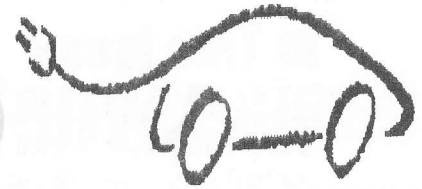


CURRENT EVENTS



June-July '00

Promoting the use of electric vehicles since 1967

Vol. 32 No. 6&7

Unanimous CARB Vote ZEV Mandate Stands

The California Air Resources Board (ARB) Friday (Sept. 8th) held fast to its mandate requiring automakers to market thousands of zero emission vehicles (ZEVs) in the state starting in 2003.

ARB Chairman Dr. Alan Lloyd said, "We have to think not just of 2003 but also of protecting the state's air quality far into the future." He said California could lose the battle against air pollution unless its motor vehicle fleet moves toward zero emissions.

The 11-member Board, after listening to testimony Thursday and Friday, unanimously decided to keep the ZEV mandate in place.

Currently, there are about 2,300 electric vehicles on the road in California as part of a demonstration fleet of ZEVs the automakers were required to produce prior to 2003. Automakers satisfied their demon-

stration fleet requirements and then stopped making ZEVs.

A number of technological innovations have resulted from the ZEV mandate. Automotive breakthroughs such as hybrid and fuel cell vehicles, and cars free of evaporative emissions are now realities as a result of efforts to meet ZEV requirements. ZEVs have won over a large number of supporters who like the quiet ride and efficient operation of zero emission vehicles.

In addition to eliminating tailpipe and evaporative emissions, ZEVs also reduce greenhouse gases and toxic emissions. Dependence on petroleum products and the emissions associated with drilling, refining and transporting those fuels are also reduced with ZEV technology.

The ZEV mandate is an important air pollution control tool since more than half of the state's smog-forming pollutants come

from motor vehicles. California is required by the federal government to reduce air pollutants or face federal sanctions. The ARB received about 75,000 letters in support of maintaining the ZEV mandate.

While automakers claim there is little demand for ZEVs, the ARB hearing drew testimony from many consumers who said they were turned away when they went to auto dealerships and tried to get ZEVs.

While upholding the ZEV mandate, the Board expressed concern at several issues:

- ◆ Current lack of ZEV availability.
- ◆ Market demand.
- ◆ Cost and incentives.

Continued on page 12

In This Issue

- 1** Of course the big news is the unanimous CARB vote. It is truly a turning point in the EV movement. Without it we go backward, with it we move into the future. Our lead story covers the outcome of this event.
- 3** Now days the press seems to cover only new factory EV's. With all this coverage many people are asking why do we need conversions? This month Clare Bell answers this very question with her article "The Real Reason We Need Conversions."
- 4** Mike Brown is truly one of the pioneers of our EV movement. He has designed and produces one of the finest kits on the market today. CE is happy to announce that Mike is now going to write a regular column called Conversion Workshop. We know that EAA members are going to be looking forward to Mike's nuts and bolts approach to looking at EV's.
- 6** Let Will Beckett help you relive the big HOV EVent that started out in Palo Alto. In the end all who came had a great time.
- 8** It seems we really never have enough inside EAA news. For people trying to build a chapter there are very few places to find information. This month Bruce Parmenter tries to fix this with his article titled "A Chapters Guild to Treasures, Events, and How to Do It".
- 10** The big dream many of use have is to buy a new EV. After 27 years with his old MG that is just what Bob Wing did. He gives us a very good overview of his new Ford truck in his article "My New Electric Vehicle".
- 12** Bill Dean gives us inside coverage of what each ARB board member spoke about during the September 8th meeting.
- 16** Terry Wilson, EAA Historian, brings us his Famous EV's

DID THE DOG EAT YOUR EV PREVIEW 2000?

Or did your gasoline car leave oily tire tracks on the cover?

Well, never fear! EAA in its wisdom bought EXTRA copies (for those unfortunates who harbor magazine-eating puppies or vengeful petromobiles). So just order up another for your friendly EAA store and it'll be right in your mailbox. Just be sure that the above-mentioned malevolent entities don't get to it first.

For those unfortunates who aren't members and did not receive this excellent survey of EVs and HEVs available by the year 2000, JOIN EAA NOW! and order a copy via the EAA store order form, conveniently located on p. 23.

COPYRIGHT 1999 c Current EVents is a publication of the Electric Auto Association. All rights reserved. While Current EVents and the Electric Auto Association strive for clarity and accuracy, we assume no responsibility for usage of this information. Permission to copy for other than commercial use is given, provided that full credit is given to originator of material copied. This permission does not extend to reprinted articles.

Editor N' Chief/Publisher /Graphic Design

Kurt Bohan
2701 Monarch Street, Suite 142, Hangar 20
Alameda, California 94501
Tele: (510) 814-1864
Fax: (510) 864-9293
E-mail: eanews@aol.com

News In Brief

Ruth Shipley

CE Reporters/Contributors

Kurt Bohan, Michael Brown, Clare Bell,
Will Beckett, Bruce Parmenter, Bob Wing,
Bill Dean, Terry Wilson

Photo credits:

Kurt Bohan, Michael Brown, Terry Wilson

Calendar of Events

Anna Cornell

Advertising Manager

Roy Kaylor
1918 Menalto Ave.
Menlo Park, CA 94025
Tele: (831) 338-2200 Fax: (510) 864-9293
E-mail: Kaylor@access1.net

Article Submissions

The deadline for articles is the 1st of every even numbered month for the next issue of CE. Articles received after this date will be retained for future issues of CE. Contact the editor for more information.

Advertisements

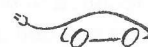
A full advertisers information package and Rate Sheet can be sent by U.S. Mail, Fax or E-mail. Please contact advertising manager or CE staff for details.

National EAA

www.eaaev.org
Tony Cygan tonyc@144volts.com

Membership/Address Changes

Electric Auto Association
P.O. Box 6661, Concord, CA 94524



The REAL Reason We Need Conversions

By Clare Bell

Yes, we have commercial EVs now and we welcome them - the EV1, the EV Plus, the Ford Ranger, the Prius and others. However their presence in the marketplace is still tentative and highly controlled. The companies who made and marketed them could easily pull them back. Automotive pundits are already branding the EV1 a flop and GM doesn't seem to be doing much to rebut those claims. They could recall all the cars, scrap them and call the experiment a failure.

Granted, that is not likely. The EV cat is pretty much out of the bag and it would take some major effort to stuff her back in. However for one who sat through the California Air Resources Board hearings on zero emission vehicles only a few years ago and listened to the automakers repeatedly say, "we can't, we don't wanna and we ain't gonna", it isn't easy to trust the apparent change of heart. Especially since it is no longer backed up (at least in CA) by strong ZEV legislation. The 1998 mandate was swept away and the 2003 one looks like it is going to topple.

"Why, since we are so willing to build EVs, you don't need the ZEV laws any more do you?" say the auto companies in beguiling tones. I would like to believe that I can trust in corporate goodwill, but that quantity is notorious for being switched on and off as the bottom line dictates.

Let's face it, without the ZEV laws, we are dependent on the enthusiasm and willingness of the big guys. OK, I'm glad they seem to have come around, but the situation still makes me a little nervous.

As our OPEC buddies often say, trust your fellows, but tie up your camel.

EV drivers and advocates have only recently come in from the cold (of being viewed as somewhere beyond the lunatic fringe). But we are still far from the main-

stream as far as the much of the corporate world is concerned (yes, there are some exceptions). Let's not kid ourselves - we are still fundamentally outsiders with ideas and attitudes that have been threatening in the past and could be again. They are being nice to us now, and providing us with shiny new toys, but they could change their minds, take away our EV1s, EV Pluses, dismantle

trolled by individuals and cannot easily be co-opted or taken away. They are examples, gadflies, challenges to business as usual, rolling statements that there can and should be a better way to treat the earth and ourselves. They take us beyond words to actions. They funnel our energy, talents, beliefs, creativity and outrage into something physical that is good for the world.



Clare Bell shown working on number 13

our infrastructure and shove us right back out into the snowstorm.

THAT is why we need conversions.

As long as we drive and build our brushed DC cars, the idea will be kept alive. EVs will be in the hands of those who really believe in them, not because they happen to be the hottest fad at them moment. We need conversions because they are most fundamentally vehicles for social change.

Conversions are built by individuals in a decentralized environment, they are con-

Building and driving an EV is a political action - it is an act of public witness, akin in some ways to civil disobedience.

Until the commercial EVs are firmly established in the market, namely sold in mass-market quantities at mass-market prices (with mass-market financing!), EAA members and dedicated EV-ers must continue building conversions.

CB, In Norway

Letters to the Editor - Continued on page 13

CONVERSION WORKSHOP: WHY CONVERT?

By Michael Brown

This is the first in a series of articles on converting gasoline or diesel powered cars or trucks to electric power. I think I should begin by telling you a little about myself, so you'll understand where my information and ideas about EV conversions come from.

My background is in the automotive repair industry, having spent thirty years as a VW dealership mechanic and as the owner-operator of my own repair shop. In 1979, along with Roger DeNault, I founded Electro Automotive.

Electro Automotive was established to be a converter for the local market and a mail order supplier of conversion parts for the national market. In 1989, my wife Shari Prange and I wrote the first edition of *Convert It*, our step-by-step conversion manual, which was revised in 1990 and again in 1993.

In 1991, with the help of Steve Pombo and Paul McCain, Electro Automotive developed and put into production the Voltsrabbit Kit, a complete bolt-in custom kit for the VW Rabbit. In 1996, with the help of Clare Bell and Paul McCain, we developed the VoltsPorsche custom bolt-in kit for the 914 Porsche.

This is the pool of scraped-knuckle experience I am drawing from. Over the years and cars, I have learned a few things about converting cars to electric power and I'd like to share them with you.

The title of this first installment of the Conversion Workshop series is "Why Convert?" In order to answer this question, let's look at the reasons an electric car makes good sense. Then, in later installments, we'll talk about the hands-on how-to issues.

Save The Environment

The biggest reason an electric car makes sense is environmental. In California, an electric car is 85-97% cleaner than the gas car sitting along side it at the stoplight. This statement is based on the amount of pollution produced by the power plant that produces the electricity the EV runs on. Even in areas that get their power from dirtier power plants, an EV is 27% cleaner than a gas car.



Mike Brown's legendary Volts Rabbit Kit.

Since the power companies are required by law to be continuously upgrading their plants to meet tighter emission standards, the longer an EV is driven, the cleaner it gets. In contrast, as a gas car ages its mechanical condition deteriorates and its emissions go up. Also, most gas cars are driven 25 miles or less in a day in stop and go traffic. This means they are not fully warmed up, and spend much of their time idling, which is when their emissions are the highest. In contrast the EV sitting at the stoplight is not producing any emissions at all.

Air pollution is not the only form of pollution that an EV reduces. The dark stains on the parking lot and the black stripe down the center of the road are from the oil, coolant, fuel, and other fluids leaked from cars. When it rains these fluids are washed into the storm drains and from there into the nearest river, lake, ocean, or into the ground and then into the water supply.

When a gas car is serviced, the old oil and oil filters are considered hazardous waste. If the coolant is changed, it is either recycled or treated as a hazardous waste. The used tune-up parts and air filter are not recyclable so they end up in a landfill. Since an EV doesn't use any of these items it helps save the environment in yet another way. In fact the only things that are periodically replaced on an EV are the batteries, and then only after three or four years use. Even then, there is very little non-recyclable waste involved, as the batteries are 99% recyclable.

EVs help reduce the waste stream in even more subtle ways. When a gas car is sent to a wrecking yard and stripped of its usable parts for resale and all the recyclable materials are reclaimed, 30% of the car, the glass, rubber, upholstery, and most of the plastic, ends up in the landfill. In addition, when the new cars that replace the scrapped ones are manufactured, several tons of waste are generated in the manufacturing process. Doesn't it make more sense to recycle a whole car that is in good shape except for a tired or dead engine?

Save Energy

There are several energy saving reasons that make converting a gas car to electric power a practical idea. The efficiency of an electric drive system is the first. Let's follow the energy trail from when the energy source is removed from the ground, coal mined, oil pumped etc. to when the wheels turn and the car moves down the road. If the car is gas powered, 11% of the energy that came from the ground remains to turn the wheels. If the car is an EV, 17% is left to propel the car. These figures take into account all the energy used to produce the fuel and transport it to the car, whether by gas tanker truck or electric power lines.

This energy saving is true of all EVs, either factory built or conversions. Recycling a used gas car by converting it to electric power brings its own unique energy savings. Take all the various types of energy used in the manufacturing of a new 2500-pound car, convert them to a common form of measurement (the British Thermal Unit, or BTU), and total them. This is about 120.7 million BTUs. Next use the number of BTUs in a gallon of gas (125,000) to calculate the number of gallons of gas (965) the total manufacturing energy represents. Now divide the 965 gallons of gas by the 506 gallons a year the average driver uses. You find that the 2500-pound car can be driven for almost two (1.91) years on the energy that it took to build it. This is a very real reason to recycle a gas car by converting it to electric power.

Another small but satisfying energy savings comes when the EV is sitting stopped in traffic. The only energy it is using is the amount it takes to play the radio, if you have it turned on.

Save Money

Converting a gas car to electric power makes sense economically in many ways. First, if you already own the donor car, you don't have to pay for 70% of your "new" EV. Even if you have to buy a car or truck to convert, buying a good chassis with a dead engine will be much cheaper than

buying a comparable reliable running gas car.

Once you have converted the car, the real savings begin. Gone are the periodic oil changes and the expensive tune-ups and maintenance services. The inevitable muffler replacement has vanished along with the rest of the exhaust system. Cooling system failures, which usually occur in the worst place at the most inappropriate time, are a thing of the past. The expensive carburetor replacement, or the fuel injection problem that has the technician scratching his head and saying things like "I've never seen a problem like this before", cease to exist when the fuel became electricity.

Since you are the person who did the conversion, and you did your documentation as you did the conversion, you are the person best qualified to repair and service your EV. The simplicity of an EV drive system and the reliability of the components limit your service tasks to checking the batteries for water level and cleanliness, and keeping the tires at the right pressure.

The only other parts of the car that require attention are the brakes, wheel bearings, drive axles, suspension parts like ball joints, and steering parts like tie rod ends. These parts and their maintenance and repair could be left to a professional mechanic if you desire. The only service is wheel alignment, which is best left to a professional because of the need for very specialized and expensive equipment. Correct wheel alignment is a factor in the car's rolling resistance, which influences range.

Bonus Benefits

The money savings we talked about above are pretty tangible benefits. It's great to know you will never again hand over a \$20 bill at a gas station and get a few coins in return, or shell out the cost of a week's groceries for a simple maintenance. By contrast, most EV owners can't even detect an increase in the electric bill from charging the car.

But other benefits are more subtle, though just as real.

