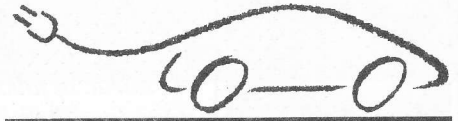


CURRENT EVENTS

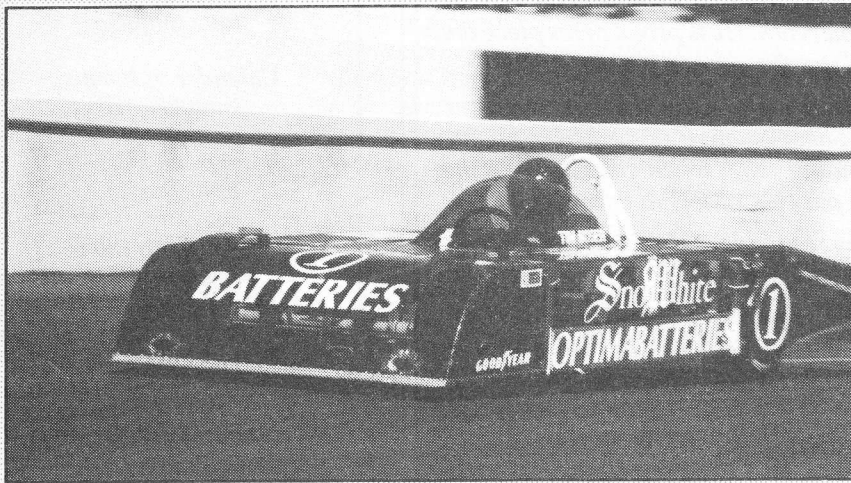


September/October 1993

Vol. 25 No. 5

Seeds of Change

By Paul Hebert



Tim Moser on track with SnowWhite at Phoenix during APS SERA 500 Break-100.

Sitting in a '64 Lincoln during the oil crisis, well back in a line of cars waiting for their chance to fill the tank, machinist Bob Schneeweis was among dozens of people who were being buzzed by an electric car with a sign on the side declaring its independence of gasoline. There and then a seed took hold, and by the time Bob got to the pump (45 minutes later) he had the design for his first electric vehicle well under way. Six weeks later, still nursing that same tank of gas, Bob took to the road on a converted Harley-Davidson motorcycle powered by a pair of Ford starter motors (modified at the machine shop) and two golf cart batteries. It had a range of just under 10 miles, a battery pack designed for quickly swapping a depleted pair of

batteries for fresh ones, and plenty of power. A year later he sold the Lincoln—still running on the tank full he'd purchased when the seed took hold.

Since then Bob has built several small electric vehicles, many of which have gained notoriety in the EV community and beyond, including the "Electric Wheelbarrow", "Number 1", and "Snow White". The wheelbarrow started out normal enough, grew a small motor and a pair of batteries underneath, and a trailing platform where the "driver" stands (it would be difficult to keep up with the thing if you tried to walk it like the garden variety implement). It's still primarily a wheelbarrow, reborn as an EV to help cart the multitude of batteries used in Snow

Continued on page 8

DMV Alert for CA

Due to the actions of some gas-car owners who have evaded smog fees by fraudulently registering their cars as electric, DMV is turning a skeptical eye on ALL electric car registrations. Renewals of registration by mail has been affected for some electrics. DMV now wants to see the car before they will renew the registration as electric, which is why some EV owners have not received their renewals. Scott and Anna Cornell have experienced this. So has Bill Williams.

People who are in the process of converting cars or getting newly converted vehicles on the road have also run into trouble from DMV. Certificates of non-operation (filed when a car is taken off

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Notes from the Editor

The biggest and nicest result of the CE Reader Survey was the horde of folks who answered CE's request for contributions (question 25). A whole whopping 76 of you said that you would be willing to cover an event, write an article, manage a column, or shoot photos. The response from question 25 alone was probably worth the entire effort of putting together the survey!

The survey results support the columns and features we have already put into place, such as "Do It Yourself" (Recent EV Conversions) and "Chapter News". "Bolts and Volts" or some variation will be along as soon as we find a TechWiz to manage and/or write it.

Paul Hebert, who took "Do It Yourself" (DIY), off to a flying start last issue, really soars this time with his Bob Schneeweis interview. He is proud of his piece and I agree, enough to present "Seeds of Change" as our cover story this issue.

Ruth Shipley, who was announced as CE Chapter Liason in our last issue, now steps forth with her "Chapter News". She's been working under slightly adverse conditions but she's done an outstanding job. When she starts getting material by modem, she'll be able to do more out-of-California coverage.

Both of these new contributors were survey respondents (although Ruth had a Letter to the Editor prior to the survey).

We have made up a volunteer talent database and have drafted a thank-you letter to everyone who responded. In the coming months we will be fitting abilities together with assignments. (Those of you who have already contributed to CE will also be included.) The idea is to maximize enjoyment on the part of the contributor as well as the quality of CE. [It's a win-win situation for everyone.]

What's ahead? Well, in these pages you will soon see promotional items such as T-shirts and bumper stickers. Mike Slominski of Peninsula Chapter, has taken the initiative to have promo items made up for his chapter. We are considering adding a page of promotional items to CE so that all members can order and receive these items by simply filling out a form and mailing back to CE. [More info on this to come in our next issue.]

About bumper stickers—Everyone who sent a completed survey will get a "Switch is On" bumpersticker. CE designer Sue Hollis did the graphics and I think they're nifty. Look for them soon in a mailbox near you!

CE is also planning to go to monthly publication and second class mail in January 1994. We can do a 16-page monthly publication for about the same cost as the bimonthly, and about half of you indicated you wanted monthly, even if you didn't want to pay extra for it. This month we are implementing 7-zip code to all addresses as well as barcoding the labels to increase delivery and reduce the postage cost.

CE is always interested in your comments and suggestions. Please send us your ideas, stories or questions. And don't forget to "tell a friend". Share Current EVents with your neighbors, friends, families and co-workers. Remember "The SWITCH is ON to electric cars". [See member referral program on last page of CE.]

—Clare Bell, Managing Editor

Current EVents Staff

Managing Editor
Clare Bell
(408) 225-6403

Advertising & Production
Susan A. Hollis (PC TEK)
(408) 374-8605
Fax: (408) 374-8750
18297 Baylor Avenue
Saratoga, CA 95070

Contributing Authors
Paul Hebert
Bruce Brooks
Shari Prange

CE Chapter Liason
Ruth Shipley

Calendar of Events
Anna Cornell

Photography Credits
Paul Brasch

Special Mention
Bruce Brooks

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 TIF formatted files with your 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 Rates on page.

Membership

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

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Hal & June Munro
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announces
two new
short courses
at UCLA

Electric Vehicle Technology

October 18-22, 1993

This course provides engineers, scientists, managers, and marketing specialists with a comprehensive overview of electric vehicle technology based on the extensive hands-on experience of the instructors. Lessons learned from the history of electric vehicles are presented, and participants examine current systems in a wide variety of vehicles. Powered roadway concepts, with their significant future potentials, are also discussed.

The primary thrust of the course is to present state-of-the-art tools and components as they are used today. Participants have the opportunity to actually drive an electric vehicle, learn how to set up computer-controlled battery tests, analyze a transistorized controller, study a new bipolar battery, and examine a switched linear induction motor (SLIM). Topics are structured to be tutorial and not programmatic.

COORDINATOR AND LECTURERS

Erwin A. Ulbrich, Jr., President, Twenty First Century Electric Vehicles

Jeffrey Arias, President, Arias Research Associates

John G. Bolger, Owner, Inductran Corporation

David Harbaugh, Vice President of Engineering, Arias Research Associates

Randolph J. Johnstone, President, R.J. Electronics

Arthur Kochman, Consultant; Member of Senior Technical Staff, Hughes Aircraft Company

William W. Palmer, Director, Electric Auto Association

Zdenek (Stan) E. Skokan, Member of Senior Technical Staff, Hewlett-Packard Corporate Laboratories

Batteries and Fuel Cells: Applications and Performance

October 25-27, 1993

This course provides a comprehensive overview of the various types of primary and rechargeable battery systems and fuel cells. Basic electrochemical concepts and terminology are presented which describe the chemical/electrical energy conversion processes. Methods for calculating and predicting key parameters are discussed.

Primary batteries are described, with applications and expected performance of zinc aqueous systems and lithium nonaqueous systems. Rechargeable (secondary) battery topics include nickel, silver oxide, lead-acid, and sodium systems, their applications, charge methodology, and performance. The newest concepts in nickel-metal hybrid, lithium rechargeable cells, state-of-the-art fuel cells, and other concepts are also covered.

Specific and sample applications, from consumer to military and space, are presented for each of the systems. Recent developments in handling, disposal, and environmental regulation, and relevant manufacturing issues associated with the specific technology are reviewed. The course also includes a problem-solving session.

COORDINATOR AND LECTURERS

Gerald Halpert, Supervisor, Energy Storage Systems Group, Jet Propulsion Laboratory

Samuel Levy, Senior Member of Technical Staff, Exploratory Batteries Department, Sandia National Laboratories

David Pickett, Jr., Program Manager, Special Projects (Development of New Business/Technology), Electron Dynamics Division, Hughes Aircraft Company

To request a brochure describing these two courses in detail, contact Alex Hennessy, UCLA Extension, Department of Engineering, Information Systems and Technical Management, 10995 Le Conte Avenue, Suite 515, Los Angeles, CA 90024-2883; **(310) 825-1047**; **FAX (310) 206-2815**.

DMV Alert

Continued from page 1

the road for storage or conversion) are getting harder to obtain. Apparently this is also happening because of fraud—people file non-op certificates to avoid paying reg fees. Get your non-op, even if it takes some pushing. Don't let your donor car's registration expire without getting the non-op first.

If you convert a pickup, be aware that these trucks are registered as **COMMERCIAL VEHICLES**, not as passenger cars. CE has already been made aware of a case in Santa Cruz where a woman who attempted to register a newly converted EV pickup was slapped with \$600 worth of fees for changes in vehicle weight and value.

Apparently there were some laws passed in recent years that attempted to regulate EVs used as commercial vehicles. These laws are now starting to show up on the books. It appears that DMV is using them to rake in more revenue to make up for the shortfall in registration fees caused by evasion and fraud.

If this case is any indication, California is making it more difficult to get EVs on the road while at the same time encouraging EV manufacture and purchase. DMV is assuming that electric car registrants are crooks while EV drivers are being lauded as pioneers! Sounds like we have a one-hand-doesn't-know-what-the-other-is-doing situation.

Have other EV owners run into these sorts of roadblocks? Can anyone supply CE with quotes from the sections of the DMV code where these new laws are lurking? And have people in other states had similar experiences?

Let's cut off this rising tide of nastiness so that it doesn't drown us. CE needs someone to research the Motor Vehicle Codes to see what is really hiding there and how it applies to EVs. Can any of our members with legal backgrounds or skills step up to this? Maybe a call to the pro-EV state senators and representatives is in order. —CB

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Filing an EV Insurance Claim

by Clare Bell and Bruce Brooks

San Jose Chapter member Bruce Brooks is probably familiar to long-time readers of CE. He recently did a spit-and-polish 96V conversion of 1973 Karmann Ghia with a paint job that everyone in the local club drools over.

Since Bruce put a lot of work and money into the Ghia, he insured it for collision as well as liability through CSAA, the northern California insurance carrier for AAA. Which was a good idea, since the spiffier the paint job, the more likely the car will be hit (a prime automotive corollary of Murphy's Law). Alas, the unthinkable happened. His baby got crunched.

One crumpled front fender equaled a hair over \$2K worth of damage. When the time came to submit the claim to the insurance carrier, the company balked. Not so much because the car was an EV conversion, but because it was an older vehicle. \$2000+ exceeded the replacement cost of a '73 Ghia. The company wanted to declare it totaled. (This is standard practice in the insurance industry and not intended as a criticism of CSAA in particular.)

