

CURRENT EVENTS

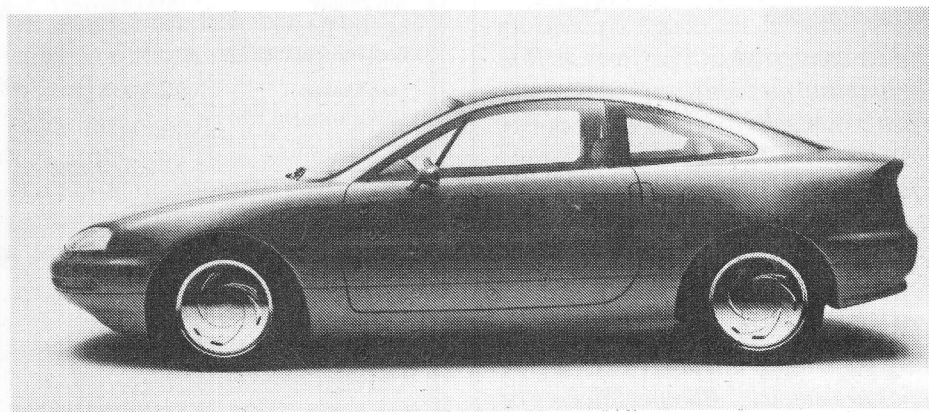
December/January 1993

Promoting the Use of Electric Vehicles Since 1967

Vol. XXIV No. 7

CALSTART Introduces New EV

by Irving Weiss



The Showcase Electric Vehicle, a program of CALSTART — the non-profit consortium developing a California based advanced transportation industry.

The California-made Showcase Electric Vehicle rolled out of the research lab and into the spotlight December 1 at CALSTART, the state-wide public/private consortium leading the way in developing a California-based advanced transportation economy.

A large news conference convened at CALSTART headquarters, 3601 Empire Ave. in Burbank. They witnessed a truly historical event at the unveiling of a unique, fully functional electric vehicle. This culminated a two-year development by Lon E. Bell, president of Amerigon, to design and produce a completely new electric vehicle.

The CALSTART consortium is a collaborative R and D effort of more than 20 California aerospace companies, utilities, and high-tech firms to develop advanced transportation components for this Showcase Electric Vehicle. Many political celebrities and VIP's participated in bringing forth this streamlined EV. In attendance at the unveiling were speakers from Con-

gress; Diane Feinstein, Howard Berman, David Drier, Richard Katz, Herschel Rosenthal, and Charles Embrecht, Chairman of the California Energy Commission.

Following the vehicle's appearance at the Los Angeles Auto Show in Jan. 2-11, a global tour will display the car to the public. It is very ironic that the depressed labor market of California has made a comeback statement and, in doing so, beat the Detroit auto companies by introducing a newly designed electric vehicle. The Showcase Electric Vehicle will be manufactured within two years and the prospect of 55,000 jobs created will do much to repair the economic losses in California. Although the technical details of the car have not been disclosed, there is some information. The 240 volt system has many innovations, such as Pirelli low-rolling-resistance tires, contour seats, lightweight plastic panels, specially designed electronic controls and several additions for passenger comfort.

IEGP—Biggest Alternate Energy Rally

by Peter Hackes

Los Angeles, Calif. — No gas guzzlers allowed in this event — a competitive road rally strictly for alternative energy vehicles. What was a year-long dream of dozens of volunteers became a record-breaking reality October 15 - 18, as 71 alternative vehicles demonstrated that they've got what it takes to master some of America's toughest roadways. Competitors in the inaugural International Electric Grand Prix (IEGP) included vehicles propelled by electric, solar, hybrid, natural gas, ethanol, methanol, hydrogen, and human powered systems.

Dedicated to showcasing electric and alternative energy vehicles at work, Grand Prix competitors mastered freeways, mountain passes and legendary traffic conditions as they ran the 120 mile course through 26 Southern Cali-

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Editor's Corner

EVs, Perceptions & Politics

Recently I was at a community college to give a talk about EVs at a "Renewables are Ready" fair. I interrupted a conversation between an exhibitor and a student when I heard the exhibitor state that electric cars were the cars of the future and implied that they still needed better batteries. The student had the distinct impression that EVs had to be a total design package. If it was not designed and built from the ground up, it would not work, he thought.

He was astounded to find that a gas car could be converted and perform as Ron Rasmussen's Porsche 914 does. (I gave him a sample of the Oct/Nov 1992 Current EVents). I believe that he would have been just as surprised at the reality of any conversion.

All this year I have been giving talks to city, transportation, education and environmental groups, radio and TV with the theme that Electric Cars are REAL NOW! How many people have I reached with this theme? Probably less than a couple of thousand.

As I pointed out in my 100th Monkey editorial (June '91) we as members of this organization must do a better job of informing the masses about EVs. One way to do this is to make it obvious that our electric cars are electric. Bumper stickers or signs are just a start.

When you talk to anyone, it is great to have some printed matter to back up your claims. That is why John Broenen and I generated a new brochure around July of 1991. I later added a chapter list and a white paper that I researched to give the back-up facts to the brochures' claims. (Both have been through several revisions and recently the new LOGO was added). This brochure and white paper should be available through your local chapter or make your request to Sue Hollis of PCTEK. (see address page 2)

The facts as stated in the brochure and backed up by the white paper must be said over and over again. You can NOT assume that the public now understands. After all, most people today never read a newspaper and many don't even watch the TV news. If they do, the chances are that they will find half-truths or down right lies about EVs more often than not.

Those of us who are "into" science and technology find it difficult to understand the depths of ignorance of the general public. There are some who don't want to learn ("don't confuse me with the facts"). However, most people are just ignorant but willing to listen to reason.

Several months ago I saw an interview with Guy Kawasaki author of "Selling the Dream". In the interview he tells how he became an evangelist for the Macintosh computer but now has gone on to being an evangelist for evangelism. Why? Because he believes that all advancement in society is sparked and moved by those who truly believe and are able to convey that belief and enthusiasm to others. In short an evangelist.

Immediately following this program, a friend turned to me and said that I was an evangelist for electric cars. I admit it. But we need all of our members to be the same. As a member you should not just pay your dues and expect to get benefits for free from then on. The EAA is a non-profit educational organization formed to promote the use and spread of electric cars.

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EAA Board of Directors

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

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

Don Mignola (415) 574-4370
299 Beach Park Blvd.
Foster City, CA 94404

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
PO Box 277
Inverness, CA 94937

Membership

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

Current EVents Editor in Chief

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

Current EVents Assistant Editor

Clare Bell (408) 225-6403

Advertising & Publisher

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

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

Advertisements

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

New Members

If you know someone interested in becoming a new EAA member, they may call EAA @ 800-537-2882 for a brochure and membership application. As a non-profit organization, the membership fee of \$35 is tax deductible.

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Consulier & Solar Electric to Build Electric Vans

SANTA ROSA, CA, November 18, 1992.—The nation's largest electric vehicle manufacturer and the country's premier developer of light-weight automobiles have formed a joint-venture to produce an all-electric multi-purpose utility van, which will weigh a ton less than comparable vehicles without compromising payload.

In response to growing demand from utility and fleet operators, Solar Electric Engineering, Inc. of Santa Rosa, California and Riviera Beach, Florida-based Consulier Automotive are producing a van that will combine Consulier's advanced composite monocoque with Solar Electric's drive train. The vehicle will be delivered to customers by early 1993.

Formation of the joint venture comes as federal and state legislation is being created to provide tax incentives for businesses and individuals purchasing electric vehicles. A comprehensive energy bill signed by President Bush earlier this year calls for a 10 percent tax credit. At the state level, California currently offers a \$1,000 credit for elec-

tric vehicle purchases. In the private sector, numerous utilities are making rate reductions available to customers who are electric vehicle owners.

Founded in 1988, Consulier Automotive is the only federally certified manufacturer of a composite monocoque sports car. The Consulier GTP is the lightest, strongest and fastest production vehicle in the United States. An active participant in IMSA Supercar and SCCA events, Consulier boasts numerous racing victories, including several endurance events.

Solar Electric (SOEE-OTC) builds several models of electric vehicles, ranging from practical commuter vehicles, trucks and vans to futuristic electric sports cars and kits for do-it-yourself mechanics to convert their own cars. Established in 1976, the company has put more than 200 electric vehicles on the nation's roadways in the last three years.

For more information on the new multipurpose electric utility vehicle, contact Solar Electric at 116 Fourth Street, Santa Rosa, CA 95401, or call 1-800-832-1986.

Editorial

(Continued from Page 2)

As with any non-profit, volunteer organization, our strength and effectiveness is in direct proportion to the contributions of our members. If everyone expects to just sit back and receive a great newsletter and go to entertaining and educational chapter meetings month after month with no effort of their own — they darn well better not complain if the meetings start to seem stale or that "this or that" was not included in Current Events.

