drive it 1/2 the time and while working on it. Would it ever sell?

3 Make it happen for somebody else.
I have been talking to a lady who thinks doing a conversion project would be a great learning experience for her two kids. They have lots of tools and sound like they could do the job .They are on fire of EV's and talking to her makes me want to do something . Money is a problem though but they could budget $300 month like a car payment. So this would be a car sold before even being made. My money would come back slow but another EV on the road.

Which path to take?

(For additional ideas and discussion, see the article on EV Rentals on page 18.)

2003 NEDRA POWER OF DC

By Chip Gribben [futurev@radix.net]
NEDRA & EVA/DC Member

What a great day of racing we had for our 3rd NEDRA Power of DC at the Mason Dixon Dragway. Eleven vehicles showed up and raced under the hot blazing sun June 29 in Hagerstown, Maryland. After weeks of rain it turned out to be a typical hot summer Sunday.

The events actually started a day before when Shawn Lawless and his crew from Youngstown, Ohio brought their 240-volt "Orange Juice" dragster and did a test run of 11.4 seconds with driver Mark Moore behind the wheel.

Just two weeks before in a test run in Ohio, Orange Juice had burned out both motors and the tranny, so Shawn tore them out and rebuilt them just days before the race. What is it they say? "If you don't break something you aren't pushing hard enough."

Cent.Shenandoah Valley's 240-Z vs. Northeastern's Volksdragon

While the Orange Juice crew was enroute to the races, we unfortunately heard from Kevin Zak of NetGain Technologies that their dragster "Bad Amplitude" wasn't going to make it. Not because of problems with their dragster, but with their truck. Apparently a faulty fuel system stalled their efforts to make it down to Maryland.

Darin Gilbert also was able to put in a few test runs just a couple weeks before in his 48-volt Pirahna motorcycle which sported twin ETEK motors and two parallel strings of 13ah Hawker Genesis Batteries.

Sunday morning Bob Salem and Dave Erb came down from Ohio with Bob's 240-volt VW "ELECTRK" with a new Zilla controller. Bob decided to install it just a few days earlier, which required a lot of rewiring in the truck. Apparently a lot of people had their vehicles in pieces just days before the race.

We had two folks who actually drove their EVs the 50+ miles to the track where some of the route wound its way through the Appalachian Mountains. Early Sunday morning Christopher Zach drove his US Electricar AC powered Prizm from his home in Relay, Maryland to the track, which was 70 miles away. He stopped in Frederick at the Battery Warehouse for a quick charge before the last leg of his journey which heading up the mountains. Bryan Murtha drove his AC powered Ford Ranger from Owings, which is in the southern part of Maryland, 70 miles to EVA/DC President, Dave Goldstein's place in Gaithersburg. Then Dave Davidson towed it the rest of the way to the track.

When we arrived at the track we were greeted by the big 70kW generator that was rented for the event. Tom Sigman from Pepco, our local utility, was studiously at work rigging up a special panel to accommodate all the vehicles that would be charging from it that day.

As we were setting up, the rest of the gang arrived. It was great to see old friends and friends from the EVDL. Lawson Huntley, Steve Sawtelle. Bob Rice and Mark Hanson were there.

My wife Monica, and kids, Jenny and Jake, set up the registration table where we had three raffles going including door prizes, the Aurenthetic scooter raffle and a raffle for the kids. We also sold plenty of Power of DC T-shirts. Jeff Silva brought some drinks, salad and watermelon for everyone to feast on for lunch.

The Orange Juice crew had their motorhomes and trailer set up on the other side of the track so they drove over to greet folks in Shawn's beautiful black 48-volt BMW based motorcycle with a sidecar. The motorcycle sported two ETEK motors.

The two high school teams later showed up each with a crew of 5 or 6 kids. The Central Shenandoah Valley Regional Governor's School in Virginia with instructor, Byron Humpries, and their 120-volt 240-Z and Northeast High School with instructor, Rick Lewis, from North Carolina with their 96-volt VW Golf GTI. The kids showed a lot of enthusiasm and some had never been to an NHRA dragstrip before.

EVA/DC Program Chairman, Charlie Garlow brought his 312-volt GM S-10 and I had my 156 volt Ford Escort and brought SkooterCommuter's MoRad 1500.

At noon the racers headed over for the tech inspection and we lined up in the staging area for the race. Leading the day's race was Darin Gilbert racing his Pirahna Bike and Dave Deibel racing the Black BMW Bike. Both bikes sported ETEK motors and Darin was just shy of NEDRA MT/I record by .25 seconds doing the 1/8 mile in 9.78 seconds at a speed of 64.98.

Orange Juice was also just shy of the DR/B record by .25 seconds with a run of 10.8 seconds in the 1/4 at 119.5 mph. Maybe we should give these guys a quarter for good luck next time.

Although we didn't break any NEDRA records we managed to set a new one. The Central Shenandoah Valley Regional Governor's School driven by Ben Wright set a new high school record with their 240-Z in the HS/F class. Ben pulled off a best run with a time of 18.374 seconds in the 1/4 mile.

Northeastern was in a different voltage class at 96 volts but they raced several heats against CSVRGS and ran a respectable 14.774 in the 1/8 mile.

One of the fastest EVs on the East Coast is Bob Salem's 240-volt "ELECTRK". At our

race in previous years, he's been able to race 15 seconds and this year did a best time of 17.323.

Our other trucks were the 312-volt AC powered Ford Ranger and Chevy S-10. So in the Ford versus Chevy shootout both trucks won against each other in races throughout the day.

SkooterCommuter donated their MoRad 1500 for the day which was driven by motorcycle enthusiast Wallace Rumbarger.

As far as my racing, I couldn't break 20 seconds with my Escort but did manage to get the second fastest reaction time of the day with .537 just behind Mark Moore's .531.

After the race, everyone headed over to the Power of DC tent for the awards and trophies. Then about 40 of us headed out to Ledo's Pizza for dinner.

Check out our website for more info and pictures: www.powerofdc.com.

See you next year for our 4th Power of DC Drag race!

2003 POWER OF DC RACE RESULTS

97 VOLTS AND ABOVE
1ST PLACE
Shawn Lawless' "Orange Juice", 240 volts, driven by Mark Moore
(10.8 sec 1/4 mile, 119.5 mph)
Winning:
$150, 1st place trophy and the book "The Electric and Hybrid Electric Car," courtesy of Megawatt Motorworks for the fastest car in attendance.

2ND PLACE
Bob Salem's "ELECTRK", 240 volts
(17.323 secs 1/4 mile, 72.63 mph)
Winning:
$100, 2nd place trophy and the book "Kar Kaptains Kry, Kalamity," courtesy of Megawatt Motorworks for being the Quickest SC-MC NEDRA class driver.

3RD PLACE
Central Shenandoah Valley Regional Governor's School 240-Z, 120 volts
(18.374 secs 1/4 mile, 67.62 mph)
Winning:
$50, 3rd place trophy and the book "Basic Electricity Crash Course", courtesy of Megawatt Motorworks for having the fastest school-sponsored car in attendance.

4TH PLACE
Charlie Garlow's S-10, 312 volts
(19.964 secs 1/4 mile, 65.3 mph)
Winning:
$50

96 VOLTS AND BELOW
1ST PLACE
Northeastern High School "Voltsdragon", 96 volts
(14.774 secs 1/8 mile, 43.34 mph)
Winning:
$150, 1st place trophy.

MOTORCYCLE
1ST PLACE
Darin Gilbert's "Pirahna", 48 volts
(9.78 secs 1/8 mile, 64.98 mph)
Winning:
$150, 1st place trophy.

2ND PLACE
Sean Lawless Motorcycle Side Car, 48 volts, driven by Dave Deibel
(14.26 secs 1/8 mile, 47.11 mph)
Winning:
$100, 2nd place trophy.

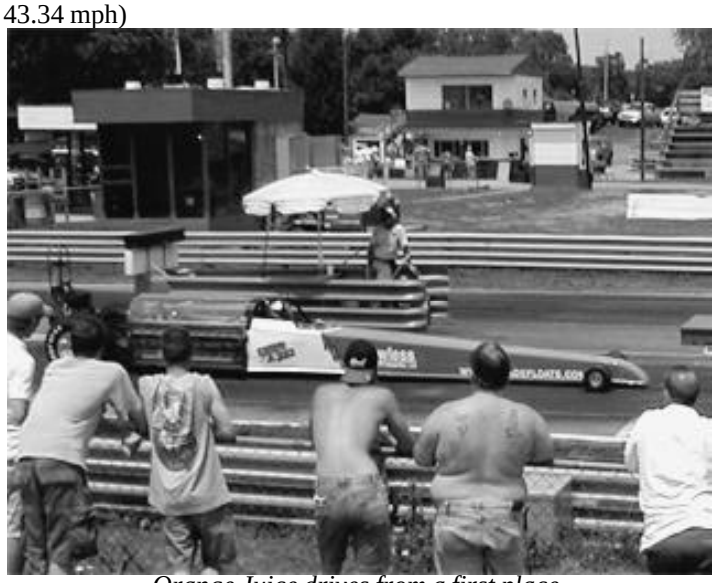
3RD PLACE
SkooterCommuter's MoRad 1500, 48 volts, driven by Wallace Rumbarger
(20.517 secs 1/8 mile, 29.48 mph)
Winning:
$50

QUICKEST REACTION TIME
.531 secs for Mark Moore driving "Orange Juice"

FARTHEST TRAVELED
Darin Gilbert from Detroit, Michigan

MOST VEHICLES TOWED
Dave Davidson for towing three vehicles to the track

FARTHEST TRAVELED ON ELECTRIC POWER
Christopher Zach and Bryan Murtha



Orange Juice drives from a first place.

This year's race wouldn't have been possible without our sponsors, contributors and all the volunteers who helped pull this race together.

And of course the visitors and EV enthusiasts who came out to watch.

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continued on page 22

THE ECOTREKKER IS COMING

By Kimberly Rogers, SVEAA Member (krogers@alumni.calpoly.edu)

What is an EcoTrekker? The short answer is Shaun Murphy is the EcoTrekker. Shaun has been involved as a presenter and producer of several eco-friendly TV shows in Australia.

Shaun will be heading a team that is on a mission to travel across the USA through 30 states in 8 months – using only eco-friendly vehicles and renewable fuels. A major portion of the trek will be completed in electric vehicles – with the electricity generated from renewable sources such as solar, geothermal, micro hydro, wind, landfill gas, biomass, sugar power (burning sugar cane), and cow power (burning cow manure). They will also use biodiesel, ethanol, hemp oil, and veggie oil.

Their two support vehicles, the camera crew van and RV, will be running the entire trip on biodiesel. They will be filming many segments along the route to create a 13-part TV show. It's expected that the TV show will appear on a US network sometime in the fall

Shaun Murphy - EcoTrekker

of 2004. Last year the EcoTrekker team made a successful 800-mile trek from the Australian outback to Sydney Harbour – again only using eco-friendly vehicles and renewable fuels.

Their goal is to share ecological knowledge in a fun way so that we can all take action to live in a healthier environment by converting to a more sustainable lifestyle. Based upon promotional videos that I've seen, the style of the show will be both educational and entertaining.

You can view some video shorts from their Australian trek at http://www.ecotrekker.com. They are also asking for schools along the route to invite Shaun to visit them, and they are creating educational materials to be used in classrooms.

We, in the EAA, have helped them with contacts for EVs, arranged for vehicles at EVents (the Today Show, local TV in the Bay Area, and a reception in Santa Cruz), and provided the locations of all of our EAA Chapters and some of the vehicles available through our chapters. The EAA will also receive a credit in the show! And since the EcoTrekker is passing through cities with EAA chapters and members, we are asking our members to come out and support the EcoTrekker. For some of the cities they are visiting, they will ask for EVs of all shapes to come out – you may even get your vehicle on the TV show when it airs. (We'll send out a notice as they approach.)

The EcoTrekker team is asking for ideas about any "eco gadget" – like the electric bar stools that were featured in a recent CE article. If they are not traveling through your town, you can send in a story about an eco-mobile or other ecological items of interest.

I have contact information for the EcoTrekker, so you can send the information

www.ecotrekker.com website tracks the team's progress across the USA, including fuel sources used.