Luckily the bodywork guy that the insurance company recommended was experienced with restored classic VWs. He gave a reliable estimation of the Ghia's value as a restoration and justified the cost of repair. The electric conversion stumped him, but the fact that the Ghia was an EV proved to be unimportant to CSAA. In addition, Bruce wisely kept a record of all work and parts added to the car during restoration and conversion.

Bruce says that he has not experienced any negative consequences from filing the claim, such as a rise in rates or cancellation of a policy. The Ghia is back to looking snazzy and its owner has only a few more gray hairs in his beard from the experience.

It is true that the only damage was to bodywork, not electrical components. If the accident had taken out a controller or a motor, would CSAA have accepted the claim? We don't know. It is interesting that AAA does have an EV of its own; a battery powered road service truck.

Bruce suggests that EAA might want to compile a "bluebook" for EVs. Having that kind of reference available would be a big help. Anyone want to do it?

Your insurance company will be more accomodating if you have previously had one or more gas cars covered by them and/or have a long term good relationship. If any of CE's readers have filed an insurance claim on an EV, we'd like to know the details. This would be especially valuable if the claim included repairs or replacement of electrical components.

If you are in the insurance industry and are considering offering an EV insurance policy, CE would like to hear from you. Or, if you already offer such a policy, we can review it and help spread the word to the EV community.

—CB

Helpful Hints

1. If you do a high quality, sharp looking conversion, put collision on it as well as liability. The legal minimum is fine for a quick-and-still-a-little-dirty basic transport or testbed conversion, but if you put the investment into a show-quality EV, protect it! Adding collision or theft coverage doesn't cost that much more on most policies.
2. Keep original receipts of all parts and labor invested in restoration/conversion. If you keep making changes even after the car is on the road, keep track of those expenses.
3. If you can, get a written appraisal of the car's value. Ask your insurance carrier to recommend a shop that can do the appraisal. This may be helpful in convincing the insurance company to pay a repair claim, especially if it comes from an individual that the company recommends and trusts.
4. Document the car with photographs. This is also important for filing a theft claim if your EV is ever stolen.
5. If you see an advertisement for a vehicle similar to yours, save a copy. This is an indication of the vehicle's market value.

Electric Car Conversions

By Shari Prange

You've taken the plunge. Your smelly internal combustion donor car lies waiting to be transformed into a clean green electric machine. Before you can install the electric components you will have to remove a lot of original equipment. Which pieces you remove—or save—and how you do it can make a big difference in the final conversion.

There are three good reasons you're doing a conversion instead of building a whole car from scratch: time, money, and results. You don't want to spend the time or money to re-invent basic things like brakes and steering and windows that roll up. Even if you were willing to do it, the results would probably not satisfy you.

When Detroit builds a car that is 70% new design and 30% off-the-shelf, it

spends 3.1 million hours of engineering design time on that 70% of the car that's new. For optimum results in your home-built electric car, it makes sense to take advantage of as much of that engineering as possible.

A fourth good reason to convert is ecological. Every car that is scrapped is stripped for saleable parts. When it goes to the crusher, 30% of the car is non-recyclable "fluff" that ends up in landfills. And that's on a metal-bodied car. Plastics or fiberglass are worse. So it makes good sense to "recycle" those dead cars and rehabilitate them into useful electrics.

If the car runs, try to find a buyer for your engine before you remove it. It's easier to sell when it's in a car and running than when it's sitting on the floor oozing oil, and it might help pay for your conversion.

When you are ready to start disassembling, the first things to save are measurements. Measure the ride height at all four wheels. If the car can be driven, get it weighed—the whole car, and each axle separately. Measure the location of the transmission bell housing against some mark on the engine bay. All this information will help you reassemble as closely as possible to the original configuration for optimum performance.

The first things to throw away are all the fluids in the old car, except hydraulic fluids. Obviously you don't need the engine oil anymore. The transmission oil should be drained, too. When you re-install the transmission, fill it with low-friction synthetic oil. Dispose of all

Continued on page 15

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

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High School EVents

Sacramento Municipal Utility District will sponsor a competition among local high schools to build and exhibit electric conversions. As in the similar program started by Arizona Public Utilities, an EV conversion kit will be provided to each school. SMUD will also provide the chassis and technical assistance from local volunteers with EV expertise.

Schools will receive their chassis in October, complete their system design by December, and build cars in spring '94. The competition will culminate in a mid-May Road Rally.

SMUD is now looking for volunteer technical advisors for the program. Time commitment will vary according to the

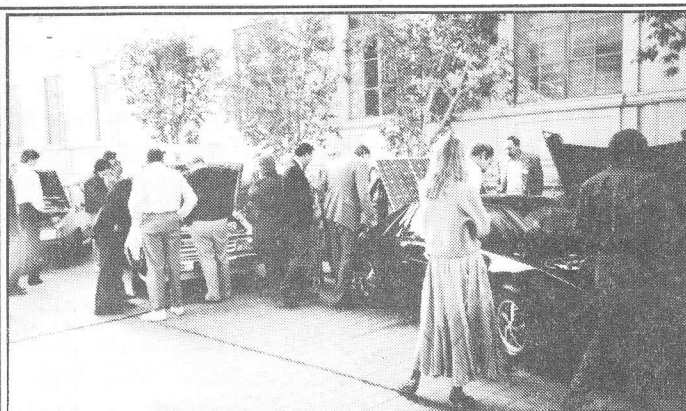
needs of the school team and the interests of the advisor. SMUD is also recruiting volunteer officials for the May 1994 Road Rally event.

The details of the program are not yet finalized. For more information, contact Barbara Duffy at (916) 732-5486 or Patrick Kennedy at 732-6578.

The Solar and Electric 500 racing team from Carl Hayden High School is moving up to Formula Lightning! Fredi Lajvardi and his students have ordered Formula Lightning Serial Number 0002. The Carl Hayden race team pitched a successful proposal to Phelps Dodge, and a private educational foundation in California (through the Solar and Electric Educational Foundation).

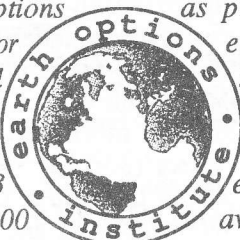
After securing funding for the Lightning, Fredi and his team went after component suppliers. General Electric will supply a motor and controller and Trojan will pony up the batteries. Goodyear is supplying a complete set of tires for all Formula Lightnings. CE looks forward to seeing Carl Hayden's Formula Lightning on track soon. Will your bolt from the blue debut at next year's APS Phoenix 500, Fredi? How about a Carl Hayden Lightning correspondent to send race dispatches to High School EVents? After all, it was your letter that got CE to start the column...

Thanks to Sacramento EAAS "EV Update" July 1993 and Solar and Electric "Racing News", July 1993—CB



EOI Sponsors Third EV Seminar

Curious about electric driving electric cars, as well as presentations from environmentalists, industry representatives and policy makers. Several electric cars will be available for viewing and test drive. For further information or to register for the seminar, contact Denise Attewell, (707) 829-4545.



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Seeds of Change

Continued from page 1



San Jose SCCA Autocross tech inspector and Bob Schneeveis (in sombrero) check out Snow White before running (7/27/93).

White to and from the pits. Number 1, a cross between an electric go-kart and a midget racer, has probably had more drivers, young and old, than any other electric vehicle. Snow White, aka "Number 2", is basically a doubling of the scale of Number 1, with numerous improvements for track racing. Bob built Snow White to have his own entry in last year's SERA race, having assisted the year before in the final prep and pit crew for Eli Schless' formula 440 electric racer. Bob has yet another electric racer design in his head waiting for implementation, unless someone beats him to it. His current project is the "Palo Alto Dry Land Yacht Club EV" - an electrathon vehicle built around an ocean kayak. This boat made an excellent showing on it's maiden overland voyage at the Hellyer Park Velodrome in July.

All of these projects have several things in common: they are undertaken on shoestring budgets (can you relate?), they balance fun and practicality, usually fa-

voring the fun, they are not done for profit, and they are calculated to scatter the same kinds of seeds as the one that took hold in Bob's own mind behind the wheel of a thirsty '64 Lincoln a decade ago. Bob hopes these seeds will take hold where they are most likely to make a difference; in the minds of racing enthusiasts, because this is where new automotive technology has traditionally been refined; and in the minds of young people because these

are the ones we hope will design, build and buy the electric cars we all believe are the future of private transportation.

In the minds of at least a dozen sports car enthusiasts, the notion that EVs are necessarily lead slugs has been put to rest.

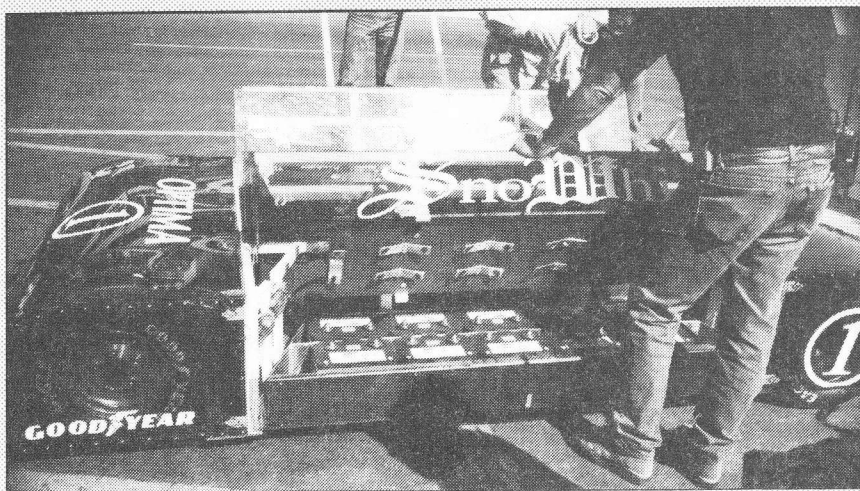
During our conversation, Bob pointed out that many of today's smaller race tracks are meeting with increasing community resistance due to the noise and fumes that go with the high-powered cars that compete there. Based on personal experience, he thinks that the racers themselves wouldn't care if the cars they drove were electric, so long as the racing experience survived the change. The SERA competitions made the challenge explicit and cars like Snow White suggest this is an attainable goal. Ironically,

one of the principle complaints that track personnel have is that the electrics are too quiet! Pit crews develop an ear for the approach of a high performance IC engine that becomes part of their reflex interactions at the track. They feel endangered by a car that can approach at high speed without the telltale roar of tuned headers. Perhaps the tracks will get a reprieve by replacing the thunder and fumes of IC dragsters with a simulated powerline hum and a whiff of ozone. In fact, one track in Bakersfield CA is working with John Gross of San Diego (driving the blue Formula Ford electric at Phoenix this year) to sponsor regular EV competition on their smooth oval track. The Bakersfield track is centrally located between the northern and southern CA communities, and has a staff of experienced race organizers and officials who welcome the chance to bring new people to the track.

On still another track, late in July Bob joined Clare Bell to enter their cars in an autocross event organized by the Sports Car Club of America (SCCA). Both cars

got a little attention before they ran. Bob tapped the guy who won the competition amongst production muscle cars (mostly 'Vettes) to take Snow White for a spin on the same course. Snow White turned in better times than all but a few of the 'Vettes (35.7 sec, less than 2 seconds behind the fastest car around the half minute course), and her driver was certain he could get another second or more out of the car if he'd had more time

Continued on page 9



SnowWhite—How to stuff a battery box and swap it quickly, too. Note: spring terminals on box lid.

to learn how to drive it. After that the car was surrounded by other drivers who needed to know how this overblown golf cart had bested their times. In the minds of at least a dozen sports car enthusiasts, the notion that EVs are necessarily lead slugs has been put to rest. Bob believes that at least some EVs can perform well in these events. Whether they are impressive or merely adequate, the course also provides a good test of handling and braking performance for new conversions. If the level of participation warrants it, SCCA will set up a separate class for EVs.

