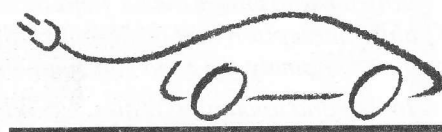


CURRENT EV EVENTS



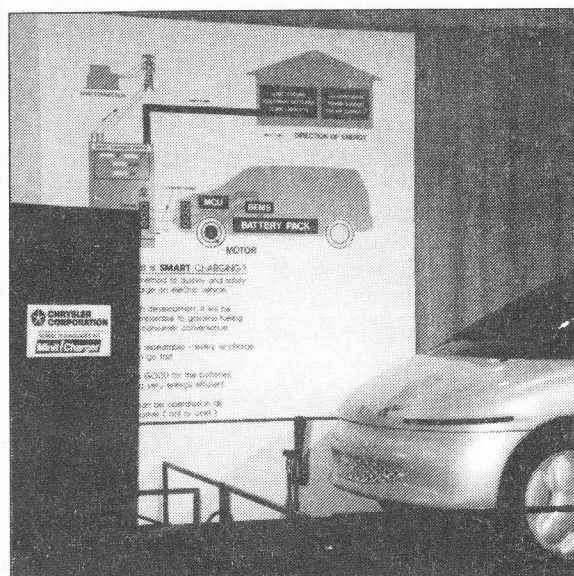
Vol. 25 No. 4

PROMOTING THE USE OF ELECTRIC VEHICLES SINCE 1967

JULY/AUGUST 1993

Chrysler TEVan Proves EV Technologies

by Clare Bell



TEVan & Norvik charger.

The primary aim of Chrysler's recent cross-country electric minivan trip (Mar. 3 to Mar. 10, 1993) was to test the practicality of EV fast-charging. Could the minivan be driven long distances while being fast-charged for charge after charge? Despite some difficulties, the answer was yes.

Although the electric van journey ended early due to repair delays, engineers from Chrysler, and from other companies whose technology is being tested in the van, agreed that the trip was a success.

The 1993 Dodge TEVan is powered by 30 6V SAFT

NiCads (See Tech Spec Box for details). SAFT president Jean-Pierre Cornu, who accompanied the Chrysler engineers, felt that the performance of the NiCads "was fantastic". The previous rule of thumb was that batteries should not be completely discharged and recharged more than twice a day to avoid permanent damage. During the trip, the van recharged five times a day.

The fast-charger, developed by Norvik Technologies of Canada, recharged the van in an average of 30-60 minutes. Norvik's Smart Charging System takes the diagnostics on the battery several times per second to adjust the charging current. (For more details, see "EV Supercharger" in Current EV Events, March/April '93, vol. 25, #2.) Jiri Nor, Norvik's president, states that the system achieves the fastest possible charge by giving the battery "as much as it can take — not more — not less." Norvik engineer Jiri K. Horak added, "The system will not 'overcharge' the batteries, so that it can actually extend the life of the pack."

The refrigerator-sized Norvik unit rode on a support vehicle along with the diesel engine generator used to power it. At the Phoenix stop, Arizona Public Service Company wired the Norvik charger into utility lines at a downtown shopping mall to demonstrate how rapidly and quietly the unit worked.

(continued on page 5)

1/2 Million People See EVs in SF

by Clare Bell

The theme of this year's Carnival in San Francisco this year was ecology/conservation. EAA's electric cars in the parade brought that message across to the estimated 0.5 million people who jammed the sidewalks this Memorial Day. The Carnival parade was also covered by two major TV news stations, Channel 4, KRON and Channel 7, KGO.

Mike Slominski, president of the Peninsula Chapter, organized EAA's participation in the Carnival. Mike's snazzily-painted VW Rabbit drove in the parade, along with Peter Barnes' clean pickup truck conversion and Clare Bell's 914 Porsche (originally built and raced by Ron Rasmussen) in full race dress. Barnes' pickup pulled a coffin-shaped trailer filled with old mufflers and

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Notes from the Editor

Anyone who enters the EV field soon discovers that, in addition to the problems of public perception and technical challenges, there are the more subtle "hidden barriers", namely the issues of financing and insuring EVs.

In this and upcoming issues, CE has decided to explore these issues and see if we can unearth or perhaps even help to knock down these hidden obstacles so that EV owners and prospective EV purchasers are prepared to deal with them. EVs are real cars. They need to be treated like real cars.

While preparing the Porsche owner interview article for last issue, guest author Michael Clark discovered some questions about EVs and insurance that had not been resolved to his satisfaction. In this issue, he returns with a report based on research and interviews with insurance agents and other key people.

Clare Bell, Managing Editor

Current EVents Survey Results

by Clare Bell

Many thanks to the sixty EAA members that returned surveys and to all who indicated that they wanted to contribute to Current EVents; many more thanks.

Some of the more interesting preliminary results as of May 15th:

- Question 11 55 out of 60 people (91 %) said they would recommend Current EVents to their friends.
- Question 13 42 out of 60 (70%) said that they DID something (wrote for information, attended a show, purchased a product, volunteered or made a donation) as a result of something they read in CE.
- Question 9 Asked if you passed the publication along to friends or colleagues, and if so, to how many. The response indicates that 60 issues of Current EVents can reach about 100 readers!
- Question 4 Current EVents readers seem to be an independent-minded bunch who do not like to be put in preselected categories. Although 34 out of 60 described themselves as "EV hobbyist/tinker" and 18 out of 60 said they fit the "EV promotor/advocate", there were more unique responses. Among them were:
- "One-time EV driver and still owner"
 - "Environmentalist and concerned citizen"
 - "EV Market Enthusiast" (from a company)
 - "Do-er"
 - "Waiting to tinker"

Among the possible ongoing columns (Question 17), the one in most demand was the technical advise "Bolts and Volts". Recent EV Conversions and Chapter Activities followed after. High School EVents and Women in EVs lagged numerically, but those who liked them were really enthusiastic.

Again, thanks for the feedback! More survey results in the next issue. Yes we are doing bumper stickers -it is being designed and will be mailed in the next few weeks.

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Paul Brasch 1968 Elden Drive San Jose, CA 95124	(408) 371-5969
Lee Hemstreet 787 Florales Drive Palo Alto, CA 94306	(415) 493-5892
Don Mignola 2471 South 2570 West West Valley City, UT 84119	(801) 977-0119
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Stan Skokan 1020 Parkwood Way Redwood City, CA 94060	(415) 366-0643
Bob Wing PO Box 277 Inverness, CA 94937	(415) 669-7402 Fax: (415) 669-7407

Membership

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

Technical Editor

Paul Brasch (408) 371-5969
1968 Elden Drive Fax: (408) 371-5978
San Jose, CA 95124-1313

Managing Editor

Clare Bell (408) 225-6403

Advertising & Production

Susan A. Hollis (408) 374-8605
(PCTEK) Fax: (408) 374-8750
18297 Baylour Avenue
Saratoga, CA 95070

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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. Any form is acceptable. Also include camera-ready photos or graphics or include TIF formatted files with your copy. Please send to Paul Brasch, Editor (see address above.)

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If you would like to submit an ad, please contact Susan Hollis/PCTEK at (408) 374-8605 or Paul Brasch at (408) 371-5969 between 10-5pm PT for additional information and rate sheet.

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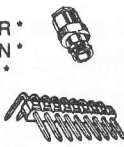
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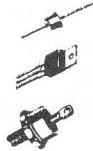
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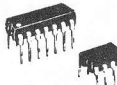
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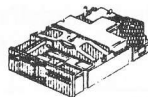
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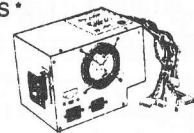
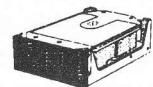
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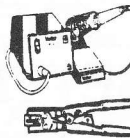
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Prize-Winning Team

Bob Batson (Electric Vehicles of America) was part of an 8-person team that recently won a \$20,000 Grand Prize for their entry in an EV infrastructure design competition. The contest, "The Electric Vehicle and the American Community" was sponsored by Edison Electric Institute. (See Current EVents, Dec/Jan 1993, p. 16.)

Mechanical engineer and EV builder Batson, designer Lucy Pedler, planner Pete Smith, plus team members Gary Brock, David Flaschenriem, Paul McWilliams, Joe Chambers and Ambrose Spencer received the award at a May 11 ceremony in Washington DC.

Choosing Cambridge, MA as their subject community, the design team proposed the use of "station cars" -- short-term rental cars located at mass-transit stations. The team envisioned drive-up quick-charging units that use flywheel energy-storage systems to buffer heavy power demands (to avoid burdening local utilities). Other ideas included "electric bollards" to charge EVs parked overnight on streets, and a multi-bay charging garage fitted with solar panels.