If, however, everyone made suggestions for improvements to chapter meetings, suggested topics or speakers, helped with Events, sent in articles and suggestions to Current Events or even handed out as little as 5 - 10 brochures a month, we would be moving much faster toward that 100th Monkey point (a theoretical point where the entire society suddenly "wakes-up" to something new). With only 2 brochures a month handed out to friends, we would reach more than 30,000 people a year with the message that electric cars are real.

One more point. We must also end our tribal mentality of only doing for or helping our chapter and must instead think of the whole organization in global terms. If you have a great idea for a speaker or a tour, then let other nearby chapters know of it. They may do the same for you. If you have found an effective way of reaching new people for your chapter, then share that with the rest of us through the newsletter.

We need help more now than ever. We must show the world that EVs are REAL now, or the pressures on government to roll back the new mandates/laws because they are "not technically feasible" will become the accepted (though totally False) wisdom of our time. [See Page 10]

Evangelists unite! The time is now!

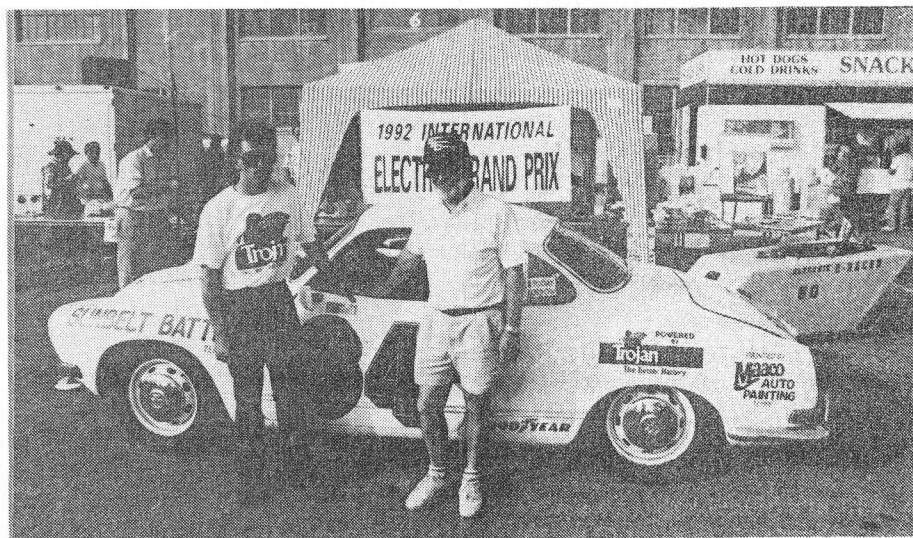
- Paul Brasch, Editor



Multi-Purpose Electric Utility Vehicle - Consulier/Solar Electric Joint Venture

IEGP - Biggest Alternate Energy Rally

(Continued from Page 1)



Jesse James' winning EV.

fornia cities: from Veterans Stadium in Long Beach to Santa Monica College, to the Rose Bowl in Pasadena, and on to the finish line at the National Orange Show Stadium in San Bernadino.

Jesse James — that's Jesse from Tempe, AZ, not Jesse the famous gunslinger — won top honors in the 1992 International Electric Grand Prix. "No exotic stuff here," said James, owner of the winning electric Commuter Class entry and of Sunbelt Battery Company. "We started with a plan to use strictly off-the-shelf parts, but in the most efficient way possible." The result: James' 108-volt Karmann Ghia conversion, whose DC motor takes it to top speeds of over 85 mph, and provides a single-charge range of 90 miles (the car traveled over 131 miles on a single charge during Saturday's competition). Sunbelt now makes the system available as a kit. "We want consumers to know that right now they could be driving an electric which will get them where they want to go, as fast as they want to get there." James says his conversion package goes for between \$5,000 and \$6,000, batteries included.

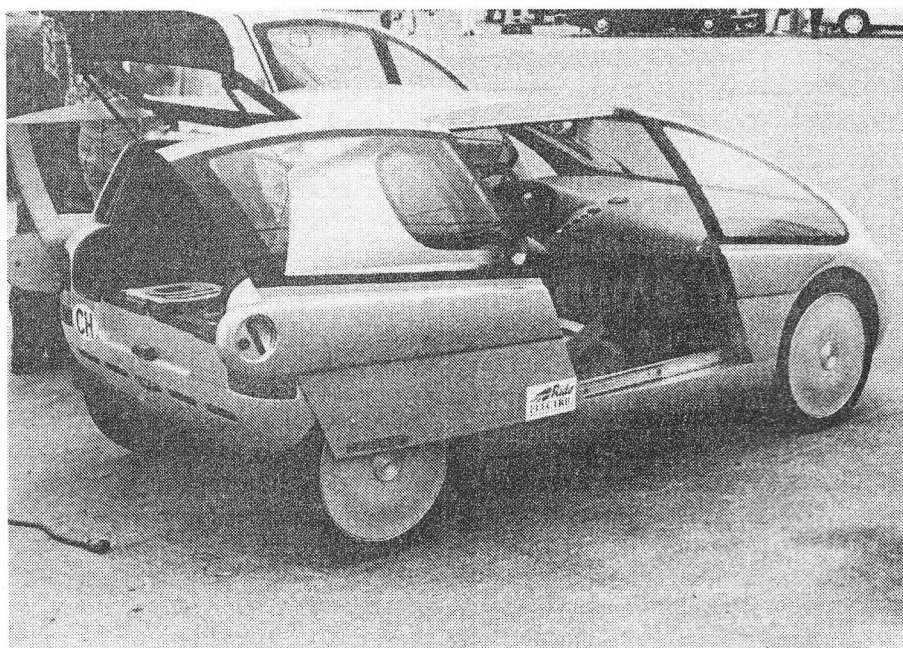
The event was open to virtually all licensed alternative energy vehicles from around the world, and drew en-

trants from all over the United States as well as Canada, Denmark, and two flown in from Switzerland by SwissAir. The three day competitive road rally was divided into three separate legs, one each day, varying in length from 33 to 55 miles. Rally cars drove through normal conditions, and scoring was based on three factors:

Course Time, which was based on a "perfect time" taking into account speed limits, traffic lights, access, etc.; Acceleration, which was tested during the qualifying portion of the event; and Endurance, gauged as competitors completed extra laps around the Expo site at the end of the first two grand Prix legs.

Finishing second [at 126 miles] in the electric Commuter Class (the largest class of rally entries) was Ron Rasmussen of Santa Cruz CA in his 108V Porsche 914 conversion. Placing third in the commuter class was Jim Lunceford driving Green Motor Works 108V Electric Runabout, the only top finishing vehicle currently available from a dealership. Two entries from the Swiss company, Horlacher, took 4th and 5th in the commuter class. Finishing 5th was the Horlacher City Car, a four-wheeled two-seater lightweight runabout, and finishing 4th was the Horlacher Sport II, driven by Boris Horlacher. Also a four-wheeled two-seater, this prototype features compos-

(Continued on next Page)



Swiss Horlachers finished 4th & 5th place.

IEGP - Biggest Alternate Energy Rally

(Continued from Page 4)

ite construction, solar charging provided by solar cells imbedded in the roof, a top speed of over 80 mph, and a range of over 100 miles per charge.

Also featured in the event was the Cocconi Electric, by AC. Propulsion in San Dimas, CA. Designed and driven by Alan Cocconi, a former member of the GM Impact design team, the converted Honda CRX sports a beefy 336 volt 120hp 3-phase AC motor, capable of propelling the car from 0 to 60 in a little over 7 1/2 seconds, and giving it a range of over 130 miles at freeway speeds, on a single charge. Topping the Open Class was American Hydrogen Association's internal combustion hydrogen truck, whose exhaust is cleaner than it's intake air. Winning the Solar Class was Cal Poly Pomona's Solar Eagle. The oldest vehicle that competed in the rally was a 1932 Detroit electric.

"There were a few surprises," says Peter Quinn Hackes, Executive Director of the event. "We were surprised how smoothly things went, for instance, how little time most of the electrics needed to charge. We were surprised at how nimbly they all handled the traffic and the course, even when we stuck in some killer hills right at the end of the toughest leg." Hackes says the Grand Prix team was also surprised at the number of major player sponsors the event garnered, ranging from the US Department of Energy to Southern California Edison to TRW. Donations from these and other sponsors made it possible for Grand Prix messages to reach the public before and during the event. From billboards to flyers, to bus signs to radio and TV announcements, the message was clear. Alternate Energy Vehicles — Less Smog and More Jobs.