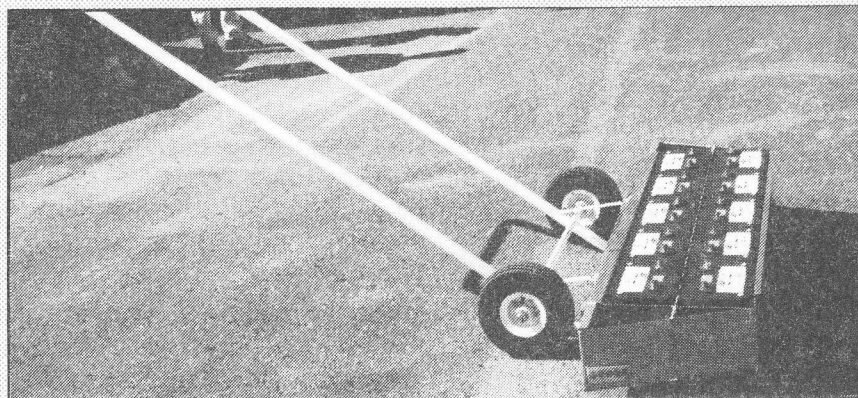
As for the young people, Bob and another local enthusiast, Jeb Eddy, are trying to give them the opportunity to get involved both in the racing and the building of their own class of electric cars. Jeb and Bob are working on ideas to lower the cost to the point where young people can afford to play, or perhaps community organizations can be persuaded that a modest investment can have a commensurate benefit. They are also

working with local educators to foster EV projects as part of junior high and high school industrial arts curricula. These young people will grow up understanding the relative simplicity of electric cars as well as the challenges still to be addressed. They will think of electric vehicles as a real alternative—

an important step. It is hoped that some of these young people will become the engineers needed to meet the ambitious goals of the CARB regulations pioneered in CA and already adopted in several other states.

Bob clearly enjoys the work he does in and around his home-based EV workshop. He has studiously avoided the dilution of that fun with official titles or business ventures, yet his work is directly supported by manufacturers of EV components who see what everyone else sees; Bob is one of those rare tinkerers who is compelled to act upon the interesting ideas he catches floating out there on "the idea channel" if only they look like fun, and they haven't already been done.

By doing what comes naturally, and sharing both his enthusiasm and what he's learned with anyone willing to listen, Bob scatters seeds of action and invention. Some of these seeds are bound to germinate, changing the way people think about EVs in the present, thereby changing the way people act to shape the future.

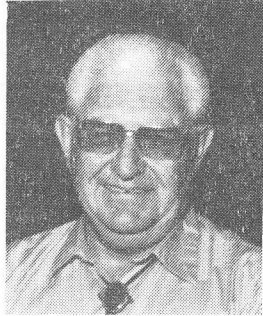


Snow White's battery pack cart.

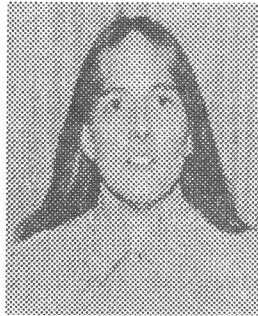
Candidates for EAA Board of Directors, 1993 election



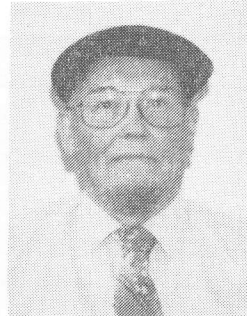
Steve Lough



Bill Carroll



Anna Louise Cornell



Gene Fowler



George E. Gless

This information was submitted by the candidates. CE has done minor editing for reasons of clarity and space).

Steven S. Lough

Steven S. Lough has been involved in the "EV Movement" since 1980. He has been an EV dealer, builder and converter at his Lough Motors Company, which had been a GMC dealership since 1947. He has been an active member of the Seattle EV Association (SEVA) since 1981 and a 3 term president. His special talents lie in education and public speaking. He has hosted countless EV events in the Pacific North West, including several EV rallies, mall shows, EV exhibits at the Seattle Science Center, and the Seattle International Auto Show, "The Great Puget Sound EV Plug In", and others. He is currently engaged in attempting to involve the Seattle Public School System in high school classes in "How To" convert (re-cycle) cars to EVs. He has coined the phrase; "Education-Demonstration-Proliferation"

"...I see my mission as one of public education, and facilitation to those who would choose to drive electrically. There is still the need for greater availability of E. V.'s through the continual lowering of initial costs of E.V. components and car prices."

W. D. "Bill" Carroll

I have been a member of Peninsula Chapter of EAA since 1981, and have

held the post of Treasurer since 1989. From 1985 to 1992 I was responsible for the setup and maintenance of the computerized membership listing and mailing labels.

I am 63 years of age, married and have three children and two grandchildren. I have lived in South San Francisco since 1960.

I served on the Board of Governors for the Square Dance Callers Association of Northern California (SDCANC) from 1974 through 1980 and am now a life member of the association, though I'm now retired from active calling. While on this board I served in all capacities from membership chairman to president (1979).

I have completed High School, had 2 years of city college in San Francisco, and have attended numerous company schools for technicians; U.S. Navy, Univac computers (1960, Frieden Co. (office machines) and Western Union, (ment). At the time of my retirement from Western Union in 1986, I had school training on 206 different machines, from calculators to radar. I am currently employed by Basic Measuring Instruments Man.

I am what is sometimes known as a "Backyard Sticky Tape Engineer," and I am building my own car.

My purpose in declaring for the position open on the Board of Directors of the Electric Auto Association is simply that

I feel I can contribute to the welfare of the organization, and the furtherance of Electric Cars.

Anna Louise Cornell

I have been a member of the Electric Auto Association for 8 1/2 years. I have been attending the meetings and have participated in many rallies since 1982. I drive an electric 1975 VW Rabbit that was converted for me 8 years ago, and have completed my first conversion of a 1979 VW Rabbit myself.

I'm currently president of the the East Bay Chapter and serving as a Technical Advisor to the Board of Directors. I am also EV events Co-ordinator for the Current EV events Calendar.

If elected to the Board, I like to help make these things happen: Abide by all the rules and charters of a non-profit organization. Establish better communication between all chapters so that everyone is informed of all issues. Get Current EV events on a monthly schedule and have more "Technical Know-how" published in it. Public interest is growing and we need to give this sort of information out to those who are trying to build their own car, or will be in future. Provide an updated EV resource guide with current information. Have each committee write its own charter and publish it so that each committee job is outline to prevent overlap. Get more of the members involved in events and informational displays. I will do my best to serve on the Board with the



Bob Batson



Mike Slominski



Ken Koch



Clare Bell

Harold Bell
Bruce Brooks
Bob Wing
John Newell
Don Mignola

No Photo

membership's interest at heart. If not elected, I shall continue to do what I can. Thank you for accepting my application to the Board.

Eugene F. Fowler

EAA Member for 16 yrs. Engineering degree, Ohio State University 44 years ago. Science and Engineering Experience 50 years as follows: Electric Vehicle research on my own during last 8 1/2 years. General Electric Design and Construction Engineer 29 years., Engr: Ceramics and Non-Ferrous-Metals Departments at Batelle Memorial Institute for 5 1/2 years, Electrochemical Dept Technician, Battelle Memorial Institute, 7 years. Energy Utilization Interests applied to all work for 50 years. No assets invested in fossil-fuelled vehicle manufacturing.

Will concentrate efforts on written communication and development of relative facts applied to all electric vehicles.

Examples of what I mean: The current understanding of what really happens in an electro-mechanical drive train and battery leaves a lot to be desired. As a result, the motor impedance is too low for too much of the time. The battery impedance is too high all of the time.

Completely suitable battery chargers for 117 Volt AC source operation that meet potential FCC and utility regulations are not available at the moment. Installation of 10-12 kwh in 8-9 hours should not require an investment in or need for 234 volt AC source equipment.

George E. Gless

George E. Gless, born Jan 15, 1917 in Schuyler, Nebraska, received his BS and MS degrees in electrical engineering from the University of Colorado in 1940 and 1946 respectively and a PhD from Iowa State University in 1963. George is a Registered Professional Engineer (P.E.).

From 1940 to 1946 he was employed as an engineer with Commonwealth Edison Co. After 1946 until retirement in 1982 as professor emeritus, he was with the department of electrical engineering at the University of Colorado responsible for courses in automatic control, electrical vehicles, power machinery, electronics and direct and alternating current circuits. Since retirement, he has been a consultant on wind and solar energy, batteries and electric vehicles. He has been editor of a newsletter for the Denver Electric Vehicle Council since 1978.

To keep abreast of EV developments, he has attended numerous meetings and symposia in this country and abroad. Chief among them are EVS-3 through 11 (International Electric Vehicle Symposium) held in various locations around the world such as Hong Kong and Florence, Italy). He has also participated in EAA Rallies and Symposia on the west coast and a Solar and Electric Vehicle Symposium organized by the Northeast Sustainable Energy Association in 1991.

Hands-on experience includes designing and building both straight electric vehicles and hybrid electrics. Some of those projects resulted in papers which were presented at symposia.

Robert D. "Bob" Batson

President, Electric Vehicles of America, Inc. Professional Engineer - Massachusetts, New York, Indiana. Northeastern University - B.S.M.E. and M.S.M.E. Patent no. 3,532,873 "Light Failure Monitoring System" with Ford. Executive Director - Electric Vehicle Industry Association. Member - Energy and Transportation Policy Task Force (Massachusetts). Founder and President - New England Electric Auto Association. Member - New England Energy Task Force (Department of Energy) Responsible for Electric And Hybrid Vehicles.

Electric Vehicle Exhibits Earth Day events 1990 New England Business Conference and Exposition 1991 and 1992 Solar and Electric Symposium

Electric Vehicle Author "Why Wait for Detroit?" edited by S. McCrea. This is a 200 page book on EVs and EV organizations. "Electric Vehicles - The Clean Alternative" published in One Person's Impact June/July Issue. Various technical papers on EVs

Electric Vehicle Speaker—12th New England Environmental Conference -

Continued on page 12

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March 1990 Tufts University New Dimension Workshop entitled "Electric Vehicles -The Clean Alternative" DOE New England Energy Task Force - Oct 1990 titled "Electric Vehicles -An Energy Solution." "Pollution Solution" Conference at SMU - April 1991 Various civic organizations

Electric Vehicle Publicity. Mr. Batson has had the following news coverage: Channel 68 "The Good Green Earth" with Peter Tonge (4/91) WCVB-TV (ABC) "Chronicle" with Mike Barnicle (4/19/91) Radio New England (80 stations) Gene Molter Monitor Radio- Patrick Timmerman The Boston Sunday Globe - West Weekly (front page 2/25/90)

Work Experience. Electric Vehicles of America, Inc. (EVA) Maynard, MA. July 1988-Present. As President of this startup, responsible for forming a strategic plan and the market development for Electric Vehicles. From 1988-1992, EVA was a supplier of EV components to enthusiasts. In April 1992, EVA initiated marketing activities toward electric utilities and commercial businesses.

EVA has an EV conversion facility in Maynard that consists of three garage bays, retail store and offices. These facilities have the capability to convert approximately 100 vehicles/year. EVA specializes in truck conversions.

Harold Bell

The Phoenix Chapter of the EAA respectfully submits the nomination of Harold Bell to be considered for the National Board of Directors of EAA at your June 26th meeting. He is an active dedicated member who will serve with enthusiasm. - William W. Sowle, President.