IEEE Spectrum, June 1993, 'EVwatch' on p. 17, 'Team Awarded Infrastructure Prize' - Michael Riezenman. Thanks to John Newell.

EVs in SF

(continued from page 1)

tailpipes, symbolizing the death of the internal combustion engine.

The electrics drew cheers and applause from the crowd as well as shouted questions. When the parade halted along the route, the EV drivers jumped out, opened up hoods and displayed batteries, gaining more applause. TV cameras on booms hung over the cars as they passed, so EAA got some good media footage.

EAA's intent in bringing the cars up to Carnival was also to impress PG&E, who sponsored the event. As well as having cars in the parade, EAA also had two cars on display for Saturday and Sunday, including Stan Skokan's Ford Escort. Peninsula Chapter set up an

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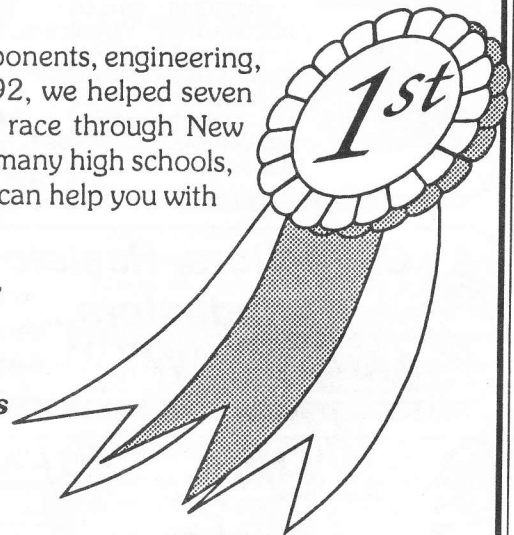
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TEVan

(continued from page 1)

The TEVan and Norvik fast-charger were also displayed during the 1993 APS Solar and Electric 500 race. The TEVan went on-track at Phoenix International Raceway during intermissions between race events.

Norvik hopes to have units that range from \$2K to \$10K, to serve households and industries. Norvik engineers feel they can reduce EV charging time to four or five minutes.

The van itself, the first Federal safety-certified EV, proved to be smooth, comfortable and quiet. General Electric's custom motor-controller package operated without failure, as did Goodyear's specially designed Momentum tires.

The big problem was in the battery cooling system. Shortly after departing Detroit, the van stopped at a Chrysler dealership in Effingham, Illinois to clear air vents. Overheating problems recurred, causing delays when the batteries required a cool-down period before recharging, extending refueling stops from 30 minutes to 3 hours. Batteries had been installed the

weekend before the start of the trip and there was no time for preliminary testing that might have revealed the overheating problems that plagued the van.

The delays took a toll on the Chrysler engineers, who had to drive the van plus two support vehicles (the charging truck and a 30-foot motorhome) around the clock to make up for lost time. Team exhaustion as well as battery overheating made Chrysler decide to scratch the leg of the trip from Los Angeles to Portland and back.

Even so, Chrysler considers the trial a success and plans to enter its accomplishment -- 2,604 miles in 158 hours -- in the Guinness Book as a landmark for EVs.

Chrysler also showed that the van could be serviced by a regular dealership with many of the same tools used for servicing gasoline cars. The team feels they have gained valuable experience about keeping the pack cool for high power and long life.

Article adapted from press release and "Charging Across America", by James R. Healy, USA Today.

Tech Spec Box

Make/Model:	1993 Dodge Caravan Electric (TEVan).
Style:	Front-wheel drive 5-passenger minivan.
Motor:	70 hp G.E. shunt-wound separately excited DC traction. 150 lb. 9" diameter by 16" long. Max 8,000 RPM.
Controller:	Microprocessor-driven, using high-current IGBTs. 300 A DC separately to motor armature and winding. Custom built by GE Electric Vehicle Systems
Voltage:	180V w. 30 6V NiCad batteries.
Batteries:	SAFT NiCad STM5-200. Manufactured in France. SAFT claims that these can be 100% recycled.
Fast-charger:	Norvik Smart Charging System - runs off three-phase 480 V. 30-60 min to full charge.
Onboard backup charger:	10 KW microprocessor controlled. Can use either 220 V single-phase 30 amp or 208 three-phase 50 amp. GFI-equipped. Charge time from 0 to full is less than 8 hrs.
Gearing:	Two-speed custom manual transaxle.
Tires:	Goodyear "Momentum" low rolling resistance. Operate at 50 psi.
Weight:	5,100 lb (test vehicle).
Top speed:	73 mph
Range:	80 miles on SAE J227A C-Cycle.

TEVan Focus: New Tires & Recyclable Batteries?

Goodyear, who supplies low rolling resistance Invicta tires for the APS Solar and Electric Phoenix 500 race, has come up with a new "Momentum" tire for the TEVan. Specially designed by Goodyear engineer John Kotanides, the Momentum produces 40% less rolling resistance than the original equipment tires. The 50 psi operating pressure accounts for 12 % of the improved efficiency. Features such as reduced tread depth, special mold shape and internal construction supply the rest. Goodyear put an extra load belt under the tread to handle the increased weight of the TEVan.

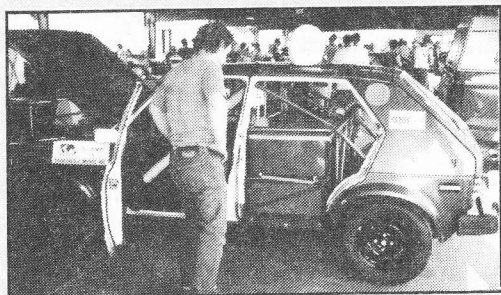
How does the new Momentum compare with the Invicta GLR's being used by some EAA members? Will Momentum tires be available for other EVs besides the TEVan?

The TEVan's SAFT NiCads may not have one of the environmental drawbacks of NiCad batteries. SAFT America claims that after years of use, the batteries can be completely recycled. SAFT has a storage/collection facility in Valdosta, Georgia for used NiCads, which are then shipped to the SAFT recycling facility in Sweden.

The fact that products can be recycled does not necessarily mean that they will be, as shown by the dumping of lead-acid batteries across the border in Mexico. Do any of CE's readers know about how NiCads are recycled and what percentage actually are re-used? Perhaps someone could do an article.

Gary Jackson & Little Guy Racing

by Clare Bell



#43, Jackson's Rabbit gets pre-race prep at APS Phoenix 500.

Sometimes it seems like the big boys are taking over EV racing, but "as long as the little guy can be involved", Gary Jackson and his Little Guy Racing will be on the track.

Jackson describes himself as a "physicist who is obsessed with efficiency". Combine that with the fact that his daily driver has been an electric 1976 VW Rabbit and you get a car that is constantly being modified and improved. And what better place to test it than the APS Solar and Electric Phoenix 500?

Add in an enthusiastic volunteer racing crew of atomic fusion engineers and physicists from General Atomics in San Diego and you've got yourself one unusual but very effective team.

Subject of local articles and TV appearances, Jackson has owned and operated electric cars for over 20 years. He is an active member of the Electric Vehicle associations of Southern California (EVOSC) and San Diego (EVOSD).

As an alternate energy technology pioneer, he has used his success with EVs to encourage greater public environmental awareness. As a fusion physicist with General Atomics in San Diego, he hopes to help build the first non-polluting fusion reactor.

Long-time EV race and rally fans are familiar with Jackson's green 1976

VW Rabbit. He holds a distance record of 141 miles on single charge (Southern California EV Rally) and 189 miles/charge over a closed course on 21 conventional lead-acid batteries.

Though Little Guy runs on a shoestring, the volunteers, whom Gary describes humorously as "over-educated", make up the cash shortfall with abundant energy and talent.

Little Guy's pit crew consists of Dr. Reed James, Dr Al Hyatt, Jeremy Phillips, Bernie Gish, Jim Vanderlaan and Jon Busath. Busath, who drove for Little Guy in the Open Full-size Feature, is also a fusion researcher as well as a race car driver (5 years)

NASCAR racer, mechanic, and race car builder. Technical support is ably provided by Dr. Tony Taylor, Jeff Jackson, Zachary Taylor, Zane Taylor and Zachary James.

At the APS 500's debut in 1990, the Rabbit was the first car using conventional lead-acid batteries to enter. DEMI had zinc-air and Solectria's Worden was using a combination of exotics, but Jackson performed well with standard lead-acid.