In the first event of its kind in Southern California, the public was able to get a hands-on feel for the

future, with opportunities to talk with the designers and drivers of the rally cars, as well as take a drive. Each day at each new stop along the rally route, a free-admission expo of exhibits and demonstrations included one on converting a pickup truck from gasoline to electric, as well as others on home solar power, electric bus and rail transportation, and many more. Each day elementary school children came from nearby schools to race solar model cars and learn more about alternative energy. There were also Electrathon (small lightweight electric go-karts constructed largely from bicycle parts) staged by Electrathon America. The overall Electrathon winner was Ms. Loy Cloud of Seattle, WA.

"We did what we set out to do," says Grand Prix Director and co-creator Rebecca Murray. "State law says that 2% of all the 1998 cars sold in California must be zero-emission vehicles. That's 35 to 40 thousand cars in less than 6 years. We wanted to show people that while they can still use some improvements, these cars are here today, and they're capable of doing the job for the average driver. 90 % of Californians drive less than 40 miles a day. [The national statistical average for 100% of drivers is 23.3 mi/vehicle/day. — Ed.] These cars will work well for them.

And we wanted to show the automakers that the public is ready to invest in alternative energy." Grand Prix participants represented the commercial and academic community, but the majority were private car owners who have made the switch to alternative transportation. The IEGP's parent association, the International Electric Grand Prix Association, is a non-profit corporation dedicated to promoting the commercial viability of alternative transportation.

Pike's Peak Solar/Electric Challenge

by J. David McNeil and Clare Bell

Even Rocky Mountain snow couldn't stop the Pike's Peak Solar Electric Challenge.

On October 8, eight vehicles completed the 5 1/2 mile course, climbing 3100 ft from the starting line near Colorado Springs, Colorado to the finish at Glen Cove. Reports of 4 ft drifts near the summit made officials limit the Challenge to reaching Glen Cove. The road was plowed and the first car left the starting line at 10:00.

First place overall and first in the hybrid class, was the Viking 21, a compressed natural gas/electric hybrid from Western Washington University, Bellingham, Wash. Driven by Ralph Bruning, the winner had a time of 8:07.74.

Second place overall, first place electric stock was E-Motion's ER-7 (Triumph), driven by Jerry King with a time of 10:06.78.

Third place overall went to Battery Automated Transportation Technology's (BAT) Geo Metro with 11:48.71. This was driven by Gene Cosmano.

[Gene sure does get around—see his Cross country story elsewhere. - Ed.]

The Electrathon event, held on the 6th, required entires to run for 1 hr around a level 0.25 mile level course. The winner was the "Leaner", built by Bob Schneewis and driven by Evan Dagle, with a distance of 107 laps. During the Challenge some vehicles were sidelined by mud shorting out motors, broken drive chains and insufficient battery capacity.

About the Saturns . . .

by Stan Skokan

During the EAA EV Symposium, on September 20th, one of the speakers Joe LaStella of Battery Automated Transportation, mentioned that Saturn was crushing new engine damaged Saturns for scrap. Some EAA members already knew about this situation. He encouraged the EAA members and leadership to urge Saturn Corporation to make these popular American made car bodies available for conversions to electric vehicles. Several members and some EAA Board members contacted Saturn Corporation only to be turned down. A two page special mailing went out to all members from Don Mignola, for the EAA board, encouraging members to call or write to Saturn Corp.

As we spoke to GM representatives we received the following information: Saturn set aside these vehicles a long time ago. While they discussed their fate, the deterioration continued on other important parts of these vehicles. Namely the damage to the brake systems evolved is beyond simple repair. At the end, the vehicles became not road worthy for safety and legal reasons. The insurance company reimbursed GM for the loss and crushing started. There is no way GM would take the risk of providing these vehicles to EAA to be put on the road. On the other hand Saturn Corporation is providing parts of these vehicles for educational and training purposes to schools and like institutions. Under this program we may get other parts but not bodies.

On the plus side, we succeeded in opening a dialog with GM that respects our organization's contributions to EV development they may be willing to work with us. The subject will be discussed at the next Board meeting. We will solicit ideas from the membership about various ways we can pursue common interests with GM and other auto makers with active EV programs. If you have any ideas to contribute please direct them to the Board. We will tell you more about this project in a later newsletter with more details about how we plan to do it. It is desirable to do it in a coordinated way.

As we spoke to GM representatives, we realized, it may be easier to work with good new bodies than old scrap ones. We know many of you got upset by the crushing story, but trust us, something good will come out of this for the EAA and its members.

Spitfire Blazes Path

When you see a Triumph Spitfire go down the road, you expect to hear that characteristic roar. Rick Michaels' Triumph, however, only whirs. He has converted it to run on electric power.

"I'm not the type to hold up a sign [in protest]," says the Brandon, Florida resident. "This is my way of doing something about smog." Michaels spent \$15,000 to restore and refit the collector-quality car, even fitting amp and volt meters into the old fuel and temperature gauges. Most important to sports car diehards, however, he also left the stick shift alone. "Using the original transmission allows you to shift," he said. "It still drives like a Triumph."

To recharge the car's 11 deep cycle marine batteries, Michaels pulls an extension cord out of the gas cap and plugs it into a standard wall socket. After six hours of charging, it's ready to drive about 50 miles before performance starts to drop. And what about performance? Road & Track magazine's 1979 tests found the Spitfire going from zero to 60 mph in 15.4 seconds. Michaels' does it in 12.4 seconds. The top speed is 72 mph, down from the gasoline-fired model's top of 94 mph.

(CHICAGO TRIBUNE)

Coast to Coast Battery Powered

by Gene Cosmano

A team of 12 electric car enthusiasts completed a trip of 7 days cross country in a battery-powered 1988 S10 pickup truck. [See "The Electric Cross-Country Challenge" announcement, p.14 in the Aug/Sept 1992 issue of *Current Events*—CB.]

Gene Cosmano celebrated this success by mixing the waters of both oceans and then drinking margaritas with the group instead of champagne. The S10 pickup truck used a General Electric motor and controller, with a Curtis PMC controller for backup. The 2680 mile trip from Santa Monica, California to Jacksonville, Florida required 65 battery charges and the truck maintained an average speed of 41 mph per leg.

To reduce time required for battery charging, a support truck provided exchange battery packs, recharging as they drove the next leg. Diversified Technical Services (DTS), with Dan Parmley (President) in charge, provided the support services. His company has provided battery charging service at the Solar & Electric 500 race in Phoenix, AZ in 1992.

P.S. We could have made the trip in 6 days, but the gasoline and diesel support vehicles kept breaking down.

California Hosts Altranex '92

In Burbank, AlTranEx '92, the Alternative Transportation Expo, had over 60 alternative-fuel vehicles on view including electric cars; flexible-fuel cars that can run on gasoline, ethanol or methanol; hybrid vehicles that switch from electric to gasoline; solar and human-powered cars; a diesel truck that runs on soybean oil and ultralight electric vehicles. Sponsors of the event included private power firms, environmental organizations, utility companies and other interest groups.

(OXY-FUEL NEWS: 10/5)

Electric Vehicle Heaters

by Russ Kaufman (Edited by Clare Bell)

For the past 25 years all production cars have been equipped with heaters. Government safety regulations require a means of defogging the windshield to provide clear forward vision. The usual design uses coolant circulated from the engine to a heater core, which then heats the forced air stream entering the passenger compartment. Air is diverted or mixed with cooler air by use of diverter doors or dampers and directed by means of movable vents.

When a vehicle is converted to electric power, the internal combustion engine is removed and with it the source of hot liquid (engine coolant). Most non-professional conversions do not employ a heating system at all, leaving the driver out in the cold. Not only is it uncomfortable to drive a vehicle in cold weather with no heat, it is downright dangerous. Wiping the windshield with a cloth does nothing for de-icing, doesn't give a large or clear enough viewing space and is dangerously distracting.

Some non-professional EV conversions have an electric heating coil placed in the airstream from the heating ducts. This is unacceptable since all vehicles from the mid 1960's on use ABS or PVC plastic ductwork. The exposed, glowing electric coil can easily melt the plastic heating duct, producing a toxic gas.

Now there is an answer to the need for a safe, efficient heating/defogging system for EVs that can be retrofitted by the owner. Unlike previous element-type EV heaters, this new add-on design uses the original climate-control panel, retaining its full function. This system supplies the hot liquid that was lost when the IC engine was removed. The add-on system is composed of a heat-exchanger and a circulating pump.

When the driver moves the "Temperature" lever on the heater control to "full heat", the system is energized, illuminating the original "Temperature" light on the dash. A heating element is energized, heating a small

quantity of liquid that flows to the heat exchanger. The 12 V circulating pump passes the heated liquid through the original heater core.