Degree: Chemical Engineer 1950, Lawrence Tech, Detroit, MI. Graduate work: Wayne State, University of Michigan, UCLA, Arizona State University.

Work experience: Director of Research

Engineering/Alternative Energy Resources. for Mobil Oil (10 years) -Motorola (10 years), Arizona Public Service Company (20 years).

Responsibilities/Affiliations: Operated APS electric vehicle fleet (1971-91). Department of Energy site operations program. Active with Electric Power Research Institute (EPRI). Electric Transportation Working Group (Past Chairman). Electric Chemical Society (Retired, 25 year member)

EAA member since 1984 (Past chapter president). Instructor at Motorola University (Current)

Michael Slominski

I am 40 years old and currently residing in Redwood City, CA. For the past 15 years, I have owned an auto repair business in San Mateo, Ca. and have approx. 25 years of general auto repair and electrical experience, of which 3 were spent doing R&D work on environmental equipment.

For the past 2 years I have been building and promoting electric vehicles. It is my desire to eventually go into full time electric vehicle conversion and move away from the standard gasoline driven vehicles repairs that I am now involved in.

I have been a member of the EAA for 2 years and have participated in many EAA events as well as other events, with an electric vehicle of my own design. I am currently working on several experimental projects in the areas of EV heating, cruise control and regenerative braking.

I was elected president of the Peninsula Chapter in December 1992 and since then I have been working toward making our organization more visible to the public. I am currently chairman of the Peninsula chapter event committee and working on its finance and communications committees.

I believe that at this time, our organization can be of great benefit to the strong EV movement that is now underway and I am willing to help in any way that I can. Thank you for this most prestigious nomination.

Mike Slominski, Mike's Auto Care, 951 So. Claremont, San Mateo, CA 94402

Bruce Brooks

EAA member since 1990. Builder, owner and daily driver of a 1973 Karmann Ghia electric converted in 1992. I am a member of the San Jose CA chapter of the EAA and have missed only one meeting in the last two years. I worked on the the 1991 rally in Sunnyvale and was a member of the Rally planning committee in 1992. I have written several articles for Current EVents. I have shown my EV on television, publicly, and at my employers' to increase public awareness and promote the use of EVs.

I believe the national organization has two primary functions. First, to publish a quality newsletter which is informative to the membership while fairly representing the views of the membership to outside organizations and agencies. Second, to give strength in numbers to the individual member and chapters by creating a critical mass which gives credibility to our convictions and voice to our concerns.

If elected to your board of directors, I will work to: Put better controls on how association money is collected and spent. Promote a standard of ethics for the Board of Directors when representing the EAA. Run the business of the association in a professional business-like manner. Encourage the involvement of all the chapters and membership. Fairly represent all the various interests of EAA members, not a select few. Make national funds available to local chapters for activities that are of benefit to the EAA as a whole. Encourage the cooperation, participation and involvement of businesses,

government agencies and other organizations to work with the EAA in promoting the use of EVs.

At the same time I will remember: The strength of the organization is in the members and chapters. The purpose of the Board of Directors and the national organization is to serve the members and chapters. The Board of Directors must not dictate the activities of any member or chapter, but rather encourage their efforts to understand, promote, build, enjoy and use Electric Vehicles.

Bob Wing

(Candidate for re-election)

Bob Wing has served two years on the EAA Board as Chapter Relations and membership Committee Chair. I have been instrumental in the organizing of the EAAS (Sacramento, CA) Las Cruces, NM, Indiana, Southeast EVA, MD, Ohio, Salt Lake City, UT, Central VA (CEVA), SDEVA (San Diego, CA) as chapters of the EAA. In 1991 I personally reactivated the North Bay EAA, which had not met for about 6 years. I believe chapters are the best way to increase EAA membership. Chapters serve as the focal point of EV interest. With the recession, we lose membership with unemployment, but with experienced EV and business-minded directors, we can keep the Electric Auto Association viable.

I personally contacted the Chairman of the Board of WESCON/92 held in Anaheim in November 1992 and asked to participate in the first ever EV Showcase in the 41-year history of WESCON. I spent four days there representing the EAA and extolling the benefits of EVs. I'd like to think that EAA presence at Anaheim helped the norther California WESCON Board decide to hold the second EV Showcase this year at the Moscone Center in San Francisco on September 26-28. I seek the support of each EAA member's vote.

Ken W. Koch

Education - AA, Education—1961. BS Electrical Engineering - 1973.

Experience - 27 years experience in commercial and military electronics industry as electrical design engineer, test engineer, environmental engineer, quality engineer and reliability engineer. 13 years concurrent experience in electric vehicle industry, including DC motor controller design, EV system architecture, and consulting to commercial industry. President/CEO of KTA Services, Inc. a leading supplier of EV conversion components, conversion kits and propulsion systems to the hobbyist and commercial EV industry. Guest speaker/lecturer on EV technology.

Memberships - Member of Electric Auto Association, Los Angeles Chapter, since 1983. Member of EVA of So. Calif since 1992. Sponsoring member of Denver Electric Vehicle Council since 1987. Member of Electric Vehicle Industry Association since 1993.

Administrative—EVA of So. Calif. vice president 1984-86, president 1987-88 and 1992-93. secretary/editor 1989.

John Newell

I am a charter member of the Electric Auto Association. For the past two years I have assisted the Board of Directors in piloting this diverse volunteer organization. I am a member of both the American Society of Mechanical Engineers and Institute of Electrical and Electronic Engineers. As a director, I will continue my efforts to carry out the stated purposes of the E.A.A.

Don Mignola

(Candidate for re-election)

Graduate UC Berkeley; over 20 years consultant in business systems; working with Battery Automated Transportation

since January of 1993. I currently travel extensively throughout the U.S. and Mexico. Usually can arrange my schedule to attend Board meetings.

I became interested in EVs because EVs are our best means to clean up the air we breathe and to reduce our dependence on foreign oil. I became interested in EAA because EAA members had the technical knowledge and practical experience to make EVs viable. I joined the Peninsula chapter and was later appointed to fill the unexpired term on the Board of Sandy Ames.

My primary assignment on the Board has been to make EAA a more influential force in the EV world, to see a greater diversity in the involvement of EAA and making the chapters stronger and more plentiful.

Last Fall, EAA conducted a campaign to try and persuade GM to make available the 1600 new Saturns that they were crushing because of a problem with their engines. The response of EAA members throughout the country was very gratifying. As a result, the public, environmental groups and politicians became aware of EAA in a very positive way. While GM still crushed those Saturns, they now have a much healthier respect for EAA.

While I was still in California, I was able to produce the Board minutes and have them distributed to all concerned members including the chapter presidents. Good input from chapter presidents and others from around the country was the result. I have stressed the need to have greater diversity on the Board. From the looks of the present slate of candidates, this may soon be a reality.

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There are many things that EAA can do to help make EVs a reality. Making EVs affordable is at the top of my list. Technology is something EAA has always contributed to EVs and will continue to do so. This is essential to making EVs affordable. Gliders (engineless new cars) and better financing are two additional ways to make EVs affordable. It is now EAA's official policy to promote these two new methods and I will be working to implement them with the membership.

Clare L. Bell

Present Managing Editor, Current EVents. Previously Assistant Editor and contributor. Member of San Jose Chapter since 1991. Presently serving as a Technical Assistant to the Board.

Own and drive 2 EVs - "Lightning Bug" - 1970 Baja Bug, converted by me in 1991, driven 2 years. "IM CHARGED" '74 Porsche 914 built by Ron Rasmussen.

BA, UC 1975, MSME Stanford University, 1983. 12 years as IBM test equipment engineer (from Associate to Staff). Parallel career as a novelist since 1983, leaving IBM in 1990 to write full-time and build an EV.

The shift in political climate and increased public environmental concern is giving EAA an unprecedented window of opportunity. As EV builders, drivers, and advocates, we have a unique chance to expand membership, receive recognition and gain clout. At the same time, EAA is dealing with a difficult transition from an amateur specialty car club to a serious advocacy group. EAA has the resources, the experience, the determination and the sheer talent to change the future.

That is why I have taken on editorship of Current EVents and why I am running for the Board of Directors. I hope to contribute in the following objectives:

Ensure that the EAA and CE are run in a professional manner with financial controls and accountability.

Enhance the value of the EAA membership, by providing services such as testing and providing tested capacity labeled batteries to members.

Provide practical information on items such as EV insurance and EV financing to the members.

Ensure a responsive and professional image to the Public and all individuals and organization who request information or electric vehicles for exhibit.

Resolve the difficult question of conflict of interest on the EAA board.

Encourage talented people to participate and contribute their talents in promoting EVs.

Encourage people who have not traditionally fit the "EAA mold", i.e., non-engineers and minority groups.

Monitor and improve the quality of technical expertise and information we provide the public.

Promote the use of computers, BBS, databases, networks and other technological tools to improve productivity and reduce costs.

Promote a truly national organization by having technical advisers and directors from outside California.

Proxy Vote

The annual meeting of the Electric Auto Association will take place at the Moscone Convention Center in San Francisco, California on Thursday, Sept. 30, following the WESCON Show and EAA EV Showcase.

I hereby assign my proxy to the present Board of Directors if I do not attend the meeting and vote in person.

Signature _____

Please indicate your choice by marking the box next to each name. Vote for no more than nine (9). The order is random.

For election to three-year term:

- ☐ Steven S. Lough
- ☐ Bill Carroll
- ☐ Anna Louise Cornell
- ☐ Eugene Fowler
- ☐ George E. Gless
- ☐ Bob Batson
- ☐ Harold Bell
- ☐ Mike Slominski
- ☐ Bruce Brooks
- ☐ Ken W. Koch
- ☐ Clare L. Bell

For re-election to two-year term:

- ☐ Bob Wing
- ☐ John Newell
- ☐ Don Mignola

Mail this proxy to:
EAA Board of Directors
1249 Lane St.
Belmont, CA 94002

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the fluids carefully and properly. This is especially important with coolant. It is sweet and attracts small children and small animals—and it is a deadly poison.

As you take the donor car apart, do so with a scalpel, not a machete, because you might want to graft some of those pieces back together later. Remove all the wires at their connectors instead of cutting them, and label them with a tape and a marker. You may be able to re-use some of them.

Save all the original nuts and bolts in baggies, and label what they came from. These may allow you to reuse original holes or brackets. In fact, try to set aside a place to save all the internal combustion parts (except the engine) until the conversion is finished. You never know what you might find useful. For example, you might be able to use the original fuel line or exhaust brackets to support battery cables beneath the car.

There are two metal tabs on the engine that are specifically for lifting it with an engine hoist. Save those tabs and adapt them to your electric motor, adaptor and transmission when it is time to sling them into place.

Even if you are replacing the clutch, save the old parts until you are sure the new ones match. Save the flywheel and all the bolts associated with it, because you will want to re-use them with your adaptor. These are special bolts, and will cost you time and money if you have to special order them through the dealer. Also save any locating dowels between the engine and transmission.

This means, of course, that we are planning to replace the clutch and transmission. The clutch has three points to recommend it. First, it is a safety feature that allows you to instantly disconnect the motor from the wheels in an emergency, such as runaway or lock-up conditions. Second, it makes the car's

Continued on page 28

Electric Vehicle Activities—WESCON

September 27th-30th 1993
Moscone Center, San Francisco

Sept. 27th
Time TBA

News Media Event
Publicity, Rides, Interviews with Media

Sept. 28 thru 30th
9am to 5pm

Electric Vehicle Showcase
Display of three dozen EV's from four groups:
Major Detroit Automakers, Small Commercial Productions, EAA, and EV Racing.