This year Little Guy's Rabbit took 1st in the Electric Stock B class endurance race (note this issue's Oops correction) and 3rd in the Open Full-size (Jon Busath driving). Jackson's intent for this year's race was to demonstrate that quick battery exchange technology

(continued on next page)

Specs on Rabbit

Vehicle:	1976 VW Rabbit converted to electric, front wheel drive, 4 speed transmission.
Motor:	Advanced DC Motors Model FB14001, Syracuse, NY.
Controller:	RUSSCO 96V 400 A transistor controller modified for external control of battery current.
Batteries:	6 V. lead-acid batteries, mfgd by US Battery, Corona, CA.
Battery Packs:	2 packs of 20 each (Open Division) 1 pack of 28 (Stock B Division).
Exchange time:	45 sec at last APS 500 race - generally less than 1 min.
Tires:	Goodyear, Akron, OH. P185/60R15 GLR (Low rolling resistance).
Max speed:	85+ mph
Race speed:	70 mph
Sponsors:	US Battery - Corona, CA General Atomics, San Diego, CA Advanced DC Motors Goodyear Research and Development Department, Akron OH EVCC Adaptor Plates, Rowland Heights, CA Bilstein (Shocks) Product Development, San Diego, Electric Automobile Co of San Diego

Jackson

(continued from previous page)

could eliminate the problem of limited range. Quick swaps and flexibility in battery configuration enabled the Rabbit to compete successfully in two back-to-back grueling races.

For Stock B, which does not allow battery exchanges, Jackson's Rabbit carried 28 batteries. These were arranged in two parallel strings of 13 each, providing 78 V to the Russco controller. Two additional series batteries could be switched in to bounce system voltage up by another 12 V during acceleration.

The Rabbit was optimized for the Stock B endurance feature. Running two parallel strings reduced energy losses due to internal resistance. Mobil One, a lightweight synthetic, replaced gear-oil in the transmission. A full-length belly pan cut air drag on the underside, although exactly how much is not clear, since it is difficult to measure effects of 5% or less on the road. The Goodyear Invicta GLR low-rolling resistance tires, Jackson feels, made a real difference and he says they are "essential for electric cars."

Jackson chose not to use any additive to the batteries or strengthen the electrolyte with acid. He had them well-cycled in before the race, which put a bit of a dent in his electric bill, since he had to do about 20 charges on several sets of batteries!

Choosing to configure the car for the endurance race caused some loss of performance in the heat or sprint race. Gary said that he tried to pick up some speed during the 25-lapper, but the team decided not to stress components in the endurance-optimized Rabbit.

For the Full-Size open, Jackson ran on 21 batteries, series-connected to give 126 V for maximum speed. Batter-

ies were contained in two-tier boxes. Jackson's pit crew rolled the spent pack out one door as they rolled the new pack in the other. Quick-disconnects and removable doors with twist pins helped the pit crew achieve exchange times as fast as 45 sec.

Is there a drawback to having a bunch of Ph. D's manning the impact wrenches? Gary says his guys like to spend time theorizing why something is happening as well as just fixing it. Doesn't sound like that big a drawback to CE, considering that electric car technology is still developing. (It can become a problem when you're hustling to get the car prepped the night before the race!)

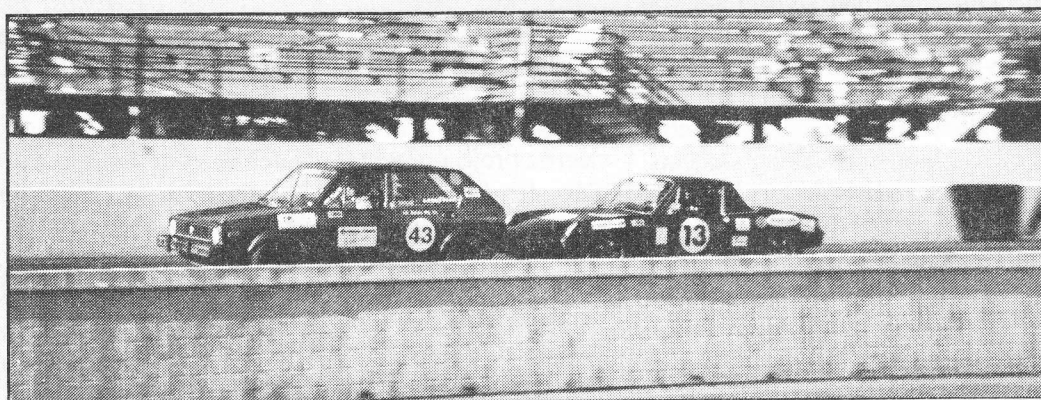
In both events, Jackson used his controller bypass, which jumps the controller and connects the batteries directly to the motor when motor voltage reaches 70 V. The bypass can give a good kick, so Jackson and his crew have installed safety interlocks. Four conditions must be satisfied before the controller bypass can operate. 1) Motor voltage, as measured by a sensing relay across the motor must be at least 70 V. 2) The accelerator pedal must be floored, activating a microswitch. 3) Brakes must be off. 4) An 'enable' pushbutton on the dash must also be on.

The pushbutton sets a latch, which stays on as long as the three other conditions remain true. In short, it insures that the direct-to-motor boost only works when you want it and are ready for it. Jackson says that he may have overdone the interlocks, but he's had enough experience to err on the side of safety.

Jackson keeps the Rabbit street-legal, since with work and racing, he doesn't have time to convert another car to electric. Optimizing the Rabbit for racing has helped in its other role as daily driver. Jackson commutes by freeway and regularly gets 70 mi/charge (not driving conservatively) or 80 (driving somewhat carefully). Leaving the roll bar in makes it a little awkward for a tall passenger or driver, since the seats can't slide all the way back.

Gary says that the trick for preparing for the APS Solar and Electric 500 race was to pick up all things that might make even a 5% difference in performance. "A bunch of little things," he says, but attention to a bunch of little things can certainly add up to a big win.

Current Events congratulates Gary Jackson and Little Guy Racing for their Stock B endurance win. What's on tap for next year, fellas?



Jackson's #43 Rabbit leads #13 Porsche during Stock A&B endurance race.

Phoenix Entry -- Agua Fria High School

by Dan Bridges

In October 1992, I heard about a grant, which, if funded, the automotive classes could use to build an electric vehicle. Knowing nothing about electric cars, I proceeded to write for this funding. As it would be, Agua Fria was one of numerous recipients resulting in a G. E. motor, controller, and \$1500 from Arizona Public Service. What am I supposed to do now? We had a 1982 Volkswagen Rabbit that was donated to the automotive program several years ago, and a lot of very energetic students.

The best piece of advice I received at the beginning was to join the Phoenix Chapter of the Electric Auto Association. They gave me valuable tips, short cuts, and people to talk with about converting a gas powered vehicle to electric. Several of my students attended numerous Electric Car club meetings to visit with others about this endeavor. The electric vehicle project started out as a class activity, but I soon discovered that twenty students around one vehicle would never work. About mid-December, a crew of five students were working every day after school and weekends. Between December and March 5 we were working seven days a week except for one Sunday in January.

March 5, 1993 was the first day of competition at Phoenix International Raceway and we were ready to race the Rabbit. Our entry had sixteen six-volt batteries supplied to us by US Battery Company in California. Our tires were from Goodyear, and an adapter plate by Greg Whitney. Our racing team consisted of five hard core racing students, two instructors, and Mr. Jeffery Willerth, our professional race driver.

Upon arriving at Phoenix International Raceway, our vehicle wouldn't move except under push power. Fortunately for us, a G.E. technician was on the spot to correct our problem. After a technical review was held on all the

electric vehicles, a brake and acceleration contest was held. We won this contest. The contest was followed by a scheduled 25-lap heat race, which we also won. The big event was scheduled for Saturday and to our surprise we finished first again. Our team was on Cloud 9 because of where we started in December and here we are winning every scheduled contest where the vehicles were in motion. A group of instructors requested to offer a "fun race" on Sunday so that students and drivers could again push their vehicles to the limits and just have a great time racing.

While preparing for this event, I dropped and broke the battery charger so that we lost precious recharging time. I finally secured a charger and began the process of putting life back into the batteries. When Sunday morning, March 7, finally rolled around, we only had a 7-hour charge. We normally charge the batteries for 24 hours. We began the race with a specific gravity of 1225 (Fully charged is 1265 to 1285 - CB). For the fun of running through the pack, our driver requested to start in the very back of the lineup. Jeffery pushed our car to second place despite the fact that the batteries were less than half charged. We later learned that the Sunday fun race was changed to an event that counted for points and the Friday 25-lap heat race was dropped.

