ELECTRIC AUTO ASSOCIATION

CURRENT EVENTS

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EVS-12 Ride/Drive Diary

The EVS-12 show was a veri table feast of EV technology and ideas, but the most exciting part was the opportunity to drive EVs from all sorts of manufacturers and converters. In addition to a route through the Disneyland Hotel parking lot, the show organizers had set up an autocross-like test track . It had hairpin turns, large sweeps, and straightaways. Guest drivers could take the cars through several times so that they could get a feel for how the vehicles handled.

Before doing anything else, I got into line to sign up for the GM Impact. I thought the list would fill up fast, and it did. The signup list opened at 11:00 Monday morning. By 11:30 most of the slots were taken. I got a Wednesday 8:15 AM appointment with a metallic green teardrop-shaped GM pocket rocket. An early morning slot would mean fully charged batteries. I was looking forward to throwing this one around a little on the test track. (For my impression of the Impact, see the editorial, "The Queen and I".)

This taken care of, I launched off into the cars that were available immediately.

My first ride/drive EV was a US Electricar Geo Prism, with a Hughes 50 kW AC drivetrain, running 336 V off double strings of Gates Genesis 32 lb batteries. The vehicle's 4700 lb curb weight, though it seemed to squash the tires a little, was carried low in a subfloor under the chassis. I figured I

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APS reshapes electric car race

By Bruce Richardson of APS

Phoenix, AZ — The world's fastest and most advanced electric cars return to Phoenix on March 3-5. They will compete at a new location, under a new name and event manager, but with the continued backing of major sponsor, Arizona Public Service Company (APS).

APS refined the world's premier electric vehicle race, now entering its fifth year, to better showcase and advance electric vehicle technology. Among the changes are a cross-town change of venue from the one-mile oval at Phoenix International Raceway, to a 1.1 mile road course at Firebird International Raceway. Firebird's left and right turns demand more balanced vehicle designs, with the quarter-mile straightaway providing high-speed acceleration and quick braking opportunities.

Other changes include: Renaming the competition the APS Electrics. It was formerly called the APS Electric 500.

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Inside this Issue

Editor's Note

By Clare Bell

Impact - The Queen and I

My appointment was for 8:15. The digital clock on my friend's van read 8:14 as I piled out and announced that I was indeed present. The green-shirted GM escort person said "Go ahead and get in." He might well have added, "And don't drool on the dash." I settled into the seat, feeling cocooned in comfort and quiet high-tech competence, while getting a feel forl the pedals. Startup was absurdly simple; not even an ignition key. My GM escort had preprogrammed the access code, so the car needed was a touch on two center console buttons; one to give the okay and another to bring her to life.

The center console shift lever slid smoothly from park into drive. As soon as the sole of my foot touched the accelerator, I could feel her strength . To make sure she didn't get away from me, I was on the brake and the car halted abruptly, giving reassurance that the braking system could handle the power of the drivetrain.

For the ride-drive, the GM engineers had fixed the regen level, although it is normally adjustable via a knob on the console. It does vary, I was told, according to the level of charge on the pack. Obviously they had set it for max stopping power so that any would-be EV hotrodder could recover if they made a mistake

Remembering to take it easy over the speed bumps, I nosed the car out. She began a silky glide through the parking lot. I felt a certain quiet assurance to this car, a queenly dignity. She had power and she didn't need to flaunt it. She just sent it right to the pavement. The accelerator response tempted me to lead-foot it just a little. The motor sang a rising note and I was rewarded by a power surge that made me feel as though she and I were on a runway, gathering momentum for takeoff.

My escort had me take a slightly different route through the hotel parking lot than the other ride/drive EVs had taken, avoiding the speed bumps. The suspension could certainly handle them, but this EV queen simply did not want to be inconvenienced. I agreed with her.

"How many times can I take her through?" I asked, as we approached the coned-out test track. "Once", was the answer, with a knowing grin.

Once? Only once? I usually take cars through a couple of times so that I can get a feel for how they handle before I try any wheel-slides through the corners. Once? Well, I'd have to make the best of that single shot.

Entering the course, Impact turned from princess into panther. On the straightaway I romped on it and knew that if I didn't back off before the first turn, I'd be through the fence. That wasn't her limitation, though; but mine. Given the right set of skilled hands on the wheel, she'd probably track through that corner as if she was nailed to rails

She was so sure and smooth through the next set of tight turns that I fantasized about entering her in SCCA Solo 2 Autocross. And she leaped out of the corners like a cheetah, giving me the sense that she could easily leave the gas-guzzle drivers in their own exhaust, scratching their heads and saying "Whatinhellwazzat?"

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Front cover photo: *Checking out the EVS-12 Ride & Drive.*

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Article Submissions

If you would like to submit an article for Current EVents—the preferred form is on a floppy disk, formatted for DOS (Ascii Format) along with a printed copy of the article. Also include camera-ready photos or graphics or include TIFF formatted files with your copy.

Articles and graphics or line art may also be submitted for the MAC. Please specify PC or MAC and identify software used. Please include a hard copy.

The deadline for articles is the 1st of the month. Articles submitted after the 1st of each month will be retained for future issues of Current EVents. Contact Clare Bell, Managing Editor for further information.

