Electric Auto Association

CURRENT EVENTS

SEPTEMBER '96 | Promoting the use of electric vehicles since 1967 | VOL 28 No. 9

EAA Helps Hatch Incubator at CALSTART

by Clare Bell

EVs from SF Bay Area EAA members enlivened the CALSTART Project Hatchery open house at Alameda Naval Air Station, Hangar 20 on 6/22/96. EAA members joined representatives of eight small startups in the clean car industry to celebrate the conversion of the 1,842-acre military facility to peacetime civilian use. Renovated with the help of a $2.5 M Federal grant through CALSTART, Hangar 20 now houses a "business incubator" (see sidebar on page 7) for California's clean transportation industry.

After six months, CALSTART's innovative Project Hatchery is two-thirds full and hosts eight advanced transportation companies that have created more than 50 new jobs. Hatchery companies are in various growth stages, from research and development to initial production. Nine new products are in the works, ranging from a lightweight aluminum chassis for electric cars to a next-generation electronic motor controller. Hangar 20 has also already seen the first products built on-site. Complete electric cars broken down into kits for export are being shipped to Asia.

Ideal for Zipping around in EVs

Located on an island with no change in elevation greater than 20 feet, Alameda is ideal for EVs. Open house celebrants took good advantage of the opportunity to play with the EVs. In the amused words of the San Francisco Chronicle, "Dozens of government officials, engineers and curious citizens zipped around the Alameda Naval Air Station airfield yesterday in electric cars."

EAA EVs

Open-house EVs included cars from EAA East Bay and Silicon Valley Chapters. David Coale brought the Bay Area Action MG, Bob Westman displayed his rally-winning Fiat 850 roadster and Bob Schneeveis showed off his Snow White racecar with a "For Sale" tag on it. A welcome sight was the Cornell Ghia, impeccably detailed as always! In the bunny department was Margaret Elizares with a classic '79 VW Rabbit conversion. In the electric trucking section, Otmar Ebbenhoech of Electric Vehicle Components Ltd. with his two-tone S-10.

The opening showcased more than 20 clean electric and natural gas cars and trucks, and electric bikes, as well as a variety of advanced components.

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"We have a hangar full of vibrant activity."

Ralph Appezato, Alameda Mayor

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New EVs such the Zebra (formerly Tropica) may be built at CALSTART'S Project Hatchery. PHOTO CREDIT: RICH HILERMAN

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Greasing the Skids — EV and Kit Financing

by Clare Bell

Most of EAA's cars are built, at least in part, from kits. For the beginner, a basic or bolt-in kit makes the conversion job much easier and for a seasoned converter, a good kit makes assembly and debug go much faster. Safety and reliability are also better with a kit, unless you are, or are employing, an electric vehicle engineer on your project. And the good kits include manuals, so that you don't have to hack your own path through the bewildering jungle.

I built my first car (Lightning Bug) from a basic conversion kit (electric components only, no wiring harnesses, mounts or battery racks/boxes). My red Porsche 914 was based on a deluxe kit with modifications and the black Porsche 914 was the prototype for a new kit.

So, what's the problem with kits. Answer. Money.

Most good kits aren't cheap. The cash outlay is going to be $5K-9K right up front for a good kit. Why? They are specialty items, not mass-market. Motors, controllers are low-volume production items. Racks, boxes and mounts are fabricated by small suppliers in short runs. There is little if no economy of scale. Bolt-in kits, because they are more complete and include tools, are more.

Let's face it. How many people, especially in today's tight economic situation, can pony up that much cash? I've heard it again and again; "Boy I'd love to build that EV, but that price is just too much!"

The Competition - Used Cars

Problem #1. New kits are competing not only with used EVs, but with used gas cars. The argument that a new gas car is now up in the $15-$30 K range doesn't wash. Unless the EV is based on a new or very late-model car, people are reluctant to pay that much. They look at the price of converting a 1970's-era Porsche, 1980's Rabbit, Escort or Datsun and say, hey, I can get a gas one of those for a few hundred or at most a thousand. Why pay new-car prices for what is essentially an old car with electric stuff in it? Even if the car is re-manufactured or restored, they often look askance.

These kinds of questions make EV people squirm. They make ME squirm. But they have to be dealt with.

Auto-matic Loans

Problem #2. People don't buy cars with wheelbarrows full of cash. They finance or lease them. Psychologically it is easier to let the money dribble out in small amounts every month than to give it up in one big lump, even if the net cost is more. The monthly payment plan is American as apple pie and is the foundation of the automotive economy. Scads of low-interest automotive loans drive the car culture. You buy a car, you get a loan. It's so automatic, it's almost a reflex. The skids are greased.

Sand on the Skids

Not so for a pre-owned EV or new kit. There you are outside the mainstream. Yes, there are credit union loans, specialty loans, signature loans, equity loans, etc. However they have higher rates, are harder to get, are issued in lower amounts, involve more paperwork and are generally more of a pain. The skids aren't greased, in fact, they're covered with gritty sand.

The REAL Barrier

This, friends, is the REAL barrier to getting EVS on the road. Not the machinations of the Western States Petroleum Association or the misinformation fed into the media by Ralph Craven or Anita Mangles. There are enough enlightened progressive souls around who can see through that nonsense. They know that there are practical, good-performing Evs and kits out there and would buy one instantly if they had the same zero-down 3 percent financing that they get from Good 'ol Gus' Gilroy Gas-hogs Dealership.

Yes, infrastructure, servicing and support are important. So are the tasks of counteracting the disinformation campaigns against EVs. But the biggest and most invisible barrier is FINANCING. If the skids aren't greased, the EVs aren't going to be out there.

If some individual or bank could put together a financing package for kit-built EVs that is as easy an attractive as ol' Gilroy Gus' zero-down three percent, they would do more for the EV movement than all the paper generated by EAA since 1967.

Enterprising Evelyn's EV Loans

Will we see an Enterprising Evelyn's Economic EVs zero percent down three percent, etc.? Why hasn't it happened so far? What can make it happen?

Problem #3. Loan collateral. As my friend Mike Brown puts it, "How do you repossess a box of parts?". Banks do auto loans because they know they can recover the outlay by repossessing and re-selling the car. But what are they going to do with a half-built EV or parts still in the box? There's no blue-book guide, no assured resale value. Yes, a bank can look up EV prices in want-ads, but they're often all over the map, especially in the low direction. As for the parts, once the new is off, all bets are too. The price drop is probably equivalent to that incurred when driving a new gas car off the lot.

So what can we EV folks do to encourage Enterprising Evelyn.

1. Develop an EV bluebook for vehicles and parts. There are enough conversions now so we have data on resale values. All automotive industries have some sort of used vehicle or used parts price guide. A starting point could be a survey of used EV or kit prices from want-ads in back issues of this very publication.

2. Develop ways and services to handle EV loan situations. Say someone finances an EV conversion, it only gets half-built and the person can't make the

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You Can't Housebreak the Gas-Guzzler Technology Review

Technology Review has come to the aid of the embattled EV movement. In "EVs: Clean Today, Cleaner Tomorrow," (August/ September 1996) Drew Kodjak argues that analyses of the overall environmental effect of EVs versus gasoline cars overlook a critical factor. While EVs and the power plants that recharge their batteries stay clean as they age, gas cars get dirtier.

"Atmospherically Incontinent"

Kodjak describes the aging gasoline fleet as becoming increasingly "atmospherically incontinent" and looks to "gracefully aging EVs" to supplant it.

According to the US EPA, tailpipe pollution grows 25% per 10,000 miles, resulting in vehicles that are 2,5, or even 10 times dirtier than when they left the factory. Due to this steady deterioration in efficiency, a gas car emits over its lifetime, 2X as much NOX as a powerplant generating charge for a comparable EV. Even if the power comes from oil and natural-gas-fired generators, the gas car will still pump out 60X more CO. 30X more volatile organics and 2x as much carbon dioxide as the electric plant.

La Car Electrique - Electric Vehicle Rally.

TECH REVIEW

"The Future of air quality is in the hands (or wallets) of the car-buying public."
In the near term, consumers will have to choose between internal-combustion vehicles that offer the romantic roar of a V8 and 500-mile road trips, and electric vehicles that zoom silently from 0 to 60 and can be recharged overnight in their garage. Over the long term the clean-air payback will become apparent as gracefully aging EVs supplant the elderly, atmospherically incontinent fleet of gasoline cars."
Good work, Tech Review!

Tracking the tailpipes of millions of individually-owned vehicles is an enforcement nightmare. The fact that the largest pollution segment in the Northeast US comes from aging gas vehicles indicates that emissions controls on individual vehicles don't do the job. Even upgrades to state automobile inspection and maintenance systems can achieve only 40% of the VOC reductions needed to comply with new standards.