As an instructor, I was disappointed for the students who built our vehicle because they did not place in the top five spots for trophies or cash prizes, but the electric project provided a much needed place for five students who otherwise were not involved in any school activities. I'm in the business of education and from which I hear a lot of talk about "critical thinking" and "self-esteem" and see only limited avenues available to meet these goals. Five students were elevated to new heights in "self-esteem"

and "self-worth" as a result of their participation in this racing event. Since the race the team has been planning innovative ways to make our vehicle run faster and longer, but have the amenities so that it might compete in next year's non-moving events.

I hope that everyone involved with the student electric car event; SERA, G.E., A.P.S., Goodyear Tire, U.S. Battery, and countless others realize what they have contributed to a large and growing number of students and instructors. I would encourage any school to participate for the sake of our students!

Dan Bridges

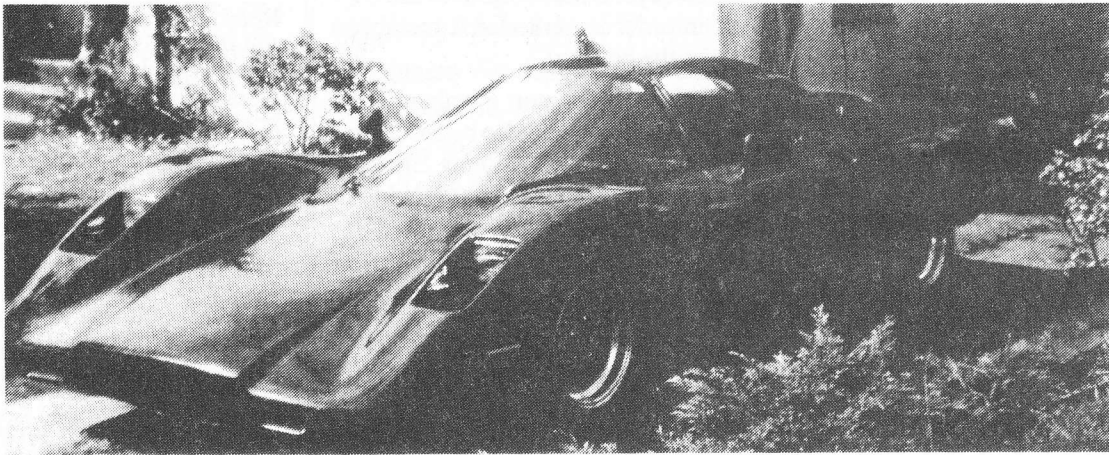
CE would like to thank Dan Bridges of Agua Fria Union High School for his contribution to High School Events. As we hoped, you high school folks are starting to take over the column, which is just great, since it is for and about you. We had an instructor respond this issue. How about some more of the students writing about their cars? Even those of you who ran into problems and couldn't finish; maybe we could learn something from your experience.

As everyone probably knows, there is some degree of contention about the student electric race (see letters to the Editor). As someone pointed out, that is almost to be expected due to the dynamic and changing nature of these events. SERA is on a learning curve and so is CE. We'd just like to remind everyone that any team of students who got a car to the track at Phoenix are winners in our book!

Paul is an EV technical whiz and Clare recently converted a VW Baja bug, so we both know and appreciate how much effort is involved.)

Pb and CB

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Short Circuits

Battery Test Proposal

by Clare Bell and Don Gillis

Remember the battery capacity test proposal that we ran last issue? Well, two individuals have called and said they are interested in working with EAA on this. One is a gentleman in San Jose, who has equipment and a place to store batteries, but who could not make a commitment due to some upcoming medical testing. The other is a gentleman in Lodi who has worked for Rancho Seco, and was involved in testing batteries for one of the APS Solar and Electric Phoenix 500 cars. He has capacity-measuring equipment, plus storage. He also feels that he could keep records of who has used batteries, who needs used batteries etc.

We are going to start this off with a trial run. One of our local members has decided to replace a pack, so we're going to get the used batteries trucked to Lodi and see if the testing works out. If it does, we'll go ahead with it and print our battery test person's name and phone number. Also a list of the batteries and their present capacities.

The only problem at this point is logistical; i.e. that this fellow is over in Lodi. We may have to establish a secondary pickup/storage station somewhere in the Bay Area.

We didn't get any phone responses from outside Northern California, but we'd like to emphasize that this service need not be limited to the Bay Area. Any enterprising chapter or other EV association can set this up. If, once we get things going, anyone wants to benefit from our experience, please contact Current EVents Managing Editor.

Watch Current EVents for further details.

CE Chapter Activities Liason

A lot of you who returned the CE surveys said that you'd like to see a column on various chapter activities. Well, we've found an individual who would like to be our chapter liason and wants to put together a brief report of what you folks out there are doing. This is part of CE's and EAA's commitment to reach beyond the confines of the Bay Area in order to serve EAA members all over the country.

Peninsula chapter member Ruth Shipley has volunteered to be the Chapter Liason for Current EVents. She will be starting a Chapter News column which will appear next issue.

Chapter presidents and/or secretaries; please send a brief report on activities that you would like to publicize in the Chapter News Column. I'm sure that a copy of your local newsletter would do. Or, if you want to E-mail, Ruth could probably handle that too, (although I'd check with her first on formats etc.) Please do not send disks, because of the potential computer virus

problems. Hardcopy or handwritten is acceptable.

Ruth M. Shipley
26A Mateo Avenue
Milbrae, CA 94030
Home (415) 871-7297 (eves.)

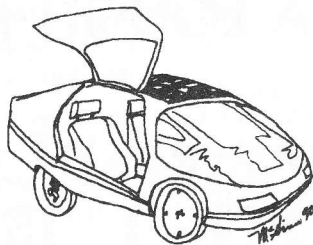
Please note, this is for Current EVents only and is intended to supplement, not replace, the activities of the EAA Board of Directors Chapter Relations committee.

Also, if anyone outside the Bay Area wants to be a regional news-gatherer and work with Ruth, that would probably be workable. As we mentioned, we want to make Current EVents truly a national publication.

Ruth is also interested in doing an "EV in the News" column. (This would be a citation reference only and would not actually reprint the article.)

She is a former reference librarian with extensive experience searching online databases. In a letter accompanying her returned survey, she says,

(continued on page 22)



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O o p s

Oops #1

Current EVents would like to thank everyone who sent protest letters about our screw-up in the APS Solar and Electric 500 Stock A and B classes. Yes, we goofed. In the heat of preparing last month's monster APS Phoenix 500 issue, your friendly assistant editor got confused about the mixed A and B stock results. Ron Rasmussen, #13, was credited with a B stock win that should have gone to #43, Gary Jackson. Many apologies to Gary and Little Guy Racing. Also to Ed Trembley in #95, Solectria's second Force entry. He took 3rd in the A Stock Endurance race.

We'd also like to mention that the cover story, which lost its byline, was written by Clare Bell. We got a lot of good response on that story so the positive stuff should balance out the goofs. When you reach for the stars, sometimes you step on your own shoelaces.

The suggestion for separating the A and B stock results is a good one. The reason why we didn't is historical; Paul has always printed the combined results, so we did it that way. In future, to avoid mix-ups, we'll split them.

Kudos to Jesse James of Sunbelt Battery for pointing out the booboo and giving us the benefit of the doubt.

The corrected results, as confirmed by SERA, are:

Electric Stock Endurance Feature, A class
1st James Worden, Boston, MA, #93, 1991 Solectria Force NiCad GT
2nd Tom Sneva, Paradise Valley, AZ, #90, SRP 1993 Ford Probe
3rd Ed Trembley, Boston, MA, #95, Solectria Force Nicad GT.

Electric Stock Endurance Feature, B class
1st Gary Jackson, San Diego, CA, #43, Little Guy 1976 VW Rabbit

2nd Jesse James, Phoenix, AZ #84, Sunbelt Battery 1971 VW Karmann Ghia

3rd Ron Rasmussen, Santa Cruz, CA, #13, Team Electro Automotive 1974 Porsche 914

Electric Stocks A and B Heat Race
1st Tim Considine, Los Angeles, CA, #11, Hackleman-Schless Honda Civic

2nd James Worden, Boston, MA #93, 1991 Solectria Force Nicad GT

3rd Ron Rasmussen, Santa Cruz, CA, #13, Team Electro Automotive 1974 Porsche 914

Anyone who suspected nefarious intent behind the inaccuracies:

No one profited from the misinformation, despite the classified ad for the electric 914 Porsche and the owner interview article. CE's assistant editor ended up buying the car to use both as personal transport and as a demo vehicle to promote EVs.