An EV saves you time. You don't have to take time to find a gas station and fill the

gas car's tank. Or make an appointment to take the car in for service, which also involves arranging to be picked up at the repair shop and be taken back at the end of the day.

An EV also lowers stress produced by wondering whether your faithful daily driver and grocery getter will pass its smog test. EVs are exempt from testing.

Why Not Buy New?

We have shown that EVs help the environment, aid in energy conservation, and have economic advantages. The question still remains: "Why convert? Why not just buy an EV from a major manufacturer? They all have them, I've seen them in all the magazines."

With the exception of the Ford Ranger pickup that is for sale to private citizens, all the other manufacturer EVs are only for lease. General Motors EV1 is the only one of the remaining factory EVs available for lease to the general public at a rate of from \$350 to \$500 per month depending on battery type. Honda leased their EV+ to private citizens but quit after leasing 300 of them. The other manufacturers only lease their EVs to fleets.

This indicates reluctance on the part of the world's major automakers to put EVs into the hands of the general public. In fact John Wallace, the executive director of Ford's Th!nk Group which oversees electric and alternative vehicles, said "God doesn't want us to have full-function electric vehicles. The laws of nature don't allow this."

If this kind of attitude is prevalent in the rest of the auto industry, the answer to the question "Why convert?" is easy.

Why convert? Because it is the only way an average person can get his hands on an affordable EV.

I know that in a magazine like *Current Events*, an article like this is kind of preaching to the converted (no pun intended), but perhaps I've given you some facts that will help you spread the word. For those of you who are thinking about converting a car and want some nitty gritty, I promise I'll get into the good stuff next issue.

HOV Event a big success

By Will Beckett

I arrived at 3000 Hanover at 6am to an empty parking lot and setup a sign on Hanover to let people know where to turn in for the staging area. Palo Alto, Hewlett-Packard World Headquarters was to be the starting point for a caravan of clean powered vehicles which would travel down Highway 101 to Trimble Rd/Montague Expressway to Propel Inc., the site of a media event to kick off the start of AB71 which allow clean vehicle to use HOV lane regardless of the number of passengers in the vehicle.

After plugging in my S-10 Blazer US Electricar (Robin's Egg), I walked up to my office to try and get some work done. I was able to get through most of my e-mail when I received a call from our lobby. It was David Coale (Bay Area Action, MG Midget), saying that a Channel 11 reporter was here and wanted to do an interview. I ran right out of the office and found the van with the downlink tower fully extended. I met Jonas Tichenor, reporter for Channel 11 News, KNTV (KBWB-20) and he let me know they would be doing some live spots in just a few minutes. "Live from Palo Alto at Hewlett-Packard's word headquarters...."

I had only had one cup of coffee but felt I was ready to go. Jonas was seemingly talking to himself but I realized he had an the earpiece in and was talking to the producer of the show. Suddenly he began to talk about AB71 and my Blazer. "So Mr. Beckett, what do you think this bill will mean to you...."

As usual, I have no idea what I said but others that saw the show say it came off well. Soon Susan Frank of the Kirsch Foundation arrived as did many of the vehicles. Scott Leavitt with his VW Bus, Lee Hemstreet's VW Bug, Ron Freund's Es-

cort, many EV-1s, Honda EV-Plus, a RAV-4EV and a PG&E CNG vehicle. Susan Frank started going through the details of the Event at around 7:45am and we began to line up the cars. There were at least 20 vehicles.

After an interview with Steven Kirsch (the lead car in the program) we were off (only about 10 minutes late). The CHP blocked off one lane of Page Mill allowing us to stay together as we turned on to Page Mill Rd. and headed for 101. Entering the freeway we all jumped right into the diamond lane for quick meter access, though the lights had not yet come on. It was very congested at this point but after about 5 minutes we moved into the slow lane and then quickly over to the HOV lane to begin our trip South to San Jose. The first few miles were slow going since there were suddenly a lot of cars in the HOV lane. Still we were moving much faster than the cars in the other lanes. I am sure all of them were thinking, "why are all those SOV (single occupant vehicles) in the HOV lane"?

We continued along the freeway at between 50 and 65 MPH and listen to Steven Kirsch talk to a radio host using his cell phone while he lead the caravan down 101. The reporter didn't believe he was really in his car because he could hear no noise typical with what it would be like if he were in a gas power car on a cell phone. Just to prove he was the reporter asked Steve to honk his horn. After he did this, everyone in the booth with the reporter cheered. We continued down 101 to the Trimble Rd. turn off and after crossing over 101, Steve pulled over to the side of the road so everyone in the group to gather together. This only took a few minutes and we were off again. Trimble turned to Montague Expressway and right after this was our turn on O'Toole then Rincon Circle and into the Propel Inc. parking lot. All of the vehicles lined up next to each other. We had arrived!

The entrance to Propel Inc. was all set up with chairs and microphones and coffee cake from Hobbies. Everyone had a chance at this point to meet all new people as well as old friends that we always see at Events. Soon Susan got behind the mic and began with the introductions and the speakers were as follows:

◆ Assembly Member Jim Cunneen, speaking about making the bill

◆ Steve Kirsch, EV1 Owner, CEO, Philanthropist, included a message about the only electric you can buy, Solectria Force. Something he had just learned.

◆ Rick Ostrov, Director of Electric Vehicle Marketing, General Motors (presentation of award), the usual GM stuff and gave out awards to Steve and Jim

◆ Bill Schweitzer, Palo Alto Yellow Cab, spoke about the CNG cabs and how this bill got his drivers to begin signing up for CNG vehicles since they could use HOV lane to get to their fares more quickly.

◆ Roland Hwang, Union of Concerned Scientists, sending the message about how important these programs are to begin the process of cleaning up our air.

All the speakers stayed on time and the program was done by 10am. After this it was time for picture taking in the parking lot as well as a few test drives. San Jose Mercury News and Channel 11 News were the primary media to cover the Event. I noticed the 5pm News on Channel 11 had one segment with pictures of the cars and the usual plug-shots. All in all it was a great success and I feel it got the message out to those watching that here is just another reason to drive clean!

Will Beckett

will_beckett@hp.com

https://ecardfile.com/id/will_beckett

ELECTRIC VEHICLE COMPONENTS

Wilde EVolutions wants to be your source for Electric Vehicle components. We stock hundreds of items and most orders are filled and on their way within 24 hours.

Our photo-packed catalog is a comprehensive resource for all the items you need to build and maintain your Electric Vehicle. You may order your personal copy by mail, fax or our toll-free phone number. For \$5.00 you get both the best EV parts reference available and a \$10.00 "Wilde Cheque" good toward your first order.

Experience gained through years of building, racing and driving EVs daily allows our parts team to provide you with service unmatched in the EV industry. Our only business is helping you meet your EV goals. Please call and tell us how we can be of assistance.

And be sure to visit us on the World Wide Web.



Phone
800 Fast EVs
800 327-8387
360 385-5770
520 634-8445



Mail
Wilde EVolutions, Inc.
P.O. Box W
Jerome, AZ 86331



24 Hour Fax
360 385-9295
520 639-0857



Internet
carguys@Wilde-EVolutions.com
<http://www.Wilde-EVolutions.com>



Wilde EVolutions, Inc.

EVA WORKS FOR YOU

- ▼ **Reliable EV components**
- ▼ **Custom designed EV packages**
- ▼ **Personalized customer service**
- ▼ **Expert EV services**
- ▼ **Competitive pricing**

For EV components and service, CONTACT

Electric Vehicles of America, Inc.

P.O. Box 2037 11 Eagle Trace Wolfboro, NH 03894
Tele: (603) 569-2100 Email: EVAmerica@aol.com

EVA - "Customer Service is No. 1" ©

Our Customers Say It All

Bangor-Hydro Electric
Commonwealth Energy
Co.
Cleveland Electric Co.
Tennessee Valley
Authority
Marblehead Light
U.S. Air Force
Briggs & Stratton
John Deere Company
Clearwater Electric Boats
Long Island Railroad
No. Carolina
Dept of Transportation
Hewlett Packard
Bolton High School

A Chapters Guide to

Treasures, Events, and How To Do It

By

Bruce {EVangel} Parmenter

There are EAA Chapter's that have an EV that belongs to the Chapter. EV insurance and registration are the responsibility of the owner. It is a wise Chapter that knows whether they can afford those costs. Some Chapters can.

There are some creative ways that EAA Chapters keep their treasures viable. Some chapters have a large enough membership to use their portion of the membership dues. Others have 'garage sales' (their members arrange for a place and time, go out and ask for donated items to sold, and promote the sale. What is left over, is donated to another nonprofit organization (GoodWill, Salvation Army, etc.) to not have to deal with storage.

Some Chapters link with others, using their specialty. Example, the SF Peninsula Chapter is quite good at maintaining a food booth at their, and other major local EAA EVentS. They keep the price competitive, yet they do have a small income to come away with for their efforts. This not only helps them, but helps the Chapters they are supporting (that Chapter does not have to do it, and can focus on their EVent).

To cover the costs of major EVentS / Rallies, some Chapters cover their EVent and award costs with an entrance fee. Silicon Valley uses a lower fee to attend and display, and a high fee if you also plan to run in the rally for a prize /award (seems fair). A postmortem of their EVent shows a majority of the costs of the EVent covered by the fees, with the difference covered by the Chapters treasury. Of course it behooves them to run their EVentS like a business, but keeping in mind it is to break even (non-profit), with costs covered.

A chapter new to having an EVent should plan at least one yearly EVent. Start out small and work up from your successes to a point that is manageable. The public

will return each year with their family and friends, to your yearly successful EVent. An EVent includes more than just an EV to see. There should be plenty of Chapter fliers to offer (two sided B&W ran off from a copier - having basic EV info, your Chapter info, and some EV images of what is available: commercial, conversions, used).

Much of the effort of having an EVent is from all the combined efforts of the Chapter's active members. Usually, a few month's before the EVent, the members will discuss the idea at a Chapter meeting. There the location, size, activities, and member responsibilities (tasks must be distributed for success) are decided. A flip chart or easel board helps to brain-storm ideas, then on a second pass it's formed what can be accomplished, and near the end, a list of the duties are labeled with which member has responsibility.

Members with responsibilities, should have a method of contact. That can be either email and/ or telephone numbers. This will help make the communication faster as the EVent date nears. In the case of the SFPEAA, they use a telephone tree (one person takes the task to phone all the others with what item needs to be known). The SVEAA uses a mix of Telephone and email (some members don't have email). The SJEEA uses email which is checked and responded to daily. Whatever method works to keep the communication going, so all are on the same page.

Liability

Being an EAA Chapter let's you use the coverage from the National EAA organization. Of Course, all precautions should be taken to limit our nonprofit organization's exposure to such risks. But several Chapters do put on EVentS for the public.

Please see the new layout for the eaaev.org site. Not only will you see more visibility for EAA Chapters, but click on the

EAA rally (lower left). The Silicon Valley Chapter regularly has an excellent EVent at Stanford University. Sacramento, Phoenix, East SF Bay, North SF Bay, and other EAA Chapters also have at least one public EVent each year. Each of those Chapter's members work together to make a successful EVent, and minimize any risks.

The San Jose Chapter attends several little EVentS throughout the year (company Earthday, Transportation, Health fairs) as well as in support of all the other local chapters (they contribute EVs, time, and/or people). They are careful to arrange their EVs for maximum visibility, yet minimize any hazards (public tripping on cords, unwatched kids that could get in trouble, etc., any EV test rides are on a short safe loop with a member to watch and control traffic for incoming and outgoing EVs).

There is an EAA Chapter Handbook. Does your Chapter have one?

Much of this knowledge is known by the EAA chapters that do the most EVentS. That is why as an EAA Board member, I am working hard to interconnect all the Chapters, so that a continuous dialogue may happen.

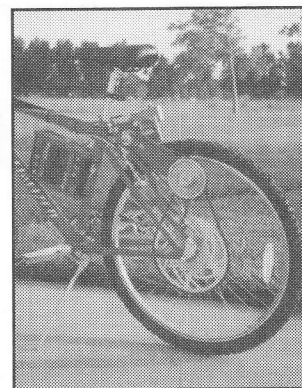
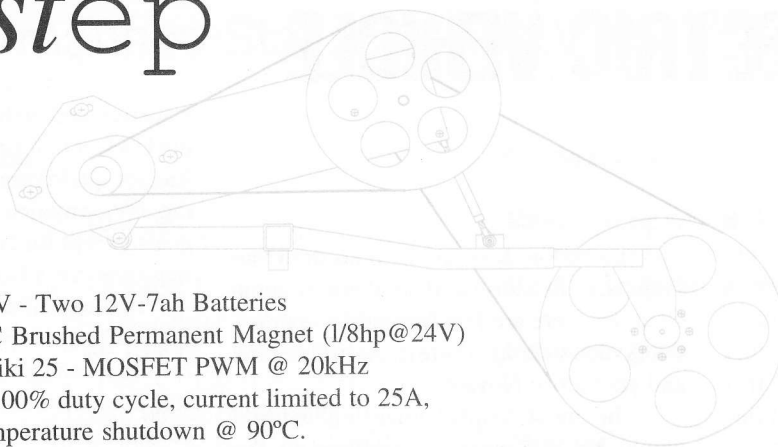
All EAA Chapters have a common goal, to bring public awareness to EVs and their use as viable transportation. One of the key reasons I took on being an EAA Board member was to accomplish this and have the EAA Board show their support of all the Chapters.

If you wish to continue your exploration of 'how to do it', I would also contact the EAA Chapter's which have had EVentS. Find out how many EVentS they have each year, how they do it, and ask them any other particular question you have. To contact the EAA Chapters, see the EAA Chapter listing in Current EVentS.

Bruce {EVangel} Parmenter
<brucedp@iname.com>

..a journey of a thousand miles begins with the...

First^{electric propulsion}step



Designed and Built in U.S.A.

- Voltage: 24V - Two 12V-7ah Batteries
- Motor: DC Brushed Permanent Magnet (1/8hp@24V)
- Electricals: Keiki 25 - MOSFET PWM @ 20kHz
0-100% duty cycle, current limited to 25A,
temperature shutdown @ 90°C.
(60V Absolute Maximum Input Voltage)
- Mechanical: Two-stage - Belt/Pulley system ratio: 4:1 & Chain/Sprocket system ratio: 5:1
Freewheeling clutch system lets the bicycle coast when the motor is off.
- Misc: Charger included.
- Price: \$599.00 + shipping (8.25% tax for CA residents)



2530 Berryessa Road #453
San Jose, CA 95132

Phone: 408-929-2777
Fax: 408-929-3777

E-mail: kwanms@aol.com
Website: www.kwanms.com

- Easy bolt-on system to standard mountain bikes with 26" rims or hybrid bikes with 700c rims (~27" diameter rims).
- Kit is a "direct-drive" system and not a friction drive.