Advertisements

If you would like to submit an ad, refer to Advertising Rate Sheet or contact contact Susan Hollis, Advertising Mgr. at (408) 374-8605.

Membership/Address Changes

For information on new membership or change of address, please send your requests to:

EAA Membership
Hal & June Munro
2710 St. Giles Lane
Mountain View, CA 94040

Advanced Transportation Technologies
at California State University, Long Beach

Electric Vehicle Conversions

Learn how to convert a combustion vehicle into an electric powered one. This course covers everything from choosing a car and electric motor to installation and maintenance. By law, by 2003, 10% of the new cars sold in California must be non-polluting. Electric vehicles are viewed as the most likely way of achieving this mandate. In addition, the California Council on Science and Technology forecasts that more than 70,000 jobs will be created in the electric vehicle industry by the year 2010. Engineers and car buffs wanting hands-on skills in this new technology will benefit from this course.

Topics Include:

- Choosing a vehicle, motor, and power supply
- Designing the suspension
- Designing the battery storage area
- The conversion process

Date: Saturdays, February 25-April 1, 8 am-12 noon

Fee: $149 (includes a comprehensive set of notes)

Sequence Number–2215

The Alameda Corridor: An Overview

Topics Include:

- Project overview, scope and schedule
- Technologies to be exploited
- Economic issues

Date: Monday, March 20, 6:30-9:30 pm

Fee: $95 (includes a comprehensive set of notes)

Sequence Number–2198

SAVE! Register for The Alameda Corridor: An Overview and any two other courses in this ad at a special rate of $550. Sequence Number–2204

C S U L B
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Human Engineering: A Design Philosophy

Topics Include:

- The systems approach to design: man vs. machine
- Visual presentation and perception of information
- Auditory presentation of information
- Design of controls
- Workspace plan
- Effects of environment on human performance

Date: Thursdays, March 30-April 13, 6:30-9:30 pm

Fee: $295 (includes a comprehensive set of notes)

Sequence Number–2207

Display Technologies

Topics Include:

- Human visual response
- Display contrast and resolution criteria
- Photometry
- Evaluation of displays
- Display components, applications, and cost considerations
- Projection displays
- Color CRTs
- High Definition TV
- Display technology trends
- Immersive display systems

Date: Mondays, May 1-22, 6:30-9:30 pm

Fee: $395 (includes a comprehensive set of notes)

Sequence Number–2211
(Not for university credit)(MS)

Closed Circuit TV: Security Systems and Applications

Topics Include:

- Fundamentals and definitions of CCTV
- Camera types and their uses
- Video signal transmission considerations
- Video signal processing and recording
- Overt and covert systems applications

Date: Tuesdays, April 18 and 25, 6:30-9:30 pm

Fee: $195 (includes a comprehensive set of notes)

Sequence Number–2208

GPS and GIS Applications In Surface Navigation

Topics Include:

- Fundamentals of surface navigation
- Operational characteristics of GPS
- Data communication and telemetry systems
- Geographic Information Systems
- Integration of GIS and GPS

Date: Tuesdays, May 23-June 6, 6:30-9:30 pm

Fee: $295 (includes a comprehensive set of notes)

Sequence Number–2213

For more information or to register for these non-credit courses, please call Mark Smith at (310) 985-8452.

University College and Extension Services California State University, Long Beach
The Choice for Continuing Education

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couldn't roll this car and the odds were against my spinning out. I assured the US Electricar employee escorting the first time EV drivers that I would not use my Skip Barber racing school techniques, at least not on the first go-round. The car lacked an ammeter, so I couldn't see how much I was pulling, but I felt a nice power surge in the mid-speed range. The acceleration was brisk, but still civilized, pushing me firmly and gently back in my seat, but not snapping my neck. The tires yelled a little through the tighter turns, but the Prism never broke traction, even when I made a half-hearted attempt at throwing the tail out. The battery pack in the subfloor pan does create a high floor in the rear seat area. The driver cockpit had plently of leg-room. Long tall Texas types may have to fold themselves up into the back seat, however that has been a problem ever since the small imports hit American shores.

All in all, this baby impressed me enough so that I'd like to take it through an SCCA Solo II autocross and see what it's really made of.

The Voltage Inc. Porsche 914-based "Escape" EV was a looker and the car's Indramat AC drivetrain promised some pleasure. This one is a modified 914 with the "Challon" fiberglass body kit, curb weight 2640. She glided nicely through the parking lot on the way to the fun run, but when I tried to romp on it, the Indramat wimped out. This was not caused by power limitations in the drivetrain, but rather a programmed acceleration ramp that was set too low. Having a soft spot for 914s, even ones with fiberglass body mods, I gave this red sled another chance and said I'd be by the following day if the Indramat engineers could up the ramping parameters. If it looks like a Porsche, it's gotta drive like a Porsche, or it's a double disappointment, I said. Unfortunately, the acceleration ramp didn't get changed before the end of the show, but I felt that the car deserved another try. When I get down to the LA area, I'll drive her again and do a second report.

The Delco car jumped as it its tail had been stepped on and took off.