Sept. 30th
9:30am to 11:30am

EV Technology—Technical Papers
"Thin Film Polymer Batteries for Electric Vehicles"
Steve Visco, Lawrence Berkeley Laboratory, Berkeley, CA
"Performance of Lead-Acid Batteries"
Benny Jay, Electrosources Inc., Austin, TX
"Art of Charging of Electric Vehicle Batteries"
Jiri Nor, Norvik Technologies Inc., Mississauga, Ontario, Canada
"A Precision DC Energy Monitor for Electric Vehicles"
Paul Brasch, Brasch Laboratories, San Jose, CA

11:35am

EAA Keith Crock Technical Achievement Award

2pm to 4pm

EV Panel Discussion
"The Past and the Future of Electric Cars"
A testimony of past experience and the vision of future.
Moderator: Bill Palmer, Chairman of the Board, EAA
Panelists: Scott Cornell, Pacific Bell
Steve Post, Curtis-PMC
Stan Skokan, Electric Vehicles Inc.
Bill Williams, Hewlett Packard Co.
More to be announced

The panel is composed of long term electric car users. Each one of them has driven an EV daily for over a decade. They represent, cumulatively approximately 500,000 miles of EV experience. Most of them live in San Francisco Bay Area and are employed by high technology companies. All of them have built one or more EV's themselves. Over the years they have driven several different vehicles of varying designs and from different manufacturers. Subjects of motivation, technology, costs, reliability, performance, safety, handling, support and general acceptance will be discussed.

4:15pm

Annual Meeting of Electric Auto Association
Election of new members of the Board of Directors

For more information please contact:
Stan Skokan at (415) 366-0643 FAX (415) 306-0137 or Paul Brasch at (408) 371-5969 FAX (408) 371-5978 or Anna Cornell at (510) 685-7580 FAX; same #, call first.

Midyear EAA Financial Report

By Stan Skokan

In 1992 the Association ended the fiscal year in debt. As a result, the rebates to Chapters were not paid on time. In January, the Board of Directors established a budget based on our current membership dues, costs of publishing an improved Current EVents (CE) and costs of other activities. The budget expressed in percentages was published in the March/April issue of Current EVents. We have incorporated a debt catch-up to pay back the delinquent rebates. We have monitored the expenditures on monthly bases and communicated back to various committee chairman about their expenditures.

The good news is, the process works well. We have paid back most of the owed rebates and gained good insight into the costs of operations and expenditures. Most of the committees took the budgeting seriously and stayed within the budget or underspent. The most difficult time was with the New Membership promotions and Chapter Relations Committee. We have seen charges such as \$30/hr for answering 800 line phone calls and 24 cents/page for copying. There was a lot of finger pointing at first. Later we separated the accounting between Membership Records, New Membership Promotions and Chapter Relationships. This helped to clarify some grey areas of overlapping responsibilities and brought attention to inefficient operations.

Some of us feel the costs to solicit new members are too high, far above the revenues from new members. Let me say here that new membership promotion is a duty of all of us, we all contribute to it by our activities. It is also our duty to do it most cost effectively. We want to grow the membership, but not at the cost of ruining the organization financially. We have also uncovered some loopholes in our rebate system. We suspect that some new members avoid joining national EAA

by paying only for local chapter dues, yet obtain the newsletter for free or at a subsidized rate thru New Membership promotions. We plan to revise our rebate program and stop such practices. We need desperately to start some serious fundraising activities to supplement membership dues. Volunteers who can help us in this area are welcome. The chapters should also do a better job in retaining their existing members.

There will be some minor adjustments of the present budget based on the last six months experience. Namely, after settling all the last year unpaid rebates, which will happen in the next two months, there will be some additional funds directed toward the new editorial staff at Current EVents. They are doing a good job in raising advertising revenues, which helps to cover the cost of CE publishing. They are also planning to resume publishing CE monthly.

In conclusion, I have to say, the organization is back in financially stable condition. It is a pleasure to serve on the Finance Committee with Bill Palmer and Paul Brasch.

EAA Board of Directors

Lee Hemstreet

(415) 493-5892
787 Florales Drive
Palo Alto, CA 94306

Don Mignola

(801) 977-0119
2471 South 2570 West
West Valley City, UT 84119

John Newell

(415) 591-6698
1249 Lane Street
Belmont, CA 94002

Bill Palmer

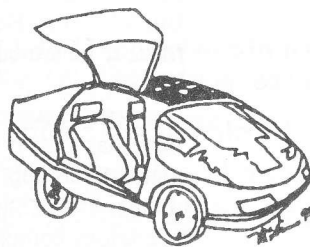
(415) 948-7677
44 Dior Terrace
Los Altos, CA 94022

Stan Skokan

(415) 366-0643
1020 Parkwood Way
Redwood City, CA 94060

Bob Wing

(415) 669-7402
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Dr. Post updates 1970's thinking and finds a viable solution.
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Includes many power and aerodynamic formulas. A wealth of technical considerations.
- ☐ **EAA XA-100 Hybrid (Includes all tables)** (\$5.00)
Report on the EAA's Hybrid Vehicle Project (all 3 chapters).
- ☐ **Current EVents (July/August 1993)** (\$3.00)
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- ☐ **Current EVents (March/April 1993)** (\$3.00)

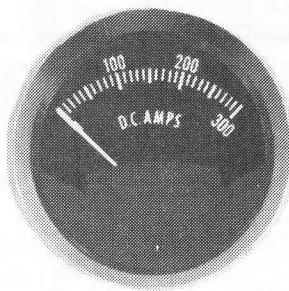
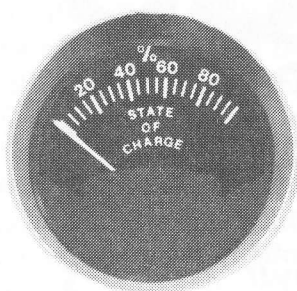
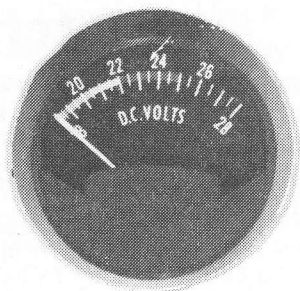
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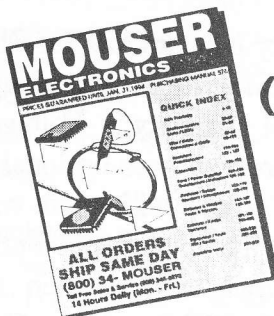


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Activity Report Silicon Valley Chapter

By Stan Skokan

In the last two months S.V. Chapter members promoted electric cars by participating in parades in San Francisco and Redwood City. Cars were also displayed at alternative transportation and environmental expo's. The S.V. Chapter sponsored bumper stickers as a reward to members answering EV ownership surveys. Paul Brasch wrote a technical paper to be presented at WESCON EAA Symposium. Mike Brown, Shari Prange, Dan Parks and Stan Skokan spoke on a one-hour radio talk show about electric vehicles on KFJC from Foothill College. Audio tapes of the program are available from Bob Wheeler. We plan to participate in the East Bay Chapter Rally in early August. At our August 21st meeting we will review our best cars for the WESCON show in September in San Francisco.

EAA Liability Insurance for Chapters

Announcing an insurance service available to all EAA chapters in the United States. This is an Owners, Landlords & Tenant Liability Policy in the amount of \$1,000,000.

Our insurance agency now has the ability to extend liability to include each of the EAA chapters in the United States.

Should you have need of OL&T coverage for your meeting place or an event such as a rally, it can be provided for you. Each chapter will be required to fill out an application which will indicated the type of event(s), how many events are anticipated during the course of one year and the number of members in each chapter. Billing will be through the EAA headquarters.

Billing charges for this coverage is based on number of membership, number of monthly meetings, and the number of scheduled events per year.

For more information, John Newell at (415) 591-6698.

Chapter News

by Ruth Shipley

San Francisco Peninsula

Four members participated in the Pacific Coast Dream Machine event in Half Moon Bay. This is a showcase for all kinds of antique cars and planes—and this year, EVs—that drew an estimated 25,000 people. Chapter President Mike Slominski reports that the crowd around the EAA booth at one point was four to five people deep.

Several members displayed EVs and participated in local parades, including the Hometown Days parade in San Carlos and the Fourth of July parade in Redwood City. The Reverend Noah Moore Smogg pulled a coffin filled with exhaust pipes and mufflers behind his electric pickup truck. The chapter exhibited and paraded several EVs in the annual Carnival Parade in San Francisco, which was attended by an estimated 500,000 people.

San Diego

Gary Jackson, vice president of the chapter, told members at their July meeting that he had doubled his range from 50 to 100 miles simply by insulating his batteries, reducing vehicle weight and implementing other performance-optimizing features. Jackson placed first in the Electric Stock B class endurance race at Phoenix. He wants to experiment with retractable brake pads to lower rolling resistance. He also estimated mathematically that he could boost his range to 266 miles using a modified lead-acid battery being developed by Trojan Battery Co. in Santa Fe Springs, Southern California. Chapter President Ron Larrea said that all EAA members should watch this company's efforts closely. He said that company President Bill Brecht would be more than happy to give a talk to any interested California chapters.

NOTE TO ALL EAA CHAPTERS:

This is the beginning of what I hope will be an exciting column, but I can't report anything unless I hear from you! Please send me a brief report of any activities you participated in within the past month. You can also send me your newsletter if you have one. If you had an interesting speaker at your chapter meeting, I'll accept a report of that also. For those of you who need a deadline that you can meet or ignore, here it is: send me your report by the 20th of each month. Your report doesn't even have to be typed—I'll accept reports in longhand if your handwriting is legible. I prefer not to receive floppy disks because I don't want to ship them back and forth and risk contracting a virus. For those of you who are modem-literate, I am on CompuServe, but you can also send me the file directly as long as you call me 5-10 minutes before you send it. Evenings are the best time to reach me at home.

Please note my new address:

Ruth Shipley, 102 Brighton Rd. #3, Pacifica, CA 94044
(415) 359-1541 (voice and modem) CompuServe ID 73043,60

Solar Electric Acquires Nordskog Electric Vehicles

Sebastopol, CA (August 3, 1993). Solar Electric Engineering, announced the acquisition of Nordskog Electric Vehicles. The development enables the publicly-owned electric car company (OTC-SOEE) to produce a full array of electric vehicles, from small, in-plant industrial units, to cars, trucks, vans and even 22-passenger buses.

The acquisition of Nordskog Electric Vehicles expands Solar Electric's product line and incorporates a dealer network of over 70 locations with the largest backlog of electric vehicles in the industry. For more information, write to Solar Electric, 117 Morris Street, Sebastopol, CA 95472, or call (707) 829-4545.



the new Doran Eco Scoot
30 mph - 25 mile range on a 110v charge.

Doran three wheel electric commuter car

Doran electric Mini-bike kit

Sleek, Lightweight Electric 3-wheeler
Build your own electric vehicle now with inexpensive and reliable components. Drive at freeway speeds on a 110v charge. Learn about construction techniques with our 96 page manual with over 100 photos and illustrations. Plans cover both the electric and Subaru gas powered performance versions. Includes valuable information to assist you in building your own design or for converting any car to electric.
Detailed \$29.95 plus \$4 p&h
Plans

"The Electric Vehicle Experience" Video
This all new comprehensive video covers the latest in electric vehicles, racing and technology. Demonstrates motors and controllers, and discusses battery developments and charging. Also includes demonstrations of the Doran 3-wheeler and EcoScoot. Take a 90 minute ride into the future!
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Product Brochures and Parts Catalog
Information on all Doran products including ordering information on the EcoScoot, Electric Mini-Bike Kit, 3 wheeler plans, motors, controllers, and other parts for building your own electric vehicle.
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Your source for converting scooters, mini-bikes, and go-carts to electric, also **ELECTRATHON** racer components and information.

CE Questionnaire Results

By Clare Bell

The CE Reader Survey confirmed some of our assumptions about CE's readership, but there were some interesting surprises.