For folks interested in baking from scratch, here is a list of circuits of my '95 homebuilt Electro-Metro with associated experiments, published previously in the DEVC. The schematics are \$2 per page, and the software (3.5" floppy) for projects using a microprocessor is \$10. For those who want a pre-programmed microprocessor chip, they are \$25.

Order from:

Solectrol
184 Vista Lane
Fincastle, VA 24090
540-473-1248

For Sale - Circuits Published in DEVC

- ◆ DC-DC Converter, 300 W buck converter, non-isolated-used in Commuta-Car.....(3 pgs)
- ◆ PPM variable frequency motor speed control used in Commuta-Car, tractor.....(4 pgs)
- ◆ Individual Battery Charger, used on Electro-Metro to keep batts at + or -0.1(5 pgs + micropr)
- ◆ Commuta Car Speed Control 2, 60V controller for tractor, NEV, or golf.....(5 pgs + micropr)
- ◆ LiteBar, LED lightbar for brake lights, etc, using HP ultra-brights.....(1 pg)
- ◆ Solar Heating System_Controller, controls Grundfos circulating panel.....(3pgs. + micropr)
- ◆ Metro Charger and dashboard display, batt gauge, tach, temp, amps etc....(6pgs + micropr)
(uses PFC Ferro-Resonant transformer, or individual secondary transformer)
(36% more power to batts with PFC <PF of .91> Ferro, 12A vs 7.5A <PF .64>)
- ◆ Metrol, 800A 120V motor speed control.....(2pgs + micropr)
- ◆ 1800W Switching charger with PFC, if into pain, lotsa parts.....(5pgs + micropr)
- ◆ 300W Individual Supply (one per battery) charger with PFC, if into pain.....(4pgs)
- ◆ Instructions for converting a microwave oven transformer to a battery charger.....(1pg)
- ◆ Log Annunciator, controls fan & plays "Put Another Log on the Fire".....(2pgs + micropr)
- ◆ Golf-Tractor speed control & charger 48V, 400A.....(3pgs + micropr)
- ◆ Battery Scanner, my favorite, displays all batteries & indicates bad batt.....(3pgs + micropr)
- ◆ Surround Sound Demystified, shows simple hook-up for surround sound.....(1 pg)
- ◆ 200 W Class-D amp 95% efficient audio amp for batt applications.....(2pgs)

MY NEW ELECTRIC VEHICLE

By Bob Wing

I have missed having an EV. I sold my electric '59 MGA Roadster just over a year ago after daily use for 27 years. In my search for a replacement EV, I found one with a sticker on the windshield that read "Manufacturers Suggested Retail Price \$49,105, with no extra charge for electric motor and nickel metal hydride battery pack, \$5k Air Quality Management District discount, destination and delivery total \$44,810." But then it continued with "incentive discount \$30,000, with a total MSRP \$14,810." I don't ever expect to see a discount like that again. Ford no longer sells the Ranger EV but instead was leasing these Rangers last year for \$399/month. On Christmas day I saw on the internet EV discussion list that the Senator Ford Dealership in Sacramento, California, was leasing for 3 years the Ranger EV pickups for \$199/month with the NiMH batteries provided free. Two hundred Ranger EVs were available in California but most went to non-profits and government agencies. After these 200 EVs are gone, the lease price will be increased. There is no remainder value to me after the 3 years but I appreciate that I will have only routine maintenance to do.

My Ranger EV was delivered to me by flat bed truck on Feb 16, 2000. My nearest dealer, Hansel Ford in Santa Rosa, has two mechanics trained in EVs, one who will come to the rescue if the electromotive system fails. If the Ranger cannot be repaired on site they will have an EV or gas car for me to use temporarily.

Charging can be a problem for me when I go over the hill to US Hwy 101, My useful range is about 60 miles, just about the distance of my round trip with no side stops. There are over 250 free public charging stations in Sacramento County, thanks to the Sacramento Municipal Utility District. There are also free charging station to the San Francisco Bay area but mainly on the

east side to San Jose and then north to San Francisco. In Marin and southern Sonoma Counties there are few free public conductive Avcon stations. There is one in Petaluma and another in Novato.

The most helpful charging support would be 2 Avcons, in addition to the already-installed 2 GMEV1 inductive units at the Larkspur Landing Ferry Terminal parking lot for ferries to San Francisco. The charging time is 3-6 hours, depending on the discharge level - but only for inductive now. It is ridiculous that US EV vehicle manufactures cannot get together and have a common plug-in charge system. After all, people have been plugging in with conductive cords for 100 years now.

Instead of hard-wiring the EV Power Pack Avcon connecting box to the electric breaker panel, I use a stove plug 14-50 and carry the box with me to an RV park, or to EV friends with similar receptacles. I have had as many as 4 EV friends charging their cars at one time at the 240 Vac, 30 A breaker at my house. Ford recommends a 40 A breaker but 15 years ago, when I built my garage, I used underground conduit for a 30 A breaker. The 30 A breaker does not even get warm and I hope this electric supply setup lasts.

The fuel gauge in the EV is about as accurate as one in an ICE car - do not depend on the low end reading. The best idea is to set the trip distance to zero after every charge and avoid driving more than 60 miles more miles if under 45 mph.

The Ranger EV motor is 67 kW (90 hp), with swing shafts at each end driving the two rear wheels; torque 140 ft/lbs. Use of the heater or air conditioning reduces range up to 15%. There are two radiators in the usual place to cool running temperatures of electrical components and the electric drive motor and another for the air conditioning. Here are some performance

statistics and vehicle specifications from the US Dept of Energy test of a 1999 Ford Ranger qualifying that this vehicle met all the EV America minimum performance goals except for the charging time, 15 minutes over the 8 hour limit:

In the rural area of National and State Parks where we live, it is great to drive to the Pacific Ocean in my new EV to watch the surf in a storm, see the elephant seals on the beach, and watch the whales go by offshore. The hills are now green, dairy cattle are in the fields, moose and deer feeding, lots of different birds, and on occasion I have seen bobcats and mountain lions.

The hills go up to 1000 feet or more so the regen braking is helpful and feeds power back to the batteries and saves brakes. There is no transmission but the selection on the "gear shift lever" provides park, neutral, and drive at freeway speeds plus an economy position to provide more regenerative braking when driving under 55 mph.

Ray Roy, Fleet Sales Manager, Sacramento, was very helpful in taking my order and making arrangements for delivery, all entirely by phone.

We had 3 EVs in west Marin County - my EV Ranger and Jerry Hudgins GM EV1 in Inverness and Pt Reyes Station and a fellow with a 1997 EV1 GEN 1 with lead-acid in Tomales, which has now been recalled.

Bob Wing
POB 277, Inverness, CA 94937-0277
415-669-7402
bwing@svn.net

Copyright 2000 Bob Wing



Performannce Statistics and Vehicle Specifications

Acceleration 0-50 mph

At 100% SOC	10.3 sec
At 50% SOC	11.2 sec
Max Power	84.13 kW
Performance Goal	13.5 sec at %50 SOC

Maximum Speed at 50% SOC

At 1/4 mile	62.1 mph
At 1 mile	74.6 mph (Ford has the speed pegged at 75 mph)

Constant speed Range @ 45 mph

Range	115.0 miles
Energy used	27.81 kWh
Average power	10.94 kWh
Efficiency	242 Wh/mile
Specific Energy	57.3 Wh/kg

Constant Speed Range @ 60 mph

Range	74.2 miles
Energy used	28.63 kWh
Average Power	21.52 kW
Efficiency	362 Wh/mile
Specific Energy	55.3 Whr/kg

Gradeability

Maximum Speed @ 3%	67.4 mph
Maximum Speed @ 6%	58.9 mph
Maximum grade	39.9 %

Charger

Underhood with Avcon Connector near right headlight, input 187-260 Vac

Max DC Charge Current	13.57 A
Maximum AC Charge Current	24.96 A
Time to recharge	8 hrs 13 min

The performance goal was 8 hrs, this was the only test goal where the Ford Ranger failed.

Energy cost with Pacific Gas and Electric Co. at 485 Wh-AC/mile = 6.94cents/mile

Battery pack located under the body

Panasonic Nickel Metal Hydride, 25 modules weighing 18.54 kg each,

12 V each, total system 300 V, capacity at C/3 rate 95 Ah. Located under the body.

Weights

Curb weight delivered	4196 lbs
Distribution F/R	51-49%
GVWR	5350 lbs
Payload	1154 lbs
Performance Goal	600 lbs

ZEV Mandate Stands *Continued from page 1*

Staff was directed to review the regulation and propose appropriate modifications to address these issues and assure successful penetration of ZEVs into the market.

"Even the cleanest internal combustion engine will pollute more as it ages," Dr. Lloyd said. "California needs ZEVs to help offset emissions from the growing number of vehicles on our roads and rising number of miles they are driven each year," he added.

The ZEV mandate was first adopted in 1990. It was modified in 1996 and again in 1998 to provide additional flexibility to automobile manufacturers and to accommodate the growing number of zero and near-zero emission technologies.

The Air Resources Board is a department of the California Environmental Protection Agency. ARB's mission is to promote and protect public health, welfare, and eco-

logical resources through effective reduction of air pollutants while recognizing and considering effects on the economy. The ARB oversees all air pollution control efforts in California to attain and maintain health based air quality standards.

(BUSINESS WIRE)

CONTACT:

California Air Resources Board
Jerry Martin, 916/322-2990
Richard Varenchik, 626/575-6730
www.arb.ca.gov

More ZEV

ARB quotes and events reported by Bill Dean. Testimony ended at noon then each Board member spoke.

Alan C. Lloyd, Ph.D., chair of ARB: Our future depends on continuing the march toward zero emissions. This is a long-term program. It would cost us more to abandon what we have started than to continue. As we move ahead, we need to partner with the auto industry that has brought us this far. We need to mitigate the cost gap with incentives and public education.

Supervisor DeSouliner: I want to appreciate the difficulties of the auto makers, but I respectfully disagree with their claims. The mandate must stay; it is going to take place. I ask staff to work with auto makers about cost. Does the 10% requirement have to be applied individually to each manufacturer?

Matthew R. McKinnon: We don't want to villainize the auto makers; they did a lot to get us where we are. The mandate needs to continue. We can do some work around the

edges, to make the mandate relevant to what we know now rather than 10 years ago. We need to think about plug-in hybrids. I have a concern about being fair to some manufacturers who have plans to comply with the mandate. Also I have a concern to not do anything that provides incentives for city cars so that they are the only ZEVs that get built. The Board has a role in educating the public. Local governments have done their part.

Dr. Friedman: I learned how to make models from faulty premises. ARB is running a prospective longitudinal study of long-term health effects of air pollution. We must continue to subscribe to the mandate.

Dorene D'Adomo: This vision was created over a decade ago. All stakeholders have the ability to be creative. Staff can work with auto makers to create incentives to create a market. We have a responsibility to help auto makers to join in this vision. We need to look at the benefits to society.

Professor Friedman: The mandate has always been about clean air, zero emission air. Auto makers claim that reduction of emission would be quite small, if any; yet the long-term benefits are well-established. The mandate gets credit for battery ZEVs, hybrids, and cleaner ICEs. The existing mandate will cause continuing progress. The mandate is a no-brainer; stay the course. We recognize that we have a responsibility

to assure that the cost issue is addressed with all our creative ability. We have not seen an all-out effort by the auto makers.

Mrs. Barbara Riordan: I am comfortable with staying the course, more than I was two years ago. It has to be a cooperative effort with auto makers. It is incumbent upon us to make it work. I am deeply committed to the ZEV mandate as it exists.

Dr. William A. Burke: I represent SCAQMD, with 45% of the cars of CA, in 5000 square miles. I have seen children and adults who are victims of air pollution. Most emissions in the South Coast are from vehicles. We must continue the mandate. I am impressed by the number of people from Southern California who took their own time to come to the hearing at their own cost. I understand business, that anything that causes a company to lose money would upset it, but the social effects of pollution makes compliance with the mandate a social responsibility.

Mr. Calhoun: I was not a big fan of the mandate at the time of adoption, but recognize that it stimulated a lot of good work. Problems with the current mandate can be fixed. Auto makers will step up to the task and surprise us. They will lose money at first, but we have to take into consideration that technology will advance as we move ahead. We have to make it work; this requires cooperation between staff and auto

Electro Automotive

Since 1979

- ★ **Books:** including *Convert It*, the hands-on how-to manual
- ★ **Videos:** from introductory to technical
- ★ **Components:** Advanced DC Motors, Curtis/PMC Controllers, taperlock adaptors, and much more
- ★ **Kits:** Universal kits to fit any suitable chassis, and custom bolt-in *Voltsrabbit* and *Voltsporsche* Kits for plug-and-play conversion

For catalog, send \$6.00 to:

Electro Automotive, POB 1113-CE, Felton, CA 95018

Or visit us on the internet: <http://www.eleetroauto.com>

Email: electro@cruzio.com

Phone: 831-429-1989



makers. Changes are needed; staff needs to examine auto makers' proposals. Let some auto makers opt out by paying into a fund for R&D.

Supervisor Patrick: I was impressed by EV drivers who took off time to come and testify. The whole Board is committed to the mandate. The MOA, instead of turning out to be a ramp-up, provided one-time targets for the auto makers to meet and then stop. Staff should look at standardization of charging facilities and whether SUVs should be counted in calculating percentages of vehicles. Auto makers thought that ARB might back down from the mandate. Do these biennial reviews increase regulatory uncertainty?

Then the Board voted to keep the mandate in effect, and to schedule a meeting in January to consider tweaks to the mandate.

Thanks for Bill Dean for being at the CARB hearings and for giving us the Boards quotes. W.E.Dean@worldnet.att.net

Help Support ZEV while you Eat

Looking for a good EV outing? If you live in Concord California you could go out to dinner and support ZEV at the same time. It's simple, just make your next EV trip out to dinner at T.R.'s Restaurant in Concord. T.R.'s is owned by Contra Costa County supervisor and restaurant owner Mark Desaulnier. Mark was appointed to the CARB board by Gov. Pete Wilson in 1994. For Mark the zero emission vehicle program is an example of what "smart growth is supposed to be all about - changing the way we plan our communities so they are sustainable". So if you live close to Concord, help support people who think the same way we do by making your next EV trip out to eat at T.R.'s Restaurant!

A CALL FOR LETTERS TO THE EDITOR

Read something in CE you would like to comment on? Do you feel something is being left out? Send us a "Letters to the Editor". You can E-mail us, Fax us or use snail mail at the addresses below:

E-mail: eaanews@aol.com

Fax: 510-864-9293

-or- Snail mail at:

EAA/Current Events, Hangar 20,
2701 Monarch St., Suite 142
Alameda, CA 94501

Call for builder write-ups

Proud of your car ? Would you like to share what you have done with others ? Why not send in photos and a short (or long) written description to CE so we can print it. For the last 30 years the EAA has grown strong by members sharing with members the technology they have used in creating their cars. Help continue this tradition. Take some pictures of what you think stands out most about your vehicle and send it in with a description (photo essays are OK). Don't forget to send your contact information, including, telephone number, mailing address, and E-mail if you have it, to:

Kurt Bohan
EAA Current Events
2701 Monarch St., Suite 142
Alameda, CA 94501
Tel. (510) 814-1864
Fax (510) 864-9293
- or E-mail to -
EAANEWS@AOL.COM

Get Published

Write for CE!