Ed Thorpe's Sparrow rigged up to file the launch. This is at the Golden Gate Vista Point, on the north side of the Golden Gate Bridge, just north of San Francisco, CA.

to me (krogers@alumni.calpoly.edu), or you can use the "Get Involved!" link on the EcoTrekker web site to send them your idea. We would like to make use of the publicity that will be generated by the EcoTrekker to also raise the awareness about the Electric Auto Association.

They decided to launch their trek in Ed Thorpe's Corbin Sparrow. The trek began on July 16 from the Golden Gate Bridge in San Francisco, and will complete when they return to San Francisco in early March of 2004.

As you can see in the picture, they rigged up the Sparrow with several cameras to view the driver (and his dog Sparky) along with the road ahead. In addition, they had cameras shooting from the camera crew's van (behind the Sparrow), and also from a helicopter. They used Ed's Sparrow for the first two weeks of the trek – from San Francisco to the Oregon border.

The Sparrow and several other EVs present at the Golden Gate Bridge Vista Point were quite an attraction to the public. We were able to use this opportunity to talk to the public about EVs and what the EcoTrekker was doing. It turns out that several folks had seen the EcoTrekker the day before on the NBC Today Show and earlier that morning on a local TV show. So they were primed to hear more about EVs!

You can keep track of the EcoTrekker's progress on their web site at http://www.ecotrekker.com. You will find their itinerary, map of their route, and a daily trip log. You will also find more information about the vehicles and fuels they will use along the way.

Highlights from the scheduled itinerary:

July '03: California & Oregon
August '03: Oregon, Washington, Colorado, Minnesota, & Wisconsin
Sept '03: Wisconsin, Iowa, Illinois (including a PR stop in Chicago),
Oct '03: Indiana, New York, Massachusetts, Pennsylvania
Nov '03: (PR Stops in NYC, Philadelphia, PA, Washington, DC) Tennessee, & Florida
Dec '03: Florida, Alabama, & Louisiana
Jan '04: Texas
Feb '04: Texas, Arizona, & California
Mar '04: California – finishing back in SF

The EcoTrekker has also been in the news, check out the following links:

June 26, Santa Cruz Sentinel: http://www.santacruzsentinel.com/archive/2003/

June/26/local/stories/05local.htm

July 15 on NBC's Today Show: http://www.msnbc.com/news/939218.asp

July 16 on KTVU's Mornings on 2 Show (local TV morning show): http://www.ktvu.com/video/2337925/detail.html

After filming the Sparrow crossing the Golden Gate Bridge, here theyh go ontheir trip with the camera van (biodiesel-powered) closely following.

CONVERSION WORKSHOP, STEP 18
FINAL HOOKUP AND TESTING

By Michael P. Brown, © 2003

At last we have come to the point we have been waiting for. After months of design, fabrication, component installation, and wiring it is time to make a few final connections and bring this new conversion EV to life.

This is one of the most critical parts of the conversion process and should be done in a careful methodical manner. The final few connections should not be made by tired or excited individuals late in the last day of a three day "get this car on the road" thrash. So, now that you are well rested, calm, and ready to proceed in a methodical manner, let's get started.

Safety First

First find, clean, and put on your safety glasses or goggles. Now look around your garage and locate the rest of your safety gear. You should have a large box of baking soda to neutralize small acid spills and a garden hose with a shutoff nozzle ready in case of a large one. It is also a good idea to have a couple of eye wash bottles, the kind with the eyecup, in a known easy-to-reach location. Last, in case things get really bad, have a fire extinguisher close at hand, properly rated for electrical fires.

Don't let these comments panic you. If you have worked carefully on your conversion, and do the same on these final steps, you should not have any problems, but it's always better to be safe than sorry.

If you haven't done so already you should make up a pair of dedicated battery wrenches. Buy two cheap ½" open end box end combination wrenches. Wrap the wrenches with electrical tape leaving one open end and one box end exposed. This will prevent shorts caused by inadvertent contact with battery posts if you drop the wrench or don't watch what you are doing when tightening battery terminal connections.

Moving to the EV, put the end with the drive wheels up on jack stands. The wheels should have about three inches of air between them and the floor. Raising the drive wheels off the ground as well as having the transmission in neutral will keep the car from moving if the motor starts to turn before it is supposed to.

While you are in the driver's seat checking the transmission for neutral, make sure the ignition key is in the off position. If the circuit breaker or emergency cutoff switch is inside the passenger compartment, open it if it is not already open. If the circuit breaker or cutoff is under the hood, get out of the vehicle and be sure that it is open.

Next remove the auxiliary battery's negative cable at the battery terminal to open the EV's 12-volt circuit. Disconnect the onboard battery charger from the battery pack at the Anderson connector, and remove the input negative wire from its terminal on the DC-DC converter. Both of these components have capacitors in them that will give you sparks or false readings at various parts of the hookup/testing procedure.

Making the Series

Since most conversion EVs have split battery packs, the hookup and testing sequence I am giving here is for that battery pack configuration. For those of you with all your batteries in one box, I will note the place where you are finished with that part of the procedure.

Before you start hooking up interconnects, get out your battery layout drawing and confirm that all the batteries are installed with their terminals in the correct orientation. Mistakes can happen when you are putting a large number of heavy batteries in small awkward-to-reach places.

Starting at the rear pack, install all of the interconnects except for the fused interconnect. If you are using batteries with "L" terminals, remember the order in which the hardware is installed. Start the battery bolt with a flat washer on it from the inside of the "L", through the hole in the terminal. Next, coat the contact surface of the interconnect with a small amount of Noalox and install it on the bolt in the terminal. Place a Belleville washer over the battery bolt, with the concave side of the washer facing the interconnect. Finally, thread the nut over the bolt.

If this is the first end of the interconnect being installed, leave the nut finger tight and install the other end of the interconnect on its terminal, using the method given above. Then tighten both of the nuts securely. When you are finished with all of the interconnects in the rear pack, install the rear battery pack's most positive and most negative cables on their respective battery terminals. When you have installed all of the interconnects and the two cables, go back and check all the bolted connections for tightness. Loose connections cause melted battery posts!

Install the front battery pack interconnects, except the fused interconnect, using the same installation procedure. Do not connect the cables that go to the front battery pack's most positive and most negative terminals at this time. They get connected further along in the hook up sequence.

Test and Test Again

Before we install the fused interconnect and complete the series circuit of the rear battery pack, check to see that the circuit breaker or emergency cutoff is open. Also make sure that the end of the cable that comes from the rear battery packs most negative terminal is not hooked up or touching any part of the vehicle.

Take the fused interconnect and lightly touch it to the two battery terminals it is to connect. If there is a spark, check for a short between the cables going to the front of the car from the rear pack most positive and most negative terminals. If there is no spark, install it.

Now use a voltmeter to check the voltage for the rear pack at its most positive and most negative terminals. The voltage should be at least the nominal voltage of the individual

Common battery post terminals

battery times the number of batteries in the pack. For example, a pack of eight 6V batteries should read at least 48 volts.

Note: while we are calling 6 volts the nominal voltage, the new batteries' actual voltage will range between 6.34 to 6.5 volts, depending on how fresh they are. Your total pack voltages should always be higher than nominal.

If the total voltage is two or three volts less than the nominal pack voltage, do an individual battery voltage check to find a battery or batteries that have a lower voltage than the other batteries in the pack. If the difference between the measured voltage and the nominal pack voltage is the same as the nominal voltage of an individual battery, you should check and see if you have a battery in the string with the terminal positions reversed.

If the rear pack voltage is correct, we want to see if it gets through the cables to the front of the car or whatever the next stop is in the series string. In our split battery pack EV, the cable from the rear battery pack most positive goes through the circuit breaker or emergency cutoff to the battery positive side of the main contactor. The cable from the rear battery pack most negative goes to the front battery pack's most positive terminal, but should not be connected yet.

To test the continuity of these cables, close the circuit breaker or emergency cutoff. Connect a voltmeter between the battery positive side of the main contactor and the lug on the end of the cable from the rear pack most negative. The voltage reading should be the same as the voltage reading taken across the rear pack's most positive and most negative terminals. If there is no voltage, check to make sure that there is continuity across the circuit breaker or emergency cutoff when they are closed. If the voltage is correct, open the circuit breaker or emergency cutoff and proceed to the next step.

For those of you with all your batteries in one pack skim over the next steps. I'll tell you when to join in again.

Go to the front pack do the interconnect spark test. Since this battery pack is not yet connected to any other part of the high voltage system, there should be no spark. Install the fused interconnect.

Use a voltmeter across the most positive and most negative terminals to check for the nominal pack voltage for the number of batteries in that pack. If you get less than nominal voltage, check for the problems mentioned in the rear pack test a few paragraphs above and correct them.

The next stage of the hookup procedure is joining the two separate battery packs into one traction battery pack. This is done by attaching the cable from the rear battery pack's most negative terminal to the most positive terminal of the front battery pack.

Now that we have both battery packs in series, connect a voltmeter between the battery positive terminal of the main contactor and the most negative battery terminal of the front battery pack, which is now the most negative terminal of the traction battery pack. Close the circuit breaker or emergency cutoff and read the

voltmeter. You should have a reading that is the total of the nominal voltages of the front and rear battery packs, which is the nominal voltage of your system. Since we tested each individual pack for their total nominal voltages and there is only one connection to make there should be no problem getting the proper total nominal pack voltage.

You all-the-batteries-in-one-pack people jump back in here.

Bringing It All Together

Now we are going to test the operation of the main contactor, make the final connection between the battery pack and the controller, turn on the ignition key, press down on the gas pedal, and see if the motor spins.

To get started, remove the fuse to the power brake pump to keep it from going on every time we turn the ignition key on. Next, connect the negative or chassis ground cable to the negative cable of the auxiliary battery.

Connect your voltmeter between the controller side of the main contactor and the battery pack most negative terminal. The reading should be 0 volts. Turn on the ignition key. Nothing should happen. Now move the potbox arm away from the off stop. The main contactor should close and your voltmeter should show full battery pack voltage.

Turn off the ignition switch. Locate the loose end of the cable attached to the battery negative terminal of the controller. Install the loose end on battery pack's most negative terminal. Get in the driver's seat, make sure the transmission is in neutral,and turn the ignition key on. Press down gently on the gas pedal, listen to the main contactor close, and then hear the motor start turning. It lives!

Resist the urge to sit there and spin the motor. Let everything stop turning. Depress the clutch, put the transmission in first gear, and gradually let the clutch out as you gently press down on the gas pedal. This times the motor and the drive wheels should turn. While the wheels are turning check the direction they are rotating to be sure that they are going in the direction, which will move the new EV forward.

Reconnect the battery charger and DC-DC converter to be sure that they are operating correctly. Replace the fuse for the power brake pump and check its operation.

On the Road Electrically

Take the new conversion off the jack stands. If you have already modified the vehicle's suspension to compensate for the weight added by the batteries, you are ready for the first test drive. If you haven't done the suspension work, the next article in this series will cover that subject.

The first test drive of a new EV should be a slow short trip around the block. Be alert for any strange sounds, smells, or vibrations. At the end of the drive bring the conversion back into the garage. Immediately feel each individual battery terminal for any that are unusually hot. Recheck all the tightness of all the terminals one more time. Correct any problems you might have found on the test drive and you are ready to go again.

The first few drives of a new EV should be a little longer each trip as you get to know each other. The longer each trip is, the wider your "EV grin" will be.

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ElectroAuto has developed conversion kits for VWs and Porsches over the years. Check out their website http://www.electroauto.com/ for further information about kits and componients.

Ginger at the docks

Continued from page 1

single 36v battery string I estimated that I didn't just double my time and range, but instead increased it to nearly 2.5x, due to the reduced Peukert effect losses. Thus, for the cost of 6 golf cart batteries (and very little hassle), I gained as much time and range as optimizing the prop/outdrive.