BAT's Bob Martino invited me to try the company's automatic Geo Metro, running on two strings of 10 each of 12 -volt Optimas. The Otimas were manufactured in a special run and had BAT's catalyst added during production, Martino told me. The drivetrain is DC, utilizing the new Curtiss PMC 144 V 500 Amp controller (preproduction test version) and an Advanced DC Series motor. I have had my differences with BAT in the past, but the parallel-string concept seemed solid, so I bit. Though this Metro, like the US Electricar Prism, is an automatic, it had excellent accleration in the low speed range. The low curb weight (2600lb) helped, as did (definitely!) the Optimas. This Geo was firm-riding and agile, responding well when the foot went down. Martino believes that the DC drivetrain is far from dead and the performance of the series motor supported his conviction. Perhaps it was my increasing familiarity with the track that tempted me, or the willingness of the car, but I think I came close to sliding her a few times into the corners. As Martino said, "We've got lots more tires."

The Need for Speed?

To those CE readers who think I seem obsessed with acceleration; no I am not. I do think efficiency, range and other factors are important. In this EVent, however, the course and limited time allowed only an exploration of handling and performance. I will admit that Skip Barber BMW Driving School, on-track experience in the 1994 Phoenix Solar and Electric 500, and owning an electric 914 doesn't discourage an inborn leadfootedness. Hey, the hard-working EV editor has got to have a little playtime, right?

More Drives

I hadn't yet driven a Solectria Force, so I took the opportunity. What I really would have like to have driven was the Solectria Sunrise that Worden unveiled at the show, but nobody was getting their hands on THAT baby quite yet.

The Geo Metro-based Force was a 144 V automatic. One feature I liked was the choice of economy, medium or high settings for the drivetrain ,using a button n the center console. Economy took us through the parking lot while sipping only small amounts of amperage. It still had enough agility and go to get out of the way of other parking-lot roamers. High performed well enough to squeal tires through the turns and give a push-back in the seat on the straights. I found the sound of the motor slightly unusual but not annoying. It is a high-pitched but soft singing whirr that wavers up and down. as the car runs. Acceleration is brisk and overall perfromance very smooth.

Craig McCann of Pro EV had an interesting EV truck with a General Electric shunt motor and regen. The shunt motor is rigged to run like a series at low motor revs, so that it has almost the same torqiness as a straight series. At high revs, it acts like a shunt motor and delivers regen capability. The regen on this vehicle kicks in just by touching the brake pedal. I accelerated the truck in 2nd across the parking lot to 30-35 mph, then just put the toe of

EVS

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my hiking boot on the brake pedal. The regen kicked in almost instantly, slowing the truck dramatically before I even pressed hard enough to engage the hydraulic braking system. During that run, I was putting about 40 amps back into the batteries, and someone familiar with the vehicle could probably do better. $4600 for this drivetrain may seem a hair steep as compared to the cost of a straight series motor and controller, but for those folks who climb up and down hills, the slowing effect of regen may be worth it in terms of safety and less wear and tear on the regualar brakes. And you don't have to give up much on performance.

John Federere invited me to try a car that is used as a battery testing vehicle for Delco Propulsion Systems components. This was another Geo Metro-based EV with the Advanced DC 8-inch motor, Curtis 1221B and manual transmission. There was no regen on this car. The series motor and standard Metro transmission made the car very torquey at low rpms. I had been driving a series of EV automatics and forgot to use the clutch. The Delco car jumped as it its tail had been stepped on and took off. The 2500 lb curb weight made it behave a lot like the race Rabbit I'd driven at Phoenix, which also has the straight series drivetrain. John told me that there is a report that contends that DC still has many advantages over AC and I can see why.

More EVS-12 stuff in the March issue (remember, there won't be a February one — EAA members will be getting the EV Buyer's Guide instead). —CB

APS

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Contracting with Phoenix-based Electric Transportation Application (ETA), to manage the event. ETA is an industry leader in the development of electric vehicle safety and infrastructure. "We're moving this showcase to the next level." said APS Economic and Community Development manager Bill Stephenson. "Car builders now will test their cars' limits under actual road conditions. We expect continued improvement in battery strength and endurance—the hallmark of the APS event."

Car builders now will test their cars' limits under actual road conditions.

Stephenson added that Firebird's close proximity to the Phoenix metropolitan area will allow more people than ever before to see the three-day competition, which attracts major auto manufacturers and media from around the globe. More than 60 cars are expected in the following divisions:

Stock car

Cars compete in a 100-kilometer event highlighted by experimental batteries and fast-charging systems. The 1994 event showcased nickel-metal hydride, nickel-iron, zinc-flow, nickel cadmuim and advanced lead-acid batteries.

University Spec

Teams from Notre Dame, Arizona State Unversity and Northern Arizona Unversity, along with other college and universities nationwide, compete in this growing class. With state-of-the-art components, these open-wheel racers have the potential to reach speeds over 100mph. The feature race is 80 km.

Formula E

Wide-open racing with triple-digit speed and fast battery changeouts. The field features cars with large horsepower electric motors and advanced electronics and other components. Two-time Open champion Billy Roe, of Chandler, Ariz., drove a converted Lola Indycar to a national one-mile closed course speed record of 107.162 mph in last year's qualifying. The feature race is 80 km.