By
Clare Bell

Current EVents, as the newsletter for the Electric Auto Association, is a unique publication in the electric vehicle field. Since 1967, CE or the Electric Auto Association newsletter has specialized in useful hands-on technical information for EV builders, would-be builders, enthusiasts and advocates. It also became the vehicle for notifying EAA members about upcoming EVents, such as rallies and shows. Founder Walter Laski utilized the newsletter to publish a series of articles on how to build an electric vehicle using relay and battery-tapping speed control before the advent of the modern PWM controller.

Since then, CE has grown in various ways under various editors, adding other facets to its central mission, including coverage of legislative and political events that have affected EVs, EV competitions, notably the Phoenix APS Electrics race, and articles about long distance runs, battery technology, the accomplishments of EV builders such as Ed Rannberg and Bob Schneeweis and more.

At the Crossroads

Now CE stands at a crossroads. After decades of arguing, pushing, demonstrating and agitating, we have begun to see our dream realized in the form of electric vehicles from major manufacturers. The GM EV1, which has been covered in these pages since its birth in 1990, is no longer a willow-the-wisp or a dim possibility on the horizon, but a real car. Toyota is preparing to market the hybrid Prius in the US this fall. The conversions that we use to show the reality and practicality of EVs are numerous, growing, and still the most affordable way of getting an EV. The number of EV drivers is increasing, bringing in people who have not been part of the hobbyist world. EAA has the potential to expand its membership many-fold, in part by generating a publication to serve both the core community of EV builders and drivers and the new "early acceptors" of the commercial EVs such as the Honda EV Plus, the EV1, the EV Plus, the Ford Ranger and others.

The best way CE can serve this growing and increasingly diverse community is by combining what we have done in the past with what we have done recently, making it better. For that we need writers and we are reaching out to you, our readers.

Experience and Details

The most important things are experience and details. We want the blow-by-blow and the nitty-gritty. CE's readers want to sit behind the wheel of a Honda EV Plus as it is being driven from LA up to San Francisco, wrestle with the charging problems in a Jet Escort, take a trip with an EV Rabbit with a range-extending generator trailer on the back, puzzle out how to fit battery racks in an MG Midget and so on.

Feelings

What sort of feelings does an EV generate? Excitement? Elation? What does it feel like to pass the gas-mobiles on the freeway in a converted Porsche 914 or experience the silky smooth push-you-back-in-the-seat acceleration of an EV1? To load the kids in an electric Rabbit or haul garden equipment in a converted S-10? What does it feel like to run out of juice (yes, it does happen, even to the best of us) and how do you cope with it? Has an EV embarrassed you, frustrated you, made you happy, sad, satisfied, delighted or ? What does your mate think of it? Do you take your pets in it? Do you make long journeys or just bop around town?

Doers More than Dreamers

This sort of writing is even better when combined with technical details. CE's core readership are doers even more than dreamers. Put the screwdriver or wrench in the reader's hands, give them the parts list and the address of the supplier lay the components out in front of them, let them crimp a cable, lay out a wire harness, mount a motor. In short, provide enough information so that someone can actually BUILD something that works. Tell how to build battery heaters or install an E-meter, and give them safety tips when working with batteries. Tell them how to test the vehicle and fix it if it breaks.

Infrastructure

CE also wants to know about experiences with the growing EV infrastructure,

including the political and legislative decisions that affect it. Has a public charging station been available when you needed it? What do you feel about inductive versus conductive charging? How can we integrate our existing conversions into an infrastructure that is increasingly designed for the commercial EVs and their specific requirements?

Advocacy

CE has been and wants to continue to be a primary weapon in countering misinformation in other media and stating the truth about EVs. If you have data that shows how EV station car use can spare the air, or a rebuttal to a misleading university study, CE is the place to reach people who use and need that sort of information. If you hear about legislation that could either help or hinder EV use, write a heads-up or alert article.

Chapter News and Events

Tell CE what your local EAA chapter has been up to. Have you exhibited cars at shows? Do you have a member who has come up with some new ideas or built some innovative EVs? Give us some news or a member profile. And don't forget to submit EV events to the calendar.

You Don't Have To Be Hemmingway

For CE, the writing style is less important than content and organization. You don't have to be a brilliant stylist either, although the piece should be coherent. Liberal use of sub-headings helps organize the information or direct the flow of the article. CE's editor and staff can work with the author of a fairly rough-cut piece and help structure and polish it.

Editing

CE, like other publications, reserves the right to edit for accuracy, length and basic English. Since we like to let an author's style show through, we try to minimize the amount of editing. We will often send an edited piece back to the author for review

and correction before it goes to layout. This can be done quickly via email.

Computer Stuff

Computer-generated submissions should either be placed on a 3.5 HD IBM PC formatted disk and mailed, or sent via Internet as text (.txt) or Word for Windows (.doc) files. E-mailed submissions should go to either ce96ed@aol.com (Clare Bell) or eanews@juno.com (Kurt Bohan)

Photos and Art

CE publishes most photos in black and white, though we have done color covers. We prefer hardcopy color or black and white prints, although we have recently had good results with reproducing electronic images (and they reduce the cost of publishing photos). Prints should be at least 3 x 5, though the larger the better for resolution. Images can be sent via the net or put on disk in either JPEG or TIF format. Resolution should be at least 200 dpi and file size no more than 1.44 MB, or what will fit on a HD floppy. We can handle bitmap, though it gives a lower quality.

We can generate line art by re-drawing from a clear sketch or scanning the material in. We can also accept computer-generated line art in the above formats. Camera-ready hardcopy is also appreciated.

Returns and Copyright

Hardcopy material will not be returned unless accompanied by a request AND a self-addressed stamped envelope.

Copyright will be in CE's name unless an author specifically requests it in their own name. Reprinted material will carry the original copyright and credit the original source.

So... DO IT

It isn't that hard to write for CE and our staff are willing to work with you. By contributing to CE, you help your fellow EV enthusiasts, assist the EV cause and get warm fuzzies by (wow!) actually getting published. —CB

Help EAA Grow

Support **Cars for** **Clean Air**

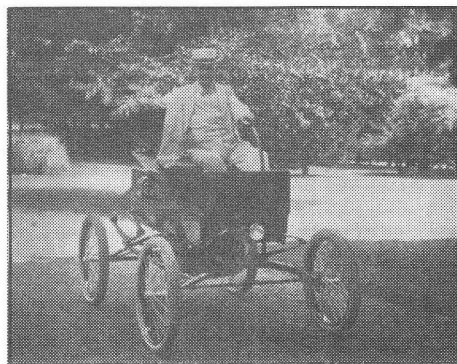
**Donate a car
and receive a
tax deduction**

EAA has already received its first donated gasoline car (in Sacramento), made \$700 on it and generated a handsome tax credit for its owner. Help continue this program by finding other cars. Donate your own, persuade a friend or relative, or talk to your local mechanic, who often has customers that decide not to repair a car and need to get rid of it. Do yourself a favor by knocking something off your income tax while helping EAA.

Contact Information:

For the San Francisco Bay Area:
Kurt Bohan
EAA, Hangar 20
2701 Monarch St. Suite 142
Alameda, CA 94501
Tel. (510) 814-1864
Fax (510) 864-9293
E-mail: eaanews@aol.com

For the Sacramento area:
Tim Loree
7428 Wisconsin Dr.
Citrus Heights, CA 95610-7432
Tel. (916) 967-3044
Fax (916) 863-0303
E-mail: loreet@2xtreme.net



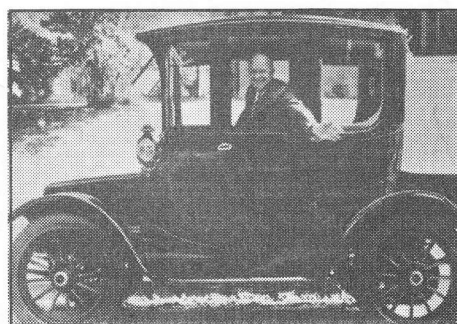
Famous EV'rs

From the files of Terry Wilson
eaahistorian@juno.com

Thomas Edison had already built a tricycle with an electric motor.



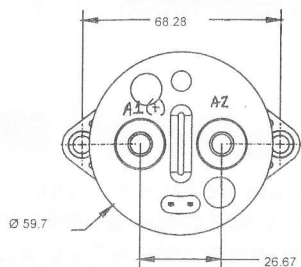
And soon (wife) Mina would be driving a commercial electric carriage. Many of Americas elite, like Thomas and Mina Edison, and Henry and Clara Ford, owned "his" and "her" gasoline and electric automobiles.



President Dwight D. Eisenhower in a 1914 Rauch and Lang Electric owned by his mother-in-law, this photo was taken during the 1952 campaign.



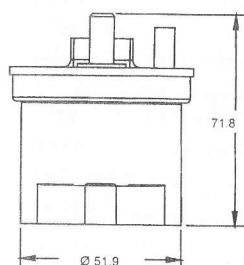
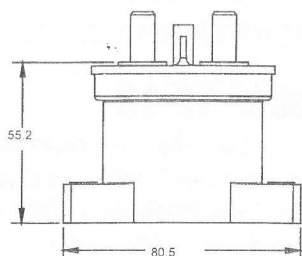
This 1901 Electric ambulance drove the wounded President McKinley to the hospital after he was shot.



New from Kaylor Energy Products

KILOVAC Czonka 3

High Power Switching Contactor



All dimensions in millimeters unless otherwise specified.
Tolerances: 0.X = $\pm 0.77\text{mm}$ 0.XX = $\pm 0.26\text{mm}$

Kaylor Energy Products
20,000 Big Basin Way
Boulder Creek, CA 95006

Tel. (831) 338-2200
E-mail:
kaylor@access1.net

- ◆ Maintenance Free
- ◆ 320 Volts
- ◆ 200A Continuous
- ◆ 2000A Maximum
- ◆ 12 Volt Coil
- ◆ Make & Break at 250A
- ◆ Uses less than 1/10 Ampere
- ◆ Magnetic & Gas Arc Quenching
- ◆ Hermetically Sealed: arc contained
- ◆ Weighs Less Than One Pound
- ◆ Size less than 2.58" X 2.83" X 3.16"
- ◆ Mounting hardware provided

\$69.95

+\$5.00 S&H

+8.25% tax in CA

Mike's E-Bikes

30 miles at 25+ MPH
for only a nickel

Glide by traffic

No parking hassles

Recharge anywhere

Very comfortable

Use the **E-BIKE** for "no-sweat" commuting! Whatever your normal bicycle performance, the **E-BIKE** will add 20 miles to your range, and will add 10 MPH to your average speed. You can use your **E-BIKE** for errands, nature rides, shopping, and recreation.

E-Bike is easy to ride! The **E-BIKE** is far more comfortable than an ordinary "head-first = sore back/neck" bicycle. Pedal as much as you want or as little as you want.



Prices starting under
\$2,000

Mike's E-Bikes
2270 Yale Street
Palo Alto, CA 94306

Tel. (650) 493-7633
E-mail: saari@aol.com

Events Calendar

July 23-28

8th International Energy Forum ENERGEX 2000, Las Vegas, Nevada. An international forum on all energy disciplines and energy related issues. Contact: Suzanne Ulrich, NTS Development Corp. Tel: (702) 317-0777 Fax: (702) 257-7999

August 21-23

2000 Future Transportation Technology Conference, Costa Mesa, California. SAE annual conference discussing the latest developments in vehicle technologies. Contact: Karin Bolcschazy, SAE Tel. (724) 772-7179 Fax (724) 776-1830 E-mail: karinb@sae.org

August 26

EAA National Endurance Range Rally. Hosted by the East Bay chapter of the Electric Auto Association. To be held in San Ramon, CA. Event runs on a 3-mile endurance course, just like the old Silicon Valley rallies. Shade trees, too! Public hours: 10am -4pm. Limited charging available; lots of trailer room. Contact Anna Cornell at (925) 685-7580 10am - 4pm M-F. Or E-mail Anna at ebeaa@juno.com

September 11-13

Intertech Hybrid Electric Vehicle Conference, Windsor, Ontario, Canada. Automotive and fuels executives and technologists will appraise the recent developments in hybrid electric vehicles (HEVs) from market, technical and investment perspectives. Contact: Intertech, 19 Northbrook Drive, Portland, Maine 04105. Tel. (207) 781-9800 Fax: (207) 781-2150 E-mail: info@intertechusa.com Web: www.intertechusa.com

September 17-19

Hyforum 2000 - The International Hydrogen Energy Forum 2000, Munich Germany. International forum on the use of hydrogen and hydrogen technologies as an alternative fuel and energy source including a discussion on technologies, economics, policies, and potential investment in hydrogen-related businesses. Contact: Sandra Hoderlein, Congress Manager Tel. +49 (0) 228/9 59 56-0 Fax: +49 (0) 228/9 59 56-50 E-mail: energie.forum@t-online.de Web: www.zukunftsenergien.de

September 19-20

EPRI - Electric Bus Users Group Workshop, Norfolk, Virginia. The second EPRI Electric Bus Users Group Workshop of 2000. Contact: Layla Sandell, EPRI Tel. (650) 855-2756 Fax: (650) 855-2737 E-mail: lsandell@epri.com

September 23

Silicon Valley EAA Rally, 10:00 a.m. - 4:00 p.m. The big yearly EV rally! Stanford University, Palo Alto, in front of Encina Hall & Burnham Pavilion (just south of Hoover Tower on the corner of Galvez & Serra). Contact: Will Beckett BeckettW@corp.hp.com 650-857-3859 Website <http://www.evcl.com/eaasv/>

September 25-29

ISATA 2000, Dublin Ireland. International Symposium on Automotive and Transportation Technology. Contact: ISATA Tel. +44 1372 720 620 Fax +44 1372 720 101 E-mail: isata@compuserve.com

October 1-3

CAATS 6th Annual Meeting: E-Transportation - The California Advantage, Palm Springs, California. Information technology and e-commerce solutions for mobility and safety. Contact: Randi Dixon Tel. (916) 325-0473 Fax: (916) 325-0471 E-mail: Randi_Dixon@caats.org

October 16-18

International Electric Vehicle Symposium, Montreal, Canada. EVS-17 will be hosted by the Electric Vehicle Association of the Americas. Contact: EVAA Tel. (415)249-2690 Fax (415)249-2699 E-mail: ev@evaa.org

October 16-18

Convergence 2000, Dearborn, Michigan. Annual conference by the Convergence Transportation Electronics Assn. that features speakers, panels and exhibits in the field of automotive electronics. Contact: Ravi Rajagopalan, Delphi Automotive Systems. Fax: (781) 828-9992 Web: www.convergence2000.org

October 18-20

New Visions in Transportation - Accelerating Emerging Technologies and Innovative Designs, Aspen, Colorado. The purpose of the conference is to help build a new consensus and advance innovative transportation systems. Contact: Bill Flanigan, NVT Tel. (970) 963-6824 E-mail: flanigan@sopris.net

November 6-7

7th World Congress on ITS: From Vision to Reality, Turin, Italy. An international forum on the latest in ITS technology developments. **CALL FOR PAPERS** Contact: Mrs. Kip Stacy Ports, Congress ITS Tel: (202) 484-4542 Fax: (202) 484-3483 E-mail: kstacy@itsa.org Web: www.itsa.org

For more information, or to add an Event to this calendar, please call Anna Cornell (925) 685-7580 (10 AM to 4PM, PST only, please!)

