



Loss of Ozone 'Worse Than We Thought'

Washington Post

Washington

Atmospheric ozone has decreased by as much as 3 percent over densely populated areas of North America and Europe since 1969, according to a new international study that provides the first evidence of worldwide ozone depletion.

The study found even more dramatic ozone losses during winter months and at higher northern latitudes, including some drops of more than 6 percent in Alaska and the Scandinavian countries.

The severity of the decrease came as a surprise to researchers and once again confounded scientific theories that had projected a much smaller rate of ozone depletion.

It also raises immediate questions about potential effects of stratospheric ozone depletion on most damaging ultraviolet rays, and federal scientists estimated that each year of decrease in ozone over the United States would result in an additional 50,000 cases of skin cancer.

ELECTRICITY IS THE ONLY!

CLEAN AIR FUEL

BUSSES

TRAINS

CARS

Is this air deadly?
To breathe or not to breathe,
that is the question
SANTA CLARA VALLEY LAST JULY

San Jose Mercury News

San Francisco Bay could grow by 50 percent, producing not only widespread flooding but an inland delta sea.

'Greenhouse effect' would flood bayside cities, pollute water

By Don Edwards

What future the north coast?

By Jane Kay

EXAMINER ENVIRONMENTAL WRITER

THE FEDERAL government's ambitious plan to search for oil off California's unspoiled north coast portends much more than clusters of rigs on the horizon.

It would bring the heaviest industrialization ever proposed from Point Arena north to Eureka, say state officials.

The rugged coast, haven now for nature-lovers and fishermen, also would accommodate oil tankers, miles of pipe, petrochemical companies and processing plants, both on and off shore.

Unless the next president halts the sale of leases, or Congress stands in the way of Interior Secretary Donald Hodel, a million acres of ocean floor off Mendocino and Humboldt counties will be auctioned in February.

Within five years, about 6.5 million acres of other coastal sections, including Bodega Bay and San Francisco Bay, would go on sale.

Like Alaska 10 years before a pipeline network was laid over tundra, California is at the turning point, weighing the benefits of increased domestic oil and revenues against environmental risks.

It is much to ask of a state, opponents say, particularly when, according to estimates by energy experts, the north coast drilling of 1.1 million acres will yield at most 800 million barrels. That equals a two-month supply of oil for the United States.

There is a 50-50 chance of finding oil on the north coast, the Interior Department indicates.

Many Californians agree with the view of one Eureka woman who compared drilling for oil off the scenic coast to "rolling up a Rembrandt and selling it like a Presto log."

The nation would do better to move toward cars that get more miles per gallon. That alone could save 17 times as much oil as could be found off the north coast, drilling opponents say.

Now, Californians use 2 million barrels of oil a day, says Hodel,

while it produces 1.2 million barrels daily. The state must accept oil activity like other areas, and, excluding more than 100 miles out of the Gulf of Mexico. Hodel notes that the only significant commercial discoveries in the federal program are off the California coast.

WHAT FUTURE THE CITIES ?

Some extreme air pollution events of the past generated public pressure to improve our air quality in the Cities. The result was the Clean Air Act Amendments of 1970. Then the pollution declined markedly, but the increase in the number of automobiles in our cities have again created our present serious pollution problem.

The seriousness of the problem is indicated in Fig. 1, showing one result from Total Suspended Particulates (TSP) in the air. This Harvard Study of Air Pollution and Health, known as Six Cities Study started in 1974. Ref.1. Today more than 60 cities in the U.S. are exceeding EPA Clean Air Standards. The result is that the cities can be denied,

Federal funds such as thier highways. Pollution conditions threaten to get worse, not better in the future. Therefore our cities are beginning to pressure for repeal of the Clean Air Acts. This does not seem to be the proper solution to the problem.

If the increase in vehicles could be made up of pollution free Electrics, this, worsening of pollution could least be balanced out. Pollution could ultimately be reduced as electrics are intergrated into our system. This is the only solution for urban pollution!