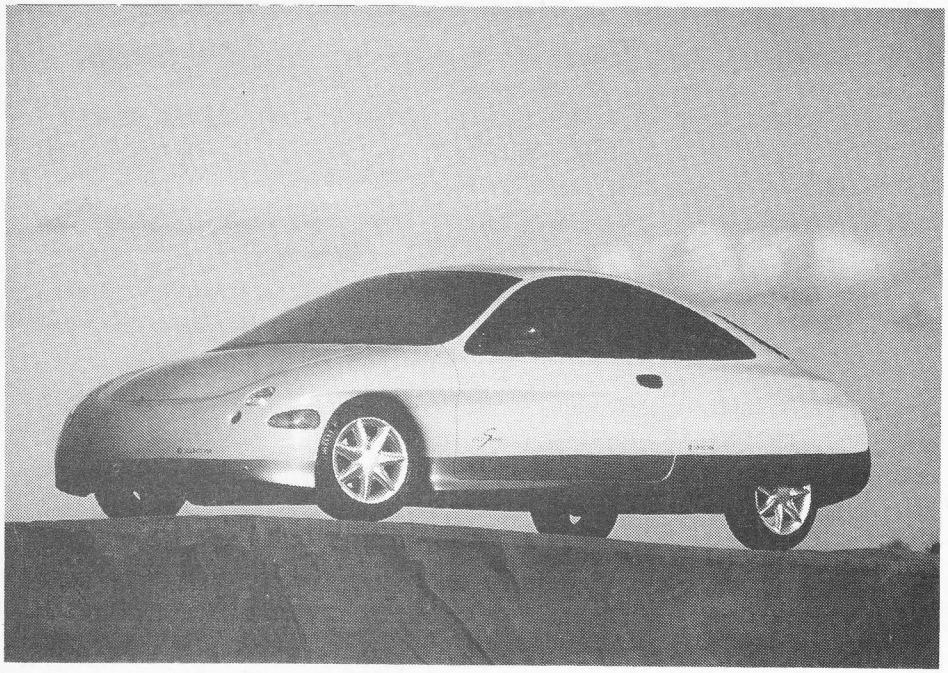
High School Competition

Beside competing on the track, high school teams, including entries from Mexco and Canada, compete for academic awards.

An electric vehicle expo will feature displays of various electric automotive components and charging systems. The event's title sponsor is APS, Arizona's largest electric utility and a wholly-owned subsidiary of Phoenix-based Pinnacle West Capital Corp. Another major sponor is the U.S. Department of Energy.

For race information and official rules, interested parties should call (602)250-3284. —BR

Sunrise Dawns at EVS-12



Sunrise by SOLECTRIA

Solectria drew back the curtain on their new Sunrise 4-seat EV sedan at EVS-12 in Anaheim,CA. During a press conference at the show, James Worden announced the entry of Sunrise into the market. The car's low curb weight (less than 1700 lbs) combined with a low drag coefficient of 0.17 (from scale model wind-tunnel testing) follows a proven philosophy for EVs. The wake-up color and appealing body style will make this one fly right off the showroom floor, given a good enough pricing scheme.

Sunrise features a monocoque composite-based structure and offers sleek aerodynamic styling, a state-of-the-art AC Induction drive system and a range of 120 miles (200 km) per charge, using advanced lead-acid batteries. Substantially enhanced range is expected with the introduction of improved battery technlogy. Sunrise provides all of the standard amenities and options expected in a world-class sedan, including power brakes, AM/FM stereo, dual air bags and cruise control. Additional attributes are automatic battery thermal management for winter driving, highly efficient electric air conditioning/hating and a sophisticated onboard battery charging and monitoring system. Sunrise also includes features unique to Solectria's EVs, such as a Power Saver (TM) control, a digital amp-hour meter, and an array of other technlogies developed by Solectria to make EV driving safe, reliable, cost—effective and fun.

The development of the Sunrise by Solectia is a Northeast Alternative Vehicle Consortium (NAVC) project co-founded by the Advanced Research Projects Agency (ARPA and by Boston Edison Company. Other technology partners have joined in

Specifications

System Power:	42 kW/50 kW peak AC induction direct drive with regenerative braking
Gradability:	20% grrade
Curb weight:	770 kg (1694 lb)
Payload:	310 kg (682 lb)
Passengers:	4
Airbags/Doors	2
Heat/defrost:	Maintains 20 - 25 degrees C (68-77 degrees F) at -10 to 35 degrees C (14 to 95 degrees F) ambient temperature.
Wheelbase:	277 cm (109 in)
Track front/rear:	152 cm (60 in)/132 cm (52 in)
Length:	467 cm (184 in)
Width:	188 cm (74 in)
Ground clearance:	18 cm (7 in)
Cabin height:	112 cm (44 in)
Brakes:	Front and rear hydraulic disk
Tires:	Low rolling resistance
Range at 85 km/hr (53 mph) with:	
	Sealed lead-acid batteries—200 km (120 mi) -Ovonic Nickel metal hydride batteries—330 km (200 mi)
Acceleration:	0-48 km/hr (0-30 mph) — 6 sec
	0-97 km/hr (0-60 mph) — 17 sec
Price and availability:	Projected price $20,000 each given a production run of 20,000 cars. If they only make 500, the price will probably be $70K each.