News in Brief

Compiled by Ruth M. Shipley from information provided by EIN Publishing, Inc. If reprinted, please credit Ruth Shipley and CE.

Altair Conducts Fuel Cell Research

Altair International, Inc. recently reported that its wholly owned subsidiary Altair Technologies has begun development of ceramic oxide fuel cell membranes and reactive catalyst support structures. The company said that if the new technology is successful, it could initiate the widespread use of fuel cells. Fuel cells are expected to become widely used as power generation sources. Altair Technologies' developments may spur new development and manufacture of fuel cells. "Success of our research work in the fields of crystalline catalyst bases and surface chemistry control of nanoparticle-sized titanium dioxide led us to the decision to support the development team on the ceramic oxide fuel cell membranes and reactive support systems," said Altair Technologies President Ken Lyon. The company will use surface chemistry control methods to apply catalyst and conductivity components as an integral feature of the support structure. In addition, the company is trying to use this reactive base to support oxygen transfer membrane film using established sol gel techniques. In addition, Altair is currently developing nanomaterials with potential applications in fuel cells, hard coatings, catalysts, cosmetics, paints, batteries, computers, semi-conductors and telecommunications.

(ALTAIR RELEASE: 7/19)

Nuvera to Deliver Fuel Processing Systems

Nuvera Fuel Cells, a company recently formed by the merger of Epyx Corporation and De Nora Fuel Cells, has announced that it will soon ship a complete gasoline-powered fuel processing system designed for testing fuel cell transportation applications. The company said the units will be deliv-

ered to automakers in the U.S., Europe and Japan. "As the only company to successfully demonstrate the conversion of gasoline to fuel cell electricity, we have taken significant steps toward leading the industry in advancing the development of clean, low-cost and reliable fuel cell-powered vehicles that will more than double fuel efficiency, resulting in dramatic fuel cost reductions," said Nuvera Senior Vice President and Chief Operating Officer Jeffrey Bentley. The company said it has "successfully addressed the issue of sulfur removal in the conversion of gasoline to fuel cell power." The fuel processing system is able to generate fuel cell electricity from a variety of fuels, including gasoline, ethanol, methanol, natural gas, propane, butane, naphtha and other synthetic fuels. In addition to international automobile manufacturers, Nuvera will deliver the system to Latham, NY-based Plug Power, LLC, as part of a Department of Energy program to advance the development of transportation-based fuel cell systems.

(BUSINESS WIRE: 7/19)

New Marketing Campaign Launches Prius

Toyota Motor Sales (TMS) is working in cooperation with Saatchi and Saatchi and Oasis Advertising to launch an innovative marketing plan for its new Prius gasoline/hybrid electric vehicle. TMS said the marketing campaign will focus around the Prius' website, offering potential customers a chance to buy the vehicle before it is offered to dealerships. According to TMS, the website campaign has opened a two-year dialogue between Toyota and over 40,000 interested customers. TMS said that 1,800 of the vehicles had been sold via online purchase requests before the car ever arrived in showrooms. "Prius enthusiasts have been following the development and availability of this new technology for more than two years," said TMS Marketing Vice President Steve Sturm. "We wanted to reward the enthusiastic reception for Prius among these early intenders by offering them the first opportunity to submit an online pur-

chase request." TMS said they will launch a special demo program available at 900 dealerships nationwide that will give potential customers the opportunity to rent a Prius for up to one full day. <http://www.prius.toyota.com>.

(TMS RELEASE: 7/20)

WestStart-CALSTART Launches Hybrid Projects

WestStart-CALSTART recently introduced two new heavy-duty hybrid EV (HEV) demonstration projects funded by the Defense Advanced Research Agency (DARPA). The projects have a total program value of \$1.2 million and are designed to enhance the commercial viability of advanced transportation technologies. One of the HEV projects will demonstrate the use of a microturbine in a Class 8 hybrid electric truck. The other project will work to develop a universal multi-port rapid charger for EVs, especially off-road vehicles used for electric ground support equipment and forklift trucks at airports and in metropolitan areas. ISE Research will demonstrate the first-ever use of a microturbine in Class 8 hybrid truck applications. The "Turbine-Driven Hybrid Electric Truck" will feature a Capstone 60-kilowatt turbine that powers a truck owned by Sparkletts Water Company. The truck will transport bottled water from Sparkletts bottling plant to regional distribution centers in southern California. Power Designers will develop a high-efficiency, low-cost universal multi-port rapid charger for off-road vehicles. The project will address such rapid charging issues as providing optimal charging to the batteries, the ability to charge different types of EVs with varying power requirements, and different battery chemistries and terminal voltages.

(WESTSTART-CALSTART RELEASE: 7/20)

Matsushita to Produce Lead Acid EV Battery

Matsushita Battery Industrial Company recently announced it will produce a high-performance, lead acid battery designed for

EVs. The company said its new battery lasts twice as long and offers twice the power of existing lead acid battery technology on the market. In addition, Matsushita said that the cost of charging them will be approximately one-third that of its nickel metal hydride batteries. The battery has a lifetime of 1,000 charges and requires 10 minutes to be charged from 20 percent to 80 percent of its capacity. Matsushita's new batteries will cost about 20,000 yen (about \$184) each. The company noted that the batteries are designed for use in Everyday COMS, an ultra-small EV produced by Araco Company. The company is also considering marketing the new battery overseas. (KYODO: 7/19)

Kathmandu Rescinds Ban on EVs

The government of Kathmandu has rescinded its ban of electric taxis. The taxis, known as safa tempös, can carry as many as 10 passengers and are powered by golf cart batteries. The vehicles were introduced in 1995 following a 1993 report which revealed that Kathmandu was one of the world's most polluted cities. They were an instant hit, completely replacing diesel vehicles in 1999. Environmentalists claim the government initially banned the vehicles because members of the Kathmandu police force have a financial interest in preserving diesel-powered vehicles, since the largest diesel fuel station operates at police headquarters. The police department also complained that the electric taxis moved too slowly at 40 kilometers per hour. However, the government withdrew the ban following protests from the public, aid groups and environmentalist groups. Other major protests came from donors such as the Danish government, which funded much of the conversion from diesel to electric. There are presently almost 600 EVs in the Kathmandu Valley. Officials noted that the vehicles are ideal for narrow, congested streets because of their compact size.

(EUROPE INTELLIGENCE WIRE: 7/16)

Senator Buys Honda Insight Hybrid

Honda Motor Company recently announced

that Senator Bob Bennett (R-UT) has purchased one of the company's model year 2000 Insight hybrid EVs. Bennett is the first member of the U.S. Congress to own an Insight HEV. "When it was time to replace my seven-year-old car, the new hybrid really caught my attention," said Bennett. "Now, not only do I have a new car, I have a new high-tech marvel." Honda said Bennett's interest in the HEV was the result of his immersion in technology issues as part of the Senate Y2K Committee and as chairman of the Senate Republican High-Tech Task Force. Bennett will use the HEV for his five-mile commute to Capitol Hill. The Insight can travel 61 miles on a single gallon of gasoline in city driving and 70 miles per gallon on the highway. Honda noted that the Insight's Integrated Motor Assist system — a one-liter, three-cylinder gasoline engine combined with an electric motor powered by a nickel metal hydride battery pack has received numerous awards. (AMERICAN HONDA RELEASE: 7/18)

AZ Offers Tax Credit for NEVs

Sales of neighborhood electric vehicles (NEVs) in Arizona have nearly doubled since state officials implemented a tax credit for the vehicles earlier this year. Through June 30, the NEV tax credit provided 50 percent of the cost of the NEV, or \$10,000, whichever was greater. On July 1, the credit dropped to 50 percent of the cost of the vehicle, or \$1,000. Officials said since the credit was implemented at the end of March, sales have gone from 1,831 registered NEVs in the state to 3,460. Officials said some NEV dealers were selling as many as 300 NEVs per month approaching the deadline. NEVs typically weigh about 1,500 to 2,000 pounds and can be recharged using household outlets. The vehicles are equipped similar to gasoline-powered cars, with seat belts, sideview mirrors, turn signals, and headlights and brakelights. However, in Arizona, the NEVs have a registration fee of about \$20, which is significantly lower than registration fees for traditional gasoline vehicles. The NEVs cannot be driven on golf courses, sidewalks, or streets with a posted speed limit above 35 miles per hour

(mph).

(ARIZONA REPUBLIC: 7/8)

EVI to Supply PCS to Ford's ECRV Program

Electric Vehicle Infrastructure, Inc. (EVI) recently announced it will be supplying the power control stations (PCS) to support Ford's United States Postal Service (USPS) Electric Carrier Route Vehicle (ECRV) program. The program is currently underway to test the first 500 of a potential 6,000 electric-powered USPS delivery vans. EVI will deliver as many as 250 of its newly designed DCS-55 dual charge stations. The DCS-55 will operate off a single 50-amp circuit and will have the option to charge two vehicles simultaneously or sequence between two vehicles. "It's great to be involved in a real world application where electric vehicles will really shine," said Jason France, CEO of EVI. "I'm sure after the success of this program, other fleets will realize how well Ford EVs will work for them." Established in 1992, EVI has helped develop standards and innovative technology for conductive charging that provides the best EV supply equipment. "I want to acknowledge EVI's contribution in making the USPS project a success," said Th!nk Technologies Electromechanical Systems Engineering Manager Stephen Fan. "EVI's proposal for the USPS fleet continues to demonstrate their superior engineering capability."

(EVI RELEASE: 7/17)

iQ Power Receives Delivery of TI Microchips

iQ Power recently announced it has received the first shipments of microchips from Texas Instruments (TI) under a strategic alliance it formed with iQ Power earlier this year. The company said the TI microchips are an important part of its Smart Energy Management (SEM) technology. "The iQ chip is the heart of our technology," said iQ Power CEO Peter Braun. "We are pleased to be working with Texas Instruments in order to provide the marketplace

with this revolutionary technology." Braun said the SEM technology links car batteries with software-controlled intelligent energy management systems to optimize the capabilities of the battery. The SEM system also allows power management information to be transferred to the car's onboard computer via the vehicle's existing power line. TI is a leading manufacturer of car electronics. iQ Power and TI have agreed to jointly develop micro-electronics for the world's first computer-controlled car battery. iQ Power is involved in the development and commercialization of advanced lead acid battery technology that utilize internal micro-electronics to monitor and control the environment and operation of the battery as part of an integrated automotive system. (BUSINESS WIRE: 7/11)

Scientists in India Develop Fuel Cell Hybrid

Scientists at the SPIC Science Foundation's Center for Energy Research recently developed and demonstrated India's first prototype fuel cell-powered hybrid EV. The foundation said the vehicle utilizes a hybrid drivetrain that is powered by polymer electrolyte membrane (PEM) fuel cell stacks and lead acid batteries. The center has been developing PEM fuel cell stacks for more than 10 years. The foundation noted that several multi-kilowatt fuel cell stacks have been developed and demonstrated at the center, and other stacks developed at the center are currently undergoing trials. The hybrid powertrain for the prototype hybrid EV was installed in a four-wheeler van. The batteries and fuel cell share the power requirement of the EV's electric motor. The center also installed a controller that allows the motor to utilize power from both sources and is able to recharge the EV's batteries whenever the vehicle is stopped. The van seats six people and can travel 40 percent farther on a single charge than a traditional battery-powered EV. The center is currently working to improve the performance of the fuel cell stack by reducing its weight, volume and cost.

(ASIA INTELLIGENCE WIRE: 7/14)

ACEEE Ranks Toyota Prius Number One

According to the American Council for an Energy Efficient Economy (ACEEE), the Toyota Prius is the most environmentally friendly gasoline-powered vehicle currently on sale in the United States. "A breakthrough level of fuel economy combined with extremely low tailpipe emissions propels the Prius to the top of our Greener Choices list," said ACEEE Green Book co-author John DeCicco. The Prius registered a fuel economy of 52 miles per gallon (mpg) in city driving and 45 mpg on the highway. The Prius joins the Honda Insight as one of the two hybrid EVs available in the United States. Although the Insight achieves a higher fuel efficiency than the Prius, it does not pass California's Super Ultra Low Emissions Vehicle (SULEV) test. According to the Green Book, the SULEV test outweighs the difference in fuel efficiency, giving the Prius the advantage over the Insight. "In terms of our green ratings, only the GM EV1 plug-in electric car and Honda's natural gas-powered Civic GX sedan outscore the Toyota Prius," said DeCicco. "Even though it is still powered by gasoline, the Prius offers environmental performance nearly as good as today's alternative technologies, but in a much more widely available and affordable package." (ACEEE PUBLISHING: 7/12)

Ecstar, Carraro to Join Efforts

Ecstar Electric Powertrain and Power Conversion Systems recently announced it has signed a memorandum of understanding with Carraro SpA to establish a cooperative effort to combine their capability in electric powertrain design and assembly. "We are very pleased to be joining our efforts with Carraro," said Ecstar President and CEO Ross Witschonke. "Our combined expertise in design and manufacturing will result in high quality and affordable electric powertrains for our customers." The memorandum of understanding is subject to nego-

ELECRIC VEHICLES ONLINE TODAY Month-in-Review

Executive News Summary Service

- ◆ Electric Vehicles
- ◆ Fuel Cells
- ◆ Hydrogen
- ◆ Hybrids

Tracks current legislation, regulations, science, and technology, industry initiatives, conference announcements and more.

For a free trial contact:
**ENVIRONMENTAL INFORMATION
NETWORKS**

119 South Fairfax Street, Alexandria Virginia 22314
Phone: (703) 683-0774 Fax: (703) 683-3893

tiation and execution of definitive agreements, said Ecstar. The cooperative effort will include the design and joint assembly of electric powertrains to meet the needs of on-road and off-road vehicle applications. "This new relationship with Ecstar represents a further step for Carraro to offer high quality and technologically advanced products to our customers," said Carraro President and CEO Mario Carraro. Formed in 1998, Ecstar is part of the fuel cell alliance formed by Ford Motor Company, Ballard Power Systems, Inc. and DaimlerChrysler. Ford owns 62 percent of Ecstar, while DaimlerChrysler and Ballard own 17 and 21 percent respectively.