The biggest and nicest one of all was the horde of folks who answered CE's request for contributions (question 25). A whole whopping 76 of you said that you would be willing to cover an event, write an article, manage a column, or have suggested your own way of contributing. The response from question #25 alone was probably worth the entire effort of the survey!

CE has benefitted from your talents already. (Paul Hebert, Ruth Shipley, Michael Clark jumped on board via telephone.) A volunteer database has been developed and a thank-you letter to everyone who responded is in process. In the coming months we will be fitting talents together with assignments. The idea is to maximize enjoyment on the part of the contributor as well as the quality of CE. It's a win-win situation.

Nor will we ignore those of you who have already brought CE to its present standing by your previous contributions. Your proven abilities will be tapped once again.

OK, now down to the nitty-gritty. The total number of completed questionnaires received before July 18th is approximately 100.

Question #1 had multiple responses, which makes sense, since most people had more than one reason for joining EAA. The primary reason was to learn about EVs (39%), followed by an urge to build an EV (21%). EV advocacy (19%) ran slightly ahead of wanting to benefit from the experiences of other EV users (16%).

Based on responses to questions #2-4, the most common profile for a CE reader is an EAA member who works full time (67%), who is a hobbyist-tink-

erer (49%) and who has been an EAA member for more than two years. Retirees were less numerous than anticipated. EV advocacy, though secondary, was strong (30%) and many respondees described themselves as hobbyists and advocates.

Based on the returned surveys, EAA members who get CE read it entirely (81%), in the usual front-to back mode (68%). About half of CE's readers pass it on to friends and colleagues. CE's articles do seem to be a topic of conversation, with 89% of the respondents indicating that they often (39%) or sometimes (50%) discuss CE's contents with others. 85% say they would recommend CE to other people. For the 7% who would not, the primary reason was that their friends are not interested in EVs. 92% of survey respondents save back issues, either because EAA members are compulsive pack-rats or because the little gems that appear in CE's pages are worth archiving.

The real shining star was question #13, which indicated that 92% of respondents DID something as a result of reading CE. This continued the trend seen in May, and if anything, increased it slightly. If the publication can get that many of us off our duffs and into action, CE must be doing something right.

Question #14 was a bit of a surprise, since we had made the assumption that those of you who are interested enough to return the questionnaire would also be driving EVs. Apparently not, since 66% of the respondents DON'T. Quite a few HAD driven an EV in the past, but retired it for various reasons. Perhaps CE should look at this phenomenon more closely to find out why people took their EVs off the road.

Those who plan to get an EV seem to favor buying a newly manufactured one (27%), although it was not clear whether a current model car conversion would count as a new EV or a converted gas car.

This question also had a few multiple responses, so folks were obviously giving more than one preference. 24% would convert a gas car using a kit, however an intrepid 17% would convert a gas car without a kit! The number of non-kit converters was higher than expected. Buying a used EV was the least favored on the list.

Questions #16 - 22 were to confirm or deny our assumptions about what EAA members want from the publication. The want list seems to be shaping up as predicted, although it gave a few surprises. As far as vehicle information goes, most people are after street-legal cars/trucks/vans etc (63%), with experimental solar ultralights tagging 'way after (17%) and race vehicles/Electrathons in the basement (11%) and (9%). That was a bit unexpected, although probably part of the answer is that this was another question that had many multiple responses (150 answers overall). The first priority for most folks is getting around, and that means street-legals. Then you can have fun with the exotics, the Electrathons and the lightweights.

What columns and stories are on the want list? The technical advise "Bolts and Volts" scored highest (29% of 261 answers—again this one had multiple responses) followed closely by Recent EV conversions (28%). CE's readers also are hungry for product announcements (35%), technical articles (29%) and interviews/profiles of EV owners.

As recent-issue readers know, CE has already introduced the "Recent EV Conversions" column, now called "Do It Yourself", being ably written by Paul Hebert. As soon as we have drawn a TechWiz to manage the column from our horde of CE volunteers (see above), CE will start "Bolts and Volts".

The 15% who wanted Chapter Activities will be happy at the debut of Ruth

Shipley's first column this issue. She's been working under slightly adverse conditions (trying to pry news out of the chapters during summer vacations etc.) but she's done a good job on the first time out. *Next time it will be easier, Ruth. And we will get you stuff via modem.*

High School EVents and Women in EVs will also be continuing, even though the survey did not reflect a high demand. Both EAA and CE need to offer more to folks who are not cast in the traditional EAA mold (women, minority groups, teenagers) in order to expand our horizons and our membership. We are still seeking a person in the high school community to manage/write/produce the High School EVents column.

Of the various items in CE, the one readers use most by far is the EVent Calendar (39%), so we have pledged to expand the Calendar and make sure the information listed is as accurate and timely as possible. Due to the increase in support by Advertisers, CE will be displaying more sources for EV products. Perhaps also due to the fact that 37% of the responses indicated that people had contacted an EV business as a result of seeing an ad. EV vendors, take note! Ads in Current EVents WORK!

On question #20 & 21, EAA members were divided on a monthly newsletter (55% no, 45% yes), apparently feeling that a monthly was not worth increasing the yearly dues. The split, however, was almost even (51% against any increase versus 49% in favor). When CE does go monthly (and we start in Jan '94, we will do so within the current budget.)

Promo items! Everyone has them these days. Of the items suggested, CE's reader responses (multiple-answer question) went for the solid idea of a resource booklet (22 %), followed by bumper stickers (19%) T-shirts (18%) and membership directory (18%). Mugs with an EAA

logo (11%) are already available through Mike Slominski and Peninsula Chapter, as are bumper stickers, key chains, name badges, etc. Mike decided to take his own initiative in setting this up. More power to him!

About bumper stickers—Everyone who sent a completed survey will get a "Switch is On" bumpersticker. CE designer Sue Hollis did the graphics and I think they look great! Look for them soon in a mailbox near you!

Q1 Why did you joint the EAA?

learn more about EV

79%

build an EV

43%

promote the use of EVs

38%

meet other EV users

32%

Q4 As a EAA member, which describes you best?

EV industry professional

35%

EV hobbyist/tinkerer

34%

EV promoter/advocate

28%

Q9 Do you pass along the publication to friends or colleagues?

Often

37%

Sometimes

54%

Q14 Do you presently drive an EV?

Yes

31%

No

64%

Q15 If you wanted an EV, which do you prefer?

buy a new EV

28%

convert a gas car w/kit

25%

convert a gas car w/o kit

18%

build from ground up

15%

buy a used EV

11%

Q17 What ongoing columns in CE?

Technical column

76%

Recent EV conversions

74%

Chapter activities

38%

Q19 During the past year, have you?

attended EVents in Calendar

46%

contacted a vendor by Ad

46%

sent letter to Editor

18%

Calendar of Events

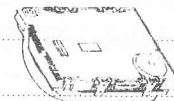
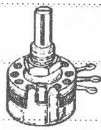
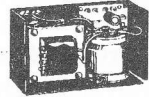
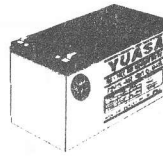
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- Sept. 28- 30** **Wescon (West Coast Electronics Conference)** in San Francisco. Includes EAA Symposium and EV Display. See Wescon announcement in this issue. For information, contact Stan Skokan at (415) 366-0643.
-
- Oct 1-3** **First New England Eco Expo** - exhibitors and displays, including alternate fuel vehicles. For more info call 818-906-2700
-
- Oct 3-5** **2nd Annual National Alternative Fuel Conference**, Lincoln, Nebraska. Sponsored by Platte Campus along with the U.S. Department of Energy. Will include speakers, displays and information on the advantages of using alternative fuels, current research and development, rules and regulations, and certification requirements and training. For more information, contact Kathy Hash at 402-562-1243.
-
- Oct 15-17** **Formula Lightnings race at Mesa Marin Raceway** at Bakersfield, CA. This is a support race to the NASCAR Winston West 300. Contact Solar and Electric Racing Association (SERA), Tel. (602)-953-6672 Fax. (602)-953-7733.
-
- Oct 21-23** **Sustainable Transportation S/EV 93**. NESEA will host a series of workshops and trade show at the World Trade Center in Boston, MA. This is the one that the Big Three bring cars to! Contact NESEA for more information.
-
- Oct 24-28** **Power Conversion/Intelligent Motion and Power Quality '93 Conference** in Irvine, California. The conference takes a SYSTEM view of EV's, from the utility generator through the charger and battery, to the speed control and motor. Contact John Mungenast at (805) 650-7070 or Fax: (805) 650-7054 for more details.
-
- Nov. 7-15** **World Solar Challenge 1993** will run in Australia from Darwin to Adelaide. No contact info yet
-
- March 17-20** **APS Solar and Electric 500** at Phoenix International Raceway, Phoenix, AZ. This is the one where the electric Lola broke 100 mph. Formula Lightning, Stocks, High School Division, Hybrids, Solar and others. (See May-June issue of CE for '93 race coverage to whet your appetite). Contact Solar and Electric Racing Association, Tel. (602)-953-6672, fax 953-7733
-
- April 8-10** **4th Los Angeles Eco Expo**, Los Angeles, CA - For information on show or exhibiting, call 818-906-2700
-
- Early May** **Lightnings race at Richmond International Raceway**, Richmond, VA. High School competition. SERA has not set the exact date yet, but stay tuned. Solar and Electric Racing Association, Tel. (602)-953-6672, fax (602) 953-7733.
-
- May 21-28** **1994 American Tour de Sol** - This classic EVent will start in New York City and run to Philadelphia, PA. For more information, contact Nancy Hazzard, NESEA, 23 Ames ST. Greenfield, MA 31301, Tel. 413-774-6051.
-
- Early July** **Formula Lightning support race to IndyCar Cleveland Grand Prix**. Burke Lakefront Airport, Cleveland, OH. Date not set, contact Solar and Electric Racing Association for details. Tel (602) 953-6672, fax (602) 953-7733
-
- Aug 7-21** **Ener-Run III** - Rally for alternate-fuel vehicles begins in Hardy, Arkansas, goes through Missouri, Iowa, Wisconsin, Illinois, Michigan, Ohio, Pennsylvania, Indiana, Kentucky, Tennessee, Georgia, Louisiana, and finally (gasp) ends up full circle back in Hardy, Arkansas. Maybe the Clintons should enter a car. For more information, contact Ener-Run, Inc. P.O. Box 665, Hardy, AR 72542, Tel. 501-856-3877
-

Info on Calendar items from SERA Racing News and Electric Grand Prix Co. newsletter.

Many thanks to Anna Cornell, the EVent co-ordinator. For more information on EVents, contact Anna at 510-685-7580.

Reminder to myself:

✓ Be sure not to miss this...



HSC Electronics

Giant 30th

Anniversary Sale!

This is their big, once-a-year blowout...nearly everything is on sale!
Discounts on everything...Many One-of-a-kind Specials...Close-outs...
Drawings...Prizes...Refreshments...Warehouse Clearance...up to 90% off!

Saturday, September 18, 1993

9:00AM to 5:00PM

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lot for this sale...
It's that huge!*

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(707) 792-2277



News in Brief . . .

EV Battery Hazards Controllable

Research conducted by the National Renewable Energy Laboratory (NREL) shows that electric vehicle battery hazards are controllable and the risks of their use are small.

NREL will soon issue a new study on nickel-metal hydride batteries that will back up its first study, "Environmental, Health, and Safety Issues of Sodium Sulfur Batteries for Electric and Hybrid Vehicles Vol I-IV."

The studies were prepared by the Ad Hoc Electric Vehicle Battery Readiness Working Group, set up by the Department of Energy to solve battery shipping, recycling, and in-vehicle safety issues.

For further information on the studies, contact Carol Hammel, who chairs the Working Group, at 303/231-7836. (OXY-FUEL NEWS: 5/31, p.5)

GM's Impact Applies for Calif ZEV Certification

General Motors Corporation has filed an application with the California Air Resources Board (CARB) to certify its 1994 Impact electric car as a zero-emission vehicle.