Sunrise

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this on-going effort which is now focusing on improved vehicle safety and design for manufacturing (DFM research.

Building on the international success of the Force Sedan and the E-10 pick-up truck, Solectria Corporation of Wilmington, MA has achieved a remarkable reputation as a leader in the development of electric vehicles and EV component technology. Over the past six years, vehicles built by Solectria or using Solectria components have consistently achieved top honors for efficiency, range and performance.

Solectria Corp. 68 Industrial Way, Wilmington, MA 01887 USA Tel. 508-658-2231 / Fax 508-658-32224

Range Extender/Battery Voltage Selector

By Paul Bell

The title of this article is Range Extender but the hardware is really a battery selector switch box. It tests voltage on each battery individually during driving, charging ,or even in a static state.

I decided to build this box after talking to Paul Easly in Lodi, CA. He is running the battery load testing program (described in *Current Events* June 94 issue) for testing amp-hour capacity of used batteries. After talking to him, I found out the best load-tester I could buy was designed to measure car starter batteries. Most load testers cost around $75.00 and only load the battery under test to 75 amps.

This is OK if you have a very bad battery that sags under a 75 amp load, but the load tester won't find a battery that only fails under a 250 amp load. However, my car can draw up to 300 amps. All I needed was a way to meter each battery while the car is running.

So I wired the car and built a switch box.You can do this very easily with 9 and 15-conductor cables and D-type connectors. A DB-9 plus a DB-15 gives you 24 wires. The batteries are wired so that every positive terminal is used plus the negative terminal on the most negative battery.

As you can see , using one wire for both the positive voltage on a given battery plus the negative voltage on the one preceding it reduces the total number of wire by 1/2. Otherwise each battery would require two connections; one on the positive and one on the negative.

Fuse each battery test lead and place the fuse as close to the battery as possible. I made the fuse holder to mount directly on the battery terminal and used a socket to hold the fuse. My terminal-mounted fuseholder is a custom part madefrom parts found at Halted Electionics. Each one is built from a 5/16 crimp-on lug, a four-pin socket, and a 1/10 amp fuse.

Note: If there are any very long battery interconnection cables, make sure you use one of those extra wires. Remember that you installed extra wires just in case.

If you choose to disregard the above note you can learn from what I did. During operation, there is a voltage drop across that long battery cable (Ohm's Law). This makes the 12th battery read just a little lower than expected. Too little of an error to matter? Yes you are right. It's not that much but if you are trying to find a bad battery under load you will be mislead by the voltage readings.

The switch box inside the car is really the easy part of this whole project. Here's how to build it. Inside the box is a 24-position 3-level rotary switch. Two levels handle the +/- wires on the batteries and the 3rd is to select LEDs. I could have used a total of two levels but three is easier because the LEDs are laid out just like the batteries in the car. In the accompanying drawing, I used drafting tape to show the battery interconnections. I have also used it to show leads for measuring voltages from the17th and 18 th batteries I plan to add when I get a new charger.

The only tricky part is planning for batteries that are not installed yet. You may need some temporary jumpers to fake out the switch into thinking that it is getting voltages from a battery that is installed. The accompanying drawings show how to wire the switch.

The complete project took about 40 hours, including the time to find the parts. The best part is that this project can be built anywhere. If you bring tools and parts, you can build and install it anywhere, even in a motel parking lot during an EV race or rally..

PS: Use as much ribbon cable as you can in the switch box. This save time and money. It also helps to have your own electronic junk pile to scrounge parts from.—PB

Announcements

Next Issue - March '95 CE

EAA and Spirit Publication are co-publishing the 1995 EV Buyer's Guide. This special issue will be sent to the EAA members in lieu of the February issue of Current EVents. Letters to the Editor returns as well as DIY. Don't forget to send us your comments, suggestions and letters.

EAA Annual Meeting

The EAA Annual Members Meeting took place as scheduled. EAA Board members prepared and presented year-end reports. Minutes from this and the EAA Board Meeting will appear in the next issue of CE.

Calendar Items

We need your HELP! The Calendar items have been shrinking each month. Our faithful EVent Coordinator, Anna Cornell, needs your help in reporting EVents for the CE calendar. Send a brief description to include the date, phone number and contact person for EVents in your local area. Fax your info before the 15th of each month to Anna at (510) 685-7580.

News in Brief . . .

Compiled by Ruth M. Shipley from Environmental Information Network. If this is reprinted, please credit CE and Ruth Shipley.

Germany May Ban Polluters

In an effort to reduce ground-level ozone during the summer, German air quality officials plan to ban high-polluting vehicles from certain urban areas. Cars not equipped with catalytic converters, along with some diesel models, would not be allowed to drive in some city centers when ozone reaches critical levels. The proposal could affect about half of the country's motorists.

North Rhine-Westphalia state environment minister Klaus Matthiesen has said that the proposed driving ban may be put in place as soon as next summer if it wins the expected approval from the cabinet and parliament.