Ref. 1. Electric Power Research Institute, P.O.Box 10412, Palo Alto, CA 94303 (RP 1001)

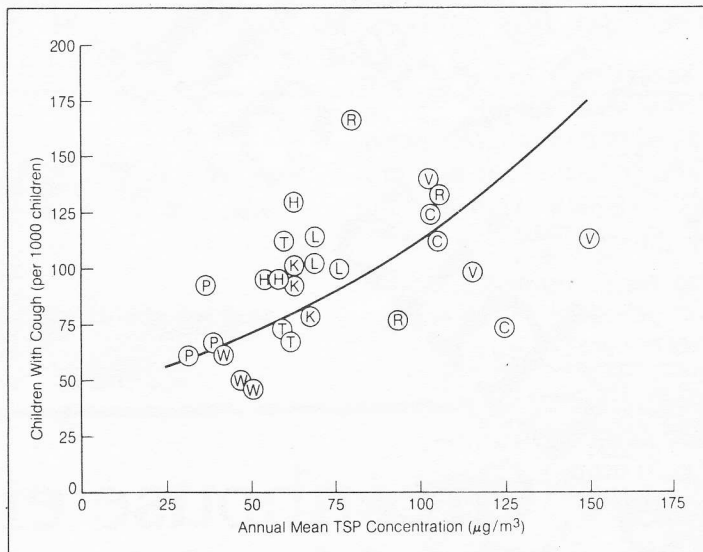


Figure 1 For each of 27 groups of children from the Six-Cities Study, the adjusted frequency of persistent cough at the second examination is plotted against the mean TSP concentration during the previous year. The letters identify the nine geographic areas covered by the analysis: C and L for the two parts of St. Louis; H and K for Harriman and Kingston, Tennessee; P for Portage, Wisconsin; R and V for the two parts of Steubenville, Ohio; T for Topeka, Kansas; and W for Watertown, Massachusetts.

ELECTRIC VEHICLES INVADE 'MOTOR CITY'

Back in the early 1900s, automobiles powered by electricity were far more attractive than gas-powered ones. Gasoline was expensive, in short supply, and engines had to be started by hand cranking. Electricity was clean, cheap, and readily available. But in today's society of convenience, the notion of a vehicle that has to be plugged in every day or so for recharging seems silly. That may be changing.

In February, a conference entitled "Electric Vehicle Commercialization: Benefits and Opportunities" was held in Long Beach, California. Sponsored by the Electric Power Research Institute (EPRI), the Electric Vehicle Development Corporation, Southern California Edison, and the Los Angeles Department of Water and Power, the conference addressed commercial applications for electric vehicle (EV) technology. The main attraction was the unveiling of a prototype of the "G-Van," General Motors' latest EV.

"Achieving full-scale design and manufacturing of an EV at mass-production levels is a difficult process," says Product Development Engineer Mike Lechner, who attended the event. "GM's prototype is a major step ahead of EVs we are using now."

Since 1985, PNM has had three Griffon electric vans in the motor pool, manufactured by GM's British subsidiary Bedford Commercial Vehicles. Like the Griffon, the new vehicle is built on a standard frame and body that would normally be equipped to run on gasoline or diesel fuel. But the G-Van will be the first full-scale production line of EVs manufactured in the U.S.



Lechner

Lechner has been closely involved with EPRI since 1976, beginning with the Solar Heating and Cooling Working Group, later as a loaned executive during 1980 and 1981, then as a member of the Energy Utilization and Conservation Task Force, and (in 1985) chairman of the In-