Where to go from here? My next project is to take my spare outdrive, cut off the ventilation plate and relocate it up as much as 4 inches. This will allow me to increase the prop diameter from 10-inch to perhaps as much as 18-inch. This will require slowing down the current max prop speed (at 34v on motor) from about 1200 to around 400RPM, but with a pitch of perhaps 23inch (vs. 10inch) and with substantially less slip (25% vs 70%), top speed could increase to (400/60)* (23/12)/1.25 ft/sec or 10.2 ft/sec (7mph), which is about all the speed I can efficiently expect given the hull speed.

The Reach of Tide EV boat readies for a cruise.

With a 36v system, max. motor RPM is about 2500 and prop speed is about half that. Max motor current is about 80amps, with hundreds of watts (1kw+?) of electrical loss in the motor. Without anything but muffin fan cooling, I don't run at this speed long. However, if the motor could spin at 4000RPM, the proportional reduced torque required would reduce the current to 50amps (versus my 80amps) at 36v w/4 battery strings.

Now, if I did modify the other outdrive unit, which accommodates a 14-18inch diameter prop, with a max prop speed of 400RPM, the max spline shaft speed would be around 800RPM. For a max motor speed of 4000RPM, I would need a 5x speed reduction from motor to splineshaft. That may not be feasible given space available.

Compounding this, going to higher RPM will likely mean changing from 36v to 48v or higher. So now I'd have to change charger, controller and battery connections. Nothing new to the EV car guys, but when things work now, as is, Murphy is whispering to me about whether it's really what I want....

The electrified Ginger getting ready to launch.

and the I-squared loss power by 60% or more. Hence, why a 2:1 reduction looks good right about now.

One local electric boat "Ginger" uses a 10:1 reduction gear from the electric motor to the output thru-hull shaft. Ginger cruises at about 5knots with only 36amps or so

In case any of these perspectives or experiences help, plese feel free to contact me.

-Myles Twete, Portland, Or.
mylest@teleport.com

Electric Reach of Tide:
http://www.teleport.com/~mylest/reach/reach01.jpg

New Electric Boating Yahoo group:
http://www.groujps.yahoo.com/group/ElectricBoating

The 2003 World Econo Move (WEM) Grand Prix third stage car race starts at Tsukuba Circuit racing course in Chiyokawa village, north of Tokyo, August 16, 2003. Fifty-two WEM racecars compete on the mileage per charge of a same battery in the two-hour endurance race on Saturday.

Special thanks to Frank Madeka for providing this information and photos from REUTERS/Issei Kato.

A Japanese driver gets into the narrow cockpit of his vehicle before the start of the race.

Kihoku industrial High School's "Spirit of Kihoku" (front, no. 49) competes against "Science Gariben" by Yonezawa-Kojokan High School.

Hide 3 team's "Car Graphic - KAI," is greeted by a checkered flag at the finish line. This car finished with the longest mileage of 73.620 km in the two-hour endurance race.

Comments of Dave Goldstein, EVA/DC Member

Neat stuff! These are Japanese Electrathon racers! Electrathons started about 10 years ago here in the US, mostly on the West Coast, and kind of got out of control when professional sponsors — also clearly evident in the Chiyokawa EVent — muscled in and with big bucks and out-classed the kids and hobbyists for whom it was originally intended. It's also interesting that these competitors are racing in the rain. Liability concerns would make that pretty difficult to do here in the good ole USA!

By Bob Oldham, CE & CVEAA Member

On Sunday, July 13, the grounds of the Museum of Science and Industry in Chicago were the starting line for about thirty solar-powered electric cars setting out for a ten-day, 12-stop trip across the country to Claremont, California.

The American Solar Challenge competition was developed to promote wider understanding and use of solar energy technology and its environmental benefits, as well as to encourage educational excellence in science, mathematics, and engineering. Student team members develop and demonstrate their technical and creative problem-solving skills to integrate inter-disciplinary scientific and technical expertise.

The lead-off team for the 2300-mile rally was from Kansas State University. They were followed by teams representing about 20 U.S. and Canadian colleges and universities. The rally route followed Historic Route 66 across much of the West.

The American Solar Challenge is sponsored by the U.S. Department of Energy and BP Solar, and features small light-weight vehicles, most shaped like flattened tear-drops and made of advanced materials chosen for their lightness and strength. Their streamlined shapes cut the air like a knife, enabling speeds of 50 to 70 mph under good

conditions.

Because they carry no batteries, the cars rely on an array of solar panels covering their upper surfaces – as many as 3000 cells – for their power. They use slim wheels and tires inflated to their maximum to reduce rolling resistance, and are designed to carry only one person, who in most cases is the smallest member of the team.

Competitors were required to make half-hour stops at checkpoints along each leg of the route, and at the "stage stops" they stayed over until all were caught up. The teams were restarted at 1-minute intervals in the place-order in which they arrived at that stop.

The University of Missouri-Columbia solar car arrives in Gallup, N.M. on day 8.

After their start from Chicago, the first checkpoint was in Springfield, IL, and the first stage stop was at University of Missouri-Rolla. The second checkpoint was in Joplin, MO, followed by a third checkpoint at Edmond, OK, a fourth at Sayre, OK, a fifth at Amarillo, TX, and a sixth at Tucumcari, NM, before arrival in Albuquerque, NM and a four-day stage-stop at the University of New Mexico to allow all teams to catch up.

The cars departed Albuquerque on July 20, again in order of their arrival, and headed for the seventh checkpoint at Gallup, NM, followed by checkpoints in Flagstaff, AZ and Kingman, AZ, before arrival at Barstow, CA for the final stage-stop July 21-23. They left Barstow on July 23 in order of ranking for the last leg to Claremont, CA.

The official race distance from the start in Chicago to the finish line in Claremont is 2306 miles. Organizers expected the first team to get the checkered flag at about 11:30am on July 23, completing another demonstration of the feasibility of both electric vehicle technology and the use of renewable energy.

The American Solar Challenge encouraged fan support along the race route. Official ASC programs and pennants were provided at the stops. Young people along the race route could earn a Solar Scout badge for learning about solar energy and for making signs to cheer the teams as they pass through their towns and cities along the route. In addition, the RNE2EW education trailer, a traveling exhibit with displays about renewable energy technologies, was available at the stage stops locations in Chicago, Rolla, and Albuquerque.

CARB ACCEPTS STAFF PROPOSAL TO PROMOTE FUEL CELLS

By Greg Hanssen, co-chairman PEVDC

In a nutshell:
The revised staff proposal is still 250 fuel cell vehicles in the 2001-2008 time frame. They've added a new 2500 requirement over the 2009-2011 time frames and 25000 requirements over 2012-2015 and 50000 2016-2018 (I think; can't wait to see the new lawsuits heading into 2009.).

The new hitch is that only HALF of the requirement must be met by fuel cells. (i.e. a fuel cell "floor").

The remainder can come from fuel cells or BEVs:
20:1 ratio for city EVs
10:1 ratio for full function EVs.
This 1/2 requirement and ratios will stand in the 2009+ time frames also Thus at best, if all 6 take the alt path (unlikely!) and all 6 make just the minimum fuel cells (unlikely^2) and make the rest as BEVs (unlikely^3) we'd get 1250 full function EVs or 2500 city EVs. Most likely we will get ZIP, ZILCH, NADA.

Also they've taken the PEVDC/CALETC proposal of credit for re-issued older cars at 1.25 credits (the details are a bit fuzzy)

The bottom line is that we lost. Our heroes Matt, Didi and Mark came through for us but their 3 votes couldn't offset the majority 8. Along with CALETC we pushed heavily for a battery floor of 75 equivalent vehicles and/or and increase from 250 to 500 total vehicles. We got neither. The politics were way too thick. (Lloyd threatened by the collapse of the California fuel cell partnership if the automakers move to Detroit; Burke threatened by Honda, which donates $1 million to his pet project, the LA Marathon)

It is highly unlikely we will see any new BEVs in the 2005-2008 time period. There is a slight chance we could see some older EVs re-issued.

They took the PEVDC/CALETC proposal of an "availability" credit to encourage sale and open lease of vehicles but again the exact details are a bit sketchy.

I'm not exactly sure at this point if all of the final regulations are ironed out. More than likely there will be a 15-day comment period where staff lays out the nitty gritty.

Plug in hybrids are NOT allowed in the gold (still). The feeling is that for those who take the alternate path (and thus have nearly no ZEV requirement but a 4% ATPZEV requirements) the high credit values of the PHEVs in the silver will be enough to get an automaker to consider production. Who knows, maybe this will work for Nissan.

Some time next week after a few phone calls and some number crunching we should have a better idea of what this all means. from my perspective sitting in the 2nd row this morning, it wasn't good.

ARB Modifies Zero Emission Vehicle Regulation

Auto manufacturers can meet their ZEV obligations by meeting standards that are similar to the ZEV rule as it existed in 2001. This means using a formula allowing a vehicle mix of 2 percent pure ZEVs, 2 percent AT-PZEVs (vehicles earning advanced technology partial ZEV credits) and 6 percent PZEVs (extremely clean conventional vehicles). The ZEV obligation is based on the number of passenger cars and small trucks a manufacturer sells in California.

Or, manufacturers may chose a new alternative ZEV compliance strategy, meeting part of their ZEV requirement by producing their sales-weighted market share of approximately 250 fuel cell vehicles by 2008. The remainder of their ZEV requirements could be achieved by producing 4 percent AT-PZEVs and 6 percent PZEVs. The required number of fuel cell vehicles will increase to 2,500 from 2009-11, 25,000 from 2012-14 and 50,000 from 2015 through 2017. Automakers can substitute battery electric vehicles for up to 50 percent of their fuel cell vehicle requirements.

With the ZEV regulations on hold for 2003-04 because of automaker lawsuits, the above requirements will not fully go into effect until 2005. However, automakers can receive credit for any ZEV, PZEV or AT-PZEV vehicles they choose to sell or lease in 2003-04.

ARB will appoint an independent review panel of technology/industry experts with no financial ties to motor vehicle manufacturers to report on ZEV technology progress, costs and consumer acceptance. In addition, ARB staff will report annually on the progress of the ZEV program.

Chairman Lloyd continued, "Over the last 13 years since the ZEV mandate was first adopted, we've seen the near impossible accomplished with gasoline vehicles: zero evaporative emissions, exceedingly clean exhaust – cleaner, in some cases, than the outside air entering the cabin for ventilation purposes, and emission control systems that are twice as durable than their conventional forebearers, forecasted to last an astonishing 150,000 miles."

ZEV Rule Vehicle Types

Zero Emission Vehicle (ZEV): A vehicle that essentially produces no emissions as it operates. Currently, this would mean a pure battery electric (not a hybrid) or a hydrogen fuel cell vehicle.

Advanced Technology Partial Zero Emission Vehicle (AT-PZEV): An AT-PZEV is a vehicle that uses some ZEV technology. Currently, there are no AT-PZEVs available to consumers. Staff expects that certain gasoline/electric hybrid vehicles and natural gas vehicles will be certified in the AT-PZEV class. A plug-in hybrid could also qualify as an AT-PZEV.

Partial Zero Emission Vehicle (PZEV): These are vehicles that have achieved the ARB's cleanest tailpipe emission standard — the Super Ultra Low Emission Vehicle (SULEV) standard. In addition, they have nearly zero evaporative emissions and their emission control equipment is warranted for 15 years/150,000 miles. There are at least 10 vehicles currently eligible to earn a partial ZEV credit. They are listed under 2003 passenger cars in the ARB's Clean Car Buyer's Guide at www.arb.ca.gov.

Local FL Police Department Unveils New GEM EVs

Local officials in Lakeland, FL, recently reported that the Lakeland Police Department (LPD) introduced two new electric vehicles (EVs) manufactured by DaimlerChrysler subsidiary Global Electric Motorcars (GEM) during this past weekend's Mayfaire art fair in Lakeland.

According to LPD lieutenant John Thomason, the EVs, which are capable of reaching speeds up to 25 miles per hour and cost approximately $7,200 apiece, will be operated primarily by the department's traffic division.

"They are quiet, maneuver well, and it's a great tool to use in a crowded area," said LPD officer John Rose. (THE LEDGER: 5/12)

NESEA Announces Final Results for 2003 Tour de Sol

The Northeast Sustainable Energy Association (NESEA) recently announced the final results for its 2003 Tour de Sol advanced technology vehicle road rally, which concluded earlier this month in Washington, D.C. NESEA said vehicles entered in the rally competed to earn points for "good fuel economy, low greenhouse gas emissions, reliability, driving range, acceleration and handling."