The Impacts can travel 70/90 miles (city/highway) between charges and take two to three hours to charge. The vehicles accelerate from 0 to 60 mph in less than nine seconds.

GM will build 50 EVs based on the original Impact prototype. The cars will be used in nationwide program to help develop the market and infrastructure for electrics. These vehicles are designed

to meet all applicable safety requirements and will be equipped with dual airbags and anti-lock brakes. The Impacts also have an electric heat pump climate system that uses ozone-friendly R-134a refrigerant. The system is designed for year-round use in major California cities.

Over a two-year period, GM will provide 1,000 potential customers with vehicles for periods of two to four weeks to show consumers the capabilities of EVs and educate GM about customer expectations. GM's goal is to begin mass producing commercially viable EVs by the late 1990s for retail sale.

(GENERAL MOTORS RELEASE: 6/15)

Big 3 Want Hybrids in CA ZEV regs.

U.S. automakers want California to lighten up on their ZEV regulations — zero-emissions vehicles — meaning all-electric. They want to include hybrids, EV's with a small IC engine as a "range extender".

State regulations require all manufacturers selling more than 35,000 vehicles in California to have 2% electric by 1998. Manufacturers that sell fewer cars must comply by 2003.

The California Air Resources Board (CARB) is holding firm, however. CARB maintains, "The big advantage of pure electrics is that their emissions do not deteriorate," as do internal combustion engines after 50,000-plus miles.

Ford Motor Company argues that hybrid EVs give customers more of what they want in performance — and the ability to drive greater distances when away from heavy pollution zones. GM, VW, Audi and Volvo have hybrid cars in trial, but according to CARB's Bill Sessa, most

foreign makers have asked for California's "pledge to not change the standards" to help protect their investment in EVs.

Steve Albu, engineering studies branch chief, admits that there may be problems with EVs, but that hybrids may "have a role to play after we completely saturate the market for pure electric vehicles."

(AUTOMOTIVE NEWS: 6/14, p.1,34)

New AFV Tax Breaks Take Effect July 1st

Beginning July 1st, new tax breaks take effect to benefit purchasers of alternative fuel vehicles. The tax break is particularly beneficial for those purchasing EVs. Ten percent of the purchase price of an EV, approximately \$4,000, can be rebated by the government.

These rebates are aimed at kicking off major EV production. California is going a step further by requiring automakers to have EVs represent 2% of their total sales beginning in 1998.

One sticking point remains: the Internal Revenue Service has yet to determine whether individually retrofitted EVs or other converted EVs done by small businesses will qualify for a tax credit or the less beneficial, tax deduction. This week the IRS will request comments on its proposal through the FEDERAL REGISTER.

(CHICAGO TRIBUNE: 6/20)

AC Propulsion "Long Ranger"

AC Propulsion, Inc., has introduced the "Long Ranger", a compact, lightweight

Continued on page 25

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trailer housing a small internal combustion engine and generator.

The aerodynamic trailer is designed to be towed behind an electric vehicle, enabling the driver to extend the EV's range by 200 miles per 5 gallon tank of fuel. It is also completely detachable, making it possible for the car to remain primarily a zero emissions vehicle. With the addition of the Long Ranger, EVs are not limited to "local commuter" status.

Specifications include power output - 91W; output voltage -up to 44V DC; Fuel - Gasoline; Tank capacity - 5 gallons; and equipped with remote manual on/off.

(AC PROPULSION RELEASE:
JUNE 1993)

Fed. EPA Will Adopt CA LEV Stds

California's low-emission vehicle (LEV) tailpipe standards will be used as the base standard for converting the U.S. vehicle fleet to less polluting cars and trucks, the EPA decided.

The Agency announced its plan in the FEDERAL REGISTER of June 10 (p.32474), in which it also issued definitions that would cover different facets of the fleet program.

The 1990 Clean Air Act Amendments say that fleets of 10 or more vehicles weighing less than 26,000 pounds each must lower emissions. Thirty percent of the vehicles must be converted by 1998 with the figure rising to 70% by 2000.

(AIR/WATER POLLUTION REPORT:

SAFETY ELECTRIC VEHICLE HEATER

The RUSSCO Safety Electric Vehicle Heaters heat and circulate coolant through the original equipment heater, replacing the source of heated coolant supplied by the internal combustion engine. The heating system provides temperature control, fan speed, heat and defrost selection for heating, defogging, and ventilation. Model H-15 is suitable for temperatures above freezing. Model H-20 is suitable for temperatures below freezing and is recommended for systems under 120 volts. Heaters are supplied with hose, insulation, clamps, fittings, wiring, mounting hardware and easy-to-follow instructions. RUSSCO Heaters are warranted for one year.

SPECIFICATIONS

- 96-120 Volt input
- H-15, 1.5 KW, 12.5 A, 5120 BTU/H
- H-20, 2.0 KW, 16.7 A, 6830 BTU/H
- Coolant temp. rise, H-15, 1/2°F/sec
- Air temp. rise, H-15, 70°F
- Size 4" D x 8 1/2" H x 16" L
- Weight - 6 1/4 lb

Model H-15
\$345

CALL or WRITE FOR DETAILS

SAFETY FEATURES

- Double fused
- Triple shut off
- Thermally protected
- Coolant loss protection
- "Heater On" dash indicator light
- No exposed high voltage
- High voltage warning label

Model H-20
\$395

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Green 914s

by Clare Bell

As anyone who has read CEs pages over the past few issues may have noticed, the Porsche 914 has attracted attention as a high-performance electric conversion. As the delighted owner and driver of Ron Rasmussen's I'M CHARGED, I am becoming more intrigued with these cars and would like to get in contact with folks who have done 914-based EVs, or who want to.

There are about ten 914s that I know about that are either on the road or in the process of being converted. Here in San Jose, there are 2; my red '74 and a white '73 (?) built in Southern California and recently purchased by San Jose Chapter President, Don Gillis. Sources say that there is a flock of about six cruising around in the Seattle area (I would like to know who was involved with those). Paul Durban of Nevada City, CA, has one in process and it looks like he's doing a beautiful job with it, judging from the "baby pictures" I saw.

Are there any more electric 914s out there? If so, I'd like to know more about the technical details. The cars can be rigged as hot-performing sprinters with 12 V batteries in a 132 V pack or highspeed cruisers with 6 V batteries in a 120 V pack. Or anything in between.

If you send in a description of your 914 EV, please mark "Green 914" on the envelope.

Letters to the Editor

Due to space limitation, *Letters to the Editor* will not be featured in this issue. *Letters to the Editor* will be back in the next issue of Current EVents, the November/December 1993 issue.

Member Want Ads

FOR SALE: Fiat 850 Spider Convertible. Super red. Cute! New conversion, Prestolite 19hp, 96 volts, PMC controller, DC-DC, transformerless charger, etc. Many new suspension parts, tires, etc. Over \$8K invested. Sell for \$4950/obo. Call Preston 415-499-0601.

FOR SALE: 1967 Fiat Convertible, Lic. # PLUGIN, powered by jet aircraft generator motors eleven 6 volt and one 12 volt batteries. Runs great and in excellent mechanical shape. Needs new batteries and sprucing up. \$850/obo. Call 415-342-0638 after 5:00pm.

FOR SALE: 1988 Jeep Wrangler, almost-new mechanical/cosmetic condition; full-time, four wheel drive with: two each 40 peak H.P. motors; gear reducers, two 120v. Curtis controllers, twenty Trojan T-145 batteries (120V.), Allis Chalmers contractors, Lester charger, 65 mph (120v); 80-100mi range (100% discharge); great daily driver. \$9250/offers. Call Myron or Jon 708-798-5415.

FOR SALE: 4 new, never used, Goodyear P225/75R15 Invicta GFE tires (18% lower rolling resistance than any available tire) mounted on new, never-used, Fittipaldi Truskstar mag wheels (five lug, 4-1/2 in. bolt circle. \$985/plus UPS shipping. Call Myron or Jon 708-798-5415.

FOR SALE: 1981 Jet Ford Escort Hatchback, 20HP Prestolite, DC Series Wound Motor, 4 speed, PMC Transistor Controller, gas heater, Exide Batteries only 7K mi. \$4500. Call 415-388-0838.

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

FOR SALE: Auto Hybrid Conversion, Prestolite MTC 4001 DC Series Wound Motor, 2 Albright, SW-202B Reversing Contactors, Generac 8-kW Generator. Paid \$3287. \$2225/obo. Call 818-398-9950.

FOR SALE: EV '66 Dodge Dart, Red convertible, running and registered. \$1200. Call 510-525-6961.

FOR SALE: 1981 Bradley GT II Electric, rebuilt to include the latest technology. Advanced DC Motor, Curtis Controller, Trojan batteries, wiring, etc. Call (508) 897-9393.

Rates for Want Ads

\$5 for the first 30 words. For each additional word, 25 cents per word.

Want Ads are available to EAA members for the sale of electric vehicles and related products. For display ads for commercial products, please see the Advertising Rates.

Send your want ads to EAA\Want Ads, 18297 Baylor Avenue, Saratoga, CA 95070. The check should be payable to EAA and included with your ad. The EAA is not responsible for the accuracy of ads.



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A Quiet Revolution

By Don Gillis and Yuzon Hao

"A Quiet Revolution" is a 70 minute VHS video produced by Avalon Video Productions. This production provides a technical guide to anyone who is interested in converting an internal combustion vehicle to electric power. The tape follows the transformation from gas to electric of a GMC S15 pickup truck.

Mary Ann Chapman, president of EcoElectric Corporation, in Tucson, Arizona, uses a GMC pickup as an example. She systematically demonstrates the conversion process step by step. She not only gives the answers to generally asked questions such as "How much is the cost of conversion? How long does it take?" but she walks the viewer through the entire transformation procedure. The sequence includes mechanical details such as labeling parts, pulling the engine, designing and building the adaptor plate and battery racks, electrical parts installation, cabling and testing.

We found that the video is a quality production and very informative at both the basic and professional levels. Anyone who is interested in an electric car will enjoy watching this video. If you are new to EV conversions, this tape will give you a good idea about the scope of the job. In addition, a detailed list of sources for components is provided at the end of the tape.

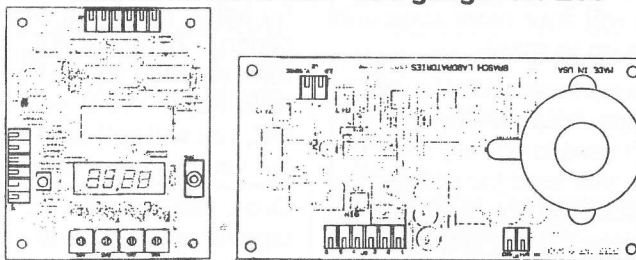
"A Quiet Revolution" can be ordered for \$35 from Avalon Video Productions, Connie Spittler, 5655 E. River Road, Suite 101-190, Tucson, AZ 85715 (602) 327-3536.

(Ed's note. Don Gillis suggested that the best reviewer for this tape might be an individual who has not yet done an EV conversion, but who is seriously considering one. In this case, since Yuzon Hao was already thinking about doing a pickup truck, she was a natural. —CB)

At last, an Easy Way to track your Energy

Now users can easily:

- And precisely track battery energy use
- Troubleshoot power losses
- Use as an electronic "fuel gauge" for EVs

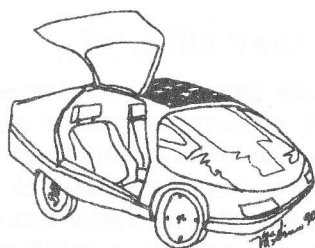


The **Precision D.C. Energy Monitor** has been Race tested & proven at the '92 & '93 APS Solar & Electric 500 at Phoenix, Az.