(ECOSTAR RELEASE: 7/13)

SHEC Develops New Hydrogen Extraction Method

Solar Hydrogen Energy Corporation (SHEC) recently announced it has developed a novel new method to extract hydrogen out of water using heat energy from the sun. "Our process is a complete renewable energy cycle," said SHEC spokesperson Ray Fehr. "Water that is used in the produc-

tion of hydrogen is returned to the planet when the hydrogen is consumed as a fuel." The technology extracts hydrogen by concentrating sunlight with reflectors to create the heat required to split water into hydrogen and oxygen. SHEC said the reflectors are "relatively expensive to manufacture, [but] the potential for an economically viable 'clean and renewable' hydrogen source now exists." The hydrogen gas separation process produces hydrogen with purities of 99.9 percent. The company hopes to integrate the technology with its solar thermal water splitting process. SHEC is a leader in the development of "solar hydrogen fuel," which is produced by SHEC's proprietary water splitting technology which converts water into hydrogen and oxygen without any pollution.

(BUSINESS WIRE: 7/12)

Global Fuel Cell Market Advancing Rapidly

With environmental regulations becoming more and more stringent worldwide, many companies are beginning to seriously examine fuel cell-powered vehicles. For example, automakers such as BMW, Toyota and DaimlerChrysler have all announced plans to develop and market fuel cell vehicles (FCV) in the near future. BMW has developed a 204-horsepower FCV that can travel about 350 kilometers without refueling. The company said the vehicle will be introduced to the automotive market next year. Toyota has also announced plans to offer an FCV. The company has developed a prototype FCV that can travel more than 250 kilometers without refueling. Toyota expects to market the vehicle in 2003. Other Japanese automakers, including Nissan, Honda and Mitsubishi have also announced plans to introduce FCVs between 2003 and 2005. German automaker DaimlerChrysler recently developed an FCV that can travel 450 kilometers without refueling. The company said the fuel cell-powered vehicle can reach speeds of 144 kilometers per hour. DaimlerChrysler will launch sales of the FCV in 2002. Governments are also beginning to examine FCVs and the fueling

infrastructure needed to support them. (KYODO: 7/12)

GM Makes Strides in Fuel Cell Development

General Motors (GM) recently unveiled its prototype, the HydroGen1 fuel cell. The company said it was its smallest, most powerful fuel cell yet. The HydroGen1 is two-thirds smaller than previous GM models, yet provides 80 kilowatts of power — similar to a traditional 1,600-cubic centimeter internal combustion engine — and has a thermal efficiency of 53 to 67 percent. In addition, GM claims that the HydroGen1 can start a car in temperatures as low as minus 40 degrees Celsius, a breakthrough in fuel cell development. While fuel cells and hydrogen storage systems generally tend to take up space throughout most of the vehicle, GM has been able to par down its system so that the fuel cell fits under the hood and its accompanying hydrogen storage system occupies minimal truck space (2.5 inches). However the fuel cell system still holds enough fuel to power the vehicle for about 400 miles. GM anticipates that it will roll out its first fuel-cell powered vehicles by 2004.

(THE ECONOMIST: 7/5)

University Attempts Second World Trip in EV

An electrical engineering professor and three students of Tokyo Denki University are attempting to trek around the globe in a converted EV. The trip should take some 100 days through Russia, Europe and the U.S. The team plans to travel 250 to 300 kilometer a day and recharge the solar battery at night. The vehicle's solar battery panels are located on the roof of the vehicle and provide 10 percent of the car's power. This is the team's second attempt at traveling around the world in an EV. Last summer's attempt ended when the group could not gain the proper road permits for travel in certain jurisdictions. Professor Masaharu Fujinaka said the most difficult leg of the journey will be through Russia in

an effort to reach Moscow since road conditions are uncertain. However, of his modified EV, Fujinaka said, "this car, in terms of speed and endurance, can be a match for gasoline-powered cars."

(KYODO: 7/3)

GM Will Develop Fuel Cell Vehicles Slowly

General Motors (GM) said it will be later to the market with a fuel cell vehicle than other automakers, and said it is currently testing a prototype fuel cell vehicle, which it developed for a little more than \$600,000. GM is somewhat wary of being a fuel cell pioneer, based at least in part on its experiences with battery-powered EVs. Production of the company's EV1, which GM introduced in 1997, was halted last year because it was deemed too expensive by consumers. Erhard Schubert, director of GM's Global Alternative Propulsion Center, said consumers generally are not willing to pay a premium for an environmentally friendly vehicle. The company is testing a fuel cell-powered version of the Zafira, a small van that uses a stack of 200 fuel cells. GM hopes to have a fuel cell vehicle available commercially by 2008. Schubert said the automaker will strive to make its offering competitive with diesel-fueled vehicles. (BLOOMBERG NEWS: 6/20)

NAVC Earns DOT Sponsorship

Northeast Advanced Vehicle Consortium (NAVC) announced in a recent press conference that it had been funded by the Department of Transportation's (DOT) Advanced Vehicles Technology Program (AVP) for the research and development of a hybrid-electric heavy duty van. The project, which includes the Massachusetts Port Authority and EVERmont, is designed to develop a cleaner, fuel efficient van that can perform in an urban setting. Using state-of-the-art compressed natural gas (CNG) technology to cut fuel consumption and emissions from the delivery van, the project's ultimate goal is to lift scrutiny from heavy duty vehicles, which are often criticized for their harmful effects on the nation's air

quality. The project's manager, Timeless Technologies, said the prototype van will combine an electric motor and a natural gas auxiliary power unit (APU) to give the van better range than a traditional EV, while maintaining low emissions standards. The U.S. Postal Service's Boston fleet will test the vans to make sure the vehicle can stand up to the needs of delivery service in urban areas.

(NAVC RELEASE: 6/21)

Ecostar to Provide Powertrain for Th!nk City

Ford Motor Company recently announced it has chosen Ecostar Electric Powertrain and Power Conversion Systems to provide a next-generation powertrain system for its new Th!nk City EV. The vehicle made its debut at the 2000 North American Auto Show. Ford said the powertrain system used in the Th!nk City vehicle operates at 112-volts, which is lower than most EVs. Ecostar said it will work with ENOVA Systems and Solectria to develop a "uniquely integrated system" for the Th!nk City. "Ecostar's goal is to create an electric system for Th!nk City that will integrate electronic functions, improve performance and quality, and reduce overall cost," said Ecostar president Ross Witschonke. "We are confident that the electric powertrain system we are developing for the Th!nk City vehicle will provide improved performance and function for the growing electric vehicle customer base." Ecostar Electric Drive Systems, founded in 1998, is a part of the fuel cell alliance between Ford, Ballard Power Systems, Inc. and DaimlerChrysler. Ford owns 62% of Ecostar, DaimlerChrysler owns 17% and Ballard owns 21%.

(ECOSTAR RELEASE: 6/20)

Nissan Develops CNG Hybrid Electric Truck

Nissan Diesel Motor Company recently announced that it has developed a hybrid electric truck that is powered by a compressed natural gas (CNG)-fueled engine paired with an electric motor. The vehicle

features a capacitor which stores electricity generated during braking. Nissan said both the CNG engine and the capacitor will provide electricity to the vehicle's electric motor. In addition, the hybrid electric truck is expected to achieve a fuel efficiency which is double that of a conventional CNG-powered truck. The company did not disclose sales targets for the truck, but noted that it plans to introduce the vehicle "in the near future." Industry observers said the development of the hybrid technology is a positive move for the company, which is strained financially. Most industry analysts believe Japan's other truck makers will soon match the company's technological development in an effort to meet strict new vehicle emission standards in Japan.

(REUTERS: 6/19)

Maryland Offers Tax Incentives for HEVs

Earlier this year, Maryland Governor Parris Glendening signed legislation that encourages the use of hybrid EVs. The Maryland Clean Energy Incentive Act (H.B. 20) offers tax incentives for HEV owners according to the amount of power provided by the vehicle's electric motor and regenerative braking system. The incentives act as a credit against excise sales taxes applied to all vehicle purchases in the state. Under the plan, an HEV with a rechargeable energy storage system that provides between five and 10% of the vehicle's total available power is eligible for a \$250 tax credit. HEVs with energy storage systems that provide between 10% and 20% of the vehicle's total power receive a \$500 tax credit. If an HEV's energy storage system supplies between 20% and 30%, the vehicle is eligible for a \$750 credit, while an HEV with an energy storage system that provides at least 30% of the total power available qualifies for a \$1,000 tax credit. The tax credits can be even larger for HEVs with regenerative braking systems. The system must provide 20% of the energy available from braking in a typical 60 mph to zero mph braking event. H.B. 20 also extended an existing \$2,000 tax credit for the purchase of battery-powered electric

vehicles in Maryland.

(THE CLEAN FUELS REPORT: JUNE 2000)

Toyota Launches Second Generation Prius

Toyota Motor Corporation recently announced its aim to sell 15,000 hybrid electric Prius vehicles next year. The company said it hopes to sell two-thirds of that number in North America. The Prius made its debut in 1997 and was the first hybrid vehicle to be sold on the mass market. So far, sales of the Prius have been limited to the Japanese market and have totaled 37,000. The second generation Prius was introduced to the Japanese market last week. The company hopes to achieve monthly sales of 1,500 units. Toyota said the new Prius has a top speed of 160 kilometers per hour (99 miles per hour). The older version only achieved 140 kilometers per hour (87 miles per hour). Under Japanese fuel efficiency tests, the new Prius is capable of running for 29 kilometers per liter (82 miles per gallon). Priced at around \$20,000, the new Prius will hit the U.S. market in July and sales in Europe will begin in September. Honda Motor Company said recently that it will begin selling a hybrid electric version of its Civic in Japan next year.

(REUTERS: 6/16)

IMPCO, Thiokol Sign Deal on Fuel Cell Research

IMPCO Technologies, Inc., a leading designer and manufacturer of fuel storage and delivery systems, recently announced it has signed a strategic alliance with Thiokol Propulsion, a subsidiary of Alcoa, Inc. IMPCO will immediately begin developing Thiokol's composite conformable storage tanks, designed to optimize the storage space available in hydrogen fuel cell vehicles. Unlike traditional hydrogen tanks, which are cylindrical in shape, Thiokol's composite conformable tank technology allows for varying shapes, which would be more conducive to commercialization by major automobile manufacturers. The com-

pany will also secure exclusive manufacturing and distribution rights for Thiokol fuel delivery and storage systems. Thiokol hopes to retain its focus on research while broadening product development and commercial development of its technologies. IMPCO has received a \$2.6 million contract from the Department of Energy (DOE) to aid in the development of new high performance hydrogen storage tanks for use on both internal combustion engines and fuel cell vehicles. Thiokol will also participate in the development program with IMPCO and DOE to further hydrogen storage technologies.

(IMPCO TECHNOLOGIES: 6/12)

Ford to Introduce Hybrid SUV in 2003

Ford Motor Company is slated to release a hybrid electric sport-utility vehicle (SUV) in 2003. The company said its Escape hybrid EV will meet California's super low emission vehicle (SULEV) standards and will be marketed in Europe under the Maverick name. Although many of the technological advances responsible for the Escape HEV are a result of Ford's P2000 research team, the company's acquisition of Volvo has moved the project along even further. Presently, Ford's research and vehicle development engineers are continuing to work on two hybrid concept vehicles developed by Volvo. The company said a Dual Hybrid Electric System for Increased Efficiency and Economy (DESIREE) program developed by Volvo will be incorporated into its HEV strategy. The Ford Escape will have a lightweight unibody structure slightly smaller than the Ford Explorer. The hybrid SUV will combine an electric drivetrain with a four-cylinder gasoline-powered engine, allowing the vehicle to travel approximately 40 miles to the gallon in urban driving conditions. The Escape HEV's motor-generator turns off while the vehicle is coasting or stopped and restarts when the accelerator is depressed again, which saves fuel. The system features a regenerative braking system which allows energy consumed during braking to be stored in onboard

batteries and reused.

(GREEN CAR JOURNAL: MAY 2000)

EAC Team to Develop Alkaline Fuel Cells

Electric Auto Corporation (EAC) recently announced that a team of EAC scientists and engineers will participate in the development of two different variations of the alkaline fuel cell at the Technical University of Graz (TU Graz) in Austria. The team hopes to develop an advanced alkaline fuel cell for EAC's fleet of Silver Volt electric cars. The first variation, known as the Apollo fuel cell, was used to power NASA's Eagle spaceship in the Apollo 11 lunar landing mission in 1969. The second type of alkaline fuel cell is the Mars Fuel Cell, an alkaline direct methanol fuel cell with circulating electrolyte. The EAC team plans to use the Apollo fuel cell for the company's EVs. Hydrogen for the Apollo fuel cell will be produced from ammonia using an ammonia cracker developed at TU Graz. The Mars fuel cell is powered by methanol injected directly into the fuel cell without the need for methanol reformers. EAC said the Mars alkaline direct methanol fuel cell is more difficult to build than the Apollo fuel cell and is in its early stages of development. The company recently filed for several patent improvements on its tri-polar lead cobalt battery. The tri-polar lead cobalt battery and the Apollo fuel cell are key components in the propulsion system for EAC's line of EVs, including electric fork lift trucks, cars and buses.

(EAC RELEASE: 6/10)

Companies Join to Develop Lithium Battery

Kansai Electric Power Company recently announced that it will join with Japan Storage Battery Company to develop a lithium polymer battery for use in EVs. The companies noted that the new battery will feature a porous polymer electrode. Because the companies have already developed a low-output prototype, the two-year project will focus on increasing the safety of the unit and

boosting its output to 60 ampere-hours. Today's lithium batteries provide a high output relative to lead acid and nickel hydrogen batteries. However, the potential batteries require large amounts of electrolyte liquid and are a fire hazard. Project participants will work to reduce the amount of electrolyte used in the lithium batteries by replacing the electrolyte with a porous polymer. To increase the safety of the lithium batteries, the companies will design the batteries to resist leakage.

(NIHON KEIZAI SHIMBUN: 6/2)

Insight Sets Guinness Record in England

Shigeru Miyano, a doctor from Japan, and a crew of 17 drivers, recently broke a seven-year-old Guinness Book of World Records fuel efficiency mark driving a new Honda Insight hybrid EV along the coast of England. The Insight traveled 6,000 kilometers (about 3,726 miles), at a fuel efficiency average of 36.33 kilometers-per-liter (about 102.59 miles-per-gallon). The prior record of 30.4 kilometers-per-liter (about 85.84 miles-per-gallon) was set in 1993 by a Honda Civic, also driven by Miyano. The overall fuel consumption record of 36.48 kilometers-per-liter (103.01 miles-per-gallon) was set by a turbo diesel version of a Daihatsu Charade. Only unmodified, commercially-available vehicles qualify for the Guinness record. The Insight began its voyage from Brighton on June 3, and made stops at 25 checkpoints along the route. Miyano finished the route himself on the afternoon of June 10, 4.5 hours under the 180-hour limit imposed by Guinness. Miyano said his effort to break the overall record was hampered only by unfavorable weather conditions and time lost changing between a total of 18 drivers.