Within 3 minutes, the liquid's temperature will have risen to about 100 degrees F. The driver may also select the desired blower speed and direct heated air onto the windshield or heat at floor level. Discharge air temperature is a factor of the particular car and blower speed, but tests show an air temperature rise of about 70 degrees F. Thus if the outside air temperature is 30 degrees F, the inside discharge air temperature will be 100 degrees F. Using the "Recirculate" mode, which uses the pre-warmed inside air for heating, will result in a much higher temperature in the air coming from the heater.

This system draws its power from the traction batteries. A 1500 Watt heater will draw only 12.5 A from a 120V system and will produce 5120 BTU/hr. Considering that a 1500 square foot house may have a 75,000 BTU/hr furnace, 5120 BTU in the small cabin of a car is more than adequate.

For best efficiency, the heat exchanger and hoses connecting the EV heater to the original heater core should be fully insulated against heat loss. For safety, the heater should be fused, thermally protected against excessive temperatures and have a redundant means of shutting it off.

A heating unit of this description is currently available as a single preassembled unit that only requires mounting in the vehicle. It is then connected with the hoses and wiring and then filled with anti-freeze. Since the system makes use of all the original equipment heating components, the heater operates just as though the car still had the IC engine. This type of installation will make use of the original climate controls and will be familiar to the public, leading to greater acceptance.

A heated car interior and clear windows provide a safe car. Don't jeopardize your safety — don't get caught in the cold.

For detailed information, contact Russco Electro Mechanical Engineering, P.O. Box 3761, Santa Rosa, CA. 95402.

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

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

CALL or WRITE FOR DETAILS

RUSSCO ELECTRO-MECHANICAL ENGINEERING
PO BOX 3761, SANTA ROSA, CA (707) 542-4151



1992 EAA Symposium

by Clare Bell

The Sept. 20th 1992 EAA Symposium at the downtown San Jose Holiday Inn covered everything from new battery technologies to the planned use of EVs in utility fleets. Paul Brasch, Silicon Valley Chapter President, welcomed speakers and opened the event. Sacramento Municipal Utility District's Ruth MacDougal launched the Symposium with her slideshow update on the district's recent EV activities. An enthusiastic spokesperson for the progressive utility, MacDougal has been with SMUD for over a year as an EV specialist. She has also written for Current EVents. [See "Solar and Electric Cars Race for Clean Air", August/Sept. 1991.]

SMUD, a member of the CALSTART electric transportation consortium, is primarily driven by concern over air quality. In Sacramento, MacDougal stated, 70 to 80 percent of air pollution is caused by "mobile sources", mainly automobiles. For CALSTART, EV's are the major answer. CALSTART was set up to showcase EVs and EV components currently available to California OEM's and conversion vendors. As a CALSTART member, SMUD is intensively involved in evaluating EVs and creating EV support services.

MacDougal showed slides of some of the 28 different EVs in utility fleets, including pickup trucks, busses and commuter cars. SMUD plans to convert 60% of their small pickups to electric by 1995. By 2005, 75 % of its vehicles will be powered by renewable energy. During her presentation, MacDougal offered a challenge to conversion kit vendors. Most kits are designed for a standard manual transmission, but most of SMUD's fleet pickups are automatics. To help SMUD meet its goals, it needs a good conversion kit for automatic-shift trucks.

The first OEM electric prototypes from American manufacturers have been promised to CALSTART utilities. SMUD is presently looking at some Solectria commuter cars that get 4 mi./kW-hr. EVs from Detroit's pilot production runs may be available as soon as 1993.

CALSTART is also testing "neighborhood vehicles", low-speed runabouts currently available in Europe. SMUD recently bought 10 Mini-Els, a lightweight three-wheeler mass-produced in Denmark. A Mini-El costs approximately

\$ 7K and three 12 V batteries will take it 30 miles at 30 mph or 12 miles/kW-hr.

The Mini-El has a "lock-out" feature to disable the vehicle when the battery pack is 50% discharged. This extends battery life by preventing abuse of the battery pack. Even if the pack does eventually need to be replaced, the cost is \$150 as compared to about \$900 for the usual EV conversion.

Anticipating increased use of the Mini-El and similar light-

weights, SMUD is encouraging the Department of Transportation to add a third type of vehicle registration to the existing Class One and Class Two.

SMUD is also urging Caltrans to dedicate one freeway lane to EVs. To address public concern about availability of recharging stations, SMUD announced that 74 stations are planned for the Sacramento area. The first, a solar electric charging facility, has already been installed at the utility headquar-

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1992 EAA Symposium

Presented by the Silicon Valley Chapter

Sunday September 20, 1992

1pm - 4pm

Downtown Holiday Inn

Plaza Room 282

Almaden Blvd., San Jose, CA 95113

Reservations and fees at the door

- 1:00 Welcome
- 1:05 Ruth Mac Dougal of Sacramento Municipal Utility District
EV Actions — An update
EV programs and activities throughout the state — New happenings
- 1:40 Joseph La Stella of B.A.T. Technologies
The Ultraforce Battery Catalyst and what it does for your present day batteries.
- 2:30 Break (10 minutes)
- 2:40 Benny Jay of Electrosource
Development and production of the "Horizon" lead-acid battery.
- 3:20 John McGinnis of FMC
Developments in High Power AC Motors and Controllers
- 4:10 Close
Announcements
New Products
Future direction of EAA
Acknowledgments



Electric Auto Association

1992 EAA Symposium

(Continued from previous Page)

ters. Future stations will be located at points downtown, near light-rail depots, and at the airport. In addition, the utility is offering incentives for businesses to install EV charging facilities.

Overnight charging of EVs aids the utility. By leveling the demand load, power plants can run more efficiently. SMUD has passed on the savings with a special night-time EV charging rate of 4.2 cents per kW-hr. (10 kW-hr = \$ 0.42.) The Hughes/GM inductive paddle charger may be a step toward public acceptance of EVs, but it has not yet become available. At present, SMUD's charging stations will use the 220V (single phase) 30 A electric dryer plug/outlet configuration as well as the standard 110V 20 A home outlet. SMUD will work closely with other CALSTART members on standardization of future connectors and billing systems.

Sacramento utility customers who already own or who are interested in EVs have been invited to join the "Pioneer Club" - a group of 4,000 "environmental pioneers". SMUD will offer rebates on installation of home-based EV charging circuits. Other incentives include a \$1,000 state tax credit on a California Air Resources Board-certified EV or conversion kit as well as a sales tax exemption.

Other CALSTART members, such as PG&E in Salinas/Monterey are considering mass-transit EVs such as electric shuttlebuses. Shuttles are well suited to electric drive since the longer "dwell time" during passenger loading and unloading allows opportunity charging.

Joseph LaStella, president of B.A.T. International, recently returned the EV distance record to the United States by driving an electric Geo 406 miles on a single charge.

[See article in October/November issue of *Current EVents*.]

Although LaStella was scheduled to discuss his company's "Ultraforce" battery additive, he spoke instead about the event. The electric Geo Metro covered the stretch of highway from Salt Lake City to Wendover, Nevada, a distance of 120 miles one-way, 240 miles round-trip. LaStella encountered mountain roads and headwinds as well as city traffic, but he sustained an average speed of 50 mph and says he could have averaged 60.

LaStella briefly described his background. Stating that he was formerly employed by New York City, he claims to have been responsible for managing 28 % of the municipality's power.

In addition to the "Ultraforce" battery catalyst, LaStella is now marketing electric Ford Ranger pickups. They do not have the same battery pack as the 406 mile Geo, but they have a pack that is "pretty good" said LaStella. He states that his company is backing up the claim by placing funds for a three-year battery replacement cost in a bank account under the serial number of each truck sold.

LaStella has drawn criticism for refusing to open the Geo's sealed battery pack or provide detailed technical specifications, leading to speculation that the battery pack used was a cell using silver-zinc chemistry. [Ed.: confirmed by Eagle-Picher]

He cites threats from competitors and established oil company interests as reasons for keeping the actual battery composition under wraps.

[Ed.: A special thanks goes to Pat Hardage for her help with the hotel arrangements and to the Silicon Valley chapter for putting on the Symposium.]

More Symposium coverage in the next issue, (Horizon battery and FMC's AC motor work).

World Record Raised to 450 Miles

Joe LaStella, President of BAT International, Inc. of Salt Lake City, broke his 406 mile Electric Car Distance Record on a single charge by traveling 450.2 miles from Stanford University to WESCON '92 at the Anaheim Convention Center in Los Angeles, California.