(REUTERS: 11/25)

Ultracapacitor Could Boost EV Performance

Maxwell Laboratories, Inc. (San Diego, CA) recently announced that its Ultracapacitor for EV use had exceeded energy and power performance goals.

During the initial phase of development, the Ultracapacitor achieved a record energy density of 7.5 watt-hours/kg and more than 2,000 watts/kg. This was accomplished with a capacitor cell of 0.1 cm thickness and a 20 sq. cm footprint. During the next phase of the program, Maxwell will scale up the hardware to the higher voltages and larger dimensions needed in EVs.

The Ultracapacitor could extend an EV's range by leveling the load on batteries during acceleration and braking and allowing the use of lower-power-density, less-costly batteries. For more information, contact Alan Kolb at (619)279-5100.

(NESS WIRE: 10/27)

OTC Compromises ZEV Mandate

Northeast regulators representing the Ozone Transport Commission have offered U.S. automakers a compromise plan designed to meet federal ozone level requirements under the Clean Air Act. The new proposal still calls on automakers to build NGVs and EVs, but requires that 1% of new car sales be zero-emission, instead of the original 2%.

The proposal would also reduce ultra low emission vehicle mandates by 50% and allows automakers to substitute NGVs for EVs on a two-to-one basis. Under the new plan, automakers would drop all pending litigation. New York and Massachusetts would be allowed to implement proposed ZEV programs starting in 1999.

For more information, call Mike Shields at (202)260-3450.

(THE ENERGY REPORT: 10/31)

NAVC Predicts Drop in EV Prices

A study by Tufts University researchers found that the cost of an EV could drop significantly in just a few years. The university's report, prepared for the Northeast Alternative Vehicle Consortium (NAVC), predicts that an EV costing $22,500 today could cost as little as $12,500 by 1998.

The researchers also found that the cost to buy, operate and maintain an EV at projected 1998 prices would be $.17/mile compared to $.16/mile for a comparable conventional car; federal and state incentives should lower costs still further.

For more information, contact Sheila Lynch at (617)371-1420.

(NAVC NEWS: 11/2)

Horizon-Powered EV Exceeds 100 Mile Range

An EV powered by Electrosource's Horizon batteries drove 110 miles in city traffic on a single charge.

The company donated the batteries to the Sacramento (CA) Electric Transportation Consortium, which said that the relatively inexpensive batteries reduced the vehicle's operating cost to 3.5 cents per mile. The consortium assumed an expected 80,000 mile life on the battery pack.

Members of the Sacramento Electric Transportation Consortium include the Sacramento Municipal Utility District, which conducted the vehicle test with participation of engineering staff from the U.S. Department of Energy's Argonne National Laboratory.

For more information, contact Mike Weinstein of Rom. at (505)298-1800.

(BUSINESSWIRE: 11/2)

Columnist Castigates EV Policymakers

Nationally syndicated columnist Alston Chase recently used California's ZEV mandate as an example of legislative irresponsibility.

Alston considers a requirement that 2% of all cars sold in the state be EVs "expensive, unnecessary and ... ultimately ineffective. At present, electric cars are almost undriveable. In ideal conditions, their range is 80 miles. Turn on air conditioning, heater, windshield or radio, and this radius drops. And it virtually disappears in cold weather."

"How can voters exact justice on those who bring such pernicious regulations to life? A novel solution would be to elect only legislators willing to drive electric cars..."

(WASHINGTON TIMES: 11/8)

News in Brief . . .

SatCon Introduces Compact Electric Motor

SatCon Technology Corp. (Cambridge, Mass.) recently finished testing what it claims is the highest power-density compact electric motor ever built. The one-foot long, 145-lb motor generates over 500 horsepower — more than 10 times the power of a conventional motor of the same size.

"Applying our high-power-density electric motor technology to future passenger vehicles will result in drive trains that are a fraction of the weight of current engines, provide acceleration and handling comparable to today's sports sedans, and offer a 400-mile-range while achieving the equivalent of 80 mpg," said James Hurley, director of automotive marketing at SatCon.

For more information, contact Michael Turmelle at (617)661-0540.

(BUSINESS WIRE:11/8)

Unique Mobility & Pininfarina to Collaborate

Unique Mobility Inc. and Pininfarina North America Inc. recently announced they will collaborate on design, development and manufacture of EVs and hybrids. The companies have also been selected to supply EVs to EV America, a program led by the electric utility industry with a goal to purchase as many as 5,000 EVs by 1997.

Pininfarina is a 65 year-old Turin, Italy, firm that has created special car bodies for low volume production. Today the company produces 35,000 vehicles annually and furnishes design, engineering, production and program management services to vehicle manufacturers worldwide. Unique manufactures high efficiency permanent magnet motors and electronic controls for automotive, aerospace and industrial applications. It has been developing EV drives for over a decade.

For more information, contact Ray Geddes or Donald French at (303)278-2002.

(UNIQUE MOBILITY NEWS: 11/9)

EV America Test Highlights

Nine EVs provided by five companies were recently tested by Electric Transportation Applications (Phoenix, AZ) for EV America, an electric-utility led program to accelerate the introduction of EVs.