The group said Toyota Motor Corporation's Prius hybrid electric vehicle (HEV) was recognized with the "most fuel-efficient sedan" award in the Production Division, achieving a fuel economy of 52.5 miles per gallon, while the title of "best battery electric" in the Production Division was awarded to "a vehicle called the Heibao that is currently being manufactured in China."

In the Prototype Division, which included "one-of-a-kind vehicles built by high school and college students, individuals, and battery companies," NESEA said the "top award for a battery-electric vehicle" was given to a student team from Union-Endicott High School in New York.

"We saw a noticeable increase in the number of folks interested in vehicle cost, performance and availability," said NESEA executive director Warren Leon.

eCycle Marine Introduces Electric-Powered Outboard Motor

Temple, PA-based eCycle Marine, Inc. recently unveiled a new electric-powered, contra-rotating propeller (CRP) outboard motor that produces "zero emissions and [exceeds] all [Environmental Protection Agency] standards for marine outboard motors."

The company said the six horsepower (hp) version of the electric motor provides the same amount of thrust as a 9.9-hp gasoline-powered outboard motor, while the 10-hp version of the motor, which will be available later this year, produces thrust comparable to a 15-hp gasoline outboard.

"The most innovative electric outboard in the world is an attractive, 60-pound package, with availability of different transom heights to accommodate a broad range of vessels," said eCycle Marine president Michael Sharer. "It's affordable, powerful, efficient, maintenance-free, environmentally friendly and versatile."

eCycle Marine said the electric CRP outboard also features a brushless motor that "allows low speeds for trolling [and] instant throttle response for acceleration." Additionally, the company said the motor conforms to the California Air Resources Board's (CARB) 2006 emission standards.

Electrovaya Announces Results of ZEV Road Test

Electrovaya, Inc. recently announced the results of the road testing of the company's prototype zero-emission vehicle (ZEV), known as the Maya 100, conducted during the recent 2003 Tour de Sol road rally.

"The test results were encouraging, with excellent performance from the [direct current (DC)] motor, drive train and onboard DC power source, including Electrovaya's patented lithium ion Superpolymer battery," the company said. "The acceleration of the Maya 100 was good and tested successfully the novel concept (patent pending) of an integrated systems approach to thermal management, acceleration, hill climbing and top speed."

Electrovaya also noted that the weight of the vehicle proved "well balanced," with the Maya 100 passing tests measuring acceleration, hill climbing, speed, slalom, braking distance and "other mechanical and performance tests." However, the company said the vehicle "later developed a major electrical malfunction, and was pulled out of the Tour de Sol."

According to Electrovaya, some "additional modifications" are currently being made to the vehicle, with further road tests expected to "resume shortly."

Mississauga, Ontario-based Electrovaya is a leading provider of portable power technology for portable computers, mobile telephones and other wireless devices.

French Catamaran to Feature Electric Motor

Fort Lauderdale, FL-based Catamaran Company recently announced that French catamaran maker Lagoon is currently working to install a Solomon Technologies,

Inc. (STI) Twin ST74 electric motor on its 2003 Lagoon 410 S2 catamaran model, making the vessel "the world's first production catamaran with electric motor technology." Upon completion in July, the company said the 47-foot multi-hull vessel, known as the "Waypoint," will undertake the "first trans-Atlantic electric motor crossing" from France, where it is currently being built.

"The electric propulsion systems being produced by STI will be the biggest power revolution the marine industry has ever seen," said Charles Chiodi, an official with Multi-Hulls Magazine.

During the Waypoint's transatlantic crossing, Catamaran Company said it will closely monitor "performance levels" in order to "record future benefits for its clients." The company noted that previous tests of the electric motor have demonstrated its ability to "stop a 43-foot multi-hull within three boat lengths while under sail in winds exceeding 12 knots."

According to Catamaran Company, batteries will primarily power the motor, although "solar panels and [wind-powered] generators" can be installed to provide additional power.

GM Testing 60 EV1s in New York, Massachusetts

Officials with General Motors Corporation (GM) recently launched a new three-year program that provides employees at the automaker's Global Alternative Propulsion Center (GAPC) in Honeoye Falls, NY, and an additional facility in Massachusetts, with its two-seat, battery-powered EV1 electric vehicles (EV).

The company said the goal of the program, which includes more than 60 EV1s, is to examine the operation of the vehicles during commutes of 70 miles or less to collect data for its fuel cell vehicle (FCV) development efforts. GM officials said researchers are studying the effect of the region's cold weather climate on the performance of the EV1's batteries, as well as the vehicles' electric motor controller, which is similar to that used in the automaker's prototype FCVs. "Obviously, there aren't a lot of [FCVs] running around yet, but with the [EVs] you're kind of using the same drive motors and some of the regenerative braking," said GAPC facilities manager for FCV activities Steve McIlwaine. "We're getting a whole lot of data and durability on that electrical drivetrain." (ROCHESTER DEMOCRAT AND CHRONICLE: 6/3)

Study Details Future Economic Impact of EVs

According to a recent study conducted by Rochester Institute of Technology (RIT) public policy professor James Winebrake for the Electric Power Research Institute (EPRI), the expansion of future U.S. markets for "electric drive vehicles," including hybrid electric vehicles (HEVs), battery-powered electric vehicles (EVs) and fuel cell vehicles (FCVs), could produce economic benefits equaling "tens of billions of dollars annually."

EPRI said the goal of the study, titled "The Future Impacts of Electric Drive Vehicles," was to quantify the economic and environmental impacts of a "hypothetical transportation future for the year 2025," where half of all vehicles are either HEVs, EVs or FCVs, including both grid-dependent and grid-independent models.

During the study, which is featured in the Spring 2003 edition of Futures Research Quarterly, Winebrake calculated the "macroeconomic impacts" of EVs, including the effect on gross domestic product, balance of trade and labor markets, as well as "total fuel cycle emissions impacts."

"The aggressive electric drive vehicle scenario we model is not a prediction," said Winebrake. "But it allows us to identify the benefits of a future transportation sector that includes electricity. In the end, we think electric drive vehicles are where the vehicle industry is headed, and we wanted to get a sense of the potential impacts due to this shift."

IL City Council Approves Ban on Electric Scooters

City council members in Marseilles, IL recently voted four to one in favor of a measure that would ban the use of electric scooters, electric pedal-driven bicycles and "electric skateboards" on the city's streets, sidewalks, parks and "other public property."

City officials said the ordinance also bans individuals from operating these devices "in a manner that would endanger the health or safety of any person." "We got kids on these motorized skateboards that are eight and nine years old running up and down the streets and sidewalks," said Marseilles mayor Don Bolatto. "They're not licensed, they're not wearing helmets."

Marseilles commissioner Steve Nicholson, who opposed against the ordinance, said instead of enacting the ban, the city should have instructed police to ticket individuals operating the devices in an unsafe manner. (OTTAWA DAILY TIMES: 6/6)

EDTA Announces Technical Program for EVS-20

The Electric Drive Transportation Association (EDTA) recently announced it has posted the complete technical program for the 20th International Electric Vehicle Symposium and Exposition (EVS-20): Powering Sustainable Transportation, which will be held November 15 through 19 in Long Beach, CA, on the World Wide Web at http://www.evs20.org.

EVS-20 International Program Committee (IPC) chair Ed Riddell said the program will offer delegates a "'one-stop event' where they can custom tailor their agenda to meet their specific interests, whether those interests center on a single technology like fuel cells, a single platform like buses, or more broadly on discovering the state of all facets of the electric drive industry."

Additionally, EDTA said the official EVS-20 conference proceedings will include nearly 80 additional papers "which were of exceedingly high quality as judged by the IPC, but for which there simply wasn't enough room on the program this year."

EDTA president Kateri Callahan noted that keynote presentations at EVS-20 will be given by such officials as DaimlerChrysler fuel cell and alternative powertrain program

director Andreas Truckenbrodt, Energy Conversion Devices, Inc. chairman Bob Stempel and Los Angeles deputy mayor of environment, transportation and infrastructure Brian Williams.

Governor of Maine Signs Bill Allowing Use of NEVs on Streets

Maine governor John Baldacci has signed a new state bill introduced by state representative Boyd Marley that approves the use of low-speed neighborhood electric vehicles (NEVs) on streets with speed limits of 35 miles per hour or less.

Although the measure became effective for more than 20 coastal cities on June 1, the new law will be implemented statewide beginning September 1. Before the law, NEVs such as DaimlerChrysler subsidiary Global Electric Motorcar, LLC's (GEM) Gemcar were prohibited from operating on the state's roads, "except on islands."

While many state residents welcomed the measure, some individuals expressed concern with the limited speed and range of NEVs, as well as the vehicle's impact on traffic congestion. (PORTLAND PRESS HERALD: 6/12)

UW-Madison Wins First Place at FutureTruck Competition

A team of students from the College of Engineering of the University of Wisconsin-Madison (UW-Madison) won first place at the FutureTruck 2003, a competition challenging students from 15 top North American universities to re-engineer a mid-size 2002 Ford Motor Company Explorer sport-utility vehicle to improve fuel economy and lower emissions while maintaining safety, performance and comfort levels". The competition was held earlier this month in Dearborn, MI.

The team scored 841 points out of a possible 1,000, outdistancing the second-place team from the University of California-Davis by more than 50 points. The UW-Madison team was ranked first in the categories of "best on-road fuel efficiency; best vehicle design report; best off-road performance; best workmanship; and best technical report." The team was awarded a "first-place trophy" and a check for $6,000 for finishing first in the competition.

Phoenix Motorcars Develops Vintage-Style EVs

Ojai, CA-based Phoenix Motorcars, Inc. has entered the production phase of its limited-edition electric vehicles (EVs) that combine "vintage hot rod vehicle body styles" with Enova Systems' all-electric powertrain.

According to Phoenix Motorcars CEO Dana Muscato, while standard EVs have yet to be embraced by the driving public, the development of alternative EVs that are "both practical and luxurious" may prove a boon to the fledgling market.

The company has produced prototypes of 1930s-era vehicles, including a 1937 Ford Cabriolet model. Sacramento, CA-based taxicab company Electricab has placed an order for 80 Phoenix Motorcars EVs, the first 20 of which are expected to be ready later this year.

Muscato said the company's new EVs, which are powered by 28 12-volt nickel-zinc batteries, will likely sell for between $80,000 and $100,000, with reductions from state and federal incentives of between $15,000 and $30,000. (VENTURA COUNTY STAR: 6/23)

CA City Employs Electric Cars for Public Works

The city of Rialto, CA recently announced it has purchased six DaimlerChrysler Global Electric Motorcars (GEMs) for the city's fleet using grant funds from the South Coast Air Quality Management District (SCAQMD. According to city officials, the SCAQMD funding helped reduce the cost of the GEMs, which normally retail for about $9,000, to $3,000.

Officials said various city personnel, who use the small four-seaters to run errands throughout the city and to transport camera equipment and crew for the city's cable television station, operate the GEMs. (SAN BERNARDINO COUNTY SUN: 6/27)

RECC to Introduce New All-Electric Minibus Next Year

Karnataka, India-based Reva Electric Car Company (RECC) plans to introduce a new battery-powered, 10-seat minibus next year designed to serve information technology and business process outsourcing companies with facilities outside the city of Bangalore. RECC managing director Chetan Maini said the buses, which feature the same "basic technology" as the company's Reva electric cars, will also be used by universities to transport students on campus. Maini noted the electric buses will include "more powerful batteries and motors" than the Reva.

Separately, RECC said it has developed a microprocessor-based "engine management system" that extends battery life and provides additional power. Additionally, Maini said the system features a "vehicle diagnostic system." (FINANCIAL EXPRESS: 6/23)

New Survey Examines Public Awareness of EVs

London, England-based market research firm Martin Hamblin GfK recently released the results of a survey evaluating local consumer awareness of alternative vehicle technologies.

While 16 percent of those participating in the survey made mention of liquefied petroleum gas (LPG)-powered vehicles and eight percent of respondents cited compressed natural gas (CNG)-powered vehicles, 58 percent of those surveyed named the electric vehicle (EV) as the most recognizable alternative to traditionally powered automobiles.