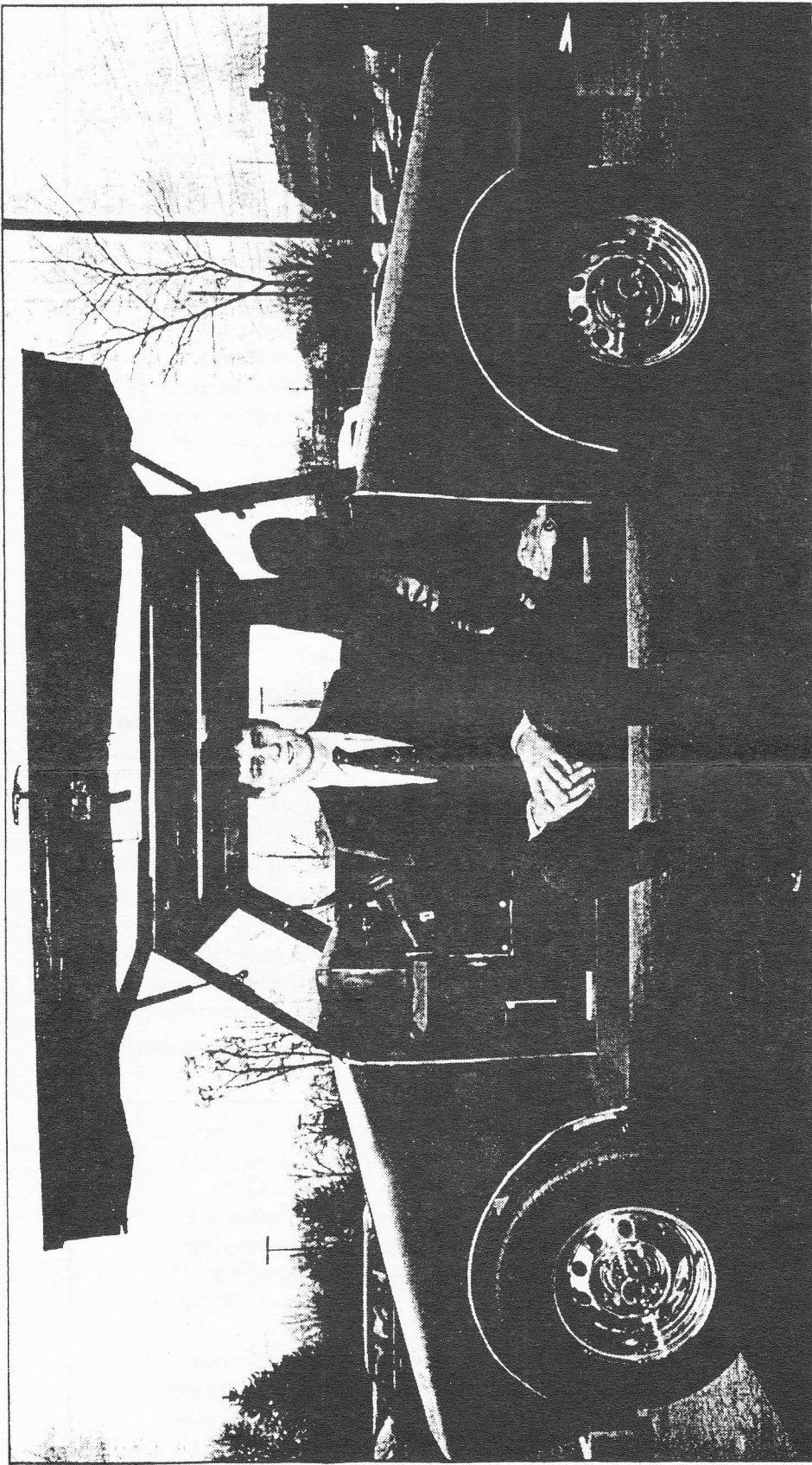
dustrial Applications Program Committee. During this time he also served as a member of the PEAC planning group, and now he is serving on the EMU Division Committee. His interest in power electronics began in the early 1980s when he heard EPRI Program Manager Ralph Ferraro discuss the potential value to the utility industry of new PE applications, such as adjustable-speed drives, and the role of PE in electrotechnologies, such as induction heating and melting, plasma processing, dielectric heating, and electrochemical processing.

NEW MEXICO

ELECTRIC VEHICLE USERS GROUP

In 1986, GM was forced to shut down its Bedford operation due to overcapacity in commercial vehicle production and a downturn in the European economy. At that time, GM decided to accelerate plans to transfer the technology to its facilities in Detroit. Over the next five years GM plans to scale-up production to 10,000 EVs a year—beginning with 10 in 1988, 100 by mid-1989, and into continuous production soon after. The estimated cost for the first models may run up to \$24,000 each, but lower prices are expected as production volume increases.

Interest is spreading beyond the innovative G-Vans. Lechner and the newly established New Mexico Electric Vehicle Users Group, are currently assisting Albuquerque's Manzano High School in converting a 1983 Ford Escort to an EV as part of the school's automotive arts program. He hopes to extend this program to other area public schools.



Matthew T. Tipple sits in the solar car he made by hand.

Student's sun-powered car wows science fair

By WILLIAM F. MILLER
STAFF WRITER

The full-sized, apple-red car, powered by 1,800 solar cells, was easily the show stopper yesterday at the Northeastern Ohio Science and Engineering fair at Baldwin-Wallace College.

