ELECTRIC AUTO ASSOCIATION

CURRENT EVENTS

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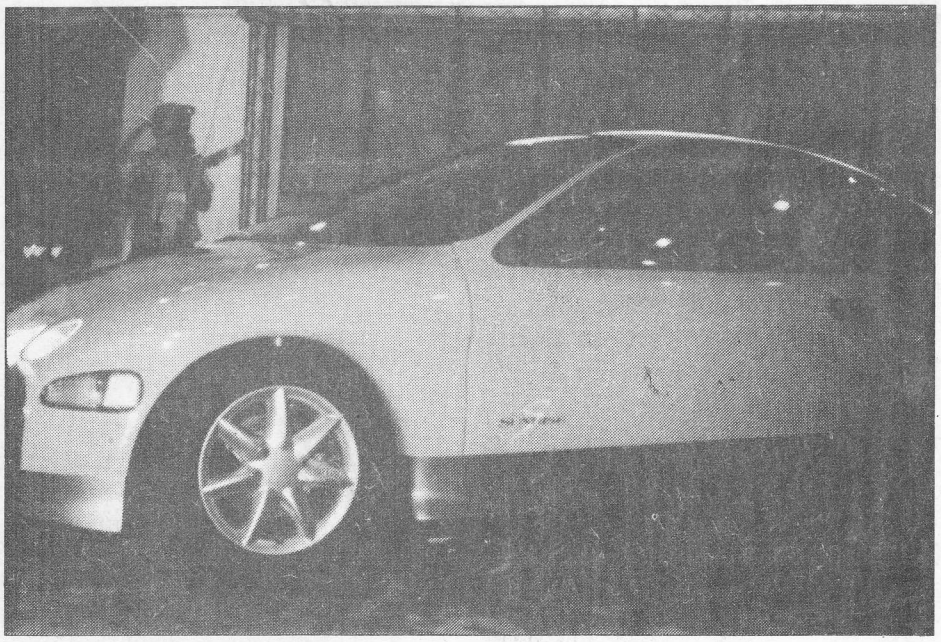

Tour De Sol Winners Break Finish & Records

By Michael H. Bianchi

PORTLAND, Maine, 5/26/95 — Nearly 3,000 spectators cheered and shouted as the winning EVs crossed the finish line in downtown Portland today. First across was the Sunrise, a pre-production prototype built by Massachusetts-based Solectria Corporation.Team New England II walloped the competition efficiency-wise, getting 43.48 miles/kWh(!).

One day earlier, Solectria's Sunrise had set the event's distance record, traveling 238 miles without recharging. The Sunrise was also the overall top finisher in the week-long American Tour de Sol national championship road rally for electric and solar electric vehicles.

The Sunrise, a static model just 6 months ago, showed itself to be a very real contender that points the way to at least a portion of the future. I suspect I will someday tell folks about my first encounter with this groundbreaking EV.

The second top finisher was a Solectria-built Force GT raced and sponsored by Virginia Power Company. The third finisher and also the top finishing utility vehicle, was a Ford Ecostar sponsored and raced by Connecticut-based Northeast Utilities. Both the Force GT and the Ecostar are commercially available.

Among student entries, the top scoring vehicles came from Mt. Everett High School in Sheffield, MA, Bolton (CT) High School and the Salisbury School in Connecticut. The Mt. Everett vehicle was the top hybrid vehicle, an EV that carries an on-board generator to recharge batteries while on the road. The Bolton High School entry was the top scoring student entry in the Discovery Channel Commuter Class — the largest category in the American Tour de Sol. This vehicle, the Solar Bolt, also set an American Tour de Sol record for vehicles powered by common, lead-acid batteries by traveling 143 miles without recharging.

The other top student entry, built by students of the Salisbury School, was this year's winning solar racer. The solar race vehicles are designed with large "wings" covered with solar cells. Built specially for competition, these cars run en-

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EAA Info: 1-800-537-2882

Don't Give 'Em Any Ammo - EV Safety

By Clare Bell

I've been thinking and talking lately about what will happen to the EV movement in the US. By doing so, I'm hoping to help head off what could be the worst thing that could happen, namely a bad EV crash. Yes, we have been careful so far, but we have also been incredibly lucky. If a big bad one does happen, the anti-EV forces will be all over us like flies on you-know-what. The Carnegie-Mellon study and the Mobil ad campaign will like birdshot compared to what will be coming our way in the event of a widely publicized EV wreck. If someone is killed, or even badly injured, the outcry could possibly close down our conversions. There have already been hints that some of the investigations of EV safety could possibly be used to legislate our cars right off the road. If nothing else, the anti-EV crowd could put pressure on insurance companies to deny us coverage.

Fair? Of course it isn't fair that one EV crash could do so much damage to our cause. Such an incident would be ridiculous in scope compared to the wholesale slaughter happening on our freeways full of gasmobiles. So, let's make our EVs as safe as they possibly can be. Not only for the sake of personal and family safety, but to safeguard the future of the EV movement.

Rear battery box design is one of the weaker links in the EV chain. So what's the big deal about battery boxes or racks? You just saw a hole, bolt the boxes in, slap a lid on, stick a bar or strap across and you're home free, right? I thought so until I saw the results of some single vehicle accidents during the 1994 EV racing season. It is not sufficient to bolt through sheet metal. The stuff rips like aluminum foil. You can cut a car body, especially the newer ones, with a pair of shears. Remember, we are talking about impact forces and they are many times greater than just the inertia of the box plus batteries. I've seen the kind of tears 1/4-20 through-bolts make in late model unibody cars.

So what can you do to make sure that your batteries stay where they're supposed to? John Witt, of EcoElectric Co., has addressed some of these concerns in some recent conversions and I'm hoping I can get him or someone else to do a good detailed article on how to secure battery boxes so that they don't even start to move in a collision.

Continued on next page

Front cover photo:
Solectra Sunrise as unveiled at EVS-12.

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Article Submissions
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.

If you would like to submit an article for Current EVents, the preferred format is on a floppy disk, along with a printed copy of the article. Include camera-ready photos or graphics in TIFF or EPS.Please specify PC or MAC and identify software and version number.

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

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

EAA Membership
2710 St. Giles Lane
Mountain View, CA 94040

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For now I'll just share some observations I've picked up along the way from various folks, including John.

1. Think about where your batteries will go in the event of a collision. Try to design your rear box so that if the batteries do break away, they are deflected down underneath the car. Batteries in the nose will act as an impact absorber in front of you, an advantage in a head-on with a heavier vehicle. If you provide a crush zone (either space or crushable material) box and batteries should survive intact while helping you to do so as well. In some EVs, such as the GM Impact, batteries are contained in a tunnel along the centerline of the vehicle so that in a worst case collsision, they will self-eject as a single self-contained mass in front of and below the car, staying away from the occupants.

2. When you cut your mounting hole for the rear box, take a little time and some welding equipment and weld a reinforcing frame around the rectangular gap. If you don't weld, grab someone at an EAA chapter meeting who does (aha, that's what EAA chapters are good for!) Don't be afraid of welding. It is often the best and safest way to secure heavy components. It isn't even that hard to learn, (I've done both oxy-acetylene and electric-gas type) but don't practise on your conversion until you can make a good weld. Car bodies are thin, and its easy to burn a hole through. Bad welds break, too. If you are unsure about your skill, get someone else to do it.

3. Find and use the "hard points" i.e. places where hardware like suspension components etc. mounts to the body. Seat belt mounts are good anchors, since they are often in thicker metal and are designed to absorb an impact from even the heaviest human beings. Use as many as you can.

4. If you have to bolt through the body, weld on a reinforcing plate and drill through that. If possible, connect it to a frame member or other structural part. It isn't a bad idea to consult an automotive or mechanical engineer if you don't feel confident about any aspect of the project.

5. In unibody vehicles it is often necessary to distribute the impact force over as wide an area as possible. Buttress beams going from the box or rack to the inside of the fender wells are one way of doing that. Be sure you spread the load with a curved plate against the fender well so that the beam doesn't pull away or punch through. Buttress beams and large floor plates help spread the load.

6. Whenever possible, sink the rear box into the spare tire well. Get the rear pack as low as possible (and still meet the 4-inch ground clearance requirement!). That way the batteries will tend to go down and under the car in the event of a sudden deacceleration.

7. If the car has a rollbar or rollcage, consider bracing to the mount plates or the bar itself (though don't weaken it by drilling). In the some of the Phoenix races the rollbar was the only impediment that kept the battery box from ending up in the driver's lap. Another alternative is to tether the boxes using aircraft cable. (I use that as the tie-down straps over my rear battery box in my Lightning Bug. Combined with turnbuckles and good anchor points, aircraft cable will do an excellent job of securing batteries.)

8. Use angle or channel steel instead of flat strapping across the top of battery boxes. Angle or channel gives the hold-down member resistance to bending and keeps the box top flat. If you are using Redi-bolt threaded rod, get at least 5/8" diameter, preferably 3/4". Extruded fiberlass in channel or angle also works well and is light, but expensive.

9. Polypropylene, fiberglass or plywood battery boxes are pretty tough, but consider putting a reinforcing metal frame around them. If the rear box is sunk deep into the car body, consider adding a skid plate or cover so that the batteries don't get bashed from below.

10. Think about installing one of those inertia switches to cut off power in the event of an impact. These are now being used as fuel cutoffs in the newer gas vehicles and can easily be fitted as a pack cutoff in an EV. At least put a fuse or fusible link in each battery box. Think about ways to attach cables so that if batteries do shift, the lugs don't pull or break the battery terminals off (major arcs and sparks, folks). Pull-loose connections or extra cable slack might do the job here. Do NOT by any means, depend upon battery weight or cable connections to hold batteries in place. I've seen too many cars without any holdowns whatsoever. You know who you are, so fix 'em. It isn't that hard and the incident you prevent might be the critical one, both in terms of your safety and the EV movement.

In short, don't give the guys in the black hats any more ammunition than they've already got. Thanks to: John Witt, Bob Schneeveis, Mary Ann Chapman and others.

LA Hosts (Involuntary) ICE Hazard Study

Carbon monoxide from a van warming up in a garage killed three Los Angeles family members and left two others in critical condition. Armando Berumen, 44, started the van at 5:30 to be sure it would run when he wanted to take the family to church, said Lieutenant Sergio Robleto of the LA police. Berumen left it running in a garage adjacent to the family home. The door between the garage and the house was left open. Berumen and his sons Armando Jr., 12 and Noel, 9, were pronouced dead at Martin Luther King Jr/Drew Medical Center. Berumen's wife and daughter were on life support at Harbor UCLA Medical Center. A water flow alarm triggered by sprinklers that responded to heat buildup in the garage alerted firefighters. They found the stricken family at 6:07 am, only a half-hour after the van was started.

[Credit: San Francisco Chronicle, Nov. 21 1994]

If the vehicle had been an EV, this tragedy would never have happened. Not only do you avoid the exhaust fumes, but you don't have to warm the vehicle up to make sure it will be ready to run. —CB

Continued from page 1

tirely on sunlight. "This was the top field of electric vehicles we've ever had in the American Tour de Sol," said race technical director Dr. Rob Wills. "There is no doubt in my mind that what we've seen develop here is a technology and an industry that can effectively meet transportation and environmental needs."

Two high school projects, Project e-, a hybrid, and Solar Bolt, a lead-acid battery car, took overall positions 4 and 5, ahead of some of the PRODUCTION cars. The Tempest, a college hybrid, also placed up amidst the PRODUCTION entries. Personal projects, such as Genesis I and Millenium Falcon, did very well overall. And Helios the Heron may have come in (almost) dead-last, but the kids were wonderful and I would not be surprised to see some of them go on to do really marvelous things in the future.

Dr. Wills said race officials were particularly impressed by the Solectria Sunrise. "This may be the one everybody's been waiting for. Something that's clean running, attractive and performs even better, in many ways, than a gasoline-powered car."

Wills commented that it is sometimes too easy to see Solectria as a corporation and separate from the student racing community. He reminded the audience that it was born in a hole-in-the-wall lab at MIT, and he hoped the younger people such as the Helios team, would remember that.

The NESEA Best, Most Autonomous, Practical Car award went to Sol Survivor III. This car had large solar panels to supplement their battery charge during the race. It raced in the 2-passenger COMMUTER category against cars that had to plug in. Nancy Hazard, director of the ATdS, said she would like to create a new category for "practical, solar-electric, 2-seater, autonomous car" to compete with Sol Survivor III. Sol Survivor III was also recognized as having the most outrageous paint job. (Hot pink and electric blue.)

Solectria GT/VA Power won the Perpetual Trophy in the PRODUCTION category. Because both Photon and Spirit of Massachusetts will share the Perpetual Trophy for the SOLAR RACING categories; 6 months of display rights at each school. Project e- also got a trophy for Best Overall Hybrid. ERANGE was also awarded the Perpetual Trophy in the OPEN category. The same team, the Schiller Group, won last year for CityCat, so it is returning to Germany.

The Nordic Challenger won the daily efficiency award in the PRODUCTION category each day. Friday's number was 7.98 miles/kiloWatt-hour. (This vehicle is part of the EVermont electric vehicle evaluation program, and drove 11,000 miles in the past 10 months.) The 1959 Berkeley was awarded an efficiency award for getting 9.26 miles/kWh Efficiency awards were presented by the Department of Energy, Argone National Labs' Robert Larson. Michael Beebe and Gary Carr gave out a safety award to recognize the best high-school conversion. This went to RHAM Rod.

Just for Fun

Sofix Design was acknowledged as the car with the most batteries and the most electrical connections to troubleshoot. (180 nickel-zinc batteries.) The Old Timer Award went to the only car that has been in every ATdS: Suntech. The Most Inches Of Ink (press coverage) went to the Electric Hare from Falmouth ME. The Tough Luck Award: WE'RE-IT's Wild Cherry. This scooter came from Austin TX, and had problems that ended with a burned-out motor that they were unable to replace. The Bullwinkle Award for the Recognition of the Largest Non-Human Life Form Encountered During the American Tour de Sol: Fulmine Angelo Esposito, from Staten Island NY, saw a full-sized moose during the race. (Welcome to Northern Exposure, Southeast!).

Major sponsors of the 1995 American Tour de Sol include the United States Department of Energy, the Waterbury (Connecticut) Region Visitor and Convention Bureau, the Massachusetts Department of Transportation, the Federal Highway Administration, the Maine Solar Blast and the Discovery Channel. The American Tour de Sol is organized by the Northeast Sustainable Energy Association (NESEA), the nation's leading regional association involved in promoting awareness, understanding and development of non-polluting, renewable energy technologies. Headquartered in Greenfield, Massachusetts, NESEA is celebrating its 20th year of working successfully in the fields of transportation, building construction and energy.

(from the official Tour de Sol winners press release) CONTACT: Jack Groh (401)732-1551 Internet: GrohPR@aol.com WWWeb http://nesea.nrel.gov

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'95 American Tour de Sol Race Results

(Sat, 03 Jun 1995 - While taken from NESEA data sheets, this is a bit simplified form of the race results. There are a number of different subcategories, such as those that separate basic lead-acid batteries from advanced batteries.)

Rank	Overall	No.	Vehicle Name	Miles	Award sub-category
1	2	56	Solectria GT/VA Power	538.7	sedan/adv energy store
2	3	55	Ford Ecostar	519.7	utility/adv energy store
3	6	7	Nordic Challenger	454.9	sedan/lead-acid
4	7	50	Solectria/Horizon Bat	438.8	
5	9	51	'95 Solectria Force	415.1	
6	10	62	Solectria E-10	389.9	utility/lead-acid
7	12	90	ZAP Powered Rotator	366.4	2-wheel/lead-acid
8	30	54	US Electricar Bus	169.6	mass-transit
Discovery Channel Commuter					
1	1	63	Solectria Sunrise	587.4	$500 sedan/overall
2	5	61	Solar Bolt	480.7	$500 sedan/lead-acid
3	11	66	Genesis I	383.6	
4	13	64	Kineticar II	358.1	$500 utility/lead-acid
5	14	78	Sofix Sedan	352.6	
6	15	81	Sparky	348.9	
7	16	60	Millenium Falcon	336.8	
8	17	74	Lightning Volt	315.3	
9	18	70	Sun-Bunny	311.3	
10	19	72	Sungo	294.6	
11	20	80	Brock Electruck	294.4	
12	21	53	Elfa Electra(Skoda)EV	227.7	
13	25	76	RHAM Rod	239.5	
14	27	69	Fulmine	218.0	
15	29	65	Electric Hare	213.1	
16	32	71	S-15 Truck	133.9	
17	34	75	KA1000	64.7	
18	41	67	ZeeVee88	-121.1	
19	43	73	Electric Fiero	-336.1	
20	44	79	1959 Berkeley	-339.0	
21	47	68	Solar Flair I	-484.9	
Tour De Sol Racing					
1	28	85	Photon	212.5	$500
2	33	83	Sol Survivor III	71.8	
3	35	98	Solar Flyer	11.5	
4	40	84	Suntech	-117.2	
5	42	88	Mach .05	-138.6	
Cross Continental Solar Racing					
1	21	87	Spirit of Massachusetts	251.7	$500
2	37	37	Ottawa Orange III	-15.7	
Hybrid					
1	4	96	Project e-	485.6	$500
2	8	3	Tempest	432.6	
3	38	95	Ecovox	-22.8	

Official American Tour de Sol information is available from the sponsor, the Northeast Sustainable Energy Association (NESEA) at 413-774-6051. All media enquiries should be addressed to Jack Groh Groh Associates, Sustainable Public Relations, email: GrohPR@aol.com (401)732-1551 tel (401)732-0547 fax. For more great stuff on the American Tour de Sol, check out our home page at http://nesea.nrel.gov which contains route maps, weather conditions, race standings, background pieces and other material. The ATdS Home Page is produced by Bill Lord with facilities donated by the National Renewable Energy Laboratory in Colorado.

Open - 3 or 4 wheels

1	24	92	Sunpacer	247.1	$500
2	26	94	Hopper EV	230.8	
3	31	10	Gasoline Control Car	167.8	
4	36	28	Team New England II	40.9	
5	46	93	Helios the Heron II	-412.5	

Open - 2 wheels

1	22	49	ERANGE	255.7	$500
2	39	89	Envirocycle III	-74.7	
3	45	91	Wild Cherry	-342.7	

AMERICAN TOUR DE SOL
SOLAR AND ELECTRIC CAR RACE

Notes: Rank is position within the CATEGORY, based on Miles. Overall is overall standing, across all CATEGORIES, based on Miles. Number is the vehicle number. Miles is called Pole Miles on the sheet this is taken from, and (I believe) Tour Miles on earlier sheets. It is the adjusted overall score, summing up starting banner-to-finishing banner distance, plus extra laps, plus extra credit items, minus penalties.

The NESEA (oil well to wheel overall energy usage) Challenge:

Vehicle type	Vehicle Name	oil well-to-wheel miles/gallon
2 wheel vehicle	ERANGE	245.5
1 passenger car	Team New England II	127
2 passenger car		
Sol Survivor III		90.6
4-6 passenger car	Solectria Sunrise	70.7
utility vehicle	Ford Ecostar	58.7
hybrid	Ecovox	41.0
control car (gasoline)	Geo Metro	34.7 (20% distribution loss)

Highest 1-day efficiencies:

Category	Vehicle Name	miles/kWh
PRODUCTION (sedan)	Nordic Challenger	9.86
PRODUCTION (utility)	Ford Ecostar	?
PRODUCTION (2-wheel)	ZAP Powered Rotator	?
COMMUTER	Sungo	10.4
COMMUTER sedan conv	Solar Bolt	?
HYBRID 1 seat	Ecovox	3.25 (including fuel energy)
HYBRID 2+ seat	Tempest	2.64 (including fuel energy)
OPEN 2 wheel	ERANGE	23.54
OPEN 3,4 wheel	Team New England II	43.48
Mass Transit	US Electricar Bus	2.86

Highest efficiency, entire race:

COMMUTER	Sungo	9.5

Longest Range, 1 day, NESEA awards:

Category	Vehicle Name	miles
PRODUCTION lead-acid	Nordic Challenger	128 tie
	Solectria/Horizon Bat	128 tie
PRODUCTION adv energy	Solectria GT/VA Power	175
COMMUTER lead-acid	Solar Bolt	143
COMMUTER adv energy	Solectria Sunrise	238
HYBRID	Project e-	186
OPEN	Team New England II	95

Longest Range, 1 day, DOE award:

COMMUTER adv energy	Solectria Sunrise	238

Next year's race is scheduled to go from New York City to Washington DC; contact NESEA for details.
I extend my thanks to all those who generously gave of their time and thoughts for these interviews, NESEA for their support in this project, and Bill Lord for cross-posting all this stuff to the World Wide Web.—MB

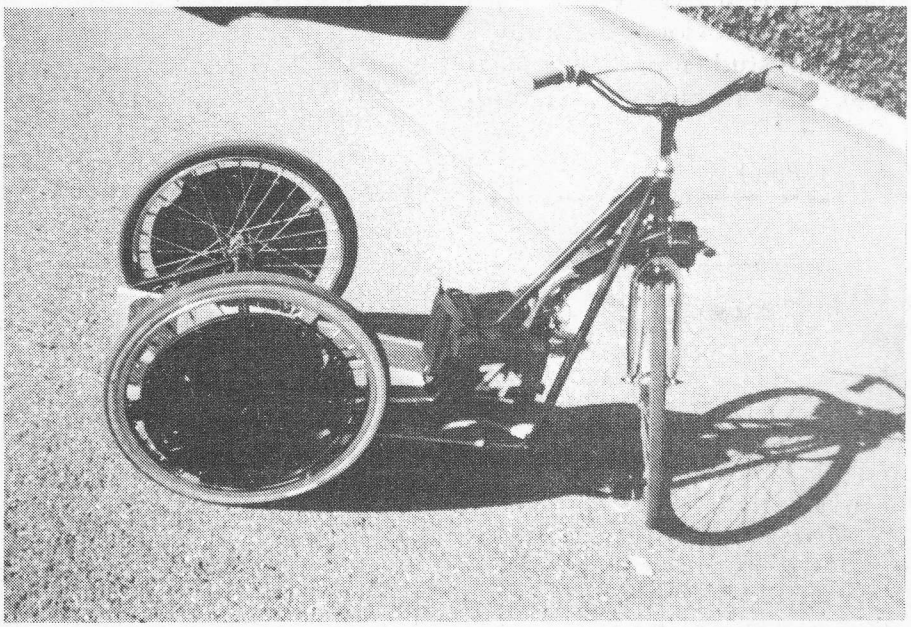
Tech Notes

A new ac induction motor design by engineers at Custom Servo Motors, Inc. provides the performance of a three-speed transmission without any need for a gearbox. Using three different winding configurations, the motor creates an "electronic transmission" effect without the cost and bulk of conventional systems. The new design uses a Y-shaped series configuration, a Y-shaped parallel configuration and a "Delta" configuration to give a range of power ratings: 5 lb-in/amp, 11 lb-in/amp, and 20 lb-in/amp. Combined with a 50 A RMS permanent magnet motor, the windings help achieve torque ratings of 250, 550, and 1,00 lb-in when operating off any single winding.

Without the need for high horsepower as a means for achieving high torque, the design reduces the motor's size to 1/3 that of similarly rated AC induction motors. A specially designed servo amplifier controls the unit's current, torque and speed. Custom Servo Motors engineers say that the motor operates constantly at 10 hp, regardless of spindle speed. The company plans to include the concept in larger motors, rated at 25, 50 or 1000 hp. One of their envisioned application is EVs.

A friend of mine tells me that this concept can be applied to DC systems. In fact, it was applied in old ones such as the 1918 Detroit Electric. In looking at the original electrics, I get the feeling that their builders have forgotten more than us modern folks will ever know. We seem to be just retracing their steps. If any of Current Events' readers has made a detailed study of the technology of the original turn-of-the-century or so electrics, I'd be interested in publishing it. — CB

Access: Willam G. Anderson, Custom Servo Motors, Inc. 2121 Bridge St., New Ulm, MN 56073 (507) 354-1616 (From Design News, Oct. 94. Thanks to Bob Wheeler.)



Cocky trike: Zapcycle with an attitude. Photo credit: Clare Bell

Letters to the Editor

Dear CE:

Good work on Current EVents. Although I have been disppointed by the lack of coverage of the college SunRayce in advance of the June 20-29 event. I do hope that you can provide some coverage of the event post-race. Same goes for the high schools solar electric bike race and the Jr. Solar Sprint.

But then, it is not like you have an army of cub reporters on your paid staff. I guess if I want to see these articles, I need to write them MYSELF.

So find my first offering enclosed.

Charlie Garlow, EV Association of Washington DC, 9929 Woodburn Rd. Silver Spring, MD 20912

And you will find your article in print in this issue, p. 15. Good writing, good work and good reporting! About Sunrayce coverage, yes I would welcome a report. This editor, roving reporter and CE jack of all trades gets spread pretty thin sometimes and there is so much happening in the EV field now. I would like a bunch of volunteer cub reporters in various areas or various chapters to cover local EVents and send me photos and copy.

Folks who have sent material in and haven't seen it in print, please bear with me. I do have a backlog and I've been moving through it, but things such as the anti-EV backlash and the !@#$%^& Carnegie-Mellon study tend to push other items onto the back burner. — CB*

Fine Particulates Up Death Rate

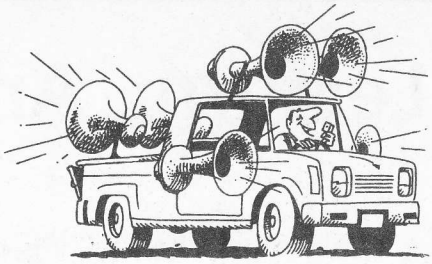
Airborne particles generated by traffic and smokestacks are killing people even in areas that meet EPA standards. A study conducted by the Harvard School of Public Health and published in the March issue of the American Journal of Respiratory and Critical Care Medicine found that exposure to "fine particulate air pollution", particles 2.5 microns or less raised the premature death rate from 17 to 17 percent. While overall urban air quality has improved, thanks in part to the Clean Air Act Amendments of 1990, fine particulates are not separately regulated under the standards.

On the West Coast, the largest sources of fine particulates are auto tailpipes, where nitrogen oxides and hydrocarbons combine in a noxious stew that not only generates gaseous smog but fine particulates that can penetrate deeply into lung tissue. Diesel engines in trucks and busses also produce clouds of fine particulates in sooty and smoky exhausts. On the East Coast, the main sources are industrial — power plants and smokestacks not fitted with scrubbers.

Since 1987, EPA has targeted particles 10 microns or less, assuming that those get into the lungs. However, "We're worried that those in the smallest fraction — those less than 2.5 microns — may be chaemically the and size-wise among the worst," said John Bachman, associate science policy director at EPA's office of air quality standards.

The study tracked 552,138 adults over 30 in 151 metropolitan areas between 1982 and 1989. It compared mortality data in each location with the amount of fine particulates measured by EPA at each site. Factors such as age, sex, tobacco use, occupational exposure to pollution, obesity, and alcohol consumption were eliminated. Risk of death from all causes was raised 15 to 17 percent in the mnation's most polluted cities. The averages reflect a 30 percent differece in mortality due to heart disease, respiratory illnesses and lung cancer. The finidings agree with a previous 1993 study covering 8,000 individuals in six cities. In 1991, this study found that pine particulates cuased about 60,000 deaths a year or 3 percent of all US mortality.

(Adapted from an article by Curt Suplee in the Washington Post.)



ANNOUNCEMENTS

Mailing Services

EAA National mailing services and permit are being made available to chapters at cost. This should help lower the price of chapter mailings.

Short Announcements

CE will also run short announcements for chapter rallies and short form applications to chapter rallies. We are running the Silicon Valley Rally application, so we will open this up to other chapters. CE apologizes to Peninsula/SF for not doing this for their SFBEAR EVent (partially due to distractions on the part of the editor, such as moving, etc.)

Board Nominations

EAA Board member, Lee Hemstreet has decided not to run for re-election. One seat will be open for nomination. Please fax nominations and candidate information to Lee Hemstreet at 415-857-0823 or mail to him at 787 Florales Dr. Palo Alto, CA 94301.

News in Brief

News in Brief did not run this month — Look for *News in Brief* in next months issue of CE.

Lecturn: An Enlightened Conversion

by Fr. Ed Eschweiler

I remember the electric trolley buses that provided smooth, swift, clean, and quiet transportation in my home city when I was young. I remember too, their replacement with the noisy, smelly diesels. And I recall dreaming of electric buses without power lines. I was dreaming, of course, and had no idea of the problems of storing the amount of energy necessary to propel such a heavy vehicle.

Many years later, in 1992, I attended the Midwest Renewable Energy fair in Amherst, WI, a small town in the middle of the state. It is always held on a weekend close to the summer solstice. Amazingly, in this small town, in a sparsely populated area, the Fair drew thousands of people, some from distant states and even some from foreign countries.

I was impressed with the people there — informed, dedicated and very diverse. The entire Fair, including a model home and a dance in the evening, was powered by wind generators and solar panels. Tents held workshops, lectures and demonstrations on a variety of topics. And there were electric cars!

After returning home, I joined the Electric Auto Association and began to receive and read their publication, Current EVents. Later I recieved a special mailing with the news that a number of Saturn automobiles had had the wrong coolant installed on the assembly line and that this had damaged the engines. It seemed like a good opportunity for those interested in converting a gasoline car to an EV. The damaged engines would have to be removed anyway, in a conversion. The damage, however, went beyond the engines and extended to other areas, including the brake systems. Saturn decided that they could not sell these vehicles, but they did not simply crush them. Some, for example, were donated to museums and parts were salvaged from others.

Meanwhile, I heard that the Saturn would be very good for conversion. It is well designed, has an excellent record of quality control in assembly (despite the coolant slipup) and is significantly lighter than many cars of comparable size because of the extensive use of space-age plastic in the body panels.

About this time I mentioned my interest to a mechanic friend of mine. In addition to his regular job, he has, for many years, had a small company where he refurbishes classic cars. He said he would do the conversion. After searching without sucess for a suitable used Saturn, we bought a new one. We ordered the simplest model with no extras. Now the work of conversion could begin.

What difference will one conversion make?

Like the Chinese, I believe that it is better to light one candle than to curse the darkness. One candle, of course, does not illuminate a great area. Likewise, converting one ICE car to an EV will not by itself contribute greatly to solving our problems, so this conversion is only part of the story.

When I first began to think and then to plan for an EV, and in all my discussions with my mechanic, one thing has always been prominent. This EV has to be attractive, well-engineered and well-constructed. It must be capable of selling the practicality and advantages of EVs to others.

I have decided to give the car the name Lecturn, taken from the world electric and Saturn. We have another word in our language which is spelled differently but pronounced the same: lecturn. A lectern is a speakers stand; a place for teaching and motivating. From this Lecturn, I hope to be able to encourage others to greater environmental responsibility.

The new Saturn was driven from the dealership directly to the garage of John Bohdalic, of Gold Eagle Restorations, in Sussex, WI. It had 23 miles on the odometer. Although John had never done an EV conversion, he had many years of experience with cars and does outstanding work.

Before dismantling, he took measurements such as vehicle weight and the height of the highest point of the wheel wells above the wheels.

For the sake of both safety and convenience, he removed the from fenders and splash shields, the grille, lights and hood. The next step was to remove all of the parts which would no longer serve any purpose in an EV.

These included the entire exhaust system, the engine, electric wiring not needed in the EV, the gas tank and the fuel system, the radiator, and cooling system.

We purchased a kit of electric vehicle components from KTA Services, Inc. of Upland, CA. We purchased the #5 kit, which is recommended for 4-wheeled vehicles up to 5,000 lbs. This includes a DC motor with an operating voltage of 72 to 120. Its

horsepower rating is 20 continuous and 65 peak.

After checking the kit to make sure that all the parts were there and in good condition, the work of assembly could begin. The first order of business was to design a new instrument cluster with the new gauges. New fuse blocks and wiring were added. An adapter plate was designed and fabricated to connect the electric motor to the transaxle. When this was assembled, it was installed with the new mounting brackets in the engine cradle.

The original car had power brakes as standard equipment. With the removal of the gasoline engine, a new source of vacuum was needed. For this we purchased a vaccuum restoration kit. Also a breaker was installed in the main power supply, controlled by a T-handle located under the steering column.

Wisconsin winters are cold. To supply heat to the passenger compartment, we obtained a heater unit from Russco, Santa Rosa, CA. This system utilizes the original vents and controls. An indicator light on the instrument alerts the driver to the fact that the system is turned on.

A control panel, with the controller, converter, charger, interlock, junction block and shunt was fabricated, installed and protected with a custom-made fiberglass cover. A small 12 V battery, to supply power for lights and accessories, which is recharged from the main power supply batteries, was installed.

We purchased twenty 12 V batteries from GNB of Lombard, IL. Two banks of ten are connected in series to give 120 V. The two banks are then connected in parallel to give added amperage to maximize driving range. Insulated and vented battery boxes were designed and constructed, with fifteen batteries installed in the back and five in the front. We also bought Goodyear low rolling resistance tires. The weight of the converted car is considerably greater than the original. To compensate for this, we upgraded the suspension system. —FE

What advantage will an EV be to me?

- ❒ EVs don't have radiators and coolants. They have no hoses to leak, they do not require antifreeze, and never need to be flushed.
- ❒ EVs have no spark plugs, never need tuneups and oil or filter changes. And you can't "flood" them.
- ❒ EVs have no exhaust system, will never need a muffler or tailpipe replacement. They have no catalytic converted that might start a leaf or tall grass fire. EVs don't need to report for emissions testing.
- ❒ Evs have no gas tank that could rupture or leak, leading to a fire in the event of a collision. And filling up means simply plugging in when you come home.
- ❒ EVs are dependable. Their motors have only one moving part.
- ❒ EVs are modular. As improved components become available, they can easily be installed in place of existing ones.
- ❒ EVs are inexpensive to operate. There is a signifant Federal tax credit.

Other (not so obvious advantages of EVs) —CB

An EV with a manual transmission can be driven like an automatic. Most EVs can be started in second gear (yes, it will suck a few amps, but you aren't going to do it for very long) and will reach a decent speed before the next shift is necessary. With a motor that you can't stall and don't have to re-start (in the same way as a gasoline engine), an EV is a good trainer for new drivers or those who are adapting to a stick shift.

An EV is a handy backup power source in an emergency. With a suitable inverter running off the battery pack, you can get power to lights, low-wattage heaters such as electric blankets, pumps and water purification equipment communications gear, and other equipment that may become vital during an emergency. An EV is also a mobile power source — it can drive to where the need is. Even if you don't have an inverter, simple resistive devices, such as lights, will run off a lower voltage DC. I ran some 120 V AC miniature Christmas lights off an 80 V DC tap to my EV's battery pack. It worked, although the flasher light got fried. If the EV has a DC to DC converter supplying the 12 V system, you can tap off the main pack via the 12 V battery, using an adaptor that plugs into the car's cigarette lighter. You can then run any 12V appliances or equipment.

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For other chapter information call Anna Cornell, EAA Board Member , call (415) 685-7580. [7/1/95]

All information and statistics in this application are for the exclusive use of the EAA.

Electric Auto Association -- Membership Application

New member: ☐ Renewal: ☐ Date: ___/___/___

US ☐ $35 Canada ☐ $40 USD Other country ☐ $45 USD

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

Name: _____ Company: _____ (If applicable)

Street: _____ Phone: (___) ___ - ___ x ___

City: _____ Fax: (___) ___ - ___

State: _____ Zip: ___ - ___ (Please use 9-digit code.) Country: _____ Country Code: _____

EAA Chapter you attend or support: _____ I need chapter information! ☐

Member/Vehicle Information -- Please complete if new or changed.

Professional Background: _____ Age: _____ Sex: M / F

Please identify your primary areas of interest relating to the Electric Auto Association.
(Please rank choices with "1" being the most important, "2" second, etc.)

1	☐	Hobby / Builder
2	☐	Professional (EVs are a source of income for you.)
3	☐	Competition (Rallies, Races and Records)
4	☐	Environmental and Government Regulations for EVs.
5	☐	Social (Rallies, Shows, Dinners, other)
6	☐	New Technology and Research
7	☐	Promotion and Public Awareness of EVs
8	☐	Student or general interest
9	☐	Electrathon / Bicycle / Off-road vehicles
10	☐	Owner/Driver of electric commute vehicle
11	☐	Other: Please specify. _____

Number of Electric Vehicles you have ever owned? ____ Number of EVs you now own: ____

Please describe any Electric Vehicle you now own or are building: Veh. Lic.: _____ State: _____
(If more than one, please attach information for each.)

Vehicle Type: _____ Make: _____ Model Yr: _____ Build/Conversion Yr: _____

No. Wheels: _____ Motor: _____ Controller: _____ % Complete: _____

Batteries: No./Type ___/_____ Pack Volts: _____ Avg. EV Mi./Week: _____

Other Features: _____ Avg. EV Trips/Week: _____

If new member, where did you hear about EAA? _____

Comments: _____

_____

Please fasten your check or money order to this form, then fold with EAA address showing and mail.

Ver. (6/15/94)

CARB Marketability Workshop

by Bob Mueller, San Jose Chapter

"June 28th", the e-mail said. "L.A", it continued. ".. the American Automobile Manufacturers Association has a war chest of $2 million to get the 1989 ZEV Mandate repealed...".

Tim Carmichael's message hit home. I believe, as all of us do, that each person counts and I was really worried that the mandate would be beaten. After jumping back and forth across the fence I told Tim I'd go. If the AAMA wins, it won't be because I wasn't there, I thought.

I told Tim my decision. He told me which airport to fly into and graciously offered me a ride to and from the meetings. I drove my EV to San Jose Airport early Wednesday and parked it prominently near the exit of the parking garage. I proudly shared my mission with my seat-mate on the flight. He turned out to be an environmental consultant working on clean water issues.

Tim was waiting for me at the mostly deserted LAX at 8:15 a.m. He is also an environmental consultant as well. Wow, pollution, the career of the 21st century!

As we drove the 40 minutes to the meeting, Tim briefed me on what I would hear from the automobile industry presentations. They would argue that enough people won't pay the predicted price tag for a vehicle that doesn't go far. UC Davis would present the results of their poll that said enough people would. The focus of this one-of-several workshops was EV marketability, so these surveys were of prime importance. Tim also said that I would get an education from the hearings. Boy, was that an understatement!

Tim drove slowly past the meeting place looking for a parking spot. The meeting place was a building in a light industrial part of El Monte.

I was thrilled to see a row of famous EVs parked at a display angle across the front of the meeting place! The 'pocket rocket' Cocconi CRX from this month's Road and Track, the Tropica, Solectria's Geo Metro, the Ford Ecostar, and others.

Tim saw his boss as we approached on foot. He introduced me to her and her companion. I got in line to register and signed up to present, though with so many people I might not get a chance to speak.

While waiting in line I was feeling very excited about being there, but I couldn't tell who was on the ZEV side and who wasn't. I did guess that the more expensive suits were ICE people, but I tried not to jump to conclusions.

I decided to simply ask anyone I felt like talking to if they were 'pro or con' (the mandate).

I really didn't care where they stood, I had decided that we are all people, after all. Unfortunately, since I never conversed with any ICE people, except later on in questions to them at the workshop.

After registering, I viewed the Tropica. Ken McGraw, that car company's VP, gave me his spiel about his car. I told him I was excited about his 'purpose-built' car, but I hoped he would support EV conversion companies because right now the industry needs to work together to survive. Later on, he impressed me thoroughly with his presentation to the board.

The meeting room was SRO, seating 300+ people. Several individuals were shooting videos. One by CARB itself, another by Roy Kaylor, still another by a stealth group sponsored by the oil industry. More about them later.

Tim got me a choice of seats. I took one near him along the back wall of the room. I sat next to a David Brandmeyer, who was very knowledgeable about the people present and the history of the issues.

The early presentations worried me. It seemed like only Pro-EVers were talking, and some yahooing went on in the back, making me embarrassed for our side's lack of professional restraint. I was thrilled to recognize Ed Begley, Jr. in the midst of the crowd. He and Jackson Brown gave their impassioned defense of EVs ahead of the others because of 'time conflicts'. They were put in front of the Big-7 automakers and Mr. J.D. ('Dave') Powers and Associates himself.

When automobile industry representatives did get up, they took control like the pros that they are. Each one, in their own way, with their own polls, with their own years of marketing experience, showed the audience, time after time, how minute a market exists for EV's within their present price/distance range capabilities (GM's "Price/Utility Curve").

The business side of me understood their presentations, and judged their findings as reasonable. GM's rep impressed me quite a bit. He claimed something very inter-

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Junior Solar Sprint Races into the Future!

By Charlie Garlow

Junior high students in 7th and 8th grade at 38 locations around the US built 25,000 solar electric cars to race on a 50 foot track this May and June 1995. The cars are powered by a solar panel about as big as a shoe box lid and an electric motor a little smaller than a 35 mm film canister, but no batteries. No steering either! A fishing line down the length of the track running through a loop on the underside of the body keeps the racers on-track..

"Look at that sucker zing!" said Joe Teach, science instructor at Jefferson Jr. High in Washington D.C. as one car turned in a record 7 sec. run, beating last year's record. "This is the fun way to learn science," said Ilene Miller, a mom on transport duty. Trophies and medallions were won, but everyone who participated as a winner because they learned about gear ratios and mechanical advantage, aerodynamics and axle friction reduction. So all participants got a T-shirt or a hat, even if they couldn't get their baby to clunk across the finish line.

Sponsored by the US Department of Energy's National Renewable Energy Laboratory in Golden, Co, with the help from the Society of Automotive Engineers and the National Science Teachers Association, the race keeps getting bigger each year. Last year DOE sold out of the 10,00 kits they ordered and sold at below cost ($5 for a panel and motor. This year they sold out of the 25,000 they bought. Next year 50,000?

This teaching module is designed to catch students at a "make or break" age for interest in science and math. If they lose interest in science now, they too frequently give up technical studies. With these solar racers, they can get fired up about electric vehicles, and move up to the solar bike races for high schools students and the full-size solar race car competitions for college kids sponsored by US DOE. On June 20-29, solar race cars built by 30 college engineering schools will drive on the highways from the Indianapolis Speedway to Golden CO, stopping in small towns across the heartland to meet local fans and talk about future cars.

"This is just the sort of pollution prevention concept that we want to promote, said Charlie Garlow, of the US Environmental Protection Agency and organizer of the Washington D.C. race. "It means zero air pollution, zero oil spills, zero job exports. All the right stuff!

To get involved in organizing next year's races in your state, call 1-800-NEW-ENGY — CG

A New Moose on the Loose

By Laura Braun and Thomas Fuller, JLS Middle School

This year Mr. Booth has started an Electric Moose Club, based on the Electric Moose built last yearby six eighth graders. The Electric Moose is a solar powered vehicle that can go up to about eight mph. It seats one, and it's only about a third the size of a normal car. The students last year started by building a chassis. This year we plan to use an adult trike for a frame because last year so much time was spent on the chassis instead of the solar technology itself. Mr. Booth has advertised for one in the Palo Alto Weekly and the Los Altos Town Crier. The ads worked and we now have a big blue and white trike; the beginnings of of Moose II.

Our goal this year was to improve on the old Moose and build our own Moose as well. We meet after school on Wednesdays during club time, but we sometimes stay later. An unexpected number of people signed up; about twenty-five. It's nice to have such a response, except that it is very hard to work with so many people at once. Since there is only one Mr. Booth, it's difficult to split up. Almost an equal amount of seventh and eighth graders showed up. Mr. Booth would like to have seventh graders on the team this year because last year they were all eighth graders and they graduated, so there is no one here with experience.

Right now we are learning about AC and DC power. Our solar panels for the Moose work with DC. We have been using motors to learn about volts, resistance and amps. We have also learned how to make an electric brake, putting batteries into sequences and series, and about torque. We have been working with Mr. Booth's Power Station, which is equipped with a solar array and a switchboard. We can use this to power a motor directly or charge batteries!

In the near future we hope to delegate groups to work on different aspects of the Moose and the Moose II. We are looking forward to a finished product that will perhaps pave the way for a solar powered vehicle project in the Industrial Tech curiculum. — LB & TF

Rally Registration Form
Silicon Valley EAA

Entry Fees

$10 (Mail In)

$14 (At Rally)

Registration Form

Make check payable to Silicon Valley EAA and mail completed registration form to:

Pat Hardage
1085 Tasman Dr #732
Sunnyvale, Ca 94089

Event Time

9AM to 4PM

Rally Rules

1. All EVs must be road worthy.
2. No battery replacement is allowed during the rally.
3. The only battery charging permitted will be from photo-voltaic cells mounted permanently on the vehicle.
4. Each lap must be completed in 15 minutes or less. Drive at the speed limits whenever possible. Don't save the watts!
5. All traffic lights and signs must be obeyed. NO SKIMMING THROUGH STOP SIGNS!!!
6. The all-electric vehicle that completes the most laps by 4 PM will be declared the endurance winner.
7. In the event that 2 or more vehicles have run the same number of laps by 4 PM, those vehicles may run a special lap to determine the winner.Observing the speed limits, the shortest lap time wins.

Rev. 7/3/95/ L.H.

CAR NUMBER

Rally Registration Form
Silicon Valley EAA
9/16/95

Vehicle Type

Basic Mfg _____ Year _____ Seating Capacity _____

First Run (as electric) _____ Year _____ Payload if truck lbs. _____

Frontal area _____ Sq ft. (height x width) _____

Curb Weight lbs. (before conversion) _____ Curb Weight lbs. (after conversion) _____

Batteries

No. of Drive batteries _____ Mfg _____ Voltage _____

Batteries tie down provision (Recommended) ❑ Yes ❑ No

Accessory Battery

❑ Yes ❑ No

DC to DC converter ❑ Yes ❑ No

Tires

Brand & Model _____ front _____ rear _____

Size _____ front _____ rear _____

Body

❑ Metal ❑ Fiberglass Other (specify) _____

color _____ number of doors _____

Transmission

(Circle one) Manual 3 4 5 speed Automatic 3 4 speed

Clutch used ❑ Yes ❑ No

Drive Axle Ratio

Differential _____ Chain _____

Motor

Mfg. & Model _____ Continous HP rating _____ Peak rating _____

❑ D.C. ❑ Series Wound ❑ Shunt

❑ Compound ❑ PM ❑ A.C.

Control System

Electronic Chopper (Mfg.) _____ Model _____ Chop. Freq. _____

❑ Diode Switching ❑ Relay

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

Name _____ Telephone No. _____

Address _____

City _____ State _____ Zip _____

Insurance Co. _____ Car License# _____ State _____

Signed _____ Rev. 7/95

Continued from page 14

esting which was completely consistent with the 'too small a market' contention. He (passionately) stated that GM had been ready to go into production with the Impact UP UNTIL THE MANDATE WAS CREATED!

He says that they could justify the investment for the small EV market when they were the only ones going into it! Once the mandate forced all other automakers into the niche, they could no longer expect the return on investment they originally planned on, thus they had to back off. This rings true with me, especially in light of my knowledge of GM's advances so far (which, I quickly admit, is not all that extensive).

On the way back to the airport that evening, Tim and I discussed my feelings about the GM presenter. I figured he was put in charge of the Impact program as punishment (:-) or because he really believes in EV's. If the latter is true, I'd like to meet the man.

A seeming paradox was brought up in the auto presentations. It seems that the technology cannot progress fast enough to meet the 1998 mandate, and, simultaneously, if EV's are sold in 1998, the technology will advance so fast that no car will have any resale value. PC advances (286 to 386 to 486, etc) were given as an analogy. Despite my initial agreement with their argument, I called them on that discrepancy.

Just before we broke for lunch, a white-bearded fellow asked for, and got, permission to give a quick statement. He said that the main reason for the mandate had not been mentioned by anyone so far that morning. He talked of the inner city kids of L.A. whose breathing problems are approaching those of Mexico City's sickly children. He reminded us that the business bottom line, was not the only issue on the table.

As I waiting at the single doorway for a glimpse of Tim among the crowd of exiting lunch-goers, I saw B.A.T.'s Bill Wasson. Tim finally appeared and I gratefully heard him ask if I wanted to join him and some ALA people for lunch. ...

While waiting to use the rest room, I was alone near the back door of the restaurant. I was able to see a wide swatch of L.A. sky from my vantage point. It didn't look too bad that day, making me wonder what all this fuss was about. It's so easy to forget the bad air days when the wind has moved our problem to some other locale. Trouble is, it doesn't go away from our atmosphere, it's just relocated, in this case, to the Grand Canyon area. The wind will just keep blowing away our exhaust until the atmosphere is full and we have a swirling grey dust cloud covering our once blue planet...

The hearings resumed around 3:00 P.M. (the morning session had gone until 2:00 P.M!). The automakers' reps were not present for the afternoon session. I thought this was very rude. To me, it pointed up the difference between people who are just doing a job and believers in a cause.

The UC Davis people presented their survey reports. Their presentation was not as crisp and easy to follow as the automakers' had been, but their survey did seem professionally done, and it did seem to support a larger market for EV's than was previously suggested.

Three EV manufacturers presented to the board (B.A.T., Solectria. and Renaissance).It dawned on me that these entrepreneurs believed in their products, and believed they could make a living selling them. As they talked I wondered why the 20,000 ZEV's mandated for 1998 couldn't be sold by these people? I asked this question of the board and they said the mandate pertains to the big 7 auto makers, but that these big guys could buy credits for cars sold by the little guys from the little guys. I didn't quite understand why it was arranged this way, but as long as it covered ZEVs sold by anyone, it achieves the end goal. This might even be a boost to the smaller companies.

When I realized I wanted to ask the EV companies the above question, I looked to the two microphones set up in the aisles for audience feedback. I immediately noticed that the same people who had been asking anti-mandate questions all day were clustering in the seats immediately around the microphone. It looked like they were getting ready to storm the presenters as soon as questions were allowed.

There was one aisle chair open right next to and half-way in front of the microphone closest to me. I quickly moved to that seat even though the last presenter (Renaissance) was not finished yet. I nonchalantly looked back as if to communicate with my friends. I saw the other people crowding the

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microphone were looking at me with quizzical looks, as if wondering what I was doing using their tactics! I fully planned on being the first person to ask my question, since once these folks got the microphone, they could easily tie it up. I was able to get in first, which was good, since the others did ask negative questions.

Earlier in the day, Tim had shown me a flier distributed among retired folks in the L.A. area. It offered free breakfast, lunch, and dinner, and a luxury bus ride to the CARB hearings. The flier was distributed by an alleged 'tax fighter' group, saying things like, 'The scoundrels are at it again!' referring to the CARB.

These bussed-in supporters were well trained, clapping and griping loudly at all the right times throughout the day. They even seemed to be purposely going in and out of the meeting room, talking loudly in the hall, etc., whenever pro-mandate presenters were giving their talks. I guess this was the opposition's organized version of our side's spontaneous yahooing.

{The next day, I was talking to Richard Simon (Santa Clara County's Fleet manager who is a staunch EV supporter) about my experience in L.A. I told him how great it was to see American government at work. He sardonically replied, 'You were seeing American MONEY at work!'.}

Bob Mueller is a very active member of the San Jose chapter. His report on the hearing was posted to the Internet Discussion List by Mr Bruce [EVangel]. Parmenter and printed with Bob's permission. Bob can be reached via e-mail (0006489760@mcimail.com.

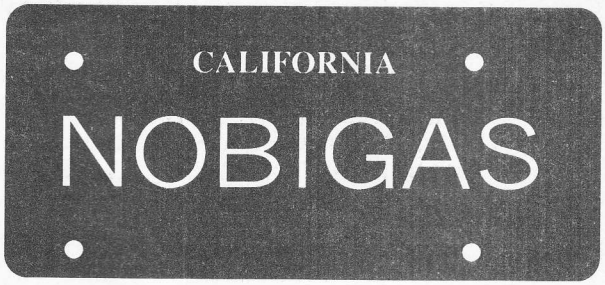
Thanks for attending the CARB workshop and speaking up for EVs, Bob. I may not agree with all your opinions, but you wrote a very enlightening report - CB

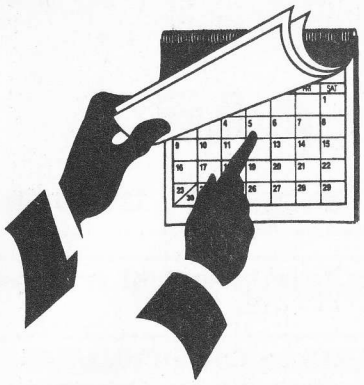
Part 2 of Carb Marketability in next issue of CE.

Electric HOT Plates!

The plate [LEK TRUK], featured in the July '95 CE, belongs to Peter Barnes, SF Peninsula chapter.

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





1995 EVents Calendar

Aug. 2-4 **EV Conference for Fleet Managers.** Edison Electric Institute, (202) 508-5558.

Aug. 7-10 **SAE Future Transportation Technology Conference & Expo.** Red Lion Hotel, Costa Mesa, California. Sponsored by Society of Automotive Engineers (SAE) International. Contact Sam Barill, tel: 412-772-7187, fax: 412-776-0210.

Aug. 11-13 **REDI Conference '95.** Followup to '93 REDI Conference. PV and Utilities, Financing, EV Marketplace where fleet operators meet EV Manufacturers. Plus more! Call (707) 459-1256, or submit a paper by fax: (707)459-0366.

Aug. 12	**East Bay Chapter Rally** will be held from 9 AM to 4PM at the North Berkeley BART station at Delaware and Acton. Space available for alternative energy and vehicle displays. FREE ADMISSION and no fees! Call Lou MacMillan by July 30 to reserve space for your booth or vehicle. (510) 525-3636 or Anna Cornell (510) 685-2580
Aug. 26	**The Seattle Electric Vehicle Association presents "Gasless in Seattle"** 11 am-6 pm. Exhibits, information, presentations, discussions and more! EVs on display include converted (recycled) gas cars, pickups, neighborhood EVs (NEVs), scooters, trikes, bikes, world record-holding racing EVs and electric boats! Walk, bike, bus or EV to Gas Works Park, Seattle, WA. For info, call (206) 634-0263 or (206) 524-1351.
Aug. 26	**Rally For the Environment,** featuring clean fuel vehicles including electrics. Hosted by EAA Albuqurque NM Chapter. To be held at Southeast corner of Coale and University, Albuquerque TVI, Ted Chavez Hall, 1800 Coale SE, from 9AM to 3PM. Activities include exhibits, vehicle displays, scavenger hunt and ride/drive. Open to the public. For info, call Dale Riddle (505)260-0070 or Joan Wolf (505) 768-5345.
Sept. 10	**1995 Silicon Valley Concours D'Elegance** presented by San Jose Lions Club. EAA members are invited to exhibit. For information, contact Jim McCoy at (408) 267-9077 or fax (408) 978-5127.
Sept. 10-15	**PCIM '95, & Electric Transportation System Compatibility, Long Beach, California.** Sponsored by Intertec International. Location: Long Beach Convention Center. Contact Technical Director, Tel: (805) 650-7070, Fax: 805-650-7054. Or write to 2472 Eastman Ave, Bldg. 33 Ventura, CA 93003-5792.
Sept. 12-14	**ElectroExpo '95 in Richmond, VA.** Hosted by Virginia Power. This is sponsored by GM. Three days of exhibits and some opportunities for test drives. Vehicles are reportedly new, unseen, as yet.
Sept. 16	**Silicon Valley Chapter Rally** at 1184 N. Mathilda, Bld #56, Lockheed. Lee Hemstreet is helping to organize the rally. Interested in participating? Call Lee for info and a registration form (415)-493-5892 .
Sept. 19-22	**Fourth Grove Fuel-Cell Symposium** will take place in London, England. Contact the conference secretary at Elsevier Advanced Technology, PO Box 150, Kidlington, Oxford OX5 1AS UK Phone +44 (0) 1865 843721/843659. Fax+44 (0) 1865 843971.
Sept. 25-30	**Trade Show in Paso Robles, CA** at the Fairgrounds. They are inviting EAA to exhibit cars and run in a road rally. Similar to the EcoCar challenge of last year. Call Ben Lovejoy at 805-438-4646 for info.
Oct. 19-21	**Monaco is having its FIRST EVent!** They want American manufactuers to display, and teams to race/rally their vehicles. They are also looking for some AMERICAN SPONSORS (you'll get your name out there) MEDIA WILL BE INTERNATIONAL. Activities include test drives and race events. Deadline for participants is July 21, 1995. Contact Lisa Jeffery via fax at +92 15 03 13. Organization: Ediions & Promotions Internationales, S. A. M. 11 Boulevard Albert 1st MC 98000 Principuats de Monaco.
Nov. 29- Dec. 1	**Global Electric Vehicle Conference** focuses on EVs and their impact on international business and the global environment. Crystal Gate Mariott, Arlington, VA Presented by INTERTEC Publications. Contact JoAnne Romanek, (610) 566-7080 or Betsy Norberg at (913)-967-1865.
Dec. 12-14	**North American EV and Infrastructure Conference**, held in Atlanta GA at the Stouffer Renaissance Hotel. International EV Synosium and Exposition combined with EPRI's National INfrastructure. Exhibitor info: (415) 855-2050, conference info: (415) 855-2010.
July 31 - Aug. 5 1996	**Scandinavian Electric Car Rally** from Gothenburg Sweden to Oslo, Norway. Tour the fjords in your green machine. Sanctioned by Federation Internationale de l'Automobile (FIA). Begins with a seminar on July 31, then the rally. Submit abstracts of papers to SECR '95. Travel and hotel compensation available to presenters (confirm directly with them first). Contavt SECR '95 Box 53, 401 20 Gotenburg, Sweden. Tel. +46 31-62 60 61, fax. +46 31-62 60 66.

Want Ads

FOR SALE: '80 Jet 600 Van, 102 V system, USB 2200s, 55 mph, 25-40 MPC, 120/240 V on-board charger. $3,200. Call Allen Downs at (415) 694-7714

FOR SALE: '81 Subaru G.L. Wagon, 2 WD, 108v system, PMC controller, Prestolite motor, Trojan batteries, K& W charger. All new 4/93. $6,500. Call Harold (804) 798-1818.

FOR SALE: '81 Jet 007. 20,000 mi., refurbished, PMC Controller, DC/DC, Charger. $7,500/obo. Call (510) 837-7086.

FOR SALE: '84 Ford Escort, 5-Speed Conversion. 9" Advanced D.C. Motor, Curtis PMC controller, 10 new 12 V Delco D-C27 maintenance free batteries, on-board charger, complete with tow bar and lights. Very clean. $7,500. Call Al Ryan at (510) 447-5369.

FOR SALE: '79 Jet 750 (Ford Courier), 120 V system Lester dual voltage charger, 40-mile range. Will need new batteries soon. $5,000. Call Richard at (303) 280-9372.

FOR SALE: '81 Centaurian, Silvergray. Prestolite 114 V US2300 bats 18/months/1200 mi. New clutch, rear brakes, Invicta-GLR tires. Magwheels, tinted glass, all powerdisk brakes, 70 mph top speed, 30-40 mile range. $6,800. Call Danny at (415) 467-2392.

FOR SALE: '84 Fiero, 108 V DC, 9" Advanced, new Curtis controller, on-board charger, Trojan batteries, U.L.R. Goodyears, 60-mi range. Custom throughout. 23K mi. $10,000. Call (520) 575-4687.

FOR SALE: '76 Black Magic, Volts Porsche #1, Built with the newly-developed Electro Automotive Volts Porsche Kit, 20 US Battery 2300s, 9" DC Motor. Nice highway cruiser. Comes with manual and documentation. For more information, call Clare at (408) 469-9185.

WANTED: Ford Pinto conversion. I can't believe somebody out there doesn't have an electric Pinto, project car or complete for sale. Call (201) 839-9053.

WANTED: Information on converting Triumph Spitfire, to an EV, or possibly trading it for an EV. Prefer pickup. Call Dave (612) 252-8675 after 5pm central time.

ORDERING INFORMATION: $7 for the first 25 words. Each additional word, 25 cents. Please send check payable to EAA, 18297 Baylor Avenue, Saratoga, CA 95070. Want Ads are available to EAA members for the sale of electric vehicles, equipment and parts. The EAA is not responsible for the accuracy of ads. Please see advertising rates on next page for commercial products.

Electric Shopping carts? Stay tuned ...
Photo credit: Clare Bell

Index of Advertisers

EAA Order Form

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Current EVents Newsletter (specify issue)		$3.00	
Current EVents Newsletter (Full year)		$20.00	
Current EVents Index - 10 years		$4.00	
Reprint Articles			
Discovered: The Perfect Battery		$2.00	
Flywheel Energy Storage		$5.00	
Team Tucson Land Speed Record Plans		$5.00	
EAA XA-100 Hybrid		$5.00	
95 Buyer's Guide to Electric Vehicles		$5.00	
T-Shirt/with EAA logo (only 5 XL, 2 L, 3 Small available)		$15.00	
Mugs with EAA logo (only 5 available)		$6.00	
Auto Sunshades with EAA logo		$6.00	
Bumper stickers with EAA logo		$1.50	
Key Chain with EAA logo (only 10 available)		$1.00	
Window decals with EAA logo		$3.00	
Video Tape - Current Solutions/Motor Show Video (14 minutes)		$13.00	

Other items with EAA logo?

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5820 Herma St.
San Jose, CA 95123

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Advertising Rates

Full page	**7.25" x 9.25"**
1 ad	$400 ea
3 ads	$300 ea
12 ads	$250 ea
1/2 page	**7.25" x 4.50"**
1 ad	$200 ea
3 ads	$150 ea
12 ads	$100 ea
1/4 page	**3.50" x 4.50"**
1 ad	$150 ea
3 ads	$100 ea
12 ads	$ 75 ea
1/8 page	**2.0" x 3.5"**
1 ad	$100 ea
3 ads	$75 ea
12 ads	$50 ea

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

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

Contact Susan Hollis, Advertising Manager, for additional information or assistance at (408) 374-8605/FAX (408) 374-8750.

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

Electric Auto Association
Attn: Advertising Mgr.
18297 Baylor Avenue
Saratoga, CA 95070

ELECTRIC AUTO ASSOCIATION

2710 St. Giles Lane, Mountain View, CA 94040

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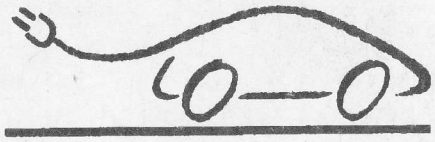

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