Officials also noted that hydrogen power was mentioned by nine percent of the survey participants, with biodiesel cited by five percent and fuel cells by three percent. Officials said 713 adult U.K. drivers participated in Martin Hamblin's "Britbus" telephone survey.

IDTechEx Releases New EV Market Statistics Report

Cambridgeshire, England-based electronics publisher and consultancy IDTechEx, Ltd. recently announced the release of "Electric Vehicle [(EV)] Market Statistics 2003-2013," a new report that forecasts EV sales by application, region and technology.

"The [EV] business is booming, with sales of $16.2 billion set to grow eleven-fold to $177 billion in 2013," said IDTechEx. "However, it is changing rapidly and it is essential that participants understand which sectors are prospering, which are struggling and what are the hot opportunities."

According to IDTechEX, the report also provides company profiles and assesses planned launches of new products and technologies for "all types of [EV] from cars to mobile robots."

IDTechEx noted that IDTechEx chairman Peter Harrop authored the report, which sells for $1,600. Mr. Harrop has "written several transport-related management reports for the Financial Times and lectures and consults internationally on profit optimization in the [EV] industry."

Canadian Car Dealer to Begin Selling Dynasty EVs

Maxwell's Auto Service in Penticton, British Columbia, recently has begun selling electric vehicles (EVs) built by Dynasty Electric Car Corporation of Delta, British Columbia.

The vehicles, which are powered by six 12-volt, gel-filled batteries, are not meant for highway use as a built-in control keeps the top speed at 40 kilometers per hour (about 25 miles per hour). Canadian laws restrict EVs to roads with a posted speed of 60 kph (about 37 mph) or less.

"This car is the answer to every parent's dream," said Maxwell's Auto Service owner Doug Maxwell. "It can't go over 40 kph and you can't go more than 35 kilometers [(about 22 miles)] from home." (PENTICTON HERALD: 6/19)

FL College Offers EV Technology Course

The Florida Solar Energy Center (FSEC) recently announced that Brevard Community College of Cocoa, FL will offer a three-credit-hour course on "Alternative Fuels and Electric Vehicle Technologies" for a second semester.

The course, which will be taught by FSEC alternative fuel vehicle researcher Bill Young, will provide an overview of alternative fuel technology and infrastructure, covering "the description, application and characteristics of compressed natural gas, liquid petroleum gas, methanol, ethanol, electric, fuel cell and hybrid electric alternative fuels."

The course will also introduce students to the "history, legislation, regulations, safety, environmental impact, vehicle design, manufacturing, processing and storage of the major alternative fuel technologies available today and in the near future." Students who complete the course will receive a certificate or credit toward an advanced technology education degree from Brevard.

EV RENTALS - CAN THEY FLY?

By Bob Rice, NEEAA Member

Had to comment on Steve's note here. Steve has the right idea. Maybe he has to move to So Cal, where there are gunna be a helova lot of EV withdrawal symptoms when all the EV-1's are finally reeled in? Where he and his fleet would be appreciated!! Why is this man mowing lawns for a living, comes to my mind. But then nobody really makes a living in the EV thing, well, maybe Rich is doing OK in a modest sort of way. Has Victor been able to give up his day job? EV biz seems to be a part time thing for people who hafta punch in SOMEWHERE to put food on the table or pay taxes, the big thing today! With the money the Corbins put into EV's somebody like Steve or others on the List could have done EV's right. Gees! Somebody's gotta do it. But we have been talking about that on here for years.

I tried it years ago, Electro Liner of Detroit. Yup? Ya never heard of it? I know, didn't have any money or business smarts. Built a few electric push mowers, go carts, and my pride of my fleet a 65 Corvair conversion, 120-volt forktruck motor contactor controller. It worked, but didn't have much interest generated in 1971 or so, cheep gas and all that. Perhaps if I had any biz sense? Done an EVS show, the one in Atlantic City, in the early daze of EVdom.

As for the guy with the EV biz for sale. Ah Poo! Bicycle wheels I tried YEARS ago in Viet Nam, home brew bike wheel Quadeacycle rig. First set lasted a few weeks, until they collapsed from the loading. Cars and buckboards can't/don't lean in to curves, like bikes do, so the spokes tire early and get loose. I went down in gales of Vietnamese laughter, as I came back from the store and went into the curve into our compound. Back to the shop, I settled on motorcycle wheels. Same problem, but they were stronger, lasted longer. The final solution was Lambretta scooter wheels, pressed steel split rim, bolted the sprocket to the chain drive, to the GM starter motor I was using for a traction motor. Don't try this at home as they get damn HOT as TM'S.

Got carried away, again. This Biz guy has built a few cute fiberglass bodies that probably would fit on golf carts. Seems there IS a thriving biz converting Golf Carts into mini Rolls Royces, hunderbirds, Jeeps and God forbid, Hummers, using that body style on a hellova lot more Eco -friendly rig. Maybe starting small like that, with a poz cash flow with these novelty cars, to step up to a REAL car. Of course it is hideously expensive to go through the NHSTA BS to be street legal, Like Citi car didn't or couldn't.

Maybe Think has been there passed that? Can we import Thinks legally here? Go to Europe, Norway, and bring one home as hold baggage. Be tricky getting it on the plane, though<G>. But Ships still run from Europe to the US, Don't they?? They sure do from China, or Wal*Mart would be outta business. If they could slip a few Hai Bao's on board. Would rename it the "Gofur" and sell it as just, that a gofur car, to work the store and all the other enchanting places we go everyday. Like over 60 k in my Rabbit, in 4 yearz I have had it up and running. Have asked the Hai Bao folks if they would like a few dealers in CT, not much interest. Hey! Hai Bao, got your ears on?? I'm still interested, just the oft chance they copy the mail on the list// Bettya they are too busy, like India's Reva, too busy with their domestic market to bother with the US's Bullshit to import the car here??

China and India are the places to watch, for EV's sad to say for OUR Auto Biz. China is serious, more than some, at cleaning up their air. If the Govt. there says" Build an Electric Car" Somebody will, especially if they throw some cash their way?

Energy independence? Yeah, nice, could it be coming to a country near you? Us older folks remember the Manhattan project, a no holds barred plan to build nuke bombs to early end WW 2. It worked as well as industry gearing up to turn out fighter planes in 8 hours, a ship a week, in shipyards all over the coasts, enough production to fight a war on two fronts. And win it, eventually. We need that sort of thinking now, we have the minds to do it, I'm talking to them now, on the List. One List of many where the Yankee Ingenuity is lerking.

Guess we need another Pearl Harbor or 9-11 to get us going. 9-11 got ME going on the EV thing, as if we didn't make THEM wealthy, enough to do us harm.

OK I'm out of line here, end of rant. Thanks for listening to a nobody blasting everybody. Back to getting EVeybody ELSE the EV grin.
Seeya

Additional comments from Steve Clunn.

Profit? What's that? Seeing that EV grin on someone else's face, that's the profit.

Some memorable quotes:
" I got lost but the truck is still doing fine, the E-meter says 145 ah I thought you said it was empty at 100."

" 30 miles. I drove it 45 before it stopped."

" I didn't bother to plug it in as the meter didn't say 10.5 yet."

" Some stupid B**** through a beer bottle at me and broke the windshield."

On the other hand:
" Thanks for letting my use your truck while my car was in the shop. I showed it to the people at work and..."

" I've been telling everybody about your truck, when my truck engine goes I'm going to do mine."

There is something in us that when we find something good we want to share it with everybody. As time goes buy I'm getting more picky about who I lone my EV's too. I'd like to have 10 conversions running around my town. If each one brought in $300/month I'd have enough income to build one every other month. That's plan B (if they don't sell first, plan A) doing one at a time. What's your plan? Would you pay $300 a month to try one out help the cause? Maybe I should move to the [SF] Bay Area.

Steve Clunn
68 VW 120v
Mercury Lynx 120v
Ford ranger 120v
Hynida xl 72v now 120v
Mitsubishi pu's 83 and 90 120v
Porsche 924 now 240v
Porsche 959 156v
Mazda pu 120v.

Dragon Rose was a crowd favorite this year. It set a new 156V MT/D record of 12.531 seconds at 97.75 MPH.

Rookie Todd Kollin on his GRP motorcycle challenges NEDRA veteran Don Crabtree in the foreground.

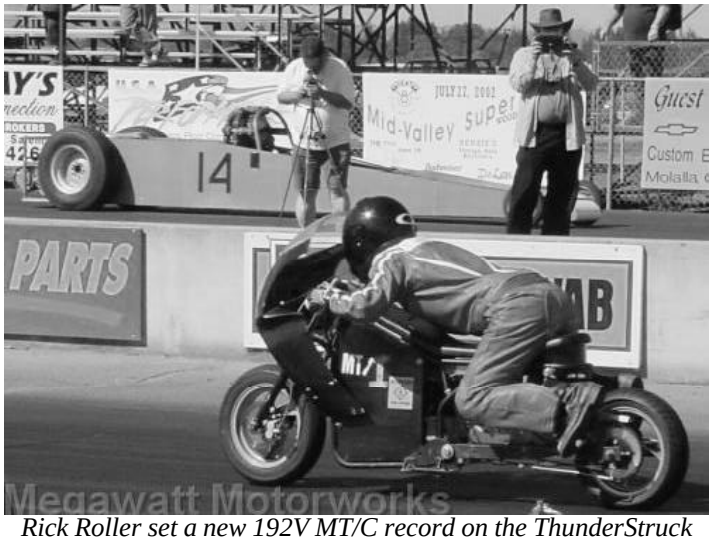
EV Parts' Lightning Rod II set a new 204V CV/B record of 16.576 seconds at 71.97 MPH. That's Roderick at the wheel.

Jim Tryon and John Wayland setup for a run.

Tom True of EV Parts goes for a record in this GEM truck.

Chris Brune of Sure Power set a new 72V SP/H record in this GEM. Finished 1/8 mile mark in 19.547 seconds at 27.68 MPH.

Photographs by Dave Stensland.



Rick Roller set a new 192V MT/C record on the ThunderStruck Motors' "ReVolt" did 1/4 mile in 13.18 seconds at 96.02 MPH.

There was something for everyone here! Where were you? EV's taking a drink at the Rudman power pole.

We thought Dean Tryon claimed the MP/E record with SayWatt. SayWatt was a solid performer and fun to watch.

ll Bruder and the Windwagon shadowed by Todd Kollin's electric motorcycle.

Rick Barnes (foreground) set a new 48V MP/I record in the 1/8 mile of 21.952 seconds at 25.75 MPH.

Steve Nash's Quick and Dirty set a new 192V DR/C record of 12.442 seconds at 101.9 MPH.

SPEEDY FLOAT DELIVERS RECORD / 2003 NEDRA POWER OF DC

(Reprinted by permission of BBC News Online)

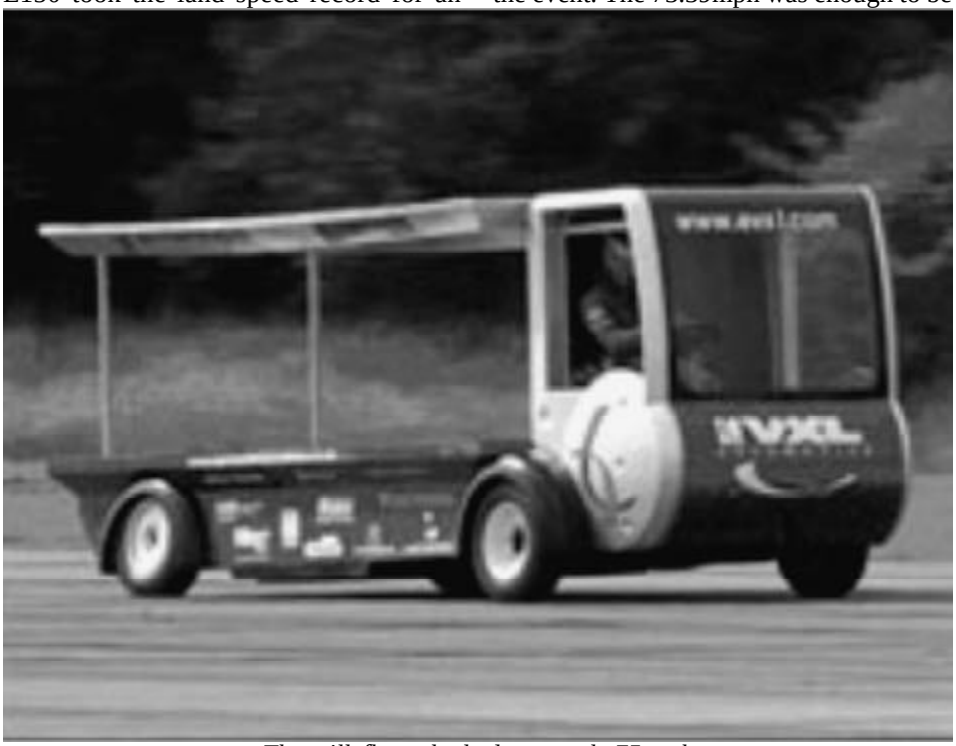
Move over Ernie - a team of engineers has delivered the title of the fastest milk float to south Wales.