Whether Solarex, the nearly all-aluminum car that runs on the sun's rays, will win one of the two grand prizes will not be known until final judging tomorrow.

"That is a long time to wait, isn't it?" said Matthew T. Tipple, 17, the Keystone High School senior from La Grange, O., who built the car.

Because the car was too large to get through the doors, the tall, model car.

reed-thin Tipple had to show a panel of judges his science project outside the recreational building where 400 students, in seventh through 12th grades, had their projects.

"I think the car is fantastic," said Carole A. Allore, a Cleveland school teacher and judge who also is a resident scholar with Cleveland Electric Illuminating Co. this year.

Tipple, who in two previous science fairs when he was a sophomore and junior designed toy-sized solar cars, decided this year to produce a full-sized vehicle. Last year, he won first place for engineering design in state competition for his model car.

The hand-made vehicle started with a transmission, front struts, a transaxle and steering wheel salvaged from a 1968 Volkswagen. He then handbuilt its suspension system and body, including the gull-wing doors.

The electrical power comes from solar cells. They charge nine 12-volt batteries in the front of the car and four in the trunk. A five-horsepower electric motor in the trunk turns the wheels.

Tipple said the car would travel at 45 mph tops. At night or on cloudy days, he said the car could go about 120 miles on battery power.

To help finance the project, he

lined up 14 sponsors, including a few family members in the construction business. He assembled the car in a barn workshop on his family's property.

He estimated the car cost \$15,000, of which \$3,000 was his money. His schoolteacher mother, Marilyn, said her son sold personal possessions to help raise money.

"I built my car because I believe we need to clear up our environment, and I wanted to do something about it. I worked on it seven days a week after school since November and seldom took a break," he said.

He even built the trailer to transport the car to the fair.

Because he just finished it and has not applied for license plates or insurance, the car has only been test driven on a 300-foot long driveway on his family's 13-acre property.

Not surprisingly, Tipple said he planned to be an engineer and design cars for the Ford Motor Co., his favorite car producer. But to get there, he will enroll at the General Motors Institute in Flint, Mich., this fall.

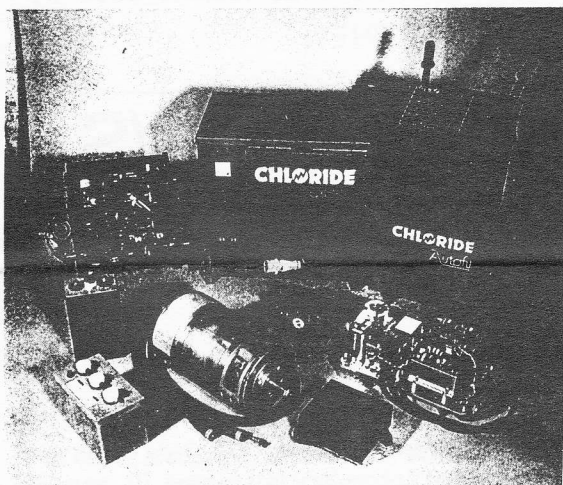
The two top winners of the fair in Berea will compete at the International Science and Engineering Fair in Knoxville, Tenn., May 8-14, where scholarships and other prizes await the winners.

PD/DAVID J. ANDERSEN

MOTIVE POWER AND DRIVE SYSTEMS FOR HIGH PERFORMANCE ELECTRIC VEHICLES

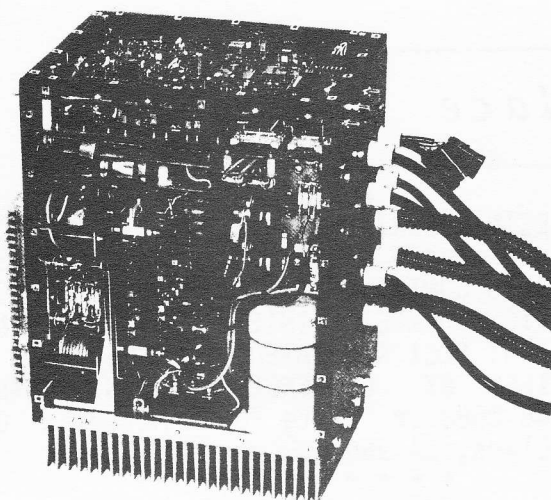
CEVS — Products

CEVS offers complete, fully-compatible drive systems for a wide range of high-performance electric vehicles. Products include motive power batteries and chargers. DC traction motors, electronic controllers, DC-DC converters and associated service equipment.