CE's assistant editor was impressed with the 914's performance in the A and B heat race, since it came in 3rd behind Considine and Worden and beat out the rest of the A stock field. Not too shabby for a B-class car running on standard US 2300 lead-acid batteries.

Oops #2

It's the APS Solar and Electric 500.

Apologies to Arizona Public Service Company, who has shown such foresight in sponsoring this alternate-energy event. The correct name is the APS Solar and Electric Phoenix 500 and we will refer to it as such in order to give Arizona Public

Service Company full credit for their sponsorship. Thanks to Carol Holden of SERA and Dan Merrit of PC House for the tap on the shoulder.

We are hearing that people enjoyed and appreciated coverage of how APS, SERA and PIR handled safety at the race. Great! We want to do more.

Oops #3

Our previous issue was really the May/June CE, not March/April, as shown (incorrectly) on the cover. Sharp-eyed readers noticed that it was correct on the inside pages, but not on the front. The error that happened when the cover identifier file didn't get updated and we didn't catch the goof during proofing.

Oops #4

At the EAA Board of Directors meeting on May 22, 1993, the Board of Directors voted to have Current EVents publish the following statement.

CORRECTION: The May/June issue of Current EVents carried a "product disclaimer" notice on page 16. The EAA Board has accepted Don Mignola's statement that his intent in the video in mentioning the Electric Auto Association and that he was a Director of EAA, was to promote EAA and he did not intend to imply that EAA endorses any B.A.T. products.

The Board has apologized to Don and regrets any implication in the disclaimer article that Don did anything improper. No letter is being sent to B.A.T., the TV station, or to Don.

Insurance and the Electric Vehicle

by Michael Clark

There are always barriers to change -- some real, some perceived. Largely due to the efforts of the EAA membership, public perception of electric vehicle technology is steadily improving and much has been written to dispell the common misinformation regarding EV performance issues such as limited speed and range. This should continue. But acceptance of electric vehicles is not restricted simply to technology.

As performance issues are addressed, second-layer concerns now take their place as barriers to public acceptance. In order for the general public to accept, purchase and use EVs, electric vehicles not only have to function within acceptable performance parameters, they must also be recognized by the same sort of support functions that gasoline and diesel-powered vehicles depend upon. One such non-technology support function is vehicle insurance.

As is the case with many EV performance issues, the perception of a problem may exist when there is really no problem at all. The same may be true for electric vehicle insurance. Several non-EV people I spoke with thought that there would probably be a problem insuring an EV.

One company who specializes in insuring show cars, kit cars, and vintage cars abandoned their pursuit of the electric vehicle market because they found that most electric "conversion" cars were insurable by mainstream insurance companies. Each of the three largest vehicle insurance companies in California, (State Farm, AAA, and Farmers) each have experience insuring electrics. State Farm, in particular, has specific language covering electric

vehicles. If your vehicle is a conversion from a "standard automobile", the car is usually insurable. Filing claims against the policy may be another matter.

No insurance carrier I contacted could give me specifics regarding the actual payment of a claim for EV damage (see EV Insurance article in next issue of Current EVents). This may be due to their limited experience with EVs. Agent's concerns about possible claims seemed to fall into two general categories:

- Is the value of the converted vehicle adequately documented?
- Are the costs of EV-specific components available?

There was also a concern that some EVs may be insured as "standard cars" and that this "misrepresentation" could possibly invalidate a claim. For the moment here are the things we recommend you do when insuring your electric vehicle:

Document the value of your car

Keep original receipts of all parts and labor invested in the restoration/conversion. If you keep making changes after the car is on the road, keep track of those expenses. Have your car professionally appraised if possible.

Document the appearance of your car

Take photographs from several angles, including the exterior, interior, motor and the battery compartment. Have your insurance agent inspect the car. Use a video camera during the conversion process.

Insure your car to the proper level

Determine what your car would cost to replace and make sure that it is covered to that level. Document the fact that it is an electric by including the vehicle registration. Pay for collision and comprehensive coverage if your car is more than a test-bed.

Curiously, there has been very little information published about EV insurance. In future issues of CE, we will continue our series of articles and interviews regarding insurance for EVs.

We need your help

Any experience you have had, positive or negative, while seeking insurance for your EV would be helpful to know. We are particularly interested in which companies you have dealt with, the level and type of insurance you have obtained, and any history you may have had regarding claims.

With your help, Current EVents hopes to find and publish the facts about these non-technology issues for EVs. Only when the EV is perceived to be a "real car" will public acceptance and use of electric vehicles prevail.

EVs in SF

(continued from page 4)

information booth that was continually thronged with people asking about the cars.

KGO, Channel 7 (ABC), re-broadcast their entire coverage of the Carnival on Sat. June 5, at 3PM (PST). Carnival is considered a national event, and both KGO and KRON send footage to their networks. The SF Chronicle/Examiner ran articles on 5/29 and 5/30. See "Carnival" by Susan Ferris, Sect. B-1 in 5/30 Examiner. More coverage next issue.

Urge State Reps to Act on CA EV Package

by Clare Bell

A package of proposed bills, called the Electric Vehicle Stimulation Package will soon be before the California Legislature. California EAA members should contact their state legislators and ask them to support this package.

In a March 23 press release, state senator Tom Hayden described his own EV bills and others that are currently before the State Senate Committee on Energy and Public Utilities. Senator Herschel Rosenthal, who is also sponsoring pro-EV legislation, is chair. (EAA members might also consider writing Rosenthal to thank him for his good work so far and urge him to continue.)

Hayden, who suggested that the State Senate fleet purchase electrics, and who has requested that he be assigned an electric Escort, is sponsoring SB 381 and SB 531.

For more information, contact Tom Hayden's office at (916) 445-1353 or write to Tom Hayden, Senator, 23rd district, State Capitol, Sacramento, CA 95814.

SB 381 and Amendments

- State fleets must have an ZEV/EV average of:
2% by 1998
5% by 2001
10% by 2003
- Local government and private fleets will add:
5,326 EVs by 1998
13,314 by 2001
26,629 by 2003
- Extends 2 current EV purchase incentives to 1997.
- Cuts base registration fee in half for EVs (from \$27 to \$13.50).
- Exempts EVs from air pollution district fees.
- Creates a consortium to establish criteria for and large scale purchase of EVs for government agencies.

SB 381 has passed State and Senate and is in the Assembly.

SB 531

- EV charging stations to be installed at mass transit terminals.
- Updates building code - new construction must provide adequate wiring for EV charging outlets.
- California Highway Patrol to adopt safety standards/regulations for EVs.

EAA at WESCON '93

by Stan Skokan

The 1993 WESCON electronics show will be presented in San Francisco's Moscone Center from September 28-30. This year, for the first time, the EAA is a co-sponsor of an EV Showcase at WESCON. The annual EAA Symposium of technical papers will also be presented at WESCON

We are inviting all EAA members to attend this event. The latest developments in battery technology will be presented. Norvik Technologies from Canada will present a paper on fast EV battery charging techniques. Precision battery energy monitoring equipment will also be described.

We are also inviting West Coast EAA chapters to participate in the EV Showcase. We would like each chapter to display one or two EVs from their area. Please start preparing the vehicles early, so we can display cars that the Association can be proud of. For more information and to reserve a spot, please call Stan Skokan at (415) 366-0643.

NEXT ISSUE

Results of CE Survey

*Interview
with Bob Schneeveis*

Electric Bus

Filing an EV Insurance Claim

Formula Lightning Race

Chapter Activities

Meet the Press: A Guide for the EV Owner

by Shari Prange

One of the first things you will discover as an EV owner is that an electric car is an instant ticket to local fame. You will find yourself stopped by strangers in parking lots, speaking to the Rotary Club, driving politicians in parades, and invited to participate in Concours d' Elegance. You will also find yourself talking to reporters.

One of the next things you will discover is that the story the reporter files usually isn't nearly as enthusiastic about EVs as you are. In fact, the more important the venue for the story, the more likely that it will come out downright negative. "Electric cars can't. . . not yet. . . still limited."

Knowing that you are an ambassador for EVs, and facing a skeptical world, here are some things you can do to improve the results.

Choose your forum. Not all publicity is good. If you are invited to participate in an eighty mile "Clean Air Race" as the only electric among a pack of methanol and CNG cars, and you know you will limp in dead last if at all, don't go "just to show the flag". The flag doesn't show well dragging in the dust. Don't participate in events you know will make your car look bad by comparison.

Prepare your car. Even club rallies, which are events within the EV "family", attract a lot of general public and some media. Be sure your car is as clean and professional looking as you can possibly make it. If the paint is old, there are products to buff it up. At least wash and vacuum it. Clean the battery terminals. Take a few minutes to tie wrap wires tidily out of the way.