The £50,000 ($78,450) float rattled up an impressive 73.39mph as it sped past the competition and into the record books.

Designed by VXL Automotive in Rogerstone, near Newport, the Electron E150 took the land speed record for an electrically powered vehicle. In a competition held in Leicester, the float soundly beat its rival - run by Midlands team Electric Dreams - which could manage only 52mph.

In comedian Benny Hill's hit song, the fastest milk cart in the west, was driven by Ernie.

His successor in the Electron E150 was Richard Rozhon, 32, a Formula Three racer from St Clears, west Wales, although he did not have to carry any milk on the back during the event. The 73.39mph was enough to be accepted by the Guinness Book of Records, but the float's makers believe it could go much faster.



The milk float clocked up nearly 75 mph

"It wasn't the speed we hoped to achieve - we hoped to achieve well in excess of 100mph, but we did well to get what we did on the day," he said. "It is nice to have brought a record back to Wales."

Team leader Martin Rees praised "a marvellous team effort" for the record and thanked everyone who had given help and support. He said he hoped to see the new-look float on the streets soon.

The Electron is the first in a line of new electric commercial vehicles that VXL Automotive will roll out in the coming year. Production orders are being delivered to Bridgend-based dairy Golden Vale, Cardiff's University Hospital of Wales and the new IKEA store in Cardiff.

Mr. Rees said the E150's batteries could be exchanged rapidly, eliminating the need to be tied to an electricity point for hours. "The success of Electron can only help to highlight the economic and environmental advantages of electric-powered commercial vehicles," said Paul Symonds, chief executive of the Symonds Hydroclean group, which runs VXL Automotive.

(Continued from page 5)

CONTRIBUTORS

Our contributors helped out with ads in our programs or provided donations for door prizes.

Bad Fish Engineering - T-shirts
Metric Mind Engineering - program ad
Vanner Incorporated - program add
Flexcar - carsharing membership
SkooterCommuter - scooters
Virginia Solar Council - program ad
Battery Warehouse - program ad
Advanced Energy and Lighting - program ad
Charlie Garlow - Auranthetic Scooter, solar car kit
Jerry Asher - t-shirts

POWER OF DC STAFF

Chip Gribben - 2003 Event Coordinator, t-shirt design, program layout and design and the website
Monica Gribben - Race Registration, t-shirt sales and timeslip recording
Wallace Rumbarger - Media Coordinator
Charlie Garlow - Advertising
Gregory Crabtree - Video
Tom Sigman - Generator and Power
Gary Sumner - Printing
Greg Pokorny - Digital photography, 2001 and 2002 Event Coordinator
Rob Neighbor - Digital photography
Bryan Murtha - Awards
Dave Davidson - Transportation
Jeff Silva - Set up, food and drinks

AND MORE . . .

Jenny and Jake Gribben - door prizes and awards presentation
Hugh Gribben - truck
Phil Pollack - car trailer
Mark Hanson - Video
Chris Cason -Video

Last but not least we'd like to thank Cathy and Elmer of the Mason-Dixon Dragway who has been very accommodating to us for the past three years.

The Electric Auto Association

Proudly Announces:

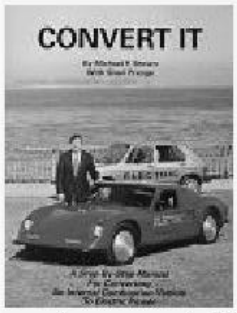
A Free
EV Conversion Workshop

Sunday September 21, 2003
10am-5pm Palo Alto, CA

(Hewlett-Packard building 20A Auditorium,
3000 Hanover St)

Presenters: Mike Brown & Shari Prange of Electro Automotive

(Authors of "Convert It!" the definitive book on EV Conversions)



Learn general information about conversions - cost, performance, environmental issues, etc. – along with the nuts and bolts. Several electric cars will be on hand for examination during breaks.

Registration: via the web at
http://www.electroauto.com/workshop.shtml

Or call 831-429-1989

The EAA is a non-profit educational organization that promotes the advancement and widespread adoption of electric vehicles; organizes public exhibits and events of electric vehicles to educate the public on the progress and benefits of electric vehicle technology. For more information about the Electric Auto Association (EAA), please visit http://www.eaaev.org.

EAA Board Candidate Statements:

Name: **Will Beckett**

Professional background: Currently self-employed, supporting PCs in the home.

Education: BS Information Systems Management, University of San Francisco

EV owner/driver: Yes Vehicles: Solectria Force, Mike Saari Betterbike, Home-made scooter, former owner of Robin's egg (S-10 Blazer)

Relevant experience:
In three years, served as co-chair of the EAA and managed the membership functions for the secretary. President of the Silicon Valley Chapter of the EAA and primary coordinator of the Silicon Valley Chapter Rally/Show.

Have been working with Jerry Asher to increase the number of chapters in areas of the USA where there are clusters of members.

I feel strongly that the focus of the EAA should be to educate the public about electric vehicles and their inclusion in the mix of vehicles to improve air quality and reduce our dependence on oil.

Other volunteer activities:
Board member of the Barron Park Association (neighborhood association) Board member of West Bay Opera, and supernumerary captain during shows. Volunteer with the Palo Alto Police Department.

Name: **Ron Freund**

Professional background: Currently employed as engineer in Silicon Valley.

Education: BSEE, MSEE hardware design Clarkson University

EV owner/driver: Yes Vehicles: 2002 Toyota RAV4_EV, Zappy

Relevant experience:
In three years as chair of EAA, I:
* fostered/created/facilitated the environment for our team to create new fund raising processes, create of printed material, and plan outreach activities,
* was instrumental in recruiting new, active board members,
* coordinated our Junior Solar Sprint grant for inner city and American Indian tribal youth,
* established framework for donations to the organization,
* Designer/builder of the AVCON to NEMA 14-50 adapter box for EAA website merchandise orders.

I have a strong desire to see the EAA thrive as an organization so I am again running for a position on the EAA board in order to continue facilitating change. We live in a fast-paced world where the role of the EAA must remain a "nimble" one.

We have achieved some of our goals and engaged in new activities. We will welcome fresh minds, embrace new ideas and approaches. With the demise of the California mandate, we return to our foundation/roots, providing help to enthusiasts to learn about driving oil-free, and educating the public.

I want to continue leading the board, while enabling others to learn about ZEV possibilities in their lives - so as to better position us for more exciting years ahead. My intent is to better our organizational "health". Our chapters are interacting with the stimulus generated by the annual Chapter's EVent and Conference, as we begin to improve the overall cohesiveness of the organization.

Thank you for voting in this election!
Ron Freund

Name: **Kim Rogers**

Professional background: A software engineer in Silicon Valley.

Education: BSCE, California Polytechnic State University, San Luis Obispo

EV owner/driver: Yes Vehicles: 2002 Toyota RAV4_EV

EAA Board position: Education Program Manager

Relevant experience:
I joined the EAA in March 2002 just before purchasing my EV (Toyota RAV4-EV). It's the only car I own and the only car in my household. My main reason for joining the EAA was to spread the word - EVs can be "real cars", meet the needs of many, and are needed for our environment. I've written letters and testified at the California Air Resources Board about the importance of EVs. I've written articles about EVs for the American Lung Association (ALA), evworld.com, and Current EVents. I've been working with the ALA to get local and county governments to commit to cleaner fleet vehicles (EVs where available). I help coordinate local EVents with the EAA, ALA, and Air Quality Management District's Spare the Air Teams.

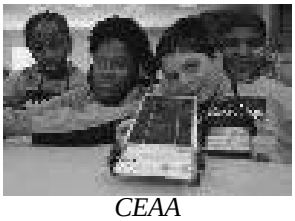
I joined the board as a delegate in Feb 2003 as the Education Program Manager, a role I defined in the Education Plan at the 2003 EAA national meeting. I became a full board member in March 2003, finishing Terry Wilson's board term. As Chair of the Public Information committee, we've made progress in developing and providing public outreach materials (http://www.eaaev.org/eaalinks.html look under "EAA Flyers"). The board obtained and doubled a donation to support the Junior Solar Sprints (JSS) - in large part due to the proposed plans for educational outreach and JSS presented at the 2003 national meeting.

I'd like to continue this work on the board. We need to continue to develop more outreach opportunities and materials; to raise the awareness of the EAA; and be a reliable source of EV information - via the web, printed materials, multi-media, EVents and seminars. We need to be an even bigger supporter of activities, like JSS; and take advantage of other opportunities to advance the cause of the EAA and EVs. This year we have a unique opportunity to piggy-back on publicity generated by the EcoTrekker to further raise the awareness of the EAA and EVs. The EAA will be listed in the credits for the EcoTrekker TV series and on their website.

(More National info. on page 28)


VEVA


PEAA


CEAA


EBEAA


LAEAA


NBEAA


SDEVA

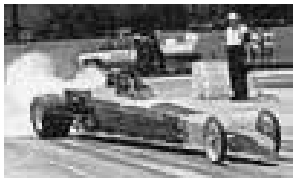

SFPEAA


SJEAA


SVEAA


VCEAA

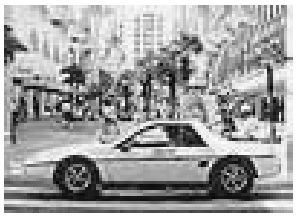

MAEAA


FVEAA


NEEAA


PVEAA


DMCEAA

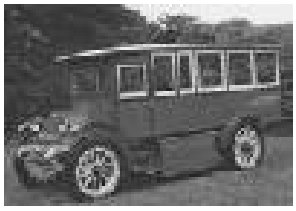

LVEAA


AEAA


EAACC


TEAA


OEVA


EEVC


AAEAA


HEAA

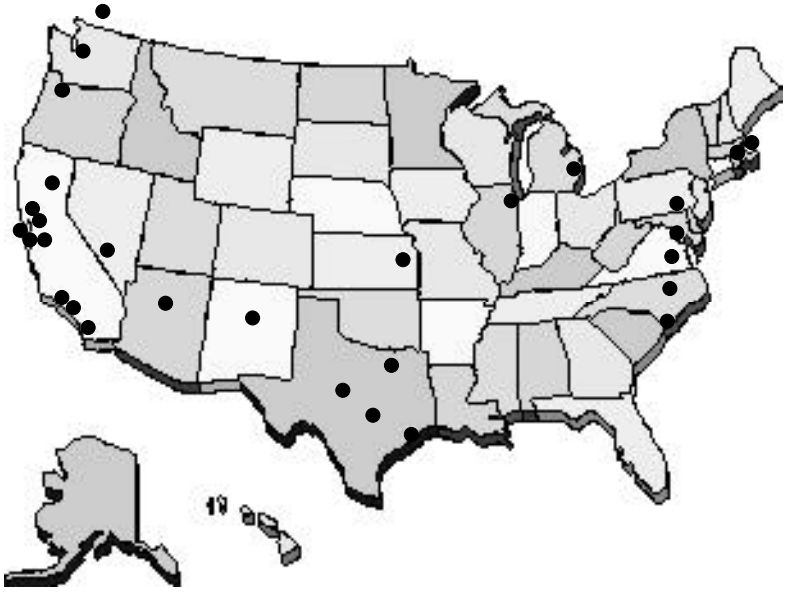

NTEAA

CVEAA


SEVA


EVA/DC

ELECTRIC AUTO ASSOCIATION CHAPTERS



Listing updated, verified and current as of 09/01/03. Please check main web page for any changes in current listing. The Electric Auto Association is a 501 (c)(3) nonprofit organization.