The company has a continuous programme of product development aimed at improved performance and reduced system cost, including:-

- Range of new-generation DC controllers
- Integrated DC-DC converter
- Improved energy and power density tubular lead acid battery



Advanced Battery Development

CEVS is collaborating closely with Chloride Silent Power Limited (CSPL) to develop a fully-compatible drive system incorporating CSPL's revolutionary sodium sulphur battery technology.

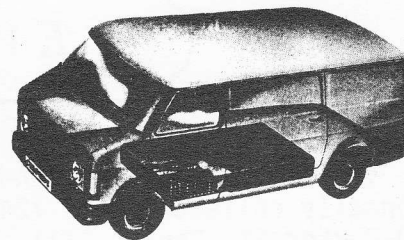
CSPL — jointly owned by Chloride Group plc and the UK Electricity Council — was established for the sole purpose of developing batteries to the stage where commercialisation can be implemented. It is funded by the owners, the UK Department of Trade and Industry, the USA Department of Energy (Sandia National Laboratory) and EPRI.

The heart of the sodium sulphur cell is its solid electrolyte, beta alumina. This ceramic membrane physically separates the sodium and sulphur but allows sodium ions to pass through to take part in the charge and discharge reactions.



CSPL's modern battery designs employ simple, compact cells connected together to maximise the system reliability and power availability.

Each cell delivers two volts and is designed for high power and energy densities, low-cost and high reliability.



A Bedford CF van fitted with an experimental sodium sulphur battery has already been driven over 100 miles on a single charge. A developed version of the battery will give a range approaching 150 miles.



**EVS9, Toronto,
November 13th--16th
1988. For information
contact:**

The 9th International
Electric Vehicle Symposium
501 Oakdale Road
Downsville, Ontario M3N 1W7
Canada



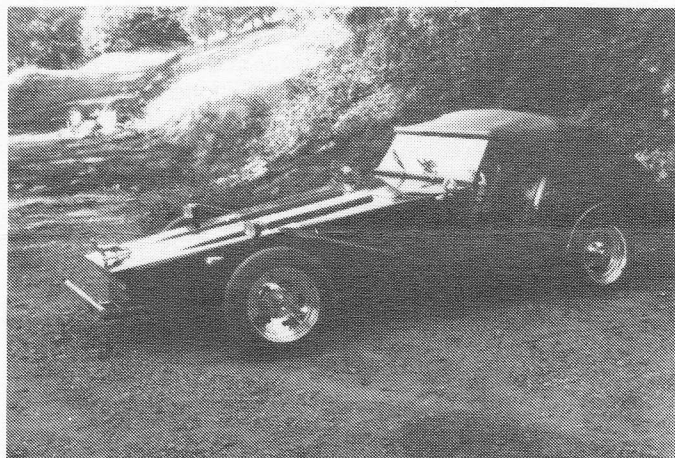
MINI-EL DISCOVERED IN PRODUCTION IN DENMARK
BY HANS SMIDTH OF SOOKE B.C. HE SAYS IT'S
GREAT! 25 MPH 25-45 MILE RANGE, 2500 W,
36 V, 3-12V BATTERIES,

El-Trans A/S

HARALDSVEJ 66 . DK-8900 RANDERS

Telefon: 06 43 47 11 . Telefax: 06 41 88 71

Telex: 65 147 dk miniel



THIS MEAN MACHINE BY EAA MEMBER
BILL BISHOPRICK, SALEM, OR '68
VW -BUG PAN--12-6V BATTERIES

MOTOR SHOWS PROMISE: Scientists at the Argonne National Laboratory in Argonne, Ill., have developed what they say is the world's first electrical motor based on the properties of new superconducting ceramics. The unit, called the Meissner motor, operates at 50 revolutions per minute. "It's too small for practical use and produces negligible power, but it demonstrates for the first time that these motors are possible," Roger Poeppel, an Argonne ceramics specialist, said Friday.

EV Marketplace

WANTED