Joe LaStella and his red '92 Geo Metro with 750 pounds of NEW GENERATION BATTERIES, embarked at 7:03 am Sunday, November 15, 1992, from Stanford University, connected to Highway 101 south through Salinas, Paso Robles, San Luis Obispo, Los Angeles, via I-5 to the WESCON '92 at Anaheim Convention Center, arriving at 9:07 pm. Stops along the way were made for support vehicles to refuel and certifying officials to eat and rest. Trip included 4 hours of night-time driving through heavy L.A. traffic. Incredible as it may sound, this trip was made on less than \$5.00 worth of electricity. His car is one of the most efficient cars in the world using only 165 watt hours per mile. This new generation of battery for 75,000 to 100,000 miles at or below the DOE targeted cost of \$150.00/kw hr.

BAT International, Inc. also plans to joint venture with a major manufacturer for the production of second generation lead acid batteries with significantly higher energy densities than any present deep cycle automobile battery.

For further information, contact:
BAT International, Inc.
2471 South 2570 West
Salt Lake City, Utah 84119
(801) 977-0119

OOPS!!!

In the October/November '92 issue of C.E., the correct time for the 406 mile run was 8 hours and 20 minutes.

News in Brief

Auto Makers & EPA Try to Stop CA Clean Air Rules

The Motor Vehicle Manufacturers Association, the Association of International Automobile Manufacturers, and General Motors are turning to EPA for help in blocking California's Clean Air Plan. The major points raised by the organizations are that the plans called for in the California regulations are **not technologically feasible**, are more costly than estimated, and do not give EPA's federal tailpipe standards an opportunity to be applied before the more stringent measures are enacted.

"There's no secret about our frustration and maybe even our anger" about the automaker's actions, said California Air Resources Board executive officer Jim Boyd. "Because they have been unable to stop the spread (of the California rules) to other states as authorized by the Clean Air Act, they're trying to get at the roots by going after us."

The automakers contend that new cars are not the right source to target because older cars, heavy-duty vehicles, and natural sources are far more responsible for pollution than new cars. Technical director for the Association on International Automobile Manufacturers, Greg Dana, points out that "the California LEV (low-emissions vehicle) program on new vehicles has a very small impact, in the range of 1-2 percent." However, California officials point out that 70 to 80% of air pollution is due to automobiles. Regarding the criticism that California is not allowing the EPA standards to work first, officials point out that they have a more severe air pollution problem than the rest of the nation.

Automakers agree that this is true, but they fear that the rigid California standards may be picked up by other states — 11 Northeastern states, Texas, and Illinois all seem to be moving in the same direction. So far, the automakers

have at least delayed the EPA's decision until December and GM has provided EPA with confidential new information to add to the arguments the organizations have raised.

(AUTOMOTIVE NEWS: 9/21)

Highest Priority for NHTSA Chief

As the nation's new chief for highway safety, Marion Blakey is blazing a new trail by giving her highest priority to electric vehicles. Safety rules for alternative-fueled vehicles will start appearing this fall. Being looked at as well will be on-board compressed natural gas tanks and methanol toxicity. "If we're going to move forward into the next level of [fuels] technology, we have to be ready with the safety considerations," Blakey said.

(AUTOMOTIVE NEWS: 9/28)

Cash Flowing for Electric Cars

Funding is flowing for a variety of projects to develop a completely competitive electric-powered car in the next 10 years. DOE labs, W.R. Grace & Co. and Saft America Inc. will spend \$54 million in contract money from the US Advanced Battery Consortium (members include Chrysler, Ford and GM) and the Electric Power Research Institute on advanced battery development. Altogether, DOE and the two industry groups will come up with \$260 million for battery development — about half from DOE.

What will the money go for? W.R. Grace, in partnership with Johnson Controls Battery Group, will use it to develop a thin-film, lithium-polymer bipolar battery using solid polymer electrolytes (the best prospect, in their view, for high specific energy and possibly a low self-discharge rate, high reliability, safety and recyclability).

The contracts, says DOE assistant secretary Michael Davis, are a major move to "meet a significant technological challenge and gain an edge against intense international competition in electric vehicle development."

(THE ENERGY REPORT: 11/2)

Less Car Use, Not EVs, is Solution to Clean Air

Speaking before the Transportation Alternatives '92 conference in Boston, Daniel Fortier, chief transportation planner for the Boston's Metropolitan Area Planning Council, cautioned that electric cars are not the savior for the environment — rather, less car use must be encouraged. "You have to ask, can we solve our car problems with another car?," Fortier asked. "Electric cars have a role. But they're not going to be our savior. They have to be part of a plan to get people out of their automobiles. EVs should not be a home-to-work transportation system. They should be used for access to public transportation," he added.

Echoing Fortier's concerns was Stephen Burrington of the Conservation Law Foundation. "What if you could clean up the air in Los Angeles, but had more highways and twice as many cars? That doesn't make it any more appealing, does it?" Burrington asked. "Cleaning up the car is not enough," he explained. "The car has to be used less, and other modes of travel used more."

According to Jay Geinzer, an analyst with Applied Energy Services, additional problems that electric vehicles could cause include making gasoline costs artificially low, increasing driving as cars become more fuel efficient, and increasing production by automakers of less-efficient vehicles

(Continued on next Page)

News in Brief

due to credits they will receive for electric vehicles.

Nobel-prize winning physics professor, Henry Kendall, of MIT pointed out that the benefits of the catalytic converter have been wiped out due to the increase in population and driving. "The Government Accounting Office has calculated that congestion in the United States will triple in only 15 years, even if we increase road capacity by 20 percent, a goal that we are unlikely to achieve...and as congestion increases, energy use will increase," said Kendall. Already, 1.4 billion gallons of fuel are wasted due to congestion. Kendall said that use of alternative fuel vehicles "must be coupled with transportation policies that will stabilize the number of vehicle miles traveled, reduce the number of commuter trips made by single individuals in motor vehicles, increase mass-transit ridership and promote intercity rail travel."

(AUTOMOTIVE NEWS: 10/26)

[These are experts??? Mr. Geinzer thinks that improvement is bad, and a Nobel-prize winning physics prof. doesn't seem to understand that electric cars don't use energy when stopped. It is truly amazing what passes for expertise. -Ed.]

Jobs & Environmental Regulations

A paper prepared by Massachusetts Institute of Technology political scientist, Stephen Meyer, found that there was no evidence to support the oft-touted belief that there existed a trade off between jobs and tougher environmental regulations. According to Meyer's paper those states that experienced the fastest growth in their economies had enacted the toughest environmental laws during the 1980s.

Massachusetts is credited with having the 6th fastest growing economy of states in the nation, but is ranked as 4th

for having the most stringent environmental regulations. Oklahoma, Louisiana, North Dakota and Wyoming have the least stringent environmental regulations, yet they have experienced the slowest economic growth.

(BOSTON GLOBE: 10/20)

GM Lowers EV Production Plans

General Motors has trimmed back production plans for its electric Impact car to 20,000 a year, and has scared off at least one significant supplier by throwing open formerly exclusive supply contracts to any interested bidders.

Rockwell International, former sole supplier of plastic paneling, reportedly didn't even bid when GM made the move to widen competition. The contract was won by ConCorp of Fairlawn, OH. The plastic panels are a crucial design element in any electric car, since they help trim weight and thus extend the number of miles that can be squeezed out of a battery charge.

Industry sources say that Rockwell had committed significant resources, including some of its own employees, to the project, and reconsidered its commitment when it lost preferential status.

(WALL STREET JOURNAL: 9/29)

GMs' Impact EV Demo

General Motors is asking city governments and utility companies around the U.S. if they'd like to buy a pre-production electric car or two for around \$100,000. GM had smooth sailing with its highly touted Impact until Ford and Chrysler began getting into the act, and to protect their product's high profile, GM has been assessing the interest in its electric vehicles compared with Chrysler's \$120,000 TEvan and the Ford Ecostar which will cost \$100,000 for a 30-month lease. Richard Schweinberg, electric vehicle manager

for Southern California Edison said that GM was also suggesting the possibility of exchanging the early expensive pre-production model for production cars later on.

Jean Crocker, government and public relations manager for GM's electric car program says that utilities all along the East Coast have shown interest as have those in Arizona, California and Michigan. Utilities are expected to be a strong support of the electric car movement since they hope to build public demand and attract development funds as well. Whether or not GM will enter the proto-demo market will be decided by Ken Baker, manager of GM's electric vehicle program, says Crocker who added that Saturn dealerships are being considered as marketing channels.

(AUTOMOTIVE NEWS: 11/9)

GM'S Delco Bets on Valence Battery

GM is giving a \$20 million vote of confidence to a solid state conductive polymer battery for use in electric cars, developed by Valence Technology. The company's Delco Remy division has this amount budgeted for a three-year research project, and will also order \$350K worth of developmental prototypes of the batteries.

GM researchers expect to be evaluating the first prototypes by the end of the year. These prototypes will have liquid electrolytes, but will help explore the potential of the solid polymer electrode couple.