CANADA

VANCOUVER EVA (VEVA)
Web Site: http://www.veva.bc.ca/
Contact: Haakon MacCallum,1-604-258-9005, info@veva.bc.ca
Mailings: P.O. Box 3456, Vancouver, BC V6B3Y4, Canada
Meetings: 3rd Wed./month, 7:30 pm
Location: 3750 Kitchener St., BC Transit

UNITED STATES

ARIZONA

PHOENIX EAA (PEAA)
Web Site: http://www.phoenixeaa.com/
Contact: Sam DiMarco, 1-480-948-0719, voltek_2000@yahoo.com
Mailing: PO Box 6465, Scottsdale, AZ 85258-6465, USA
Meetings: 4th Sat./month, 9:00 am
Location: Varies, see Web Site for details.

CALIFORNIA

CHICO EAA (CEAA)
Web Site: http://geocities.com/chicoeaa/
Contact: Chuck Alldrin, 1-530-899-1835, calldrin@sunset.net
Mailing: 39 Lakewood Way, Chico, CA 95926-1555, USA
Meetings: 2th Sat./month, 10:00 am.
Location: 1350 East 9th St, Chico, CA

EAST (SF) BAY EAA (EBEAA)
Web Site: http://geocities.com/ebeaa/
Contact: Ed Thorpe, 1-510-864-0662, eaa-contact@excite.com
Mailing: 2 Smith Ct., Alameda, CA 94502-7786, USA
Meetings: 4th Sat./month, 10:00 am.
Location: 1515 Santa Clara Ave, Alameda, CA

LOS ANGELES EAA (LAEAA)
Contact: Louis Weiss, 1-323-935-2690, warbucks@attbi.com
Mailing: 1811 Hi Point St., Los Angeles, CA 90035-4621, USA
Meetings: 1st Sat./month, 10:00 am
Location: 1200 E California Blvd, Pasadena, CA

NORTH BAY EAA (NBEAA)
Web Site: http://geocities.com/nbeaa/
Contact: Dr. Nick Carter, 1-707-573-9361, nick@npcimaging.com
Mailing: 2228 Magowan Drive, Santa Rosa, CA 95405-4924, USA
Meetings: 2nd Sat./month, 10:00 am.
Location: Call for meeting details.

SAN DIEGO EVA (SDEVA)
Web Site: http://home.att.net/~NCSDCA/EVAoSD/
Contact: Chris Jones, 1-619-913-6030, NCSDCA@WorldNet.ATT.net
Mailing: 315 South Coast Highway 101, Encinitas, CA 92024-3543, USA
Meetings: 4th Tues./month, 7:00 pm
Location: 2080 Pan American Plaza, Balboa Park, San Diego

SF PENINSULA EAA (SFPEAA)
Web Site: http://geocities.com/sfpeaa/
Contact: Bill Carroll, 1-650-589-2491, billcarroll@eaaev.org
Mailing: 160 Ramona Ave., San Francisco, CA 94114-2736, USA
Meetings: 1st Sat./month, 10:00 am
Location: 601 Grand Ave, South SF, CA

SAN JOSE EAA (SJEAA)
Web Site: http://geocities.com/sjeaa/
Contact: Terry Wilson, 1-408-446-9357 dongillis@yahoo.com
Mailing: 20157 Las Ondas Way, Cupertino, CA 95014-3132, USA
Meetings: 2nd Sat./month, 10:00 am
Location: 2350 Cunningham Ave., San Jose, CA

SILICON VALLEY EAA (SVEAA)
Web Site: http://eaasv.org/
Contact: Will Beckett, 1-650-494-6922, will@becketts.ws
Mailing: 4189 Baker Ave., Palo Alto, CA 94306-3908, USA
Meetings: 3rd Sat./month, 10:00 am
Location: 3000 Hanover St., Palo Alto, CA

VENTURA COUNTY EAA (VCEAA)
Web Site: http://geocities.com/vceaa/
Contact: Bruce Trucker, 805-495-1026, tuckerb2@adelphia.net
Mailing: 283 Bethany Court, Thousand Oaks, CA 91360-2013 ,USA
Meetings: Call or email for location/meetings.

KANSAS / MISSOURI

MID AMERICA EAA (MAEAA)
Web Site: http://maeaa.org/
Contact: Mike Chancey, 1-816-822-8079, eaa@maeaa.org
Mailing: 1700 E. 80th St., Kansas City, MO 64131-2361, USA
Meetings: 2nd Sat./month, 1:30 pm
Location: See web site for details.

ILLINOIS

FOX VALLEY EAA (FVEAA)
Web Site: http://www.fveaa.org/
Contact: Bill Shafer, 1-708-771-5202, assessorbill@cs.com
Mailing: 1522 Clinton Place River Forest, IL 60302-1208, USA
Meetings: 3rd Fri./month 7:30 pm
Location: 2000 Fifth Ave., River Grove, IL

MASSACHUSETTS

NEW ENGLAND EAA (NEEAA)
Web Site: http:/neeaa.org/
Contact: Tony Ascrizzi, 1-508-799-5977, tonyascrizzi@juno.com
Mailing: 34 Paine Street, Worcester, MA 01605-3315, USA
Meetings: 2nd Sat./month, 2:00 pm
Location: Call or email for meeting location.

PIONEER VALLEY EAA (PVEAA)
Web Site: http://geocities.com/pveaa/
Contact: Karen Jones, 1-413-367-9585, pveaa@hotmail.com
Mailing: P.O. Box 153, Amherst, MA 01004-0153 USA
Meetings: 3rd Sat./month, 2:00 pm
Location: 43 Amity Street, Amhurst, MA.

MICHIGAN

DMC-EAA DETROIT MOTORCITY CHAPTER (DMCEAA)
Web Site: http://geocities.com/detroit_eaa/
Contact: Richard Sands, 1-734-281-4087, rsands01@comcast.net
Mailing: 13162 Fordline St, Southgate, MI 48195-2435, USA
Meetings: Call or email for location/meetings.

NEVADA

LAS VEGAS EVA (LVEAA)
Web Site: http://www.lveva.org/
Contact: William Kuehl, 1-702-645-2132, bill2k2000@yahoo.com
Mailing: 4504 W. Alexander Rd., N. Las Vegas, NV 89115-2489, USA
Meetings: 2nd Sat./month, 10:00 am
Location: 1401 E. Flamingo Rd, Las Vegas, NV

NEW MEXICO

ALBUQUERQUE EAA (AWAA)
Web Site: http://abqev.org/
Contact: Tom Stockebrand, 1-505-856-1412, info@abqev.org
Mailing: 1013 Tramway Ln NE, Albuquerque, NM 87122-1316, USA
Meetings: 1st Tues./month, 7:00 pm
Location: 6810 Menaul NE, Albuquerque, NM

NORTH CAROLINA

COASTAL CAROLINAS (EAACC)
Contact: Jayne Howard, 1-910-457-4383, EAAofCC@aol.com
Mailing: 4805 E. Southport Supply Rd., Hwy 211, Southport, NC 28461-8741, USA
Meetings: Varies, call for details.
Location: 4805 E. Southport Supply Rd., Hwy 211, Southport, NC

TRIANGLE EAA (TEAA)
Web Site: http://www.rtpnet.org/teaa/
Contact: Ken Dulaney, 1-919-461-1241, teaa@rtpnet.org
Mailing: 202 Whitehall Way, Cary, NC 27511-4825, USA
Meetings: 3rd Tues./month, 5:30 pm
Location: Varies, call for details.

OREGON

OREGON EVA (OEVA)
Web Site: http://www.oeva.org/
Contact: Ralph Merwin, prizmev@yahoo.com
Mailing: 2905 NE 29th Ave., Portland, OR 97212-3558, USA
Meetings: 2nd Thur./month, 7:30 pm
Location: SW Salmon & 1st St, Portland, OR

PENNSYLVANIA

EASTERN EV CLUB (EEVC)
Web Site: http://members.aol.com/easternev/
Contact: Peter Cleaveland, 1-610-828-7630, easternev@aol.com
Mailing: P.O. Box 717, Valley Forge, PA, 19482-0717, USA
Meetings: 2nd Wed./month, 7:00 pm
Location: 201 E Germantown Pk, Plymouth, PA

TEXAS

AUSTIN AREA EAA (AAEAA)
Web Site: http://www.austinev.org/
Contact: Aaron Choate, 1-512-453-2890, info@austinev.org
Mailing: PO Box 49153, Austin, TX 78765, USA
Meetings: Call or email for location/meetings.

HOUSTON EAA (HEAA)
Web Site: http://www.heaa.org/
Contact: Dale Brooks, 1-713-729-8668, brooksdale@usa.net
Mailing: 8541 Hatton St., Houston, TX 77025-3807, USA
Meetings: 3rd Thurs./month, 6:30 pm
Location: 3015 Richmond Ave., Houston, TX

NORTH TEXAS EAA (NTEAA)
Web Site: http://www.geocities.com/nteaa/
Contact: Paul Schaffer, 1-972-437-1584, pshf@hotmail.com
Mailing: 430 Ridge Crest, Richardson, TX 75080-2532, USA
Meetings: Varies, call/email for details.

VIRGINIA

CENTRAL VIRGINIA EAA (CVEAA)
Contact: Ernest Moore, 1-804-271-6411, ernie_moore@yahoo.com
Mailing: 4600 Melody Ct., Richmond, VA 23234-3602, USA
Meetings: 3rd Wed./month, Call for details.
Location: Westwood Ave., Richmond, VA.

WASHINGTON

SEATTLE EVA (SEVA)
Web Site: http://www.seattleeva.org/
Contact: Steven Lough, 1-206-524-1351, slough1@mindspring.com
Mailing: 6021 32nd Ave. NE, Seattle, WA 98115-7230, USA
Meetings: 2nd Tues./month, 7:00 pm
Location: See website, call for details.

WASHINGTON D.C.

EVA OF WASHINGTON DC (EVA/DC)
Web Site: http://www.evadc.org/
Contact: David Goldstein, 1-301-869-4954, goldie.ev1@juno.com
Mailing: 9140 Centerway Rd., Gaitherburg, MD 20879-1882, USA
Meetings: 2nd or 3rd Tues./month, 7:00 pm
Location: Building 31-C, 6th, Bethesda, MD.

Board of Directors 2003

Chairman
Ron Freund
chairman@eaaev.org

Membership Chapter Relations West
Will Beckett
membership@eaaev.org

Secretary
Scott Leavitt
secretary@eaaev.org

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Gabrielle Adelman
treasurer@eaaev.org

Chapter Relations East
Jerry Asher
ChapterRelationsEast@eaaev.org

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electionadmin@eaaev.org

Education Program Manager
Kim Rogers
education@eaaev.org

East Coast Coordinator
Karen Jones

Delegates:
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charging@eaaev.org

Charlie Garlow - *Junior Solar Sprints*
juniorsolar@eaaev.org

Bruce Parmenter - *EAA Technology*
webmaster@eaaev.org

Ed Thorpe - *CE Publications*
ceeditor@eaaev.org

Terry Wilson - *Historian, Awards*
historian@eaaev.org

EAA Board contact:
board@eaaev.org 1-510-864-0662

Notice: IRS requires us to ask for a full disclosure by the donor for donations of $1000 or more. This should include Full Name, Complete Address, Phone Number, and Social Security or Tax ID Number.

Nominations For The EAA Keith Crock and Fellow Awards

By Terry Wilson, EAA Historian

The EAA would like to receive nominations for our EAA Fellow Award and Keith Crock Awards. These awards will be presented at the 2004 Annual EAA meeting in February next year.

The Fellow Award is made to individuals for outstanding activities in areas relating to support of the EAA, advancing the cause of electric vehicles, or other activities of benefit to the EV industry.