Five of the vehicles reached maximum speeds of 70 mph or greater, four achieved ranges of 70 miles or more at 45 mph, and all demonstrated stability during the braking test. One of the vehicles was charged in less than four hours at 208/240 volts.

Several of the vehicles outperformed their gasoline-powered counterparts in the road-handling test.

Vehicles were provided by BAT International, Chrysler Corporation, Solectria, Unique Mobility, and U.S. Electricar. For more information, contact Gloria Quinn at (202)508-5659.

(EV AMERICA NEWS: 11/10)

Washington Post Decries Subsidies for EVs

A recent Washington Post editorial criticized public subsidies for EV development.

"The temptation is particularly strong to arrange the subsidies in ways that appear on no public budget, with no public accountability." The editorial cited automakers' claims that they will have to raise the prices of conventional vehicles in order to make EVs competitive. "Consumers won't know why cars are getting more expensive, and no public record is likely ever to give a complete accounting of the true cost of this subsidy to the electrics. If subsidies are required, they need to be provided explicitly so that people can see what they are paying — and what they are getting for their money."

(WASHINGTON POST: 11/20)

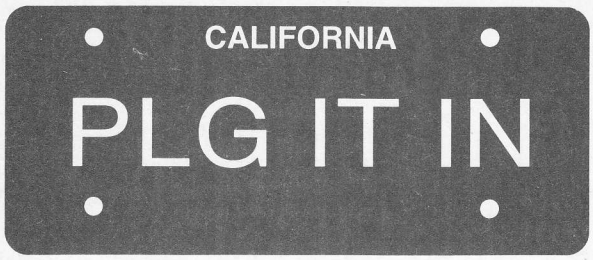
Electric HOT Plates!

"NOMOGAS" — A 1984 Ford Escort 5-speed stick shift, conversion by Albert Ryan of Livermore, California.

This plate [NOMOGAS], featured in the December CE, belongs to Albert Ryan of Livermore, California.

The 1984 Ford Escort was completed in April 1993 at a cost of $5,500, including batteries. It has 10-12 V deep cycle stowaway gel cells, series wired for 120 V DC. The 23-hp Advanced DC motor, Curtis PMC 1221B solid-state controller. The range is approximately 40 miles and the car will do 56 mph. Albert is a member of the East Bay chapter.

CE will show a vanity license plate from one of our members electric vehicles. If you spot your license, send us a picture and brief description of your car for publication in an upcoming issue of CE.



EVents Calendar

Jan 10-12	**10th Annual Battery Conference on Applications and Advances.** California State University at Long Beach. Sections on power electronics. For info, fax Nga La or Renee Madrid at (310) 985-7561.
Feb 10	**UCLA Extension presents "Electric Vehicle Technology.** EV classes and seminars. See details in Current EVents, Dec. '94.
March 2-5	**The APS Electrics at Firebird International Raceway,** Phoenix, AZ. "The Kitty Hawk of EV Technology " flies again, though under a new name and direction. Six classes of cars, including Super Stock, Street Stock, High School, Formula E, University Spec, Hybrids and Drag. No, not EVs in drag, but EV dragsters, including motorcycles. Hot! For Tickets, call (602) 978-1373. For info, write to Electric Vehicle Technology Competitions, Inc. P.O. Box 11088, Glendale, AZ 85318-1088
April 1-2	**SunDay Challenge Alternative Energy Vehicle Rally.** Cape Canaveral, FL. Includes vehicle performance testing on a racetrack and actual open-road commuter driving. Classes include Commuter, Tour de Sol (type), Cross-continental and Open. For information, contact the SunDay Challenge Race Committee, Florida Solar Energy Center, 300 State Road 401, Cape Canaveral, FL 32920-4099. Tel. (407) 783-0300.
May 20-28	**American Tour de Sol.** Runs from Waterbury, CT to Portland ME via Mass. , Vermt and New Hamp. Contact Nancy Hazard at (413) 774-6051.
Jun 21-25	**Interdisciplinary Conference on the Environment.** To be held in Boston, Mass. (Detail in December '94 CE).
August 2-4	**Second Annual Fleet Managers' Electric Vehicle Conference** in Troy, MI. Detroit Edison Company hosts this conference, which features Ride and Drive New Products, Regulatory Update, Utility Case Studies and more. Co-sponsored by EPRI, EVRN, EVIAA and the Edison Electric Insitute. Contact Rick Tempchin at EEI, (202) 508-5558 or Jean Kenney at (202)508-5564.
Sept. 19-22	**Fourth Grove Fuel Cell Symposium** in London, England (UK). Contact the conference center at Elsevier Advanced Technology, P.O. Box 150, Kidlington, Oxford, OX5 1AS, UK. Phone +44 (0) 1865 843721/843659. Fax, +44 (0) 185 843971.

Member Want Ads

FOR SALE: Electric Moped, 3.5 HP motor, new 30A Todd charger, 30 mph, needs little work. $300. Call John at 415-961-6798 or 408-255-7120.