(BATTERY & EV TECHNOLOGY: 9/92)

Solar Power Charging

The sun beats down relentlessly on most urban parking garages. Why should all that energy go to waste, when the

(Continued on next Page)

News in Brief

broad, flat roof is perfect for solar collectors? That's the discovery of several municipalities around the country, which are trying out solar panels on parking-garage roofs for power to recharge electric vehicles — or just extra electricity to pour back into the main grid.

In New York City, a solar installation on top of a parking garage fuels an electric city bus. In Diamond Bar, CA, 3,000 solar panels adorn the top of the South Coast Air Quality Management District headquarter's garage. Some 2,400 square feet of panels soak in the Florida sun at Florida Power Corp. in St. Petersburg. "It marries a very clean generating technology with a very big pollution source — the automobile," says new technology manager Tony Padillio.

The cost? Three or four times that generated by conventional plants, plus about 40 square meters of solar cells per average car per day. But these numbers should change as electric vehicles multiply on the roads of states with the toughest air quality timetables.

(CHICAGO TRIBUNE: 9/6)

Planned EPA Tests, To Be Tough

Proposed EPA rules for emissions inspection and maintenance will be sending a lot of cars streaming into repair shops — and owners steaming out with unexpected bills. MOTOR magazine estimates that some 10% to 30% of cars will fail their first round of emissions testing under the tougher standards, with repairs costing more than \$100 per car (and a few owners facing bills up to \$450).

That will mean that shops doing emissions work had better be ready for

a doubling in business by the late 1990's, when the new programs are fully phased in. Another 9,000 trained technicians will be in demand to keep up. EPA plans to expand today's "basic" emissions inspection and maintenance program to several dozen new towns, and to create strict new "enhanced" rules for the urban areas where air quality is worst. Those states with the most drastic problems have only a year to draw up plans for enhanced inspection and maintenance.

They must start testing cars by July 1994 and have their programs fully in place by January 1996. Most states will choose a centralized system, where cars and trucks are tested on a dynamometer (catching a number of cars which pass today's tailpipe tests). Some states may devise decentralized programs, using service shops to do testing and repairs.

(MOTOR: 10/92)

Electric-Powered Buses

The maker calls them "the only proven production model battery-powered transit vehicles operating today." The Electric Vehicle Marketing Corp.'s 22-foot and 26-foot buses, made in Downey, CA, also offer other features city transit agents like to find: a low floor, simple wheelchair ramp and large door opening.

The buses use lead-acid traction batteries, transistorized controllers, and DC traction motor-based drive trains. The battery rates at 70 KWhr, and is charged overnight by a fully automatic off-board charger. It also receives reverse power from the brakes, which operate as a generator when applied, which, the company points out, "increases the propulsion system efficiency and extends vehicle range."

The company plans to emphasize training services and ongoing infrastructure services, "since most users of zero-emission, battery-powered vehicles in the 1990's will be first-time users." The buses range in price from \$140,000 to \$175,000. EVMA offers financing as well as the product itself and continuing support.

(BATTERY & EV TECHNOLOGY: 8/92)

Sacramento; Solar Utility Leader

If plans being crafted now by the Sacramento Municipal Utility District (SMUD) work out, a short three years will see it become the nation's leading solar utility. Key ingredients in the plan:

An "aggressive" rebate program to try to revive the solar water-heating industry in its service area

Design of a model solar home that production builders can easily reproduce in quantity

Pursuit of several different projects to generate electricity from solar power

Installation of at least one megawatt per year of photovoltaics.

(NUCLEUS: FALL/92)

Wind Energy Makes Big Strides

Utilities around the world and across the nation are increasingly harnessing the power of wind to produce electricity. Kingsley E. Chatton, president of U.S. Windpower, says he expects wind power to soon compete with fossil fuels, benefitting the environment as well.

The new generation of wind turbines are successors to the pioneering

(Continued on next Page)

News in Brief

machines of the 80s that have now largely disappeared. The new breed, thanks to high technology fiberglass blades and computers, is far more efficient. Edgar A. DeMeo of EPRI, in Palo Alto, California says he wouldn't be surprised if wind power achieved the same volume of generation (10 percent) within 30 years as now produced by hydroelectric installations. The cost, adds Chatton of U.S. Windpower, would be about half that of an oil-powered plant per kilowatt hour.

A number of municipalities across the U.S. are installing windpowered plants, all of which is good news for U.S. Windpower who is the last surviving American windmill producer. The new generation of machines takes advantage of variable pitch, like an airplane propeller, and turning the blades to generate power from wind between 9 mph up to as high as 60 mph at a steady 60 cycles.

As of wind, there is plenty - particularly through the midwest from North Dakota down to Texas. The latter state, say windpower advocates, could theoretically generate (through wind power)

up to 36 percent more kilowatt hours than are used in the U.S. today.

(NEW YORK TIMES: 9/8)

New EVs to Debut in '94

Disneyland will be the setting for the unveiling of the Big Three's new line of electric cars in December 1994. The autos will be introduced three years before California's clean air rules requiring automakers to sell electric cars come into action.

Until recently, electric cars were only viewed as concepts and show vehicles, but now automakers are getting more specific about producing electric cars for the general public. "It's getting a lot more real. We'll have some serious cars there," said Ford Motor Co. executive, John Wallace about the event called EVS-11, the 11th biennial Electric Vehicle Symposium.

Some of Detroit's executives stated that their product plans further encourage the electric vehicle industry. Ford and GM are in the process of developing four-passenger electric vehicles for the 1994 parade, and Chrysler Corp. has

plans for an entry that may include an electric mini-van.

(AUTOMOTIVE NEWS: 10/5)

Clean Air Act Review

The following are highlights of what the Clean Air Act will require from the auto and fuel industries in the next six years:

1992: Enhanced inspection programs will begin in some areas and regulations will set a minimum oxygen content for gasoline in 41 cities.

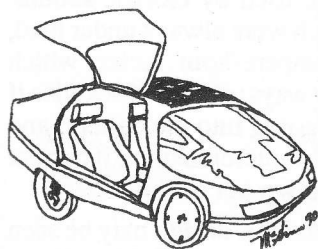
1993: Production of vehicles requiring leaded gasoline becomes illegal.

1994: New cars must have on-board computers that monitor emissions.

1996: Car and light trucks must meet tighter emissions standards. Leaded fuels are banned from all vehicles.

1998: In many nonattainment areas, 30 percent of all new vehicles purchased for corporate and government fleets must use alternative fuels. This level increases to 70 percent in 2001.

(EIN STAFF: 9/2)



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New Officers East Bay

East Bay (S.F.) chapter elected new officers on December 12th. They are:

President	Anna Cornell
Vice Pres.	Bill Nalbandian
Secretary	Scott Cornell
Treasurer	Jim Van Seyoc

[Congratulations to all. - Ed.]

Power Boost Trailer

by Robert E. May, Phoenix Chapter

After some study of the concept for a power boost trailer (PBT), an initial design concept is presented for critique. The selection of a motor generator set is a standard AC set, perhaps using propane for fuel, and capable of delivering about 10 kW of AC power. The AC power is connected to the on-board battery charger and to several AC-DC converters, also mounted in the PBT, which supply DC power directly to the battery/propulsion bus when driving in the hybrid mode. If propane is used as the fuel, then it is estimated that a 20 gallon tank will power the unit for 8 hours.

AC MG Set

These come in two types: 1) emergency (short-term usage) or 2) prime

power units. For the PBT application, the prime power version is required. Furthermore, if propane is selected as the fuel, the engine will tend to run hot and will supply about 20 percent less power than if run on gasoline or diesel. One advantage of the propane version, other than environmental considerations, is the easy access of fuel at RV service locations.

AC-DC Converters

These look like the most reliable, least expensive approach. However, one potential problem must be dealt with for safety; with the power from these converters going directly to the battery propulsion bus, if the battery is in a high state of charge and the car is moving slowly or not at all, it might be possible to charge the battery at a rate which will exceed TVG (temperature-voltage-gassing) and endanger the battery or car. For this reason, the converted should have an over-voltage trip mechanism (relay or electronic) which will cut power off at about 120 % nominal battery voltage and reset at nominal. The use of multiple converters reduces the power output per unit and provides better control at low speed in the hybrid mode. Each converter is connected to the bus through a remote, dash-operated relay, the relay being located in the car rather than in the PBT.

Power Connections

The PBT is hooked up under dead condi-

tions. The relays which control AC power to the on-board charger, and DC power to the battery/propulsion bus are located in the car rather than in the PBT. In the case of 12V DC supply for starting the engine, the switch can be manual. Everything is operated from the dash.