In addition, public concern about the cost of repairing catalytic converters and other emission control components have delayed these programs. Utilities, however, have engineering teams dedicated to powerplant maintenance and efficient operation.

Environmental Benefits: Evs, Immediate, Gas, Delayed

Technology Review points out another unique benefit of electric vehicles. Every time a powerplant gets new stack emission controls, the entire EV fleet effectively becomes cleaner. Regulators are making electric utilities commit to reducing powerplant NOX emissions by 55-75% over the next 7 years. EVs will reap the environmental advantage of these upgrades. In the Northeast, the projected switch from coal and oil-fired to natural-gas-fired plants in the Northeast can reduce NOX by a factor of 40, making the EV fleet even better. Environmental benefits from stringent new emission standards on gas vehicles are accumulated only incrementally as old cars are junked. Since 95% of the gasoline fleet takes 12-15 years to turn over, realizing environmental gains may take more than a decade.

Efficiency: Evs Up, Gas Down

Overall efficiency of passenger cars has dropped due to the rise of gas-gulping sport utility vehicles. These now account for 40% of new car sales. By contrast, EVs are highly fuel-efficient. GM's EV1 gets the equivalent of 100 miles per gallon.

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Gas Guzzler

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In gas engines, varying RPM for acceleration, deceleration and hill-climbing works against fuel efficiency. Gas engines are often re-started several times daily, wasting more fuel. The generators that charge EVs run at a constant speed., which is often set to maximize efficiency.

Non-tailpipe Toxics

Non-tailpipe emissions, such as evaporation losses during storage and fueling, operation of refineries, tankers and trucks, can be reduced by switching to EVs. Going electric also eliminates driver exposure to toxics present in gasoline, such as benzene and 1,3 butadiene.

Omnivorous EVs

Another environmental payoff is the versatility of EVs, which can tap into renewable energy sources such as solar, wind, geothermal and biomass. Solar charging coupled with battery swaps has been demonstrated as a practical way to recharge from renewables.—CB

Drew Kodjak is attorney for mobile sources at Northeast States for Coordinated Air Use Management (NESCAUM) in Boston, an interstate association of air quality control agencies.

Reference: Drew Kodjak, "EVs: Clean Today, Cleaner Tomorrow", Technology Review, Aug./Sept. 1996.

Thanks to Chip Gribben <futurev@RADIX.NET> who posted the original article on the Internet EV Discussion List on 7/24/96. He commented, "It answers a lot of critics' jabs about how EVs are just transferring emissions to the power plants. Enjoy."

Dangerous Flames

by J. Bryan

Several years ago, a friend of mine was filling his vehicle with flammable fluid (to propel it). When he pulled the filler nozzle from the vehicle's storage tank, a spark from somewhere ignited the propulsion fluid and fumes. Needless to say he was very badly burned, and spent weeks in the hospital receiving skin grafts. My point is that although most of us use EVs for our transportation, we still make occasional use of an ICE vehicle. I have a couple of them myself.

People, please be very careful when refueling these things! One very handy use for my EV is to run for parts to keep the ICEs running :-)

In the over 1 year that I've had my EV in daily use, it has not required a single part or adjustment of any kind. Even though my ICE vehicles sit almost all the time, they still seem to need constant maintenance.

Maybe it's just that I like them in top condition which is important when you consider the large number of parts and systems involved and the related dangers. Having a nuisance free vehicle to depend on is sure great isn't it!—JB

Sat, 20 Jul. 1996 17:05:32 MDT from jbryan@MICRON.COM

Fire and ICEs

General Motors is recalling about 292,860 Pontiacs, Oldsmobiles and Buicks from the 1996 and 1997 model years because of an engine software problem that could result in a fire. Vehicles affected, mostly in the United States, all have the 3800 Series II V6 engines and were built before May 1. The cars are the 1996 Pontiac Bonneville, Oldsmobile 98 and 88, Buick Park Avenue, LeSabre, Riviera and Regal, and some 1997 Buick LeSabres. GM said a faulty engine system sequence can cause a backfire during start-up. That can result in a cracked intake manifold that in some instances could erupt in a fire. There have been no injuries or accidents as a result of the problem. GM is notifying owners by mail, asking them to take the cars to dealerships for an update of the power train control module software. The procedure is expected to take less than an hour.

Knight-Ridder (lafuente@knight-ridder.com)
http://www.cnnfn.com/news/knight_ridder

Incubator

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Quote Notes

Alameda Mayor Ralph Appezzato - "Just a few months ago this hangar was empty and the mood was solemn. Thanks to Calstart we have a hangar full of vibrant activity, full of hope and optimism."

Congressman Ronald Dellums (D-Oakland) "When I stood here just half a year ago, I saw an empty old hanger with a lot of potential. "Now I look around and I'm surrounded by companies, workers and their products. This activity is exciting and exactly what we hoped to encourage in creatively reusing our military facilities. "In this case, creating jobs that also help clean the air." (Dellums recruited CALSTART to Alameda.)

Captain Jim Dodge, Alameda NAS Commanding Officer -"The buzz of the machine shop and the hum of electric motors is replacing the roar of aircraft. This historic transportation veteran, Hanger 20, has quickly retrained itself and is now an integral part of a new era in transportation in a new industry."

Charles Imbrecht, chairman of the California Energy Commission - "This is yet another example of California leadership in the clean transportation industry, in both technologies and new approaches to doing business. By combining private industry's energy and ideas with the public sector's commitment to cleaner air and economic development, we're seeing progress happen at lightning speed."

ZAP Power Systems had at least 7 E-bikes zip-zapping around

Joining the EAA cars were three Viper-lookalike Zebra (formerly Tropica) roadsters from Zebra Motors in Novato, CA. (see sidebar) A hive of 8 Norwegian PIVCO CITI Bee station cars from Green Motorworks buzzed around the scene. (Sybase and Bank of America are leasing them for their employees)

The City of Alameda itself has four US Electricar S-10 trucks and is expecting a fifth.

The Naval pullout at Alameda is scheduled to be complete by next April. CALSTART plans to have the entire 65,000 square feet of Hangar 20 leased by year-end. For entrepreneurs interested in this exciting new industry, Project Hatchery Alameda offers the secure site from which to launch new transportation ideas.

Project Hatchery Alameda was made possible through a private-public partnership that includes the US Departments of Transportation and Defense, the State of California, the City of Alameda, Pacific Gas and Electric Company, Bronson, Bronson and McKinnon, the East Bay Conversion Reinvestment Commission and several other private businesses and public agencies.

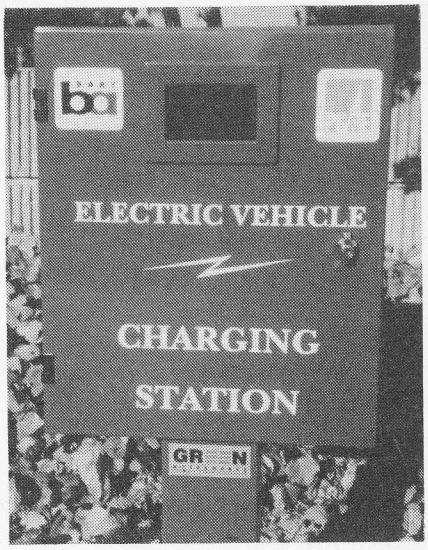
The hatchery was created in cooperation with the US Department of Transportation and the Department of Defense, and is the first civilian reuse project at the base.—CB

Access: CALSTART - Bill Van Amburg/Melanie Savage (510) 864-3000, (818) 565-5600 E-Mail: bva@calstart.orgh5. CALSTART's Internet Web site: http://www.calstart.org

References: CALSTART Press Release, 7/22/96. "Advanced Transportation Industry Flourishes at Reburbished Naval Air Station"

What is a "Business Incubator?"

Business incubators are designed to create synergies by placing small companies in the same industry side by side. Calstart has created a similar site for 25 companies in its hometown of Burbank.



Bob Wing, "Observations at the CALSTART Project Hatchery Alameda CA Official Opening of Hangar 20, July 22, 1996" Internet EV Discussion List post. Email <bobwing@NBN.COM>

Jonathan Marshall, SF Chronicle Economics Editor,"An Electrifying Conversion: Clean transportation startups hatched at Alameda air station" SF Chronicle, p. C1, 7/23/96

Tropica Becomes Zebra

No, the cars haven't acquired stripes like an African equid. The snazzy two-seaters developed by Bob Beaumont are now being made and marketed by Zebra Motors, 35 Leveroni Ct, Novato CA, 94949,415-884-5220.

Zebra co-founder Gary Starr said that the firm may relocate to the Alameda Naval Air Station, but is still considering incentives from other CA cities.

Zebra's eye-catching roadster, which drew the crowds at Alameda, will retail for about $20K in full production. You can't go 400 miles with it, but the miles you do get are packed with fun. Make like a lion and go hunt up a Zebra! —CB

Incubator

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Hatchlings

In addition to CALSTART's Northern California operations, Hangar 20 is home to:

Amerigon in developing climate controlled vehicle seats; electric vehicle component parts including a fiberglass and lightweight electric vehicle chassis and frame. Contact: Dave Gallup, (510) 864-3100.

Green Motor works is an EV maintenance and sales company presently managing the BART PIVCO CITI station car program Contact: Brian Clark, (510) 521-4300.

Jefferson Pro-grammed Power is developing an advanced, integrated regenerative EV motor controller for OEM users. Contact: Lee Ackerson, (510) 865-0672.

ZAP Electric Bikes has two styles of electric-powered bicycles, one of which is specifically designed for law enforcement use Contact: Josh McDonald, (510) 864-3181.

Kaylor Energy Products has developed a low-cost battery charger and an electric vehicle conversion kit. Kaylor also has his "Monster Motor" and handles Kostovs. Contact: Roy Kaylor (408) 338-2200.

Alameda Center for Environmental Technologies is developing a business incubator for environment-oriented small businesses. Contact: Sam Doctors, (510) 263-9874).

Worker to Business Owners Project (EBCRC) ñ is working to support former Bay Area naval base workers in entrepreneur business development.

Contact: Paul Ammon, (510) 864-3152).

CALSTART — a California-based, non-profit consortium of nearly 200 participating companies and organizations — is dedicated to the creation of an advanced transportation technologies industry in California, creating high-quality jobs and cleaning the air. CALSTART programs focus on electric, hybrid electric and natural gas vehicle and component development, Intelligent Transportation Systems (ITS), and the information and support services needed by a new industry.

Green Motorworks leases PIVCO CITI Bees to participants in station car project.

City Bee Electric Prototype

You Want It, You Got It, Toyota (But only in Japan)

Toyota Corporation stated on 6/22/96 that it would start selling its RAV4L EV this September though only in Japan. Toyota hopes for annual sales of 100 vehicles in three regions, Kanto (Tokyo area), Tokai (central Japan) and Kinki (western Japan). Japan has installed 59 EV charging stations to support EVs, mostly in the above three areas. Toyota has already sold 92 of its Town Ace EVs to local Japanese government offices, electric power companies and cooperatives in Japan since its launch in January 1993. The Town Ace, which is powered by a lead-acid battery, is priced at 8 million yen.

The RAV4L with NiMH batteries will go for 4.95 million yen or $46,000. The vehicle is the first to be sold in Japan with NiMH, which has twice the power of the traditional lead-acid batteries in General Motors' EV1, Toyota said.

The newer battery has a range of 215 kilometers (135 miles) and a maximum speed of 125 kilometers per hour (77 mph).

Toyota plans US sales of 320 electric-powered RAV4 sport utility vehicles starting in Fall 1997. The price has not yet been set.—CB

Associated Press, Tel# 415-621-7432 Fax: 415-552-9430, 1390 Market, Suite 318 Fox Plaza, SF, CA 94012 USA. Contact: Steve Elliot for Email Web access for AP. AP-NY-07-22-96 0814EDT

Tech Summary

The RAV4-EV's lightweight and responsive permanent-magnet motor powers the front wheels through a single-speed transaxle. 24 twelve-volt nickel-metal hydride batteries (288 V total) located under the floor fuel this maintenance-free air-cooled motor. The on-board charger uses 220-volt household current. A built-in timer charges conveniently during off-peak hours. A battery ECU (electronic control unit) monitors and controls the charging rate. An EV ECU controls the motor's output in response to acceleration, braking and shifting. Low rolling resistant tires exclusively developed for EVs help the regenerative brake system to convert braking energy into battery energy, increasing the vehicle's single-charge driving range. —CB

Access: Toyota website: http://www.toyota.com/inside.toyota/RA4EV

RAV4L Specs

General

Front motor, front-wheel drive, 4-passenger, 4-door vehicle

Dimensions and Weights

Exterior: Overall length 162.0 in. Overall width 66.7 in. Overall height 63.6 in. Wheelbase 94.9 in. Curb Weight 3,230 lbs.

Interior: Head room 40.3 in./39.0 in. Shoulder room 53.1 in./53.1 in. Hip room 55.9 in./56.0 in. Leg room 39.5 in./33.9 in. Cargo Volume: 31.4 cu. ft. (behind rear seats)

Standard Features

Dual air bag Supplemental Restraint System (SRS)
Fully reclining front and rear seats
Low-energy heat pump-type CFC-free air conditioning
Power windows and door locks available
Deluxe AM/FM stereo with cassette available
Heated seats (driver and front-passenger)
Heated windshield
Rear window defogger and wiper
Dual black outside mirrors
195/80R16 low rolling resistance steel-belted radial tires unique to EV)

Powertrain

Motor: 45-kW @ 2,600-2,800 rpm permanent magnet
Transaxle: single-speed, front-wheel drive

Batteries

Type: Sealed nickel-metal hydride, 24 12-volt units. One 12-volt lead-acid auxiliary battery
Charger: On-board, 220-volt/40-amp with timer and automatic-off functions.
Recharge time: 6-8 hours

Performance

City/highway/combined range: 130/106/118 miles per charge.
Acceleration: 0-60 mph: 17.5 seconds
Top speed: 79 mph (electronically limited)

Suspension

Independent MacPherson strut front/double-wishbone coil-spring rear

Steering/Breaking

Vehicle-speed sensing electro-hydraulic power steering
Power-assisted front disc/rear drum brakes with regenerative function

New EV Driver's First Impressions

by Tom Shay

I completed my do-it myself Ranger pickup conversion in March 1996. Before installing the motor in the truck, I ran it on 12 volts. I tested it a gain after installation and before driving. After installing and connecting everything necessary to run, I put the transmission in gear and set the parking brake. The ammeter headed upscale and the infamous 12231C Curtis controller hum could be heard. Several 60-foot trips up and down the driveway showed that the vehicle worked. I made sure all connections were tight and, for the umpteenth time, checked that no wires appeared pinched or damaged.

It was time to get my wife aboard for the first test drive. It was great! We ran about 6 miles around the neighborhood including some runs up and down hills runs as well as several 0-50's through the gears with the pedal-to-the-metal. The transmission whined a bit more than I would like in 1st, 2nd and 3rd, but was silent in 4th. I loved the quiet running in 4th gear. Several stops during the first drive to look, sniff and touch for signs of overheating found no problems. The controller got only slightly warm and the commutator and brushes radiated a moderate amount of heat. It took me a couple of hours to stop grinning after the ride was over.

Driving an EV takes some getting used to. Old habits die hard. I still twist the key sometimes to "start" the motor. The silence at standstill was disturbing at first and I would wonder if it had died; I missed the reassuring clues that an ICE gives that it's still running. I still forgets ometimes when I get home that I have to start the charger; I can't just shut the EV off and leave it. I shift gears more than I'd expected to. When taking off from a stop in traffic, I start in 1st or 2nd gear (usually 2nd) and floor it until about 30 mph. If I take off leisurely 3rd or 4th, the ICE driver behind will nearly run over me. They seem to wait a few seconds for me get a few feet ahead and then accelerate hard. By the time they realize that I'm starting off slowly, they are almost on top of me and closing fast. Then these clowns will stay glued to my back bumper until 30 mph. So, I take off smartly every time..

The lack of engine braking is both a blessing and a curse. I like being able to cut the power and coast. Half-way along my usual route home , there is a section where I coast downhill to build up speed. I don't like h aving to brake harder to compensate for the lack of engine compression wh en going down hills. It's a little worrisome knowing that only the brake s can slow the car. It is reassuring to have the parking brake, which is strong enough to slide the rear wheels when I tromp on it hard. I plan t o do frequent brake inspections and maintenance. I do descend hills slowe r than in my ICE rigs to save the brakes. However, I don't think the prob lem is serious enough to justify the hassles and expense of regenerative braking.

Range between charges isn't a problem for me. Most of my trips are under 20 miles and some are under 7. I haven't yet found the ultimate range by driving the EV until it stops. I have noticed some weakening of the batt eries after 30 or so miles and guess that it would go over 40 miles befor e dropping dead. All my trips are fairly hard miles with hills and stops in traffic.

It is tedious getting used to a manual transmission again After years of owning cars and trucks with automatic transmissions it is tedious getting used to a manual again. I learned to drive with manual transmissions when Harry S. Truman was president and spurned automatics until the 70's. I haven't owned and regularly driven a manual transmission since about 1984. I remember how to use it and still enjoy shifting gears. What isn't easy and never was, is operating four pedals with two feet and keeping the vehicle from rolling backwards when starting uphill. It's not so bad with electric power because you don't need the clutch on takeoff and the left foot can hold the brake. Power steering is another luxury I miss on this EV. In certain parking situations it helps to be able to steer quickly and easily. I'm also inclined to hold a cup of coffee, a soda or a water bottle in one hand and can't do any hard steering without putting it

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1st Impressions

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I have the Curtis 1231C controller, which is notorious for its low-speed whine. It's not a major pain in the <bleep> for me. The noise stops as soon as the motor gets up a little speed. It does annoy me when I'm backinguphillout of my driveway. I'm not going fast enough, so the whine continues all the way to the street. The sound is reassuring when I first step on the throttle, because it tells me that, yes, this horseless carriage is raring to go. It also warns me if I'm resting my foot on the throttle at a standstill. It probably warns people walking behind the truck when I start backing up.

I didn't expect and haven't had strangers ask me about my EV, but I don't have any EV graphics on the truck. I do notice an occasional puzzled look in parking lots from people who probably have noticed the unusual sound or lack of it. I hope they also notice the missing stink from a tailpipe 2E Most people are preoccupied and oblivious to what's going on around them. I suspect that I could lay a corpse across the hood and 50% of them wouldn't notice. I still enjoy driving vehicles with infernal combustion engines. Owning a n EV probably won't change that. There's nothing quite like the thrill of feeling a hearty V8 or a high revving 4 doing its thing; it's probably the same thrill that people once got from strong and fast horses. And it's wonderful to be able to refill the "tank" in a few minutes instead of hours when necessary and be able to drive until I'm too tired to go on. After driving my EV for a while it's a refreshing chance to drive an ICE. Owning an EV probably will make me appreciate my ICEmobiles more, not less.

All things considered, I do enjoy my EV, I'm glad to have an EV and will almost certainly have one as long I continue to drive.—TS

(Adapted from Tom's Fri, 2 Aug. 1996 22:06:59 -0700 post on the EV Discussion List, with his permission. Thanks for sharing it with CE's readers. Those of us in EAA who have been driving electric for a while can forget how it feels to a first-timer).

Nissan EV Uses Lithium-Ion

Innovative Sony Lithium ion batteries greatly enhance the Nissan FEV-II and put EVs much closer to general marketability, says Dennis Siamantis of Road and Track Magazine. According to R&T, initial applications of Sony's lithium-ion technology, first announced in 1990, have been camcorders, and personal computers, but Sony plans to continue R&D in cooperation with automakers.

Advantages of Li-ion include high energy density, high power density and long life. For instance, its energy density of 100 Whr/kg equals that of sodium-sulfur, but doesn't need the latter's extremely high (600 deg. F) operating temperatures. Energy densities of conventional lead-acid batteries are 40 Whr/kg; nickel-metal-hydride, 75 Whr/kg.

- Energy density determines an EV's range. Sony estimates that a lithium-ion EV could get 125 miles versus a nickel-EV counterpart's 65-87 miles and a lead-acid EV's 44.
- Power density determines acceleration and hill-climbing capability. At 300 W/kg, lithium-ion's power density is 1.5X to 2X better than competing technologies.
- Lithium-ion battery life is 1200 discharge cycles, 2X better than others. Li Batteries tolerate temperatures from-4 to 140 degrees F. They can also be quick-charged.
- FEV-II is the second generation of Nissan's EV development. (For the first one, see "Technology Update: Electric Vehicles," in Road&Track, May 1992.).
- FEV-II has an AC induction motor rated at 55 kW (74 hp). A 346-volt battery pack of 12 modules resides beneath the floor. Each module uses 8 lithium-ion cells connected in series to deliver 28.8 volts. The battery pack's weight is 767 lb.
- The FEV-II's total weight is 3120 lb. With its 98.0-in. wheelbase and 160.1-in. overall length, the FE-II is larger than photos of it suggest. However, it remains essentially a 2-seat city commuter with a tiny back seat.

Reference: Adapted from a Road and Track Online Column transmitted: 96-05-07 22:01:37 EDT By Dennis Simanaitis

US PO Releases Electric Vehicle Stamp

New York City, 12/7/95 — At a time when the US Postal Service is evaluating electric vehicles (EVs) in its fleets, it has released a new stamp depicting one of the first EVs, reports the Fort Lauderdale Sun-Sentinel. The 1898 Columbia was built by what later became the Columbia Automobile Co., which produced 2,000 electric cars for use as taxis in large cities.

A Columbia subsidiary, Electric Vehicle Company (EVC), held the patent and rights to the gasoline-powered engine and collected royalties from other automakers. At the turn of the century, there were more EVs on the road than gasoline-powered vehicles. In 1901, a Texas oil discovery brought the cost of oil below $5 per barrel and led to reduced interest in EVs. In 1911, EVC lost a lawsuit that sought payment for unpaid royalties from Ford and other automakers.

(from the Internet Electric Vehicle Discussion List - original source unknown)

Stanford Concours de Elegance

by Bruce (EVangel) Parmenter, San Jose EAA Chapter

Preparations for this June 23 EVent went well, as most of the attendees had been before (Stanford University, Palo Alto, Sunday, 9AM-5PM). I arrived early, 7:30AM, to coordinate the arriving EVs (I wanted to strike a balance of visibility and diversity of all the EVs on display.)

The JLS Jr. High School Solar Ebike team, and Will Beckett were the first to show. Will had already given me a heads up that he was going to use his new toy (a digital camera) at the EVent (and maybe even get real 'Techy' and upload some files, and a POST for the EVL to see via a wireless pc - cool!).

Some more EVs arrived, but we were notified that attendees were directed to use a different entrance than I had been told (sometimes these things happen). Will and I headed over to sign in (you have to sign a waiver form at these EVents), pick up our ribbons and other goodies.

Will started a running joke when it came to filling out the form. When it came to ask how many cylinders your vehicle had, we put "NONE". Everyone thought that was a kick, as the rest of the EV group came in after waiting in line to get their EV in.

Though I was told we were going to be relocated the night before, we were in the same location as last year (which wasn't that bad, we were near the food/drink stand, and everyone already knew the location).

When the show started, we had quite a nice spread of EVs:

David Coale with the Bay Area Action (BAA) MG Midget and EAA representation from:

Will started a running joke when it came to filling out the form. When it came to ask how many cylinders your vehicle had, we put "NONE".

San Francisco Chapter — Mike Slominski of Mike's Auto Care (EV converter, ZAP Dealer),

Silicon Valley Chapter — Will Beckett's 92 S-10 Blazer; Rich Hilleman with his Mendo Motive 55' Porsche Spyder (Nice!); Herman Gyr's Solar Electric Escort sedan (driven by Bob Amsley, SJ EAA),

San Jose Chapter: my 85' S-10 Blazer, EAA Board member Stan Skokan with his postal van from Electric Vehicles Inc. (broker of used EVs for San Francisco area residents only)

The "Zebra" EV (Formally known as the Tropica). Rep, Don Bright was on hand for inquiries) That is one sweet, sexy EV!

The morning was hot with no breeze, but that cooled off toward the end (nothing like last year's 100+ scorcher!). With plenty of water runs and breaks for lunch, we held up pretty good for all the public response and inquiries.

There were a few people who were into performance before they would consider an EV a 'real' car, but once they realized that it was possible to get a performance EV, then they settled down to reality, and talked turkey about their real needs, namely, how Fast, how far, how many passengers, what was their price range, and were they going to climb any hills and/or carry any cargo. Many individuals found that a 50mi, 65mph, light GTI Golf type of sedan would suit their daily work/school commute needs just fine, and at a lower cost than the new EVs coming.

A few already knew this and were way ahead of the 'de-programming' or 'de-bunking' game that they had heard/read/seen from the media. This allowed these people to get in quick contact with the EV information we had, and let them explore their EV options.

One person had heard the 'Dr.' on a local talk (complain) KGO radio station and had decided to try to prove him right (that these EVs are no better off than a gas car), by using the wrong facts/prices/figures. (There will always be this type with a "damn I'm right even though all I know is from the media" attitude. You just have to agree to disagree).

Some folks who'd rather wait until the new EVs came out, said, "Well, they're coming along. They are the future". I left them with "Well, it is your future, but not mine. I have been driving Electric for 4 years (smiling trying not to sound too much like a wise guy). I either got an ending nod or a smirk.

Some EAA networking occurred, where members encouraged EAA to bring publicity and visibility to EVs via local PSA (public service announcements). (Oh my Gad, Bruce is gone do a commercial).

After seeing many of the public with a nice water bottle from Comercia Bank, I borrowed Mike's ZAP Ebike and Ecruised the crowds over to their booth.

continued on next page

Stanford

continued from previous page

Alas, I had gotten there too late, yet they were nice enough to offer me one I could pick up later back at their office. This would be a payback to Commercia, as they were nice enough to allow me to use their outlets for both the Little Basin EVents I did. When people noticed the logo on the bottle, it would be cool to be able to say "Well, see, this company is like most quite gracious in allowing me to have access to their outlet while I am in Saratoga.

At the end, we departed with a really good feeling that many folks got their connection for EV information, and now had options to explore.

I will end with how to contact those EV Businesses that attended:

Zebra Motors, Inc. (Email and Web site coming)
Tel# 415-884-5220, Fax# 415-884-5228
35 Leveroni Ct., Novato, CA 94949 USA

Product: The model "Z" version of the Tropica (image to be scanned and made available to the EVL, later in another POST).

Mike's Auto Care
Mike Slominski (evdriver@aol.com)
Tel# 415-343-8801, Fax# 415-343-4131
951 S. Claremont St., San Mateo, CA 94402 USA
Product: EV Conversions: VW Rabbits/Trucks, ZAP and Auburn Controller Dealer +

Electric Vehicles, Inc. (!San Francisco Bay Area residents Only!) Stan Skokan Tel# 415-964-3974
Fax# 415-306-0137
Product: Broker of good clean used EVs for SF Bay area locals.

Bay Area Action,
http://www.impactonline.org/baa/ev_project/

David Coale (dcoale@wdl.loral.com)

As posted on the Internet Electric Vehicle Discussion List Mon, 24 Jun 1996 01:43:44 -0400 by Bruce {EVangel} Parmenter <BruceDP@AOL.COM> 120V '85 S-10 Blazer, EV List Newz Editor, EAA San Jose Chapter EVents officer (http://members.aol.com/sjeaa/

EVs in the Media

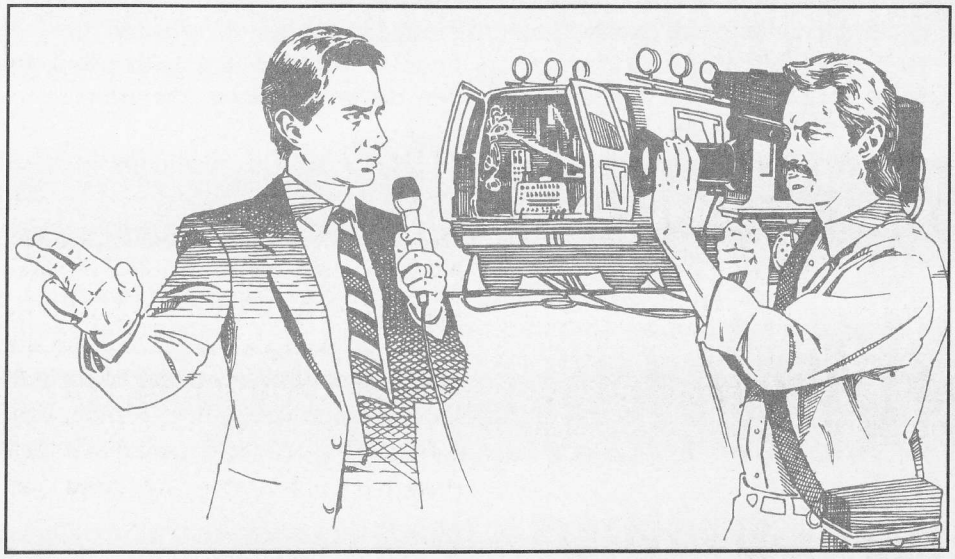
Old Cars Weekly for the week of 6/19/96 ran a nice piece on p. 11 about the EV history and current status. Mary Ann Chapman comments "Not exactly up to date, but then not negative, either."

High praise for the GM EV1 comes from an unexpected source. AutoWeek for April 29, 1996 had the following squib posted on its "Car Board" (p.12) "...our recent spin in EV1 gave us a charge. It's a two-seat horizontal elevator that get to 60 mph in 8.5 sec, and takes curves well in eerie silence, until you get the 50 psi tires to squeal."

AutoWeek also brings us news that Americans are cuddling up to the Swatch car. US customer clinics revealed definite affection for the Smart city car, made by Micro Compact Car, a joint venture between Swatch and Mercedes-Benz. It isn't the cheap running costs or high fuel economy. "Americans see the Swatch more as a "fun fashion and lifestyle statement." Could the Swatch have the same pettable appeal as the Volksie bug or the Chrysler ("Hi!") Neon. The Smart will be available in an electric version using lithium batteries. (AutoWeek, May 13, 1996, p.4)

A partially electric future is envisioned by the Economist Magazine (June 22-28, 1996). In their 20-page special section "Living with the car", are 4 pages on EVs. Headers such as "Don't be fooled by improvements in car pollution. Things will soon get worse again", "the hidden costs", and "Putting economics behind the wheel" indicate a hard-hitting approach. It also has great statistics on emissions and claims that the world has 500 million cars now and will have 1 billion by 2030, along with another 500 million trucks and motorcycles. With a huge international circulation, the Economist is widely read and respected. The piece will probably be much-cited. To quote Internet EV Discussion List poster Fred Whittridge, "It's nice to see an international publication of their stature BEGINNING to get the message."

Road and Track Magazine's August issue has a positive ONE PAGE article (p. 53) and road test on the new Honda EV. The engineering editor zipped 45 miles up and down and around Palos Verdes. He indicated that R and T want to make the Honda EV their long term (1 year) test car. "We are making progress," commented Internet poster Bill Yerkes.



Editorial

continuedf from page 3

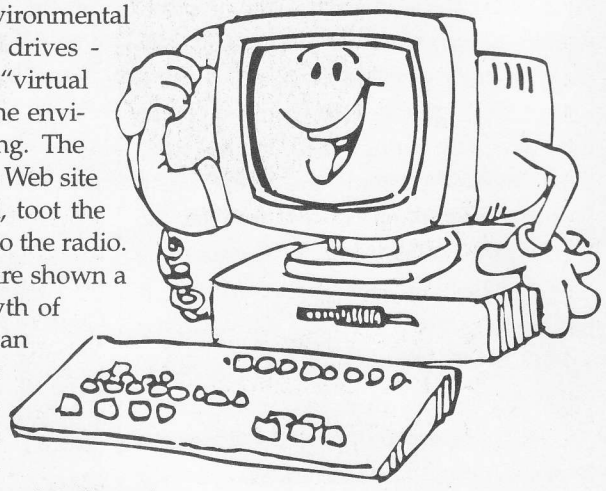
payments. If there was a service that would come in, finish the EV and put it on the market to recover the lender's cost, then financial institutions might be more willing to move into this market. If the EV was just a box of parts, the service would take the parts, do the conversion, sell it and get back the bank's money, hopefully. Even if lenders KNEW there was such a service available, that would ease their minds. Even though I don't like them, auto repo and resale services are part of what makes auto loans common and cheap. (Hopefully the EV equivalent could be done in a kinder and less sleazy manner!)

3. Look at other industries based on kits. How do people finance kit-built aircraft? Replicars? How does Green Motorworks, for instance, arrange financing on its vehicles?. How were the first gasoline cars financed? How did the auto loan industry develop? Some research on that might reveal enlightening information.

I wonder if EV financing is an area where some of the big consortia, such as CALSTART, might be able to make a contribution. They seem to have the pull with the big-money boys. As far as the EV bluebook, it's going to have to start here with good old EAA. Maybe I'll try to get the ball rolling with an article surveying new/used Evs and kit prices. Anyone want to author or contribute?

And if there is an Enterprising Evelyn or Ed out there who either knows more than I do or who is trying to set up inexpensive loans for kit or used EVs, speak up! —CB

Internet Test-Drives of 'Virtual Car'



Great Britain - An environmental group is offering test drives - via the Internet - of a "virtual car" that allows users to see the environmental impacts of motoring. The Friends of the Earth interactive Web site allows one to sit at the wheel, toot the horn, open the trunk or listen to the radio. Not only that, virtual drivers are shown a range of effects from the growth of pollution-caused asthma to an increase in "road rage." Once convinced of the environmental effects of driving, virtual drivers are then given information of the organization's proposed traffic-reduction legislation - and invited to make an on-line pledge to leave their "real" cars home two days a week. The Web site also features a kid's page for budding environmentalists titled: "Fuming Mad."

The site address is http://www.foe.co.uk/car/index.html

Source: CALSTART (feedback@calstart.org) http://www.calstart.org/ Tel# 818-565-5655, Fax# 818-565-5610

Pikes Peak Results

COLORADO SPRINGS, Colo. (AP)

Results

Thursday in the Chevrolet Pikes Peak International Hill Climb, with finishing position, driver, hometown, car and time:

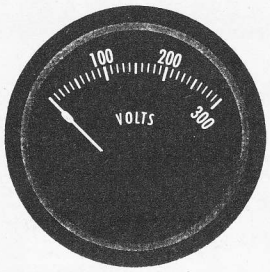
Electric

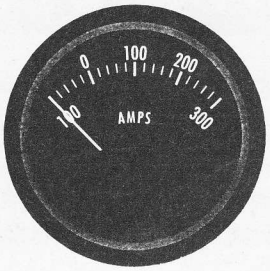
1, Ted Jones, Phoenix, Electric Pontiac, 24:00.42 (only competitor in class)

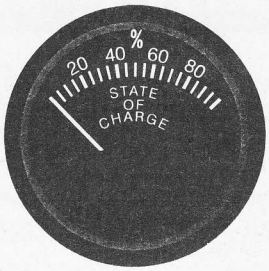
Associated Press, Tel# 415-621-7432 Fax: 415-552-9430. 1390 Market, Suite 318 Fox Plaza, SF, CA 94012 USA

Contact: Steve Elliot for Email Web access for AP

Electric Vehicle Instruments







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Desert Lightning Information: *http://www.primenet.com/~ecoelec/convnew.html*

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E mail info@kaylor-kit.com

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The Only Car for the Women of Refinement Today - and Why NEVER again will the women of fashion, driving alone in her electric, have to sit in the front seat like a chauffeur, uncomfortably conspicuous.

The beautiful Ohio Electric, with a double drive from both front and rear seat, makes it possible to drive with a clear view ahead and in privacy at all times.

No other manufacturer can offer this double drive, for we hold basic patents. And this feature has already made the old-fashioned single-drive electric entirely out of date.

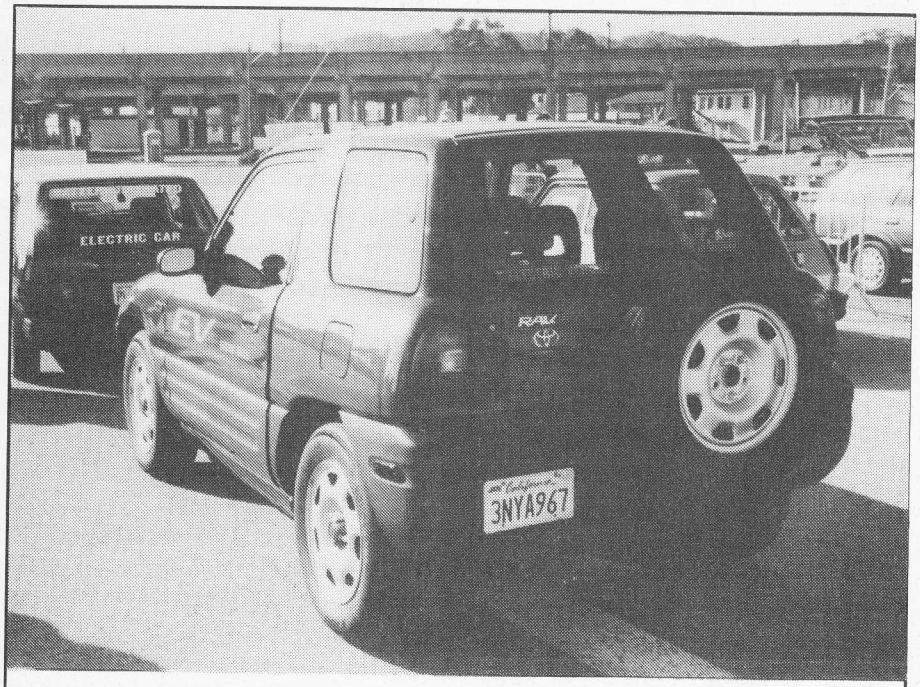
In beauty of line, in luxury of fittings, the Ohio Electric holds a distinctive place. It is of Viennese inspiration; and Vienna, among European capitals, is pre-eminently the home of good taste. Its women are the best gowned, its edifices the most artistic, its equipages the most superb; and pervading all is the atmosphere of a medieval court, with its centuries of dignity and breeding.

The traditions of Viennese equipage-makers, with generations of royal coach-building behind them, are embodied in this exquisite car.

There are Ohio showrooms in practically all large centers. Write for an artistic catalog describing the many exclusive features of the Ohio - features that no other electric can offer.

The Ohio Electric Car Company, Toledo, Ohio, 1503 West Bancroft Street

(Thanks to John Wayland) From: john Wayland <Datsun1200@AOL.COM>



RAV4L at SF BearRally (Mike Slominski's VW Rabbit in bacground.)

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News in Brief

News in Brief is compiled by Ruth M. Shipley from information supplied by Environmental Information Networks. If reprinted, please credit CE and Ruth Shipley.

South Boston to House EV Plant

Boston Electric Vehicle Corp. (BEVC) will begin producing EVs this summer in a 65,000 square-foot facility in the South Boston Marine Industrial Park. BEVC was created by South Boston Community Housing, Inc. and the city of Boston as part of an economic development program to create jobs for Boston residents and promote the use of EVs. BEVC will operate the South Boston Edison Vehicle Manufacturing facility, which will house a cluster of for-profit ventures that will produce, sell, distribute and service a wide range of EVs and components.

Solectria Corp. is scheduled to move some of its development activities, including those related to the Sunrise, to the facility. For more information, contact Mike Monahan with Boston Edison at 617-424-2460.

(BUSINESS WIRE: 6/27)

EV Crash Test Video on Internet

To counter a recent TV report showing EV batteries exploding on impact, Battery Automated Transportation, Inc. (BAT) has uploaded its own crash test video to the Internet. The video reportedly shows a textbook safe crash test result at 30 mph into a fixed barrier. All of the crash test data were well below the allowable limits. A majority of the critical data were less than 50 percent of the allowable limits, with some of the readings as low as 15 percent of the allowable forces, according to BAT. The vehicle did not drip electrolyte even when subjected to a rollover. The BAT video clip is presented in a new video format called view.topia. Once downloaded, it plays itself and does not require any additional hardware or software. To view the video, visit BAT's Internet site at www.best-web.com/bat.

(PRNEWSWIRE: 6/28)

Seattle Co. Sells Affordable Two-Seater

Seattle, WA-based Eco Motion Electric Cars now offers the ION-1 Sports Electric vehicle, the company's flagship "48 kilowatt" car for just under $13,000. The two-seater weighs 2,720 pounds, is capable of speeds as high as 70 mph, and has a "freeway speed" range of 45 plus miles and a "boulevard speed" range of 80 plus miles. Eco Motion estimates that the yearly cost to charge the vehicle is approximately $225 in Seattle, which is based on the average Seattle commuter traveling 25 miles each day at a cost of 2.5 cents per kilowatt. The ION-1 comes with a limited 5-year warranty on the motor and controller. The vehicle is available for $12,995, and an accompanying video is available for $20. Contact Eco Motion Electric Cars at 206-524-1351.

(EIN STAFF: 7/8)

BMW Unveils Concept Fuel Cell Vehicle

BMW has unveiled its "initial basic study" for a fuel cell-powered passenger car. The compact Series-3 model baseline passenger car would incorporate a 30 kW Siemens proton exchange membrane fuel cell. If BMW decides to go ahead with the project, the fuel cell-powered car could be ready by 1998. Unlike Daimler-Benz, which uses methanol as its hydrogen carrier of choice, BMW said it will employ cryogenic liquid hydrogen for fuel, reportedly gaining an extraordinary range of 1,000 km (625 miles) in the process. A liquid hydrogen tank would be installed in the back seat area, ahead of the rear axle. The electric traction motor would be part of the rear axle system, while the fuel stack and air compressor would be under the engine hood.

(HYDROGEN & FUEL CELL LETTER: 7/96)

Hydrogen Fuel Cells Have Advantages

The next major automotive advance will take the form of a hydrogen fuel-cell model vehicle, a vehicle that is cleaner, cheaper, safer and lighter in weight than gasoline and battery-powered cars, according to Rocky Mountain Institute's (RMI's) Amory Lovins. RMI and about 12 industry participants, two-thirds of them in the automobile manufacturing business, recently concluded a $10,000-per-head multi-client proprietary strategic study to begin to develop an inexpensive hybrid-electric hypercar. A hybrid car using a proton exchange membrane fuel cell could convert hydrogen into traction nearly 3 to 4 times as efficiently as today's cars convert gasoline into traction, getting the equivalent of 150-300 miles per gallon.

(GREEN CAR JOURNAL: JULY 1996)

Saturn Dealers Receive EV1 Orders

About 80 people have registered with two Arizona Saturn dealerships, one in Glendale and one in Tempe, to buy an EV1 as soon as one is available. It is still not clear whether the cars will be sold or leased, and the cars will most likely be ordered from the factory rather than sold off the lot. The car is expected to cost $35,000 but state tax credits could reduce the figure slightly.

Arizona Public Service will install 10 public recharging sites by Aug. 1 and 15 additional sites by the end of the year. The Salt River Project (SRP), which is also planning a network of recharging stations, expects the cost of the vehicles to drop as the field becomes more competitive. A price of $20,000 to $25,000 would be the most attractive to potential buyers, according to focus group studies.

(ARIZONA REPUBLIC/PHOENIX GAZETTE: 7/11)

BAT Will Produce Zinc Air Battery

A new zinc air battery for EVs will be commercialized by BAT International and Kummerow, NA under a recently signed joint venture agreement. Because of its long range between refueling — up to 4 times as long as a lead-acid battery — the zinc air battery is ideal for fleet vehicles. The battery has an energy density 50% greater than NiMH batteries, resulting in a usable range of 200 to 300 miles. BAT hopes to start production in the next year. The estimated capital cost in volume production for the battery is only $100/kwh, making it the only battery that is likely to meet the US Advanced Battery Consortium long-term commercialization goal of $150/kwh for EV batteries. BAT has acquired exclusive manufacturing and distribution rights to the battery in the US, with options in other countries.
(BAT RELEASE: 7/15)

Saft Develops Advanced Li Batteries

Valdosta, GA-based Saft America, Inc., is one of the leaders in the field of battery production for electric and hybrid vehicles. The Saft advanced NiCad batteries are being tested in station cars in San Francisco and transit buses in Santa Monica, CA, as well as in the Hawaiian Demonstration Project. At present, the company is busy pursuing the development of NiMH and lithium-ion batteries, which would offer increased range to EVs. In the last 4 years, Saft has used $36 million in funding from the United States Advanced Battery Consortium (USABC) for battery research, and the company is developing lithium-ion technology under a USABC/DOE contract for the Partnership for a New Generation of Vehicles program.
(CALSTART CONNECTION: MAY /JUNE 1996)

EVermont Project Recognized by Edison Electric

Edison Electric Institute (EEI) has awarded a "special distinction" honor to Green Mountain Power for its efforts on behalf of the EVermont EV engineering and demonstration project. The purpose of EVermont is to demonstrate overall EV performance, particularly in a cold, rural environment. In addition to introducing EVs to schools and businesses, the project has developed techniques to improve EV performance during winter months. The project's vehicles have even set performance records at the American Tour de Sol rally. With 30 current partners and more partnerships on the way, EVermont's partners will extend to companies and state agencies in New York, Maine, New Hampshire and Massachusetts.
(EEI RELEASE: 7/16)

Portland Shoppers Recharge for Free

Shoppers in downtown Portland, OR, will now be able to charge their EVs for free while they shop, dine or attend events. Two charging stations have been installed in city-owned, Smart Park garages as part of the city's Clean Cities activities. The city is providing the electricity to recharge EVs free of cost.
"We are supportive of this and other efforts to enhance the region's air quality while offering an additional clean transportation option to Portland residents,"said Portland City Commissioner Charlie Hales, who drove an EV that had been loaned to the city by Portland General Electric. Hales also parked at one of the garages and demonstrated how the charging system works. Clean Cities is a national program to encourage the availability and use of alternative fuels for government and private fleets.
(CITY OF PORTLAND RELEASE: 7/18)

GM Expects to Lose Money on EV1

Since General Motors (GM) introduced the Impact over 6 years ago, the company has spent an estimated $350 million developing the car. Although this amount seems minimal compared to the $2 billion the automobile industry spends introducing a new gas-powered car or truck, GM expects to lose money when it begins leasing the EV1 at 25 Saturn dealerships in Arizona and Southern California. According to GM, it costs a little less than $100,000 to build each EV1, but the suggested retail price of the vehicle will be about $30,000. After state and federal rebates and energy tax credits, the monthly lease payment could be based on a transaction price of about $28,000, according to Robert Purcell, executive director of GM Advanced Technology Vehicles.
(TRIBUNE BUSINESS NEWS: 7/11)

EVent Calendar

Welcome to the EAA Calendar. It lists events of direct or related interest to EV enthusiasts and alternative transportation businesses.

Sept. 5-8

Yankee Electrics - Stafford Springs, CT. ABB University Spec Series, High School Challenge Series. Location: Stafford Motor Speedway. Contact Electric Vehicle Technology Competitions, Ltd. (EVTC) in Phoenix, AZ, tel. (602) 256-2599, fax (602) 256-2606 or EVTC in Ohio at tel. (419) 433-8561, fax (419) 433-6891.

Sept. 16-18

NESEA Sustainable Transportation and S/EV96 Symposium and Expo, New York, NY. The 8th annual NESEA symposium and expo at Madison Square Garden will bring together a broad coalition of transportation planners, EV and HEV industry representatives, business people, policymakers, engineers, students and concerned citizens to foster the growth of the EV industry, and development of a sustainable transportation vision for the nation. Concurrently held sessions, and an extensive trade show have made the event the major electric vehicle conference in the United States. Contact: Northeast Sustainable Energy Association, 50 Miles St., Greenfield, MA 01301, tel 413-774-6051, fax 413-774-6053.

Sept. 17-19

Fuel Cells in Transportation - Business Opportunities, Chicago, IL. This conference will address the business and market elements needed to effectively align fuel cell technology with the goals of the automotive industry. Contact: Melanie Briggs, tel. 207-781-9800

Sept. 20-26

Bejing '96 International EV Exhibition. Symposium, trade talks, technology exchanges and exhibits. Sponsored by the Chinese Society of Environmental Science and the Chinese Electrotechnical Society Electric Vehicle Institute. Contact: Jian Lai, President, Chinese Electrotechnical Society Electric Vehicle Institute, tel 86-10-50-13-779.

Sept. 21

SunDay Challenge, Cocoa, Florida. Alternative energy car racers — here's your chance to shine. The Florida Solar Energy Center is calling for the fifth annual SunDay Challenge, a 70-mile rally along public roadways from Cocoa to Orlando. SunDay Challenge provides alternative racers the opportunity, through this national race, to showcase the technology and designs they have used to develop their innovative vehicles. Alternative racers wishing to participate in the SunDay Challenge road rally must complete an entry form from FSEC and return it by Sept. 6, 1996. For information about this event, please contact Bill Young at (407) 638-1458.

Sept. 21

Silicon Valley Chapter EAA Annual Rally - 9 am to 4 pm. SV EAA's 24th Annual Rally will be held at Stanford University (CA). Many electric vehicle manufacturers will be attending. Just to name a few: BAT, ZAP, US Electricar, and Pacific Electric Vehicles. The rally will be for distance based on the number of laps around a 1.5 mile loop. Drivers will pick up riders on each lap. There will also be awards for Best looking, Coolest, Best Classic, and Best Engineered. A press conference will be held at the Stanford campus Thursday, the 19th. Contact Will Beckett, VP SVEAA, via email at BeckettW@corp.hp.com, fax 415-852-8384, tel. 415-857-3859

Sept. 24-27

National Transportation Education Summit '96, Washington D.C. NTES '96 will showcase the nation's premiere transportation education projects, create a national forum for transportation technology transfer and facilitate the creation of partnerships among participants. Contact: NTES '96, tel. 1-888-366-6370

Sept. 30-Oct. 3

NiCad 96, Sitges, Spain. Biennial Nickel-Cadmium Battery Conference, organized by the International Cadmium Association. Presentations and discussions of the latest developments in batteries, their applications, and recycling. Held at Hotel Gran Sitges-Barcelona, near Barcelona. Contact: International Cadmium Association, European Office, 42 Weymouth Street, London Win 3LQ, United Kingdom; tel +44 171 499 8425; +44 171 486 4007.

Oct. 11

Transportation 2010, Dayton, Ohio. A regional day-long symposium sponsored by The Engineers Club of Dayton and the Global Electric Auto Association will include presentations by EV and HEV industry leaders and ride'n'drive. Contact The Engineers Club of Dayton, 110 E. Monument Avenue, Dayton, OH 45402; tel. 513-228-2148, fax 513-228-4794.

Oct. 13-16

EVS-13, Osaka, Japan. 13th biennial international electric vehicle symposium, including addresses by major figures in industry and government, panels, exhibits, ride'n'drives. Contact: EVS-13, c/o Inter Group Corp., 7-5 17 Akasaka, minato-ku, Tokyo 107, Japan.

Adapted from the Web page at http://www.primenet.com/~evchdlr/, maintained by Kathy Watson and Lynette Racine of the Phoenix Chapter EAA on behalf of EAA National for monthly publication in Current Events.

EAA Silicon Valley Rally Rules

Entry Fee
$15 (Mail In) or $20 (at Rally)

Eligibility
Anyone with a valid driver's license may apply to run an electric car in this rally. The vehicle must be "street legal" and pass an inspection by one of the officials. Registration forms, fees, liability form and your auto insurance company name are needed. Registration and inspection will begin at 8:30 am. Inspection is not required for vehicles on display only

Registration
Registration is required, with a $15 fee in advance or a $20 fee at the event. This fee helps to recover the costs of the rally. Please pre-register at the reduced rate.

Inspection
An inspection card will be issued at registration. Present this card to an inspector who will inspect your electric car.

One Passenger Rule
Every vehicle capable of carrying 2 or more people (including driver) must carry a passenger. Passengers will be lined up near the starting point, so the driver can exchange passengers after each lap. There may be an award for passenger miles.

Awards * (Distance completed and appearance). This year we will offer awards to cars on display as well as those that participate in the Rally. Passenger miles may also be a category. Appearance will include best: Looking, Engineered, Classic and Coolest Overall.

***Notes (During Run)**
1. No battery replacement is allowed.

2. The only exception will be power from photovoltaic cells mounted permanently on the vehicle.

3. Each lap must be completed in 5 minutes or less. Drive at the speed limit whenever possible, don't save the watts! Route is 1.5 miles.

4. All traffic lights and signs must be obeyed.

No skimming through stop signs!

5. The all-electric vehicle that completes the most laps by 4 pm ill be declared the endurance winner.

6. In the event that two or more vehicles have run the same number of laps by 4pm, those vehicles may run a times laps to determine the winner. Observing the speed limits, the shortest lap time winds. if there are many cars with a range greater than 100, we may add a longer route for those cars.

Make your check payable to Silicon Valley EAA and mail completed registration form to: Pat Hardage, 1085 Tasman Dr. #732, Sunnyvale, CA 94088

Car Number

Rally/Display Registration Form
Silicon Valley EAA
September 21, 1996

Charging
I will need charging at the event: ❒ before ❒ after (please attach requirements)

Vehicle Type

Basic Mfg. | Year | Seating Capacity

First run (as electric) | Year | Payload if truck (lbs.)

Frontal area | sq. ft. (height x width)

Curb Weight (before conversion) lbs. | (After conversion) lbs.

Number of Drive batteries | Mfg. | Voltage

Batteries

model type (lead/acid, nicad) | other (please specify)

Tie-down provision (Yes / No) | Accessory battery (Yes / No)

DC/DC converter (Yes / No)

Tires

Brand and Model | Front | Rear

Size | Front | Rear

Body
❒ Metal ❒ Fiberglass ❒ Other(please specify) _____

Transmission
(circle one) Manual 3 4 5 speed Automatic 3 4 speed
Clutch used (Yes / No)

Drive Axle Ratio

Differential | Chain

Motor

Mfg. and Model | Continuous HP rating | Peak rating

❒ D.C, ❒ Series wound ❒ Shunt ❒ Compound
❒ PM ❒ A.C.

Control System

Electronic Chopper (Mfg.) | Model | Chop. freq.
❒ Diode Switching ❒ Relay

Liability Statement
I hereby absolve the Electric Auto Association , all officers of the EAA, rally officials, and any city or corporation permitting use of its property for conducting the rally, of any responsibility for problems, accidents or damages caused or created as result of my participation in the rally. It is my responsibility to abide by the California Motor Vehicle Code.

Name | Telephone

Address

Car License # | State

Signed Insurance Co.

FOR EAA MEMBERS ONLY

EV Want Ads

For Sale

For Sale: '91 Jet Electrica (Escort). 15,000 miles, PMC controller, USB 2300 battery, on board charger $5995. Call (415) 964-3974. (California)

For Sale: '79 Honda Civic Station Wagon. 15hp Prestolite motor, 96VDC, 8x12V Trojan 5SHP, PMC-21 controller, radio & heater, 4-spd. trnasmission, 110 vac charger, 65mph, 35 mi. range, $2850. Call (310) 532-4532 (Los Angeles, CA)

For Sale: '80 VW Rabbit. 2-dr, 4-psngr, 4-spd. trans., Curtis contoller, Sevcon DC/DC, K&W charger, 108VDC, 18 x 6V Trojan T105, 70 mph, 45-55 mi. range, $5000/obo..Call (310) 532-4532 (Los Angeles, CA)

For Sale: '91 SOLECTRIA FORCE. New batteries, excellent condition. $12,500 or best offer. Call Pete (617) 326-3436. (Boston)

For Sale: '78 FIAT X1-9. 108V, 6" Advanced DC, PMC controller, Sevcon DC/DC, K&W charger, 60 mph, 40-50 mile range, $4200/obo. Call (206) 631-1280. (Seattle)

For Sale: '83 CHEVY S-10 BLAZER. 20 6V 2300'S 9' advanced DC, Curtis 1221B, heavy duty suspension, seats five, complete documentation. Asking $14,000/will negotiate. Call Tony (407) 382-9598. (Florida)

For Sale: '76 SEBRING VANGUARD CITICAR. 48V, 40 mph with chargers/spares. Great learners car. Daily driver. $1,200/obo. Gary Warren Siess, 139 Richards Avenue, Dover, New Jersey 07801. (201) 366-2894. (New Jersey)

For Sale: '77 TRIUMP SPITFIRE. 96V (new 12V Trojan SH5s). 8" Advance DC motor. PMC controller, K&W charger, new paint, leather. Mint. $12,000. Call (206) 762-4404. (Seattle, WA)

Member 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 each 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 @ 408.374.8750. 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 made payable to: EAA Want Ads, 18297 Baylor Avenue, Saratoga, CA 95070

ADVERTISING RATES

Full page		7.25" x 9.25"
1 ad	$400 ea	
3 ads	$300 ea	
12 ads	$250 ea	

1/2 page		7.25" x 4.50"
1 ad	$200 ea	
3 ads	$150 ea	
12 ads	$100 ea	

1/4 page		3.50" x 4.50"
1 ad	$150 ea	
3 ads	$100 ea	
12 ads	$ 75 ea	

1/8 page		2.0" x 3.5"
1 ad	$100 ea	
3 ads	$75 ea	
12 ads	$50 ea	

Ads may be placed for 1, 3 or 12 months. Camera-ready copy for each ad must be submitted along with payment. Ads may be submitted on diskette in TIF or EPS format on the PC or MAC. For 12 ads, an invoice will be billed quarterly. A minimum of 3 ads need to be prepaid per quarter.

Ad Deadline

The Deadline for camera-ready copy is the **1st of the month**. Copy received after the 1st will be run in the next issue. Ads will be placed in the priority received. Prepaid ads will receive 1st priority.

Advertising Manager

Susan Hollis, AdvertisingManager
Office: (408) 374-8605
FAX (408) 374-8750

Address

Make check payable to EAA. Camera-ready copy and payment for the ad should be sent to:

Electric Auto Association
18297 Baylor Avenue
Saratoga, CA 95070

CE ADVERTISERS

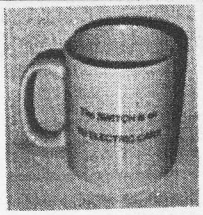
EAA **Reprint** Order Form

100% Cotton Cap
Forest Green
'Charging into the Future' EAA Logo
CAP001.....$7.50

Auto SunShade
SS001.....$8.00

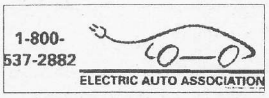
T w/EAA Logo
(adult small only)
TS001....$14.50

Thermal Auto Mug
MUG02...$6.00

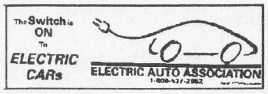


Porcelain Mug with 'Charging into....Future'
MUG003.....$5.00

Window decal 'The Switch is on to Electric Cars' Black and Red printing. 3 x 9 inches
DC001.....$3.00



Bumper sticker 3.75 x 15 inches
BS800.....$2.50



Bumper sticker 3.75 x 15 inches
BS002.....$2.50

EAA Key Chain , actual shape may vary
KC001.....$1.50

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
BG1996	1996 Buyer's Guide to Electric Vehicles (Feb 96 issue CE)	$ 5.00
BG1995	1995 Buyer's Guide to Electric Vehicles (Feb 95 issue CE)	$ 5.00
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

PN001	Ball point pen with "EAA, 800 phone # & Charging....Future"	$ 1.00
CS001	Current Solutions/Motor Show Video Tape (14 minute runtime)	$14.00
WL001	Window Literature Holder (fits pages 8.5 x 11 inch)	$22.00
PARK01	"EV Parking Only" Sign (18"x12") green icon on white background	$22.00

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

Name_____
Address_____
City,St,Zip_____

Item#	Size	Quantity	Item Description	Unit Cost	Amount

Make check payable to: **EAA** (US dollars)

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

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

CATALGGA.EPS

1996 04 04

ELECTRIC AUTO ASSOCIATION

2710 St. Giles Lane, Mountain View, CA 94040

• Address Correction Requested •

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• Time Dated Material - Please Do Not Hold •