FOR SALE: '81 Jet 007, Like new in & out. Only 3576 miles. New Curtis 1221-B, new tires, new U.S. batteries, power brakes, 110 & 220 chargersss 12/120, air condition and gas heater. Priced for quick sale only. Can deliver. $7295. Contact Ken Bancroft at 713-729-8668.

FOR SALE: 1984 Ford Escort, 5 speed, 9" advanced motor, Curtis PMC controller, 120 V system, 10-12 V batteries, maintenance free, tow bar, new paint, extra clean, a show car, on board charger, extras. Also two bars & lights. $9000/obo. Call Al Ryan at 510-447-5369.

FOR SALE: '71 Fiat Spider, 96V, Curtis PMC controller, Prestolite motor, K&W charger, very clean, new paint, tires & carpet. $4000. Call Brian at 707-263-0400 or 801-563-3269.

FOR SALE: 1972 Honda Coupe 600 Serieis, G.E. 2CM77 aircraft generator motor, Willey Model-7 speed controller, 72V TRANSISTORIZED shopper. Top speed 60 mph, range 50 miles. No batteries. $2000. Call 310-949-7103.

FOR SALE: Ferrari Daytona, raced APS 500 3rd & 5th non-stop operation. EV Weekend trophy. GE motor. Curtis controller, Trojan T-125, 120 V, range 45-65 miles. $8,200. Call Milt at 602-371-8848.

WANTED: Contact from someone who was involved with 76 Datsum 280 conversion, from Farmington, N.M. High School. Call Dennis evenings at 314-898-2329.

ORDERING INFORMATION: $7 for the first 25 words. Each additional word, 25 cents.

Please send check payable to Electric Auto Association, 18297 Baylor Avenue, Saratoga, CA 95070. Want Ads are available to EAA members for the sale of electric vehicles, equipment and parts. The EAA is not responsible for the accuracy of ads. Please see advertising rates on next page for commercial products.

1995 EV Buyer's Guide

EAA and Spirit Publication are co-publishing the *1995 EV Buyer's Guide*. This special issue will be sent to the EAA members in lieu of the February issue of *Current EVents*. The Buyer's Guide is completely revised and should be a useful EV source to our members. If you are looking to purchase an EV in 1995, this is the place to start looking.

The 1995 EV Buyer's Guide—coming soon to your mailbox!

Index of Advertisers

Editorial

Continued from page 2

On the last straightaway and then during the cruise back through the parking lot, I tried to snitch a few more doses of electric speed, but at last playtime was over. A quick photo op with my own camera and then the queen and I parted company.

GM, you've got one pretty lady here and it's not just her looks. Got some advice for you. Put her into production. And autocross the hell out of her. Start a racing program with SCCA. Get some of the best SCCA women to drive her — she's got a real appeal to that 51 percent of the population. The San Francisco Regional SCCA has already encouraged high-performance EVs to enter and some have already wowed Solo 2 spectators. My 914 Porsche electric has run Solo 2, and it's a kick. There's an EV racecar that regularly dusts everything except the hottest Formula Fords and he's coming up on them fast.

An Impact as Solo 2 National Champ? Think about it. —CB

Advertising Rates

QTY SIZE		1 AD	3 ADS	12 ADS AD
Full page	7.25" x 9.25"	$375	$300 ea	$250 ea
1/2 page	7.25" x 4.50"	$175	$125 ea	$100 ea
1/4 page	3.50" x 4.50"	$100	$ 75 ea	$ 65 ea
1/8 page	2.0" x 3.5"	$ 75	$ 65 ea	$ 50 ea

- Ads may be placed for 1, 3 or 12 months. Ads are due and payable at the time of the issue. Full payment for all issues must be received at the initial order along with the camera-ready copy. For 12 ads, an invoice will be billed quarterly. A minimum of 3 ads need to be prepaid per quarter.
- Provide camera-ready copy for each prepaid AD. Ads may be submitted on diskette in TIF format on the PC or MAC. EPS format is also acceptable. Please contact me regarding questions on file formats. If you would like assistance with the layout or design of your AD, please contact Susan Hollis at the number listed below
- For changes to the ad copy, new camera ready copy must be received *before the 1st* of each month for the next issue and must be the same size to qualify for the discounted rate.
- AD size must fall within the sizes listed above. If ad exceeds the size, the next ad size will be charged or a $10 fee will be charged to reduce the ad. Ad rates are for black and white copy only. For additional color, please add $100 per color.
- 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.
- Please contact Susan Hollis, Advertising Manager, at (408) 374-8605 or by FAX at (408) 374-8750 for additional information or assistance. Camera-ready copy and payment for the ad should be sent to: Electric Auto Association, Attn: Advertising Mgr., 18297 Baylor Avenue, Saratoga, CA 95070.

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- ❒ ***Flywheel Energy Storage***
  Dr Richard Post **($5.00)**
  Dr. Post updates 1970's thinking and finds a viable solution.
- ❒ ***Team Tucson Land Speed Record Plans***
  Chuck Lemme **($5.00)**
  A wealth of technical considerations and many power and aerodynamic formulas.
- ❒ ***EAA XA-100 Hybrid*** **($5.00)**
  Report on the EAA's Hybrid Vehicle Project (all 3 chapters) *(Includes all tables)*
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