(KYODO: 6/11)

AEAC Completing Phase I Testing on HEV

American Electric Automobile Company, Inc. (AEAC) recently announced that it has entered the final design testing stage for a

hybrid HEV under a joint venture in China. The company said the final steps of the design testing phase of the development cycle include extensive road testing and final design and engineering adjustments. "This vehicle has the potential to satisfy the estimated Chinese requirement for up to 100,000 electric vehicles needed to serve the public transportation market in China," said AEAC chairman Edward Myers. "The proposed immediate use of the present model will be to replace the gas-powered taxi cabs in Beijing." AEAC said its conversion of the vehicle produced by one of China's leading automobile manufacturers has been split into three phases. The first phase, which is being conducted in AEAC's San Diego, CA-based design and engineering center, includes the conversion procedure and the production of one prototype and the road testing of that vehicle. The second phase will be the construction of two prototypes of the HEV in China to serve as the final production models. The last phase of the project includes establishing a production system for production by AEAC Asia, the company's joint venture in China. (AEAC RELEASE: 6/6)

Poll Shows Support for CA ZEV Mandate

A recent survey by the California ZEV Alliance indicates that a majority of Californians support the California Air Resources Board's (CARB) zero-emission vehicle (ZEV) program. Nearly three-quarters of those polled also said they felt CARB's 4% "pure" ZEV requirement was "about right or too low." "The poll's findings prove that communities throughout California want cleaner air and believe the state is on the right track in setting regulatory standards that protect public health," said American Lung Association of California ZEV project manager Ken Smith. "With 33 California counties receiving failing grades for ground-level ozone pollution it is clear that electric vehicles must be part of our air quality solution." Fifty-eight percent of those questioned said the state should maintain its 2003 deadline for implementing ZEV

mandates. According to existing guidelines, the six major auto manufacturers will be required to produce 10% ZEVs in the state beginning in 2003. Four percent must be "pure" ZEVs, while the remaining 6% may run on very clean gasoline or be hybrids that conform to strict emissions guidelines. The poll questioned 600 registered voters between May 20 and 23. (CALIFORNIA ZEV ALLIANCE RELEASE: 5/31)

Minchin Praises aXcess Hybrid Vehicle

The new aXcess australia vehicle was recently lauded by the Minister of Industry, Science and Resources Senator Nick Minchin. He congratulated all those involved in the development of the low emission vehicle. The aXcess australia vehicle was showcased at the Federal Chamber of Automotive Industries annual dinner which featured a video presentation of the aXcess car and a formal address by Deputy Prime Minister John Anderson. Minchin said the launch of the aXcess showed that the government, the scientific community and industry can work together creatively in order to spur new growth opportunities. "This impressive vehicle is a successor to the highly successful aXcess 1 concept car that toured the world demonstrating the excellence of the Australian automotive industry," said Minchin. "I hope the new car will be even more successful than aXcess 1 which has been credited with facilitating more than \$700 million of new business for the Australian automotive industry." The Commonwealth Science and Industry Research Organization (CSIRO) devised the car's hybrid electric drivetrain technology. Radial Pacific design studio developed the design and build of the car, and more than 100 Australian organizations were major participants in the project. (OFFICE OF SENATOR MINCHIN RELEASE: 6/1)

MSRC Surveys EV Owners in CA

California's Mobile Source Air Pollution Reduction Review Committee (MSRC) re-

cently conducted a survey of EV owners which found that 80% of those surveyed are more satisfied with their EV than with their current gasoline-powered vehicle. MSRC said the majority of EV owners interviewed said they are "extremely satisfied" with their EVs, while 70% noted that they use their EVs as their primary vehicle. "We found that EV owners drive their EVs more than they thought they would prior to leasing or buying one and were overall very satisfied with their performance," said MSRC chairman Will Kleindienst. "Three-quarters of those surveyed said they drove their electric vehicles 76% to 100% of the time." According to the survey, 68% of EV owners use their cars for work and school commuting, while 64% use their vehicles for shopping and running errands during the week. More than 90% of EV owners said they drive their EVs on the freeways, and 14% said they drive their EV more than 50 miles a day. MSRC said a total of 294 EV owners responded to the survey, out of a total of 2,300 EVs registered in the state. (MSRC RELEASE: 6/1)

Toyota Looks for New EV Solutions

Toyota recently announced it will participate in a public-private partnership aimed at furthering the development of a transportation system based on EVs that will appeal to the public. The company will join with the University of California-Irvine and research partners at the Irvine University Research Park to collaborate on the Living Power Park Laboratory. The experimental effort is spurred by the fact that, although viable EV technology is available, it has not been embraced by consumers in California. The Living Power Park Laboratory will examine, among other things, the shared use of mini EVs — Toyota's e.com in this case — and the use of a stationary fuel cell in a micro power grid. The effort comes in spite of Toyota's success in marketing EVs. The company says over 1,000 of its battery-powered RAV 4 EVs are being used around the world. However, Toyota's market research indicates the retail market for EVs continues to be negligible. (TOYOTA RELEASE: 5/31)

EAA

CHAPTER LISTING

ARIZONA

PHOENIX EAA

Roy Thompson, President (480) 991-5075
7710 Gainey Ranch Road, #155
Meetings: 4th Saturday/month, 9:00 am
location varies in Phoenix Arizona, Contact Roy Thompson
Homepage: http://geocities.com/phoenix_eaa

CALIFORNIA

NATIONAL EAA HEADQUARTERS

Anna Cornell, Membership Secretary
60 Alan Dr., Pleasant Hill, CA 94523-1902
HomePage at <http://www.eaaev.org/>
Tel. (925) 685-7580

EAST BAY EAA

Scott Cornell, President (925) 685-7580
E-mail: spcorn@pacbell.net -or- ebeaa@juno.com
60 Alan Dr., Pleasant Hill, CA 94523-1902
Meetings: 4th Saturday/month, 10:00am (call for Nov-Dec date)
2701 Monarch St., Hangar 20, Room 215
Alameda Point, Alameda, CA (old Alameda Naval Air Station)
From Hwy 880, take Broadway turnoff to Webster St.; from Webster, go through the tube to Atlantic, right on Atlantic to the old Alameda Naval Air Station
Web: www.geocities.com/MotorCity/1756/

Los Angeles EAA

Saxe Dobrin, President (310) 453-1531
1630A Franklin, Santa Monica, CA 90404
Meetings: 1st Saturday 10:00 am
Cal Tech, Winnet Lounge, Pasadena, CA

NORTH BAY EAA

Chuck Hursch, President (415) 927-1046
13 Skylark Dr. #13, Larkspur, CA 94939-1270
Email: gandhi!chuck@uunet.uu.net
Homepage: www.ecoalliance.com/nbeaa/
Meetings in Santa Rosa, CA: Call (415) 927-1046 for time and exact location.
Web: www.geocities.com/MotorCity/1757/

SAN FRANCISCO/PENINSULA EAA

Jean Bardon, Acting President (650) 355-3060
540 Moana Way, Pacifica, CA 94044
Homepage: www.geocities.com/MotorCity/1759
Meetings: 1st Saturday/month, 10 a.m.
San Bruno Public Library.
701 West Angus St. (at El Camino), San Bruno, CA

SAN JOSE EAA

Michael Thompson, Pres., Contact Person (408) 997-2404
E-mail: m.t.thompson@ieee.org
Mail: Roy Paulson, 1592 Jacob Ave. San Jose, CA 95118 USA
HomePage: <http://members.aol.com/sjeaa> Tel. 408-269-7937
Meetings: 2nd Saturday/month, 10:00 am (call to confirm), Reid Hillview Airport, 2350 Cunningham Ave. San Jose. (Hwy 680, Capital Expressway (South), right onto Cunningham)

SACRAMENTO ELECTRIC VEHICLE ASSOCIATION

Tim Loree, President (916) 962-3044, (916) 568-3100 ex 2833
2428 Wisconsin Dr. Citrus Heights, CA 95610-7432
E-mail: Loreet@2extreme.net
Meetings: Call Tim for new meeting time, place and date
HomePage: www.calweb.com/~tonyc/sevahome.html

SAN DIEGO ELECTRIC VEHICLE ASSOCIATION

Scott C. Kennedy, President, (619) 658-4152
1621 San Elijo Ave., Cardiff, CA 92007
Meetings: 4th Tuesday/month, 7pm (except December)
San Diego Automotive Museum
2080 Pan American Plaza, San Diego, CA.
Enter North-East door and go to the second floor conference room
E-mail: EVASD@WorldNet.ATT.net
Web: <http://home.ATT.net/~EVASD/>

SILICON VALLEY EAA (Founding Chapter)

Will Beckett, Pres., Contact (650) 494-6922, fax (650) 852-8384
4189 Baker Ave, Palo Alto, CA 94306
HomePage at <http://www.evcl.com/ea-sv>
Meetings: 3rd Saturday/month, 10:00-12:00 am
Hewlett-Packard Co., Corporate World Headquarters
lobby A, Auditorium, 3000 Hanover St. Palo Alto, CA 94304
(Page Mill Road and Hanover St.)

COLORADO

DENVER ELECTRIC VEHICLE COUNCIL (DEVIC)

George Gless, President (303) 442-6566
 2940 13th St., Boulder, Co, 80304
 Meetings: 3rd Saturday/month. Contact George for time and location

MASSACHUSETTS

NEW ENGLAND EAA

Tony Ascrizzi, President (508) 799-5977
 34 Paine Street, Worcester, MA 01605
 E-mail: tonyascrizzi@juno.com
 Meetings: Every 2nd Saturday 2:00 p.m. (call for directions)
 HomePage: <http://eaaev.org/neeaa>

PIONEER VALLEY EAA

Karen Jones, President (413) 253-1633
 P.O.Box 153 Amherst, MA 01004
 Meetings: 3rd Saturday/month (Jan.-Nov.), 2pm
 Jones Library (Amherst Rm), Amherst, MA

MISSOURI/KANSAS

MID-AMERICA

Bruce Edgeworth, President (816) 524-4734
 Mike Chancey, Treas., 1700 East 80th St. Kansas City, MO 64131
 E-mail: Mike Chancey evtinker@hotmail.com (816) 822-8079
 HomePage at <http://www.geocities.com/MotorCity/Downs/4214/>
 Meetings: Contact Mike for meeting time and location.

NEVADA

LAS VEGAS EAA

William Kuehl, President (702) 645-2132
 4504 W. Alexander Rd. North Las Vegas, NV 89030
 E-mail: billk@anv.net
 Meetings: call (702) 642-4000 for time and place.

NEW MEXICO

ALBUQUERQUE EAA

Neil Wicai, President (505) 899-7660
 19 Santa Maria, Corrales, NM 87048
 E-mail: neilwicai@upaznm.com Web: www.abqev.org
 Meetings: 1st Tues/month, 7:00 PM
 Shoney's Restaurant, 6810 Menaul NE,
 Albuquerque, NM

NORTH CAROLINA

TRIANGLE EAA

Jon Mauney, President (919) 834-4077
 409 Brooks Ave., Raleigh, NC 27607
 Meetings: 3rd Tuesday of the month, 5:30 PM, location varies
 (Call Jon Mauney for details at 919-834-4077)
 Email teaa@rtpnet.org
 HomePage: www.rtpnet.org/teaa/

SOUTHEASTERN EVA

Lawson Huntly, President (704) 283-1025
 PO Box 1025 Monroe, NC 28111-1025
 Meetings: Call Lawson for date, time and location

TEXAS

HOUSTON EAA

Ken Bancroft, Contact Person, (713) 729-8668
 4301 Kingfisher St., Houston, TX
 Meetings: 3rd Thursday each month 6:30 PM - 8:30 PM
 Citizen Environmental Center, 2nd floor, room 280
 3015 Richmond, Houston, Texas (Take the Southwest Freeway to Kirby, go north to Richmond, turn left, the Center is on the left, three blocks down Richmond)

NORTH TEXAS EAA

Paul Schaffer, President (972)-437-1584
 430 Ridge Crest, Richardson, TX 75080-2532
 Email: pshf@cyberramp.com
 Meetings: 3rd Thursday/mo, see www.engr.tcu.edu/nteea for time and location

UTAH

WEST VALLEY CITY EAA

Harry Van Soolen, President (801) 989-1130
 3622 S. 4840 W., West Valley City, UT 84120
 Meetings: Contact Harry for date, time and location

VIRGINIA

CENTRAL VIRGINIA EAA

Brian Murphy, President, (804) 530-7734
 1902 Riggers Station Dr., Colonial Heights, VA 23834
 Meetings: 3rd Wednesday/month, Richmond Technical Center,
 Westwood Ave., Richmond, VA 23834

WASHINGTON

PORT TOWNSEND / NORTHERN OLYMPIC PENINSULA ELECTRIC CAR CLUB (NOPEC)

Karl Schreiber (360) 385-3532
11 Kanu Dr. Port Townsend, WA 98368
Meetings: 3rd Saturday/month, 10 AM
Port Townsend High School Shop

SEATTLE EVA

Steven S. Lough, President, (206) 524-1351, Fax (206) 526-5348
6021 32nd Ave., N.E., Seattle, WA 98115-7230
Meetings: Contact Steve for time and location
E-Mail: slough@halcyon.com
WWW Site: <http://www.halcyon.com/slough/seva.html>

WASHINGTON DC

ELECTRIC VEHICLE ASSOCIATION OF WASHINGTON DC (EVA/DC)

Dave Goldstein (President) (301) 869-4954
9140 Centerway Road, Gaithersburg, MD 20879-1882
E-mail: goldie.ev1@juno.com
Web at: www.evadc.org
Meetings: 2nd or 3rd Tuesday/month at 7 p.m.
National Institute of Health (NIH) Building 31-C, 6th floor
conference rooms, in Bethesda, MD. (Large white building near
Rockville Pike and Cedar Lane) Call for more information or
directions.