Above all, do not give rides to reporters if your car is not fully charged, or not up to snuff for any other reason. Too often, major media have ridden in undercharged or ailing cars and written about the pathetic performance. Don't give them another opportunity.

Accentuate the positive. As they say, nobody notices planes that land safely, only

the ones that crash. Likewise, nobody notices all the miles of reliable EV driving, only the one time you walked home. Even among ourselves, problems stick in our minds.

The media and general public already have negatives about EVs in their heads: EVs are small, weird-looking, slow, have short ranges, and are likely to run out of juice and leave you stranded. Don't feed these stereotypes. Before you open your mouth, remember the doctor's principle: "First, do no harm."

Don't tell the reporter about the time you goofed and had to walk home. Don't tell them how much extra effort you take to plan your routes carefully. (Is it really that much more effort?) Don't tell them you worry about having enough juice. These are the things they will blow up into headlines.

There are only about a dozen questions that everyone asks, but the same facts can be given in different ways. Practice answers that are stated in a positive way. No sentence should start out, "An electric car can't. . ." or "With an electric car, you have to. . ."

Emphasize "normal". If your car is a Citicar, or a home-built chassis, or a souped up race car with batteries everywhere, be sure the media and the public know that this is an unusual car. If possible, try to have a friend with a very ordinary-looking electric sedan included in the interview. The world in general already knows electric cars can be weird. Most of the world is put off by weird. They need to know electrics can be normal, too.

Give information bites. Reporters are looking for brief, clear quotes to use. Have some of your favorites ready. A single clear sentence will be quoted, maybe even highlighted. A lengthy discourse of run-on sentences will be condensed and edited by the reporter, if used at all. Any time the reporter edits you, your statements get farther from what you intended to say. Practice a few snappy quotes.

Have printed handouts. Send them away with something in writing they can

refer to later. Keep literature in your car at all times, for surprise interviews in parking lots. You can get brochures from the EAA, or "EV Fact Sheets" from Electro Automotive, or you can type up and copy a page of info about your own car.

When talking to the public or press, try to get inside the head of your audience. Try to dissolve their fears and surprise them with positive facts that will get them excited. Listen to what you're saying from their perspective, and see if it sounds positive or negative. Don't dwell on ideas of limits or handicaps, or anything that implies that people will have to make major sacrifices in their lives to own an electric.

We are all missionaries for electrics in a world of automotive pagans. A sermon of joy is going to make more converts than one of chastity, poverty, and obedience. So go forth and preach the gospel.

Positive vs. Negative EV Facts

The same information can be delivered in different ways, with different results. Is the glass half full, or half empty? The following are samples of different ways to convey the same facts about electric cars.

Range

Negative. Electric cars have short ranges. The average is only 60 - 80 miles, and some of the poorer ones get only 30 miles. Only a few of the best can get even 100 miles.

Positive. Ninety percent of the cars in America travel less than 25 miles a day, and even the worst electrics can do that. Most well-made modern conversions can do two or three times that, and the high-performance cars can do 100 miles or more.

Speed

Negative. Electric cars aren't as fast as gas cars.

Positive. Most well-made modern conversions can reach top speeds of 50 - 60 mph, and the high performance cars can get up to 80 - 90 mph.

(continued on next page)

Meet the Press

(continued from previous page)

Charging

Negative. Electric cars are inconvenient to refuel, because you can't just pull up to a corner gas station. Also, they take a long time to charge--as much as twelve hours.

Positive. Electric cars are easy to charge. Just plug into a regular 110 v outlet. Most people don't use up a full charge in a day. Instead of finding a gas station, waiting in line, and wrestling a smelly pump, you simply plug in at home at night, and the car is ready in the morning. Many people drive ten or so miles to work, plug in all day, and have a full charge when they leave.

Running Out Of Electricity

Negative. What happens if you run out of juice before you get home? Most electric car owners have tow bars for rescues.

Positive. When a gas car runs out of gas, it stops dead, right now. An electric will simply start to slow down gradually over a period of several miles. If you finally must pull off the road, you can park for ten minutes, and the batteries will regain some charge just by resting. You can then drive a couple more miles, and rest again if need be. Try that with an empty gas tank!

Long Trips

Negative. You can't take long trips in an electric car.

Positive. An electric car is not intended for long trips, just as a microwave oven is not intended for frying foods or baking angel food cakes. Most people who have a microwave also have a conventional oven. Most households in America have more than one car. For long trips, take the other car.

Cost

Negative. It's expensive to buy or convert a car, and to replace the batteries when they need it.

Positive. An electric car is very cheap to operate. Even including replacing the batteries every three to four years, it still costs only about a third as much as a gas car. That's because there are no tune-ups, oil changes, mufflers, starters, water pumps, radiators, etc. And how do you place a dollar value on all the time you save not taking the car to the shop?

These are just a few examples of ways to answer the most common questions in a positive way. Think up your own positive answers to questions, and have them ready when people ask.

1993 PHOENIX SOLAR & ELECTRIC 500 "B" STOCK HEAT RACE WINNER: ELECTRIC PORSCHE 914

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- ☐ Accepts battery pack voltage of 50 - 400 V
- ☐ Connections between signal and display board are 5000 V opto-isolated

Compact and flexible

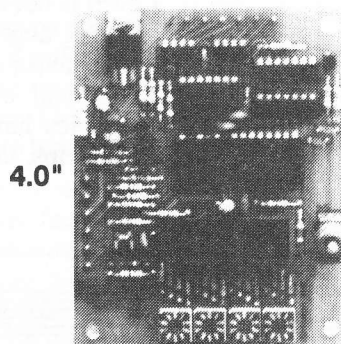
- ☐ Uses 2 pc boards — input and display
Display board may be remotely mounted in dash

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- ☐ User pre-settable count register (use to set battery capacity)
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- ☐ Power-conserving display-blanking, in standby mode
- ☐ 12 V nominal power input to both boards
- ☐ 750 V isolation from voltage sense inputs. Provides safety even when charging with non xfmr chargers.

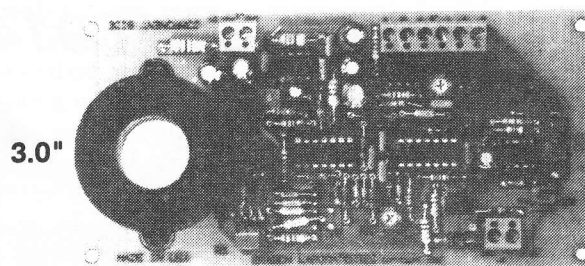
Now EV users can easily:

- ☐ and precisely monitor battery energy flow
- ☐ Quantify vehicle efficiency (whrs/mile) as a baseline for improvement
- ☐ Troubleshoot power losses
- ☐ Determine charger efficiency (by comparison with AC powermeter at charging location)
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Ordering Information:

The complete Precision Energy Monitoring system consisting of the signal processing board, the display board and user manual are stock to 12-week delivery. Brasch Laboratories — Phone: (408) 371-7276 FAX: (408) 371-5978.

Do It Yourself Column (Recent Conversions)

by Paul Hebert

DIY is a new feature in which *Do It Yourself* conversion projects and ideas are written up for all of us to share. In each issue we will present another EAA member's conversion project. Members can submit their own project writeup, or we can interview you and write up the article for you. Articles should be 500-1000 words. If you include a photograph or drawings, we will try to include those as space allows. For each project we will give a general overview of the car, and then pay special attention to any innovations.

I'll try and get us started with my own project, just three weeks on the road at this writing

This project has taken me about 8 months of weekends and some weeknights to get on the road. I've done most of the work myself (except for the machining.) At each step along the way I spent a lot of time considering the alternatives, trying things out with cardboard models or on paper. At this point, although the car drives well, I still consider it in a prototype stage. Down the road a bit I expect to redo the battery boxes, beef up the brakes and the suspension, modify the dashboard displays and perhaps even bump up the voltage to 132.

For the most part, I've done a standard conversion of an unusual car. In many ways, the Sunbeam was not an optimal choice for conversion. It is old, fairly heavy for the size of the car, doesn't have much space left over for batteries, and as a convertible it is not as aerodynamic as other cars.

Early on, as I was talking to Bob Schneeweis about whether to convert this car, he asked me if I liked the car. Bob suggested, and I agree, that you better like the car you start with, because you're going to spend \$3,000 or more on it, reduce its range and performance, and probably reduce available space and general utility. If you don't like it pretty well before you start, it may be pretty hard to live with when you're done! Fact is, I like the car a lot, so I

figured that I could get around the other shortcomings.