Interface

The following is a summary of the electrical interfaces between car and PBT:

- 1) MG starter cables for remote startup and shutdown.
- 2) Auxiliary battery power for starting the engine etc.
- 3) AC voltage for dash monitoring of generator operation, perhaps also a remote AC ammeter.
- 4) AC power from MG to on-board charger.
- 5) DC power from the PBT-mounted AC-DC converters to the battery propulsion bus.
- 6) Fuel gage hookup.

Ampere-Hour Meters—When operating in the hybrid mode, it is difficult to keep track of battery state. It may not be convenient to shut the system down to read the "fuel" meter. The device used by electric submarines, which were always under load, was the ampere-hour meter, which reads both ways: plus or clockwise if current is going into the battery, and minus, or counterclockwise if current is being drawn out of the battery.

To some this design may be seen as overkill. It is intended for those applications where the car is expected to go 400 or more miles per day. If a less strenuous goal of 200 miles over an 8 hour period is desired, then a small 2.5 kW RV generator can be used to supply power directly to the on-board battery charger.

For additional information, contact Bob May at (602) 867-1445.

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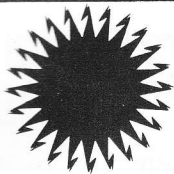
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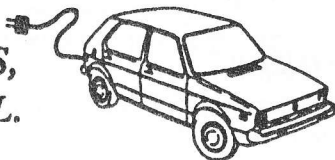
Electric Car Dealership Opens

SACRAMENTO, California.—Sacramento, a city with the seventh worst air pollution in the U.S., opened its first electric car dealership and service center. Solar Electric of Sacramento, located at 901 16th Street in downtown Sacramento on Friday, November 6, 1992.

Bob Dean, owner and general manager of Solar Electric of Sacramento, says the dealership will provide all the zero-emission electric cars manufactured by Solar Electric Engineering Inc. of Santa Rosa, California. Models include sedans, station wagons, sports coupes, light-duty trucks and vans.

The service center will install kits for converting gasoline cars to run on electricity and provide routine maintenance for electric cars. Dean says he sees quite a future for electric cars in Sacramento. "With all the incentives being given for EV's," said Dean, "like a \$1000 tax credit and sales tax exemption from the State of California, and utility rates for houses charging EV's lowered from ten to four cents per kilowatt-hour by SMUD [Sacramento Municipal Utility District], I think there will certainly be a market for electric cars." Phone: (916) 442-5110.

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The entry fee is \$100; \$50 for students. A kit with competition rules and program information will be mailed out January 15, 1993. Entries are due April 13. Prizes will be awarded at a ceremony in Washington on May 11.

Individuals interested in participating in the competition can contact: The Electric Vehicle and the American Community, 432 North Saginaw St., Suite 801, Flint, MI 48502 or call (617) 267-9035.

All-Day Conversion Seminar

Mike Brown of Electro Automotive will be conducting an all-day conversion seminar. The class follows, in person, their manual, *Convert It*. The seminar has received high praise by past attendees at college presentations.

The seminar is scheduled for January 30th, from 10 am to 5:30 pm. The cost is \$65. The location is to be determined in the Silicon Valley area. Class size is limited to 40. Call (408) 371-5969 for more details.

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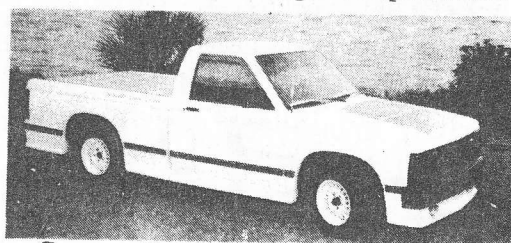
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SPECIFICATIONS

Weight	3700 lbs.
Wheel Base	108 inches
Batteries	120 volt system, consisting of 20 six volt batteries, 220 amp hours.
Motor	9" Advanced D.C., 28 horsepower
Charge Time	2 to 8 hours with 240 volt stationary charger. 4 to 20 hours with 120 volt on-board opportunity charger.
Top Speed	70 to 75 m.p.h.
Normal Daily Range	50 to 80 miles, depending on terrain, speed and driving conditions.

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A complete set of our recommended batteries may also be ordered for drop shipment to you. Please inquire.

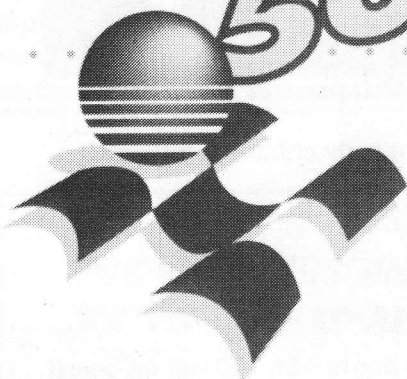
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3rd Annual Solar & Electric 500

ARIZONA PUBLIC SERVICE COMPANY

APS
SOLAR &
ELECTRIC
500



PHOENIX, Ariz. — The world's fastest and most advanced electric racing vehicles will return to Phoenix's one-mile oval next March for the third annual Arizona Public Service Solar & Electric 500 race.

Arizona's largest electric utility and a long-time advocate of electric vehicles, Arizona Public Service Co. (APS), exercised its option to again title sponsor the event, according to race organizer Ernie Holden of the Solar and Electric Racing Association (SERA).

Despite record high temperatures, more than 50 cars competed in four racing categories in last April's three-day event at Phoenix International Raceway, more than double the previous year's field, according to Holden. Racers topped speeds of 90 mph on the world's fastest one-mile oval.

The 1993 event is scheduled for March 5-7, again at Phoenix Interna-

tional Raceway. "Our mild March weather should give us excellent racing conditions for racers and fans alike," said Holden.

Additionally, SERA is revamping race classification and rules to reflect advancing EV technologies and safety issues. "We've added a safety expert full-time to staff and are overhauling safety procedures," he said.

"Race fans will see competition in open, stock and solar classifications," Holden said. "Updated race rules

and classifications will provide for more racing parity and safety without limiting car builders' innovation and creativity. Fans will get the wide open racing they expect."

He noted that Phoenix racer Tom Brawner is well along in converting a Lola Indy 500 race car to electric for the '93 race, and his team plans quick battery-pack exchange pit stops.

Additionally, general admission ticket prices for 1993 will range from \$5 to \$10, about one-half the prices fans paid at the 1992 event. And ticket prices for reserved seats have been reduced about one-third, Holden said.

"Even though our 1992 ticket sales were up 40 percent over the previous year, we felt a price reduction was in order."

"Families will one day soon be driving these cars. We want them to be able to afford to come enjoy this unique

competition and see what's in store for their future," he said.

"We're proud of what we've accomplished with the race so far and are looking ahead to 1993 and beyond with great anticipation," Holden said. "Electric motorsports has a tremendous future."

The revised safety manual, racing classifications and rules are available by contacting the Solar & Electric Racing Association, 11811 N. Tatum Blvd., Ste. 3031, Phoenix, Az, 85028-1621. Ph. (602) 953-6672.

Helpful Hits for Battery Handling

by Clare Bell

When changing a single battery one often faces a battery box jam-packed and batteries that at interlocked like the pieces of a Chinese sliding puzzle.

One often has to lift out a "key-stone" battery in order to make enough space to access the others. I've found that you can make life easier for yourself by leaving a strap under the "key-stone" battery with its ends left out so you can grab-'em.

It's better than pinching a finger and reduces the temptation to lift by the cap mechanism, which is generally a "no-no".

Use a heavy duty plastic webbing or some material that won't get eaten to a shred by battery vapors.

I've tried a quick and dirty solution by making a strap from 4 layers of fiber reinforced duct tape. Make sure that whatever you use can take the battery weight.

Formula Lightning

The Solar & Electric Racing Association (SERA) of Phoenix, Arizona has designed, built and is testing a prototype of a new electric race car called, "Formula Lightning." The open-wheel car may be the first such competition vehicle designed and built especially to be electric-powered.

SERA's goal in creating the new racing class, which is shared with the U.S. Department of Energy and Goodyear, who will supply tires to all Lightning race teams, is to provide totally equal, complete rolling chassis less only batteries, motor and controller so that companies can install their products and dramatically show their elec-

tric power and drive technologies on our nation's race courses.

The new racers will compete for the first time at the third-annual Arizona Public Service Company (APS) Solar & Electric 500 on March 5-7, 1993, at Phoenix International Raceway. A minimum of three additional events are being scheduled for the new cars, and more are likely. "We're working on some very exciting race dates and will announce them as soon as they're firm," promises Holden.