Features:

- Four digit counter, displays energy drawn or added
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Continued from page 15

performance much smoother. Third, it saves energy. You can see this for yourself by starting an electric car from a stop with the clutch and without the clutch, and watching the ammeter. The car without the clutch will draw more amps until the motor gets up to speed.

Golf carts can get away with eliminating the transmission because they are very light and don't need to go very fast. In a passenger car, you need the gearing and torque multiplication for performance. The G-van doesn't use a transmission, but it needs 215 volts to get it up to highway speeds.

Save the idea of a 12 volt accessory battery, but not the battery itself. If you do not have a DC/DC converter, you will

want to replace the original battery with a heavy duty deep cycle battery, especially if you do much night driving. The DC/DC converter is highly recommended as a constant source of voltage for lights, etc., but it doesn't replace the battery. If the DC/DC should fail for some reason, it will do it at night ten miles from home. So if you do have a DC/DC, you will still want a 12 volt battery, but you can use a very small one.

Don't eliminate the 12 volt battery by tapping across two of your main pack batteries for accessories. This will cause uneven discharge of the pack and decrease its lifespan.

Save your passenger and cargo space. It's easy to just stuff the batteries into

the back seat or truckbed, but with a little thought, they can be maneuvered under the hood, behind the back seat, or under the truckbed. This will give you a more useable and more valuable vehicle.

The building of the electric conversion actually begins with the dismantling of the internal combustion car. If it's done right, the process of disassembly is an integral part of the process of assembly. It should be done thoughtfully, with the vision of the finished conversion always in mind.

Every journey begins with a single step. Be sure your foot is pointed in the right direction.

(Reprinted from Home Power Magazine by permission of the author)

Here's a handy way to introduce your friends to EVs.

Just published, the *Buyer's Guide to Electric Vehicles* has the latest on EVs, conversion kits, and related supplies. Priced at only \$6 postpaid, this high-quality publication is an excellent tool to introduce your friends and relatives to the world of silent power. Carry a few copies with you in your EV to hand out to interested people who ask you what driving electric is all about. Its glossy cover has full-color photos inside and out — it has better quality than the hot-rod magazines and superior content (but no nearly-nude women on the front).

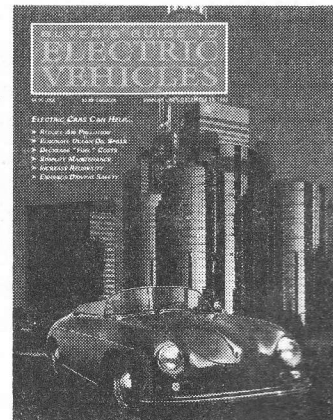
*** QUANTITY DISCOUNTS AVAILABLE ***

An ever-popular title is *Electric Vehicle Structures & Components*, which includes comprehensive descriptions of batteries under development, including pros and cons of the materials in terms of their impact on the natural environment. Loaded with information, this book costs a mere \$10 postpaid in the U.S. (add \$2 to Canada, \$4 overseas). And, if you need more complete information on the EV industry worldwide, including research groups, order our *1993 Worldwide Electric Vehicle Directory* for \$14. With over 200 businesses and organizations listed, the product and service categories include:

- | | | |
|-----------------------------|-----------------------|-----------------------------|
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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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AD SIZE		1 issue	3 issues	6 issues
			(PREPAID)	(PREPAID)
Full page	7.25" x 9.25"	\$300	\$200 ea	\$175 ea
1/2 page	7.25" x 4.75"	\$150	\$100 ea	\$ 80 ea
1/4 page	3.65" x 4.75"	\$ 75	\$ 60 ea	\$ 50 ea
1/8 page	2.0" x 3.5"	\$ 60	\$ 40 ea	\$ 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:

November/December issue	October 1st
January issue	December 1st
February issue	January 1st
March issue	February 1st
April issue	March 1st
May issue	April 1st
June issue	May 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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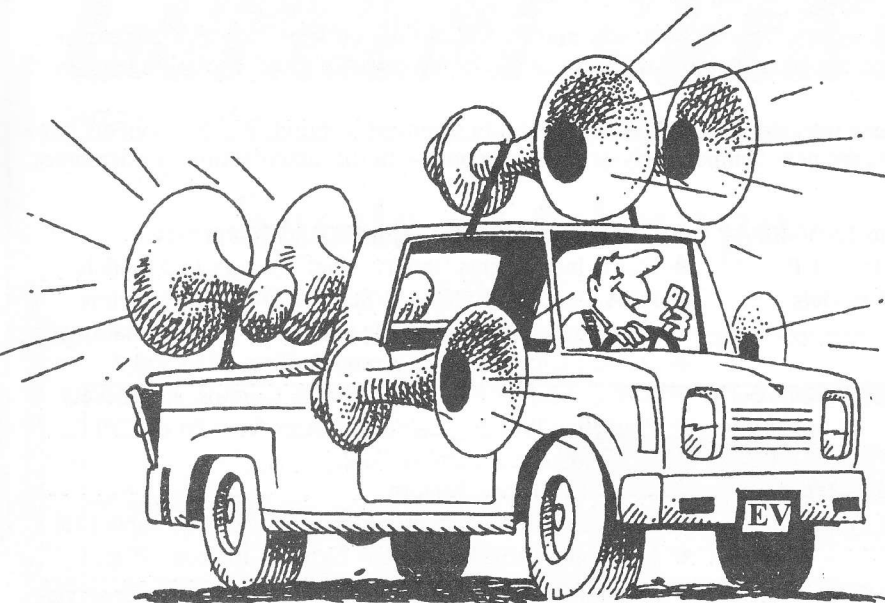
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EAA Chapter Listing

State	Chapter Name	Contact	Phone	Address	Meeting Time	Meeting Location
ARIZONA	Phoenix	William Sowle	602-250-2131 602-433-9541	POB 4153, Phoenix, AZ 85067-0153	4th Sat., 9am-noon	Arizona Public Service, 400 N. 5th Street, Phoenix
CALIFORNIA	Desert Chargers	William Hoopes	619-346-4280	72-678 Pitahaya Street, Palm Desert, CA 92260	Saturday	College of the Desert
	East Bay	Anna Cornell	510-685-7580	60 Alan Drive, Pleasant Hill, CA 94523-1902	2nd Sat./monthly, 9:30-noon	PG&E Service Center, 4801 Oakport Street, Oakland
	Los Angeles	Irv L. Wiess	818-841-5994	2034 N. Brighton "C", Burbank, CA 91504	1st Sat./monthly, 11am-1pm	Pasadena City College, 1507 E. Colorado Blvd, R E220, Pasadena
	North Bay Electric Vehicle Assoc.	Preston McCoy	415-499-0601	750 Pine Lane, San Rafael, CA 94903	2nd Sat. monthly 9:45 am-noon	PG&E Business Center, 111 Stony Circle, Santa Rosa
	Sacramento (EAAS)	Richard Minner	916-454-5524	5201 Dover, Sacramento, CA 95819-3824	4th Saturday, 10am-noon	S.M.U.D. Headquarters, 6201 S Street, between 59th and 65th Avenue
	San Jose EAA	Don Gillis	408-255-5446	5820 Herma, San Jose, CA 95123	2nd Sat./monthly, 10am-noon	1529 Jacob, near Meridian, San Jose
	Silicon Valley	Stan Skokan	415-366-0643	1020 Parkwood Way, Redwood City, CA 94060	3rd Sat./monthly, 10am-1pm	HP Santa Clara facility, Stevens Creek at Lawrence Expressway, Santa Clara
	Peninsula	Mike Slominiski	415-343-8801	951 S. Claremont St, San Mateo, CA 94402	1st Sat./monthly, 10am-noon	San Bruno Public Library, downstairs
	San Luis Obispo	James Donnell	805-472-4580	POB 1000, Morrow Bay, CA 93443	Chapter forming	
	San Diego Electric Vehicle Assoc. (SDEVA)	Ron Larrea	619-443-3017	9011 East Los Coches Road, Lakeside, CA 92040	1st Tues./monthly, 7pm	Eldyne Corp. 9775 Claremont Mesa Blvd., one block east of I-15
FLORIDA	South Florida	Steve McCrea	305-463-0158	1402 East Las Olas Blvd, #904, Ft Lauderdale FL 33301		
INDIANA	Indiana	Timothy Renaud	317-923-3028	2823 Sutherland Ave., Indianapolis, IN 46205	Now forming	Contact Timothy for location
MARYLAND	Southeast Maryland	Bob Sheridan	301-863-9042	41 E. Patuxent Beach Road, California, MD 20619	Now forming	
NEVADA	Las Vegas	Gail Lucas	702-736-1910	Desert Research Center, POB 19040, Las Vegas, NV 89132-0040	3rd Thursday	Corner of Flamingo and Seventh
NEW ENGLAND	New England	Bob Batson	508-897-8288 508-897-9393	1 Fletcher Street, Maynard, MA 01754	1st Sat./qtrly, March, June, Sept, & Dec., 1pm	Boston Edison
NEW JERSEY	Tri-State	Kasmir Wysocki	201-342-3684	293 Hudson Street, Hackensack, NJ 07601		
NEW MEXICO	Las Cruces Kar Klub of NM	Dr. Jack Hedger	505-546-0288	POB 1077, Demming, NM 88031-1077		
NORTH CAROLINA	Southeastern Electric Vehicle Assoc.	Lawson M. Huntley	704-283-1025	POB 1025, Monroe, NC 28111		
OHIO	Ohio	Pete Gall	513-683-4701	6875 Oakland Rd, Loveland OH 45140-9723	Now forming	
TEXAS	Houston	Ken Bancroft	713-729-8668	4301 Kingfisher Street, Houston, TX 77035		
UTAH	Salt Lake City	Harry Van Soolen	801-969-1130	3622 So. 4840 West, West Valley City, UT 84120	Now forming	
WASHINGTON	Seattle EVA	Ray Nadreau	206-542-5612	19547 23rd NW, Seattle, WA 98177		
	North Olympic Peninsula Electric Car Club (NOPEC)	Burton Gabriel	206-437-2136	2715 Perry Road Pt, Townsend, WA 98368		
VIRGINIA	Central Virginia	Jim Robb	804-367-8907	1620 Grove Street, #1, Richmond, VA 23220	Now forming	Science Museum
WASHINGTON, D.C.	Electric Vehicle Assoc. of Greater Washington, DC	David Goldstein	301-213-3990 303-869-4954	9140 Centerway Road, Gaithersburg, MD 20879		
CANADA	Vancouver Electric Vehicle Assoc. (VEVA)	Axel Gringmuth Bill Glazier	604-987-6188	1402 Charlotte Rd, North Vancouver, B.C. V7J 1H2		

Send corrections to Bob Wing, POB 277, Inverness, CA 94937, or call (415) 669-7402 or FAX: (415) 669-7407.

Member Referral Program



- ◆ Do you know someone that is interested in EVs?
- ◆ Have you shared Current EVents with your friends?
- ◆ Would you like to support and promote additional EAA activities?
- ◆ Would you like to receive the new "The Switch is On" bumper sticker?

If you answered YES, to any of the questions above, then fill out this form below with a name of someone you know who would like to receive an informational package about the Electric Auto Association as well as a sample newsletter.

Include your name and we will send both you and your friend one of our new "The Switch is ON" bumper stickers.

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Name: _____ Address: _____

City: _____ State: _____ Zip: _____ - _____ Country: _____

Phone: () _____ - _____ Date: _____

Your Name: _____ Address: _____

City: _____ State: _____ Zip: _____ - _____ Country: _____

Phone: () _____ - _____ Date: _____

Mail your membership referral form to:
Electric Auto Association, Membership Referral, 18297 Baylor Avenue, Saratoga, CA 95070

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September/October 1993

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