My most serious departure from a typical conversion was my decision to use the new 12 volt batteries instead of the tried and true 6 volt batteries. I knew I wanted the car to be capable of highway speeds, so I needed to get the voltage up to at least 96 volts, higher if I could, and I also knew that I was very limited in available space for batteries. These two considerations, more than anything else, persuaded me to go with the 12 volt batteries. Using batteries with a lower overall capacity, it is even more important to get the voltage up as high as possible to reduce the average operating current through the battery pack.

My current battery pack weighs in at about 850 lbs with a foot print of just

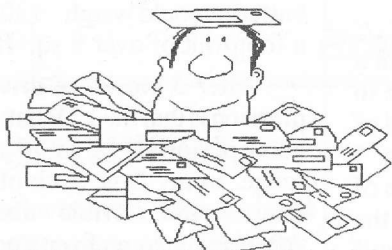
under 6 sq. ft. (A 120 V pack using 6 V batteries could weigh ~1300 lbs and has a footprint of over 8 sq. ft.)

After 3 weeks of driving, my impression is that the 12 V batteries provide good performance in all areas except range. In my first week of driving, the range seemed terrible - about 22 miles. After doing some front end work, buying the low rolling resistance tires and adjusting my driving habits, I believe that I am now getting 40-45 miles/charge. This is still less than what I hoped for (60+ miles), but it is quite workable for my daily commute.

Part Two will be featured in the next issue of Current EVents. If anyone is interested in more detailed information, send SASE to Paul Hebert, 3165 Loma Verde Pl., Palo Alto, CA 94301.

Tech Spec Box

Original Car:	'63 Sunbeam Alpine Roadster, 2 seat, convertible, dry weight 2200 lbs
Drivetrain:	20 hp Prestolite adapted to 4 speed standard transmission, rear wheel drive.
Controller:	Curtis 1221B
Batteries:	10 US Battery #1440 12 V traction batteries connected in series.
Range:	45 miles at 'round town speeds
Top Speed:	over 70 mph
Tires:	Goodyear Invicta GLR (Low rolling resistance)
Cost:	\$3800 so far
	Motor \$1100 (older model, new in crate).
	Controller \$700 (new).
	Batteries and cables \$1200 (new- got a good deal on cable at HSC).
	Tires \$260 (new).
	Adaptor \$200 (my neighbor is a machinist).
	Charger \$ 30 (home-built)
	DC-DC \$150 (used)
	Contactor \$80 (used)



Letters to Current Events

The opinions in this section are those of the EAA member submitting the letter. EAA does not endorse any person or product mentioned, but rather tries to clarify or address issues submitted. Send your comments and letters to "Letter to the Editor".

To The Editor:

1990's technology requires a fresh approach to electric vehicle heating. Gasoline powered heaters have gone the way of the Corvairs and aircooled Volkswagens that employed them. At the Tenth International Electric Vehicle Symposium in 1990, the subject was covered by J. Schwartz in "Air Conditioning and Heating System for Electric Vehicles," in which he concluded:

"...Gasoline can be used for...heating...which heats up air through combustion....A fuel tank, fuel pump and connecting pipes are necessary...."

"The main disadvantage of such a heater are the exhaust emissions. In California, the trend setter for the introduction of exhaust emission standards, an electric vehicle with such a heating device would not conform to regulations."

"The use of a combustion heater in an electric vehicle contradicts the original idea for the introduction of electric vehicles: to abolish exhaust exhaust emissions."

The only practical means of heating that produces zero emissions is electric heating. A heat pump or refrigeration system is inefficient under 40 F. This

leaves electric resistance heating, such as the Russco line of electric hydronic heaters, that heat coolant, which is circulated through the OEM heating system.

This is a more conservative approach to vehicle heating than the gasoline engine, which provides an unlimited amount of 195°F coolant for heating, but adequate heating can be accomplished if the following conditions are met:

- All windows must be closed.
- Outside ventilation shut off.
- Temperature controls set to "Full Hot."
- Interior air heated in a "recirculate" mode, heating inside air.
- Heated air discharged through dash mounted vents, not at floor level.
- Battery voltage is at rated heater voltage.

The Russco H-15 and H-20 heaters, which provide 1500 watts (5120 BTU/H) and 2000 watts (6830 BTU/H) respectively, are adequate for electric vehicle heating. For applications requiring greater capacities, 3000 watt (10,240 BTU/H) and 4000 watt (13,660 BTU/H) heaters are available. Contact Russco Electro-Mechanical Engineering, PO Box 3761, Santa Rosa, CA 95402 or call (707) 542-4151 for more information.

Dear Editor,

Gary Jackson in the #43 Rabbit took 1st place in the "B" stock endurance and the 3rd place overall in the stock endurance. J. James driving the Sunbelt Battery #84 Ghia was 2nd in the "B" endurance and 5th overall. Ron Rasmussen and the #13 Porsche were 3rd in the class and 6th overall.

Just an honest mistake, but credit where credit is due. As a side note, it's a pleasure to compete with Ron, Mike Brown and the rest of their crew...Mike saved our bacon by coming up with a needed fuse the day of the feature event.

Jesse James, Sunbelt Battery Co.

Thanks, Jesse. You're right and CE is printing a correction this issue -- see Oops #1. We're also doing a story on Gary Jackson and Little Guy Racing.

To Current Events/High School Events:

Your editorial about truth and our duty to challenge misinformation in the March/April 1993 Current Events prompted me to write this letter. The key sentence in your editorial: "If everyone annoyed by a false story wrote even a few paragraphs of their outrage and the correcting facts to the offending publication, then the public would start to hear the truth." Well, consider me annoyed, because in this case, Current Events is the offending publication.

I am referring specifically to your coverage of the High School competition at the 1993 500, where Cortez High

(continued on next page)

Letters

(continued from previous page)

School was declared the winner. Cortez did win the race on Sunday March 7; however this Sunday Race was not on the published agenda, and was announced late Saturday to appease a few vociferous entrants. The truth is that Agua Fria High School won every officially scheduled race on Friday and Saturday, and everyone involved can attest to that fact. Unfortunately, due to a combination of misinformation and mismanagement, Agua Fria was completely overlooked when it came to the awards presentation, and the race results on Sunday were considered "official".

I suppose these kinds of oversights are to be expected because of the dynamic nature of this kind of event, and the relative newness of the SERA 500. My congratulations to all the high schools who worked so hard on their projects. But imagine the disappointment those students must have felt knowing that they had played by the rules, competed and won fairly, only to be ignored by the "official" results. Better luck next year.

Keith M. Vogelsang
4765 Tonto Drive Glendale
AZ, 85308

(CE knows there is controversy about the student electric race. See this issue's High School Events for Agua Fria's Phoenix entry.)

Dear Clare and Paul,

Per your letter, faxing the official results for all divisions at the 1993 APS Solar and Electric 500.

Glad you think that Formula Lightning's neat. There are some very exciting announcements coming out shortly regarding Lightning, the '94 race schedule (with a very important addition to the APS Solar and Electric 500) and the announcement of three additional

(continued on page 20)

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Letters

(continued from page 19)

Lightning races this year beginning in August. As you may know, Formula Lightning is going to be SERA's spec car, class and series for 1994 and beyond. Details on all this forthcoming shortly. Let me know if you need anything else.

Carol Holden
Solar & Electric Racing Association

Dear Editor,

In your article on the Phoenix 500 race you mentioned that I hold an APBA (American Power Boat Association) record for fastest electric runabout. I personally have never been in an electric boat race, but two members of our club NOPEC (Northern Olympic Peninsula Electric Cars) have. Burton Gabriel of Gabriel Marine and Electric in Port Ludlow, Washington, who holds the present APBA record for electric runabout. Also member Tim Nolan of T. J. Nolan Marine Design who in conjunction with David Janos of Pelican Kyaks and Pat Mahon of Mahon Marine Woodworking all of Port Townsend, Washington all came in second in their beautiful "stealth" hull in the 12 hour battery marathon held at Spoda Lake in Western Washington last year. Many of our members have worked hard and long to expand the limits of speed and efficiency in electric transportation. I firmly believe that credit should be given where credit is due. Thank you for letting me air this clarification.

Roderick Irwin
President of NOPEC
(No. Olympic Peninsula Electric Cars)

Calendar

June 27, 1993 - Palo Alto Concours d'Elegance at Stanford University, Palo Alto. 10-4:30. The Concours is planning to have 6 EVs among their 200 classic, vintage and high performance cars. Entries and general information -Tel or Fax 415-948-1027.