The Keith Crock Award can be given to an individual, a group, a company, or other organization. This award is given for technical excellence and can be in the form of a vehicle, component, a drive system, supporting infrastructure, etc.

We ask that anyone wishing to make a nomination, submit in any form they chose, all pertinent information such as nominee's:
- full name
- email address
- phone number
- PO mailing address
- which award (Fellow or Keith Crock)
- a detailed description of their EV activities and accomplishments.

Please provide photos or images in jpg format if possible. Submissions will also be considered for profile in CE, and in our historical records. As part of EAA policy, personal addresses and phone numbers will not be given out, without the nominee's permission.

Please send your nomination by end of **Dec 2003** to: Terry Wilson
20157 Las Ondas Way, Cupertino,CA. 95014-3132
eaahistorian@care2.com, 408-446-9357

Recipients of past awards
Fellow Award (most resent):
'02 Stan Skokan
'02 Anna Cornell
'02 Ed Thorpe
'03 Don Gillis
'03 David Goldstein

Keith Crock (last 5):
'95 Bob Schneeveis
'96 Jim Worden
'97 Lloyd Healey
'03 Rich Rudman
'03 Joe Smalley

Lifetime Achievement:
'03 Mike Brown
'03 Shari Prage

Keith Crock was an EAA Member who passed away in 1982. Keith developed a diode based speed controller that he used and which he extensively and meticulously tested. From EAA News July 1982 (EAA News was the original name for CE), titled "We Have Lost a Champion", by Bill Williams.

For those of you not yet aware, we are grieved to announce that Keith Crock passed away from a heart attack on March 29, 1982. Keith had been a very active member of the EAA since 1975, when he performed his conversion of a Nash Metropolitan. A veteran of seven consecutive Annual EAA Rallies, his "Metro" was widely recognized as being "one of the best," having received several endurance awards as well as Most Beautiful Electric.

Besides serving one term as President and one as Educational Vice President of the Santa Clara Chapter, Keith frequently spoke out for The Electric Vehicle cause to California Legislatures, Public Utility Commission, radio and television stations. Keith was always willing to "take time off from his daily Ford Aerospace job" to display his car to the public in order to further the cause of Electric Vehicles.

NATIONAL EAA MEETING

Remember to mark your calendars for Saturday, February 2, 2004, for the Annual National meeting, held at the SVEAA meeting location - HP headquarters in Palo Alto, California.

ALL-CHAPTERS MEETING

The next All-Chapters EAA Conference will be in Vancouver, BC, Canada, along with REV!2004, on the weekend of June 5, 2004.

Sources - Used EVs-4-Sale:

EAA Main Links Page
http://www.eaaev.org/eaaevsforsale.html

Silicon Valley Chapter EAA
http://www.sveaa.org/

Innevations
http://www.innevations.com/used-evs.html

Eco-Motion Electric Cars
http://www.halcyon.com/slough/contributions.html

Phoenix Chapter EAA
http://phoenixeaa.com/

EVFinder
http://www.evfinder.com

EV Tradin' Post
http://www.austinev.org/evalbum/geobook.html

EVA/DC
http://www.evadc.org/forsale.html

Triangle EAA
http://www.rtpnet.org/~teaa/forsale.html

Check out these websites and the various EAA Chapter websites for new and used EV vehicles, production and conversions, and EV parts.

EV Charging Maps & Info:

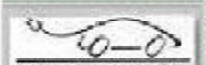
EV Charger list
Covers Arizona, California and Georgia.
Web Site: http://evchargernews.com/

Ottawa Canada Charging Locations
Web Site: http://www.econogics.com/ev/chargloc.htm

Additional Canada Charging Locations
Web Site: http://www.ve-montreal2000.com/site/en/vebornes/Cartebornes.htm

How to Install Electric Vehicle Charging
Web Site: http://www.eaaev.org/eaaevcharging.html

-- General Items --

	*License Plate Holder, black plastic frame, white lettering on visible green.*	LICPH1	$10.00	
License Plate	*Motorcycle size, only in metal & black or chrome. (Special order, need additional 6 weeks.)*	Black: LICPH2-B Chrome: LICPH2-C	$14.00	
	*Embroidered Sew-On Patch, white. (Special order, allow an additional 3 weeks.)*	PATCH1	$ 9.00	
	*Embroidered Sew-On Patch, green. (Special order, allow an additional 3 weeks.)*	PATCH2	$ 9.00	
	*Embroidered Bucket Hat, comes in: small/medium & large/xlarge.*	S/M: DCP01-SM L/XL: DCP01-LXL	$25.00	
	*Ceramic Coffee Mug.*	MUG003	$ 5.50	
	*Insulated Car Coffee Mug.*	MUG02	$ 6.50	
	*Embroidered Polo Shirt (Forest or navy S,M,L,XL,XXL), 10 weeks for all colors other than Forest.*	SHIRT01-F-S SHIRT01-F-M SHIRT01-F-L SHIRT01-F-XL SHIRT01-F-XXL Same for SHIRT01-N-...	$40.00	
	*EAA Car Window Shade.*	SS001	$ 8.00	
	*EAA Bumper Sticker #1 (10.5"x3.75").*	BS800	$ 2.00	
	*EAA Bumper Sticker #2 "The Switch is on" (15"x3.75")*	BS002	$ 2.00	

-- EV Buyers Guides --

	*"Electrifying Times Preview 2004 "Electrifying Times Preview 2000 "1997 EV Buyers Guide "1996 EV Buyers Guide "1995 EV Buyers Guide*	ET2002 ET1999 BG1997 BG1996 BG1995	$ 5.95	

-- Literature --

	*Convert-It EV conversion Book*	CONV01	$24.95	
	*KTA Electric Vehicle Kits & Component Parts Catalog*	CATAL1	$5.00	
	Window Literature Holder (light plastic)	WL002	$15.00	
Indicate Month/Year and/or Vol #, back 20 yrs.	*Back issues of CE (Current EVents) magazine*	CE001	$ 3.00	

-- Special --

	*AVCON to 14-50 adapter kit - sheet metal box, 14-50 outlet (2 hots and a ground, no neutral), for 220 VAC chargers, no 120 VAC (6weeks)*	ADAPT1	$255.00	
(fill out complete membership form on flip side of page)	***Electric Auto Association Membership ($10 rebates to local chapter.)***	***6/year of Current EVents, member voting rights***	$39.00	

Shipping: USA 10%, Canada 15%, All Others 20% of subtotal
Handling $2.00 Send check (USA dollars) to:
EAA Merchandise, 582 Herma St, San Jose, CA 95123 USA

Electric Auto Association (EAA) Membership Application Form

Copy and fill out this form, attach a check or money order or use PayPal in US funds only for $39 ($42 Canada) ($45 International) payable to '**Electric Auto Association**'. You can fold this form as indicated and mail it with your payment enclosed. Use tape to seal the form before you mail it. Or send information in this form and pay through PayPal using http://eaaev.org/membership.htm.

New Member: ❑ Renewal: ❑ Country (if non-USA):_____ Date: _____

Name: _____ *email: _____

Mailing Street Address: _____ Home phone#: _____

Mailing City, State & ZIP: _____ *Work phone #: _____

*Do you ❑ own or ❑ lease an Electric Vehicle? ❑ Production ❑ Conversion ❑ Bicycle ❑ Other:_____ ❑ No

I support the _____ EAA Chapter, or please select an EAA Chapter closest to me. ❑

(*optional) All information in this application is for the exclusive use of the EAA and not be sold or given to any other organization.

(fold back ward, this will protect your personal information, placing it on the inside)

Please Identify your primary areas of interest relating to the EAA (check as many as you wish):

❑ Hobby/Builder ❑ Professional (income) ❑ Competition (Rallies, Races, Records) ❑ Owner/Driver
❑ Environmental/Gov. Regs. ❑ Social (Rallies, Shows, Dinners) ❑ New Technology & Research
❑ Promotion & Public Awareness of EVs ❑ Student or General Interest ❑ Electrathon/Bicycle/other

The Electric Auto Association www.eaaev.org

'Providing free Electric Vehicle information to the public since 1967'

The Electric Auto Association is a non-profit, 501(c)(3) for the promotion of electric vehicles. Membership includes the informative complementary EAA publication, "**Current EVents**". Donations are tax deductible. All information and statistics in this application are for the exclusive use of the EAA and is not sold or given to any other organization or company. From your membership dues, a percentage goes to the EAA Chapter you support for public Electric Vehicle promotion EVents like rallies, shows and EV rides.

(fold the bottom half under. This will now be the front of the letter. Be sure to seal it with tape)

Return address

_____
_____
_____

membership@eaaev.org

1st Class Postage Here

Electric Auto Association
Membership Renewals
4189 Baker Ave.
Palo Alto, CA 94306-3908 USA

July 16, 2003 - Mar 15, 2004

Eco Trekker, USA
An Australian TV crew filming a cross country trek using only eco-friendly sources of energy from cow pooh to food scraps, mostly to generate electricity.
E-mail: info@ecotrekker.com
Web Site: http://www.ecotrekker.com

September 9, 2003

19th Annual Mobile Sources/Clean Air Conference, Steamboat Springs, CO, USA
Organized by the National Center for Vehicle Emissions Control and Safety
Phone: +1-970-491-7354
E-mail: kuehl@cahs.colostate.edu
Web Site: http://ncvecs.colostate.edu

September 13 - 14, 2003

GASLESS AT THE CROSSROADS, Seattle, Washington, USA
Alt.Fuel Vehicle / and Electric Vehicle show, sponsored by the Seattle EVA, will be located at Bellevue's Crossroads Shopping Mall.
Web Site: http://slough1.home.mindspring.com/seva.html

September 20, 2003

SVEAA ANNUAL ELECTRIC CAR RALLY, Palo Alto, California, USA
31th annual Premere West-coast EV rally. This year the event will be held at Palo Alto High School, at El Camino Real and Embarcadro Road.
Web Site: http://eaasv.org/

September 24 - 26, 2003

8th Grove Fuel Cells Symposium 2003, Oxford, UK
Building Fuel Cell Industries conference and exhibition
Phone: +44-1322-663-006
E-mail: pamchattin@aol.com
Web Site: http://www.grovefuelcell.com

October 3 - 4, 2003

NORTHAMPTON ELECTRIC VEHICLE RALLY, Northampton, North Carolina, USA
Eighth Annual road rally and autocross, the kickoff event for the 2003-4 EV Challenge.
Telephone: +1-252-534-1258
Email: johnsond.east@ncs.schoollink.net
Web Site: http://www.evchallenge.org

November 15 - 19, 2003

EVS-20 The International Electric Vehicle Symposium and Exposition, Long Beach, California, USA
Powering Sustainable Transportation, the theme of EVS-20, highlights the important opportunity that electric drive technologies represent for addressing societal and economic issues shared across the globe.
Phone: +1-408-741-5870
E-mail: EVS20Symposium@aol.com
Web Site: http://www.evs20.org

November 2003

RICHMOND EV RALLY, Richmond, Virginia, USA
Seventh Annual rally at Richmond Technical Center
Phone: +1-804-780-6237
Email: basketbaul@aol.com
Web Site: http://www.evchallenge.org

December 9 - 11, 2003

POWER-GEN International 2003, Las Vegas , Nevada
Sponsered by the PennWell Corporation.
Phone: +44-1992-656600
E-mail: powergen@pennwell.com
Web Site: http://www.pennwell.com

February 21, 2004

EAA National Annual Meeting, Palo Alto , California
Review of 2003, looking forward to 2004, announcement of annual awards and appointment of new Board of Directors
Web Site: http://www.eaaev.org

June 4, 2004

Power of DC, Vancouver , BC, Canada
Gathering of EAA Chapters to conference about opportunities to promote EVs.
E-mail: chapterrelationseast@eaaev.org
Web Site: http://www.eaaev.org

June 5, 2004

3rd Ever EAA All-Chapters Conference, Vancouver , BC, Canada
Gathering of EAA Chapters to conference about opportunities to promote EVs.
E-mail: chapterrelationseast@eaaev.org
Web Site: http://www.eaaev.org

Email information to <cenews@eaaev.org>.

EAA **Chapter** Event =
EV related **Event** =
EV related **Conference** =

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