CANADA

VANCOUVER ELECTRIC VEHICLE ASSOCIATION

P.O. Box 3456, 349 W. Georgia St., Vancouver British Columbia,
Canada, V6B 3Y4
Bill Glazier, Contact (604) 980-5819
3344 Baird Rd. North Vancouver, B.C. Canada V7K 2G7
HomePage at <http://www.veva.bc.ca/> E-mail: info@veva.bc.ca
Meetings: 3rd Saturday/month 7:30 p.m., BC Transit Center
Cafeteria. (Located off of Kitchener between Boundary and
Gilmore in Gilmore in Burnaby)

EAA Chapter List

*Chapter contacts and meeting locations. Most verified as of
9/1/99. For information about the Electric Auto Association,
call 1-925-685-7580*

Board of Directors Electric Auto Association

Chair

Scott Cornell
60 Alan Dr., Pleasant Hill, CA 94523-1902
Tel (925) 685-7580,
E-mail: spcorn@pacbell.net -or- ebeaa@Juno.com

Vicechair, CE Editor/Publisher

Kurt Bohan
2701 Monarch Street, Suite 142, Hangar 20
Alameda, CA 94501
Tel. (510) 814-1864 Fax (510) 864-9293
E-mail: eaanews@aol.com

Secretary

Ed Thorpe
2 Smith Court
Alameda, CA 94502
Tel. (510) 864-0662 E-mail: ethorpe@jps.net

Treasurer

Stan Skokan
1020 Parkwood Wy, Redwood City, CA 94061-3691
Tel (650) 366-0643 Fax (650) 306-0137

Board Members

Anna Cornell
60 Alan Dr., Pleasant Hill, CA 94523-1902
Tel (925) 685-7580,
E-mail: ebeaa@juno.com

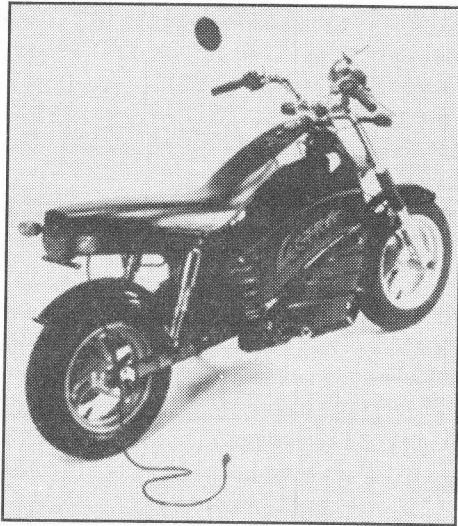
Ed Holsinger
2127 Russell St.
Berkeley, CA 94705
Tel. (510) 849-4973

Jesse James
8460 E. Pepper Tree Lane, Scottsdale, AZ 85251
Tel (480) 607-9053 H, (602) 968-8068 W,
Fax (602) 968 9838 E-mail: sunbeltJJ@AOL.com

Roy Kaylor
20,000 Big Basin Way, Boulder Creek, CA 95006
Tel (831) 338-2200 Fax (831) 458-2400
E-mail: kaylor@access1.net

Bruce Parmenter
331 E.Evelyn, Mtn.View, CA 94041
Tel (650) 694-2392
E-mail: brucedp@yahoo.com
-or-
brucedp@iname.com

- FOR SALE - MEMBER WANT ADS - FOR SALE -



Gray Lectra for sale, 2000 mi. new batteries, quick acceleration, 12-20 mi. range, 45 mph top speed. Large carry box.. Great for errands, only \$3200. (new price \$5000-www.zapworld.com). Test drive-www.evworld.com. (415) 431-8428 Bob Burnside, 360 Castro #5, San Francisco, CA 94114

A Call for Letters to the Editor

Read something in CE you would like to comment on? Do you feel something is being left out? Send us a "Letters to the Editor". You can E-mail us, Fax us or use snail mail at the addresses below:

E-mail: eaanews@aol.com
Fax: 510-864-9293
Snail mail:
EAA/Current Events
2701 Monarch St.
Hanger 20, Suite 142
Alameda, CA 94501

WANTED: Jet Industries Electra Van, dead or alive. Parts car or parts OK. Call Jack Swartz at (408) 872-0725.

For Sale: 1980 Citi-Car/Comuta-Car by Sebring-Vanguard. Body white/white interior, excellent condition. (8) good batteries. Only runs in low + mid-range, needs hi-range contactor or Curtis controller conversion. 1300 original miles. Asking \$2500 as-is or \$4500 after conversion. Come see in Colorado. Call Charlie at (970) 879-5300 days or (970) 879-2408 even.

WANTED: ONE K&W BC-20 CHARGER AND ONE DC-DC CONVETER 108 VDC OR 120 VDC. CALL BRUCE AT (510) 864-9900

1980 Dodge Jet 007 Omni Hatchback Electric Car. 2dr 4 passenger with foldown rear seat. 120 volt with 20 Trojan batteries. 4 speed, PMC Controller, Invicta tires. White with blue interior. All original gauges work for electric indicators. \$3,500.00 (415) 388-0838

MEMBER WANT AD RATES

WANT ADS: Print clearly or submit typed copy of your ad with your name, address, and phone number. The EAA is not responsible for the accuracy of ads. Want ads must be received before the 1st of every even numbered month and must include payment to run in the next issue of CE.

\$10 for the first 35 words. Each additional word, 25 cents. Want ads are available to EAA members for the sale of electric vehicles, equipment and parts only. If you want to run your ad in more than one issue, please specify and include payment for each issue requested.

For corrections or updates, please send a written note or fax to EAA Want Ads at (510) 864-9293. Photographs of your vehicles may be submitted with your ad. If room is available, we run one photo each issue. These photos will not be returned. Send your Member Want Ad request and check payable to:

EAA Want Ads, Hanger 20
2701 Monarch Street, Suite 142
Alameda, California 94501

Electric Auto Association (EAA) Membership Application

New Member: _____
Renewal: _____

USA: _____
Canada: _____
Other Country: _____

Note: EAA membership dues are
tax deductible in the USA
as allowed by the IRS.

Date: ____/____/____

Name: _____
Street: _____
City: _____
State: _____ Zip: _____

Company: _____
Phone: _____ Hm-_____ Wk-_____
Fax: _____
Country: _____

If a new member, where did you hear about the EAA ? _____
EAA Chapter you attend or support: _____
I need chapter information: _____

Membership / Vehicle Information — Please complete if new or changed

Please identify your primary areas of interest relating to EAA
(Please rank your your choice with a "1" being most important, "2" second, etc.)

- 1: _____ Hobby / Builder
- 2: _____ Professional (EVs are a source of income for you)
- 3: _____ Competition (Rallies, Races, and Records)
- 4: _____ Environmental and Government Regulations for EVs
- 5: _____ Social (Rallies, Shows, Dinners, Other)
- 6: _____ New Technology and Research
- 7: _____ Promotion and Public Awareness of EVs
- 8: _____ Student or General Interest
- 9: _____ Electrathon / Bicycle / Off-road Vehicles
- 10: _____ Owner / Driver of Electric Commute Vehicle
- 11: _____ Other: Please Specify: _____

Number of total EVs you have ever owned ? : _____

Number of EVs you now own ? : _____

Please describe any Electric Vehicles you now own or are building: (if more than one, attach information on each)

Vehicle Lic#:	_____	State:	_____	Country:	_____
Vehicle Type:	_____	Make/Model:	_____	Model Year:	_____
Converted Yr:	_____	Number of Wheels:	_____	Motor Type:	_____
Controller type:	_____	Batteries: No./Type:	_____/_____	%Completed	_____
Pack Voltage:	_____	Avg. EV Mi./Week:	_____	Avg. EV Trips/Week:	_____
Other Features:	_____				
Comments:	_____				

Please make your check or money order for appropriate amount (see below), payable to the Electric Auto Association, fasten it to this form and mail it to :

Electric Auto Association
P.O. Box 6661
Concord, CA 94524

USA \$39 /yr (U.S. Dollars only)
Canada \$42 /yr International \$45 /yr

Note: All information and statistics in this application are for the exclusive use of the EAA. We never sell or loan our mailing lists.

ver 8/29/97

EAA Store Order Form

Printed materials

CE	Selected Current EVents (specify specific issue)	\$3.00 each issue
CEFY	Current EVents - Full year (specify specific year)	\$20.00 each year
PB001	Discovered: The Perfect EV Battery	\$2.00
FW001	Flywheel Energy Storage	\$5.00
PV 2000	1998 Preview 2000 by Electrifying Times (Nov./Dec. 98 CE)	\$5.95
BG 1997	1997 Buyer's Guide to Electric Vehicles (April 97 CE)	\$5.00
BG 1996	1996 Buyer's Guide to Electric Vehicles (Feb. 96 CE)	\$4.00
TT001	Team Tucson Land Speed Record Plans	\$5.00
IDX001	EAA Current Events Index - 10 Years!	\$4.00
XA100	EAA XA-100 Hybrid	\$5.00

Other EV items

BS800	Bumper Sticker with 800 number 3.75x15 inch	\$3.00
BS002	Bumper Sticker with "the Switch is On", 3.75x15 inch	\$3.00
CAP001	100% Cotton Cap, Forest Green with Yellow Ink	\$8.00
DC001	Decal - black and red, 3x9 inch, for Window	\$3.50
KC001	Key Chain with LED light and "30 Years 1967-1997"	\$2.50
MUG002	Thermal Mug	\$6.50
MUG003	Porcelain Mug	\$5.50
PS001	Polo Shirt w/ embroidered logo select shirt color & size: Teal Green, Forest Green or Navy (s,m,l,xl)	\$30.00
SS001	Auto Window Sun Shade with Logo	\$8.00
PN001	Ball point writing pen with EAA and 800 number	\$1.00
CS001	Current Solutions/Motor Show Video Tape (14 minute runtime)	\$15.00
WL001	Window Literature Holder (fits pages 8 5 x 11 inch)	\$25.00
PARK01	"EV Parking Only" Sign (18"x12") green icon	\$25.00

Electric Auto Association Store Order Form EAA Store
 Send order to: 5820 Herma St.
 San Jose, CA 95123-3410

Name _____ Phone _____
 Address _____
 City _____ St, _____ Zip _____

Item #	Size/Color	Quantity	Item Description	Unit Cost	Amount

Subtotal	
Postage (10% of subtotal, for USA*)	
Handling	\$2.00
Total	

* for Canada add 15% or for other foreign destination add 25 % for postage

KTA SERVICES INC.

Number 1 EV Supplier over the years

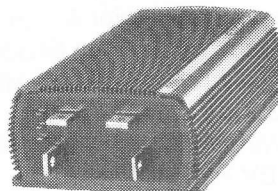
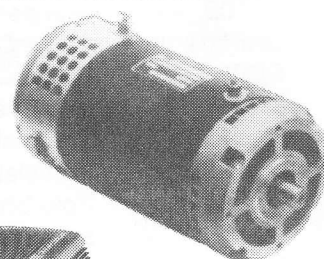
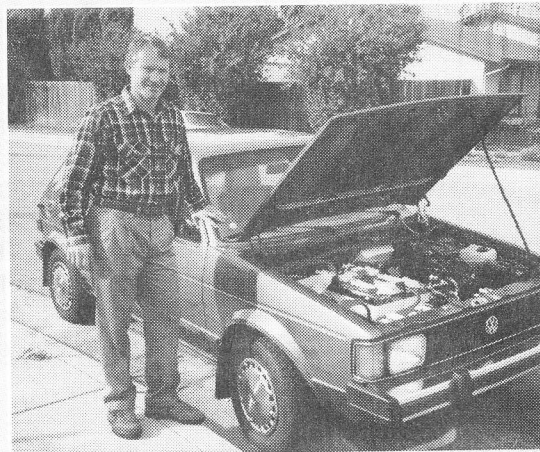
ELECTRIC VEHICLE

Components, Kits, Publications, & Design

Since our beginning in 1984, KTA SERVICES has been dedicated toward supplying the largest variety of safe and reliable components to our EV clients. We provide individual components or complete kits to electrify 2, 3, or 4wheeled vehicles weighing from 200 through 10,000 lbs. total weight.

Our components and tech support have enabled hobbyists and others in 17 countries to create nearly 500 on-road electric cars, pickup trucks, motorcycles, and various racing vehicles. Our technology has found its way into electric powered boats, submarines, aerial trams, golf course mowers, amusement park rides, special effects apparatus for the movie industry, robots, and even a window washing rig. Nobody knows the components or their application better than KTA. All components are new, competitively-priced, and come with full manufacturer's warranties. We stock and sell the largest variety of the very best.

- ◆ ADVANCED DC Motors in 11 variations from 2.0 HP to 28.5 HP
- ◆ CURTIS-PMC Throttle Potboxes & Footpedals
- ◆ CURTIS-PMC Motor Controllers from 24 V/175 A to 144 V/500 A
- ◆ AUBURN SCIENTIFIC Motor Controllers, 72-144 V/600 A to 192 V/700 A
- ◆ ALBRIGHT ENGINEERING Main & Reversing Contactors in 5 models
- ◆ GENERAL ELECTRIC & HEINEMANN Circuit Breakers
- ◆ WESTBERG Automotive Style Gauges in 10 configurations
- ◆ KTA SERVICES Expanded-Scale & Dual-Scale Meters
- ◆ CURTIS INSTRUMENTS Battery Fuel Gauges in 7 models
- ◆ CRUISING EQUIPMENT E-Meters, Prescalers, & DC-DC Converters
- ◆ BUSSMAN Safety Fuses in 4 models from 200 to 800 A
- ◆ DELTEC Meter Shunts in 4 models from 50 to 1000 A
- ◆ SEVCON, TODD, & CURTIS DC-DC Converters from 50 to 200 V input, up to 40 A out
- ◆ K & W ENGINEERING Onboard Battery Chargers and Boosters from 48 to 144 V
- ◆ BYCAN Battery Chargers for 48, 120-132-144 V
- ◆ EVCC Adapter Plates, Couplings, Clamps, Brackets & Motor Mounts
- ◆ Electric Vehicle Heating & Air Conditioning
- ◆ MAGNA Welding Cable Lugs in 3 sizes from #6 to #2/0
- ◆ PRESTOFLEX Welding Cable in 3 sizes from #6 to #210
- ◆ Battery Cable Assembly Tools
- ◆ K & W ENG. TD-100 Tachometer Drive/Rev Limiter
- ◆ 5 Conversion Kits for vehicles from 500 to 5000 lbs. total weight
- ◆ 3 Conversion Kits for Go Karts — up to 90 MPH
- ◆ Complete ELECTRATHON Drive & Instrument. Pkg.
- ◆ The latest in EV publications with a growing lineup of videos
- ◆ Project Consulting/Engineering Design
- ◆ Project Overview with Schematic & Recommendations
- ◆ Computer-Based EV Performance Predictions



*We want to be YOUR #1 source for EV components
For an information-packed 50-page Components &
Publications Catalog, send \$5.00 to:*

KTA Services, Inc.

944 West 21 Street Upland, CA 91784 USA

Tele: (909) 949-7914 Fax: (909) 949-7916

ELECTRIC AUTO ASSOCIATION

P.O. Box 6661, Concord, CA 94524



NON-PROFIT
ORGANIZATION
U.S. POSTAGE
PAID
SUNNYVALE CA
PERMIT NO.
420