July 4 - Redwood City Independence Day Parade. Contact Mike Slominski of Peninsula Chapter for more information. Tel. (415) 343-8801.

July 17, 18 - Electrathon Formula E Racing at Heller Park Velodrome. Heller Park is in South San Jose, off 101. The Velodrome is the bike racing track at the north end of the park. Contact Dann Parks (408) 437-5454 for details.

Aug 6-8 - Renewable Energy Development Invitational (REDI) Conference. From the creators of SEER. For information and registration, contact REDI, 733 S. Main St. #234, Willits, CA 95490. Tel. (707) 459-1256. Fax (707) 459-0366.

Sept. 22- 25 Wescon (West Coast Electronics Conference) in San Francisco. Includes EAA Symposium and EV Display. See Wescon announcement in this issue. For information, contact Stan Skokan at (415) 366-0643.

July - August - East Bay Chapter is planning 2 rallies. For more information, contact Anna.

August - 1st week - Ben Lomond Concours d'Elegance. Usually conflicted with SEER at Willits, so EAA hasn't participated. Maybe this time we can get some cars up there.

For more information on EEvents, contact Anna at 510-685-7580.

EAA Reprints

EAA reprints available:

- 1) \$1.00 **Editorials** - *100th Monkey*, *Market Size*, *Twilight or Dawn*, *Public Acceptance*
- 2) \$1.00 *Discovered: The Perfect EV Battery*
Facts about the battery that will change the world.
- 3) \$5.00 **Dr Richard Post** - *Flywheel Energy Storage*
Dr. Post updates 1970's thinking and finds a viable solution.
- 4) \$5.00 **Chuck Lemme** - *Team Tucson Land Speed Record Plans*
Includes many power and aerodynamic formulas. A wealth of technical considerations.
- 6) \$5.00 *EAA XA-100 Hybrid (Includes all tables)*
Report on the EAA's Hybrid Vehicle Project (all 3 chapters).
- 7) \$3.00 Back issues of Current EEvents

ORDERING INFORMATION: Please send donation (check payable to EAA) for your choice of reprints to the following address. Include SASE/w 2 stamps for \$5.00 items and 1 stamp for \$1.00 items each to cover postage cost.

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San Jose, CA 95124-1313

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The Electric Auto Association (EAA) will help you tap into a wealth of opportunity through advertising in our newsletter, **CURRENT EVENTS**. Our membership extends worldwide and consists of members who share one common interest -- electric transportation.

CURRENT EVENTS is renowned for the latest information on electric transportation. With an ad in **CURRENT EVENTS**, you will reach a target audience of 3,000 members and EV enthusiasts who understand the value and importance of your product.

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1/8 page	2.0" x 3.5"	\$ 60	\$ 40 ea

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The deadline for camera-ready copy is due the 1st of the month. The due date for future issues of **Current Events** is as follows:

September/October issue	August 1st
November/December issue	October 1st
January/February issue	December 1st

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:

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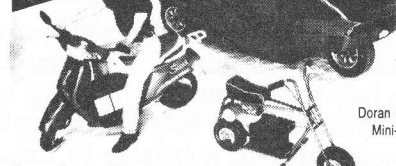
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Short Circuits

(continued from page 10)

"I've decided to sign onto CompuServe, which would give me access to databases that cover major newspapers, trade journals and general interest magazines. I could run a search every month and publish the citations in CE. The column could be called 'EVs In the News'.

CE thinks this is a great idea and could be a nice compliment to the News in Briefs that we run.

Anyone who is into this, please contact Ruth. Thanks. CB

Are You Charging At Work?

By Don Gillis and Clare Bell

The EAA has created a presentation package that we are making available to anyone who would like to present it to their company management.

The intent of this package is to communicate the benefits that EVs bring to the employer and the environment.

EVs are helpful to the employer in meeting "Trip Reduction" requirements. They help the environment by giving off zero emissions. They help the country by reducing our trade imbalance by reducing oil imports.

We are also looking for a few selected EAA members who are willing to act as spokespeople to make the presentation if the employee doesn't feel comfortable doing it.

Companies that support EV charging facilities include Hewlett-Packard, Tandem, Santa Cruz Operations, and Curtis PMC.

We would like to hear about any other companies who allow or support EV charging for employees who drive their EVs to work.

For further information, contact Don Gillis at (408) 225-5446.

Reference: Bay Area Air Quality Management District Regulation 13 - Transportation Control Measures, Rule 1 - Trip Reduction Requirement for Large Employers Dec. 16, 1992.

Member Want Ads

FOR SALE: Advanced DC Motor model #FB1-4001A. Never used. VW Transmission adapter kit included. Original cost over \$2200. \$1500/obo. Call (818) 341-5440.

FOR SALE: Jet Electrica 007, 6850 miles, white, 120 V, 75 MPH, \$8,500. Call (415) 306-0137.

FOR SALE: Sunbeam Imp, w DC Series Traction Motor, 4 spd, \$1500. '81 Jet Escort hatchback, 20 HP Prestolite DC series wound motor, 96 volts PMC transistor controller, gas heater, 4 spd, red w/red interior, \$4495. '81 Lectra hatchback, 20HP Prestolite DC series wound motor, AC & gas heater, 5 spd, silver gray w/gray interior, \$4495. Call (415) 388-0838.

FOR SALE: NICE, Lectra '81 Centurian Hatchback 20 HP Prestolite DC Series wound motor, 114 volts, PMC transistor controller, AC & gas heater, 5-speed, new paint (silver-gray), grey interior, needs new batteries. \$4495. Call (415) 388-0838.

FOR SALE: Complete Conversion of 1968 Saab 96, 9" Advanced DC motor, Curtis ctrlr, 96 V. system, Lester charger, 3K mi on Interstate, GS100 battery bank. Excellent condition. Complete efficiency specs and details. \$8000/obo. Call (802) 223-6652.

FOR SALE: 108V Mazda RX-7, 9" Advanced DC Motor, Curtis 1221B Controller/Pot; heater; Voltmeter, Ammeter, energy gauges; 5 speed; Regen and power braking; new Trojan 235AHR battery; new white paint and beige interior; Lestronic dual input/output stationary charger. Free delivery to L.A. \$13,500. Call J. James (602) 968-8068.

FOR SALE: 1981 Bradley GT II Electric Car, 500 original miles. Used as show car only. Show room condition. Tow bar and spare parts. Call (908) 527-0479.

FOR SALE: Jet Electrica 007, 6850 miles, white, 120 V, 75 MPH, \$8500. Call (415) 306-0137.

FOR SALE: Surplus EV Parts, motors, contactors. Call (707) 829-4545.

FOR SALE: Rabbit Pickup, fast, powerful electric, \$6000. Leaving country--must sell all my stuff. G.E. motor \$600, Prestolite \$800, big Gould \$400 aircraft generators \$300, 96V controller \$350, 96/12V/Lester charger \$400, Fiat X-19 \$100, New 120V controller \$700, 5 Amp solar panels \$250, 27" Travco Motorhome \$8000, 8 1/2 x 40' diesel transit bus \$5000, air bags for bus \$100, clutch adaptor \$50, UST 4800 Satellite Receiver \$600, 2-door Ac-dc refrigerator \$300. Call (805) 929-2328.

WANTED: EV technicians, owners, sales reps. Call (707) 829-4545.

WANTED: Long golf-type car. Call (805) 929-2328.

WANTED: Ford Pinto converted to electric. Will consider an unfinished electric project car. Call Bill Hossfield @ (201) 839-9053.

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National Transportation studies show that 95% of all vehicle travel is less than 30 miles per day. Typical EV's can cover 2 to 3 times this distance on a single charge -- proving them more than adequate to meet your needs.

You can learn more about EVs by attending EAA chapter meetings. The EAA welcomes the public, and will be glad to share our experience with you. Many members drive electric vehicles which they have either built or purchased. Watch for announcements of our public shows and rallies.

The electric vehicle industry is young, but growing. Join the EAA and help advance the role of EVs in society. Help improve the environment and our use of energy resources.

The Electric Auto Association (EAA) is a non-profit, educational organization for the promotion of clean, quiet electric vehicles (EVs) for personal transportation.

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- Chapter meetings with informative programs and opportunities to exchange information with other members.
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- Yearly symposia and awards to outstanding members.
- Opportunities to compete in electric vehicle rallies and participate in shows.
- Participation in plant tours and special events.
- Savings on component costs through participation in group purchases.
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Electric Auto Association Membership Application

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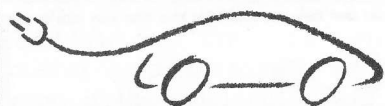
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July/August 1993

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