Race drivers' remarks after test driving the Lightning prototype reveal more surprises. Ninetime LeMans 24-hour and Daytona 24-hour veteran Clive

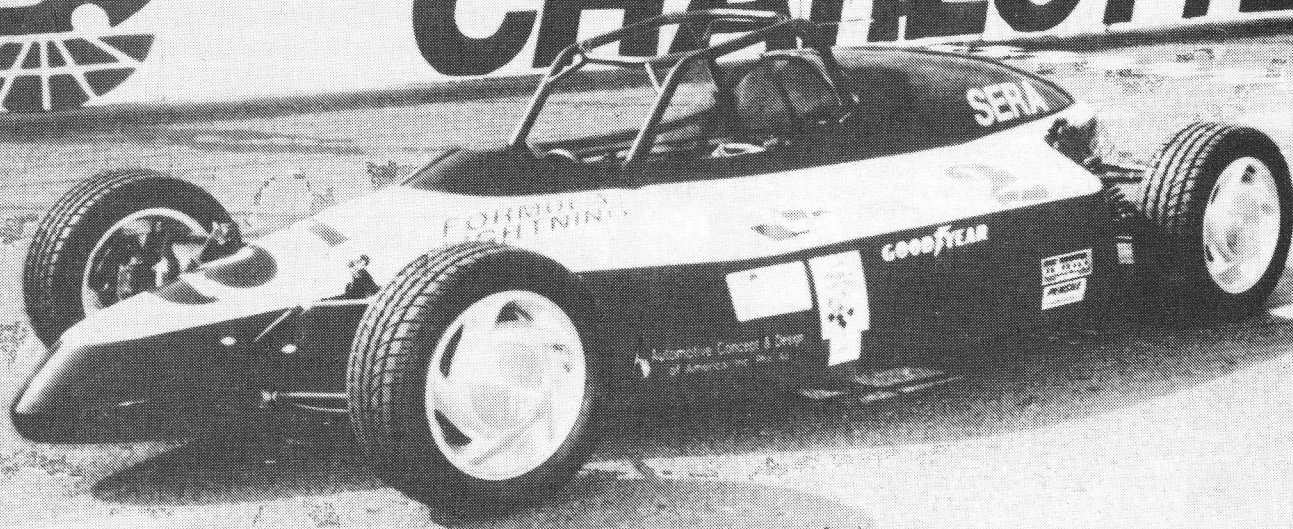
Baker reports; "It feels very stable. I tossed it around quite hard and it stuck great. It also doesn't have the noise, heat or vibration we're used to, and you can really concentrate on driving. I think it's got a great future."

Young IMSA GTO driver Nick Cole comments: "I was surprised at how quick it was - both on acceleration and tight turns. You can put so much of the weight down low, between the axles. That's probably why it's so stable."

For more details, contact SERA (602) 953-6672.

FORMULA LIGHTNING

CHARLOTTE



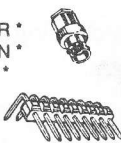
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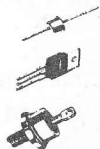
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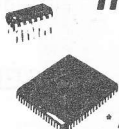
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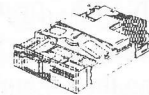
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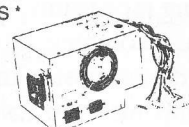
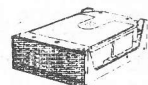
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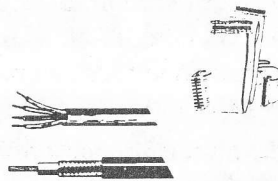
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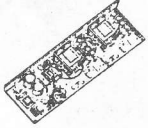
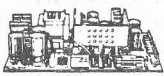
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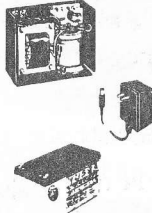
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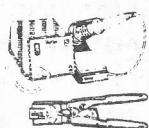
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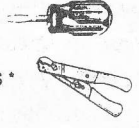
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Letters to the Editor

Dear Paul,

It is with deep concern that I write this letter to the members of the Electric Auto Association. Somehow, along the way in establishing the EAA, the leadership detoured from the goals set forth by the founder, Walter Laski in 1967. The original concept of the EAA was to educate, demonstrate, and then guide the public in EV technology. This is still the primary direction needed by the EAA.

When I became interested in electric vehicle possibilities in 1976, I established the Los Angeles Electric Auto Association Chapter and tried to carry out the EAA edict mentioned above. The years of public disinterest depleted the membership until about 1990. Then the upsurge of interest made EV technology very fashionable. Now, one-third of the membership in Southern California are involved in businesses related to EVs and many more people are charged up, ready to learn about how EVs work.

We, the leadership, must offer more to the members than just a charter for a club. There is need of support through visual aids, product acquisition, and anything new in development that will improve EV knowledge. **Members, in one sense, cannot expect to achieve any advancement in the EV movement if they are not contributing to their club with their talent and energy. Just paying the nominal dues per year does not entitle the members to a free ride while others do the necessary work.** On the other hand, after paying dues, they do deserve something more than just a newsletter every two months.

In my consensus, after polling the membership, the list selected shows:

- More interaction between the central club leadership and the members of local chapters.
- Support of the local chapters in their events like rallies, sales endeavors to raise funds and club publicity programs.
- A better realization by the membership that the chapters are not a separate entity out of sight, but must be nurtured.
- Discounts for EV products (from EV companies, not Detroit conglomerates).
- Instructive visual aids of EV progress and "How To" information.

One good aspect of the EAA is the collected information distributed by the "Current EVents" magazine. The technical articles and stories are truly collectibles and have reference library quality. The present editorial format is modern and to the point with ample coverage and opinion for both sides of the information presented.

This type of first amendment offering, unhampered by political selection or biased by any governing group, and relevant to what is reported by contributors, is free access information available to the Electric Auto Association members. Keep it coming!

In my opinion, and considering the years battling public apathy, I believe the EAA direction that is needed is one of balanced efforts. Information to the membership and public, supplying resources for EVs and products, and supporting those who faithfully try to advance electric auto technology for the most benefit. This course will embrace the hobbyist, those who are technically minded, and those who just want to ride or own an EV.

Remember, "Clean air must start with the people realizing that, in the short run, only electric vehicles can do the job."

Irving L. Weiss, Founder,
L.A. E. A. A. Chapter

Well said Irv, especially the comments about member involvement. - Ed.

Dear Editor:

406 miles on a single charge? How? Who verified it? As I recollect, the last record was a ton of batteries with electrolyte circulation in a small Fiat. Was this a ton and a half of batteries with BAT secret sauce in a Metro? Also, the map shows that Wendover, Nev. is 101 miles from Salt Lake City.

At the October Phoenix chapter meeting, we discussed the record and our members' experience with BAT electrolyte. Our consensus sounded like about a 50% range improvement. So a ton and a half of batteries in a Metro with BAT electrolyte sounds close to the mark. Safe suspension and brakes?

EAA Board of Directors, how about some verification and technical details?

(Continued on next Page)

Letters to the Editor

(Continued from previous Page)

We sure hope our first EAA Fellow does not turn out to be a phony. Like the 1800 Saturns which we heard GM does not even own anymore.

Robert E. May, Phoenix AZ

Dear Bob:

The two principals of Advanced D.C. Motors followed and witnessed this run as mentioned in the Oct./Nov. C.E.

I did a calculation based on an Eagle Picher data sheet for silver zinc batteries that showed that 750 lbs of the right model would give the performance demonstrated.

I then heard several rumors to the same effect. I called and talked to an engineer at Eagle Picher for the facts on the cycle life, energy, cost, etc., which I used in the Editorial.

I mentioned that I had heard that Joe Las Stella has used 750 lbs of these batteries for his 406 miles run. He proudly replied, "Yes, he sure did. Wasn't it great?"

And it was a great event to bring the world record back to the U.S.—whether he can make this a cost effective, practical battery pack is yet to be seen. (Joe claims he can and will not confirm the chemistry, claiming it's proprietary.)

Whatever Joe is using, let's hope he can deliver a good cost effective battery soon.

As far as the Saturns are concerned, see Page 6. - Ed.

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Calendar

March 3-6, 1993, Building Solutions Uniting Excellence & Innovation Boston Park Plaza Hotel, Boston, MA.

March 5-7, 1993, Solar & Electric 500. Phoenix Arizona. (602) 953-6672.

March 27-28 1993, The 1993 International Environmental Exposition @ Red Lion Conference Center, San Jose, CA, featuring speakers, displays, performers, and merchants. For more information, call IEE '93 (415) 927-0649.

May 23-29 1993, Fifth American Tour de Sol Solar and Electric Car Championship, Massachusetts, New Hampshire and Vermont. Contact NESEA, 23 Ames St., Greenfield, MA 31301, Tel. (415) 774-6051.



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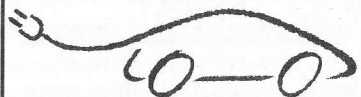
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Electric Auto Association

December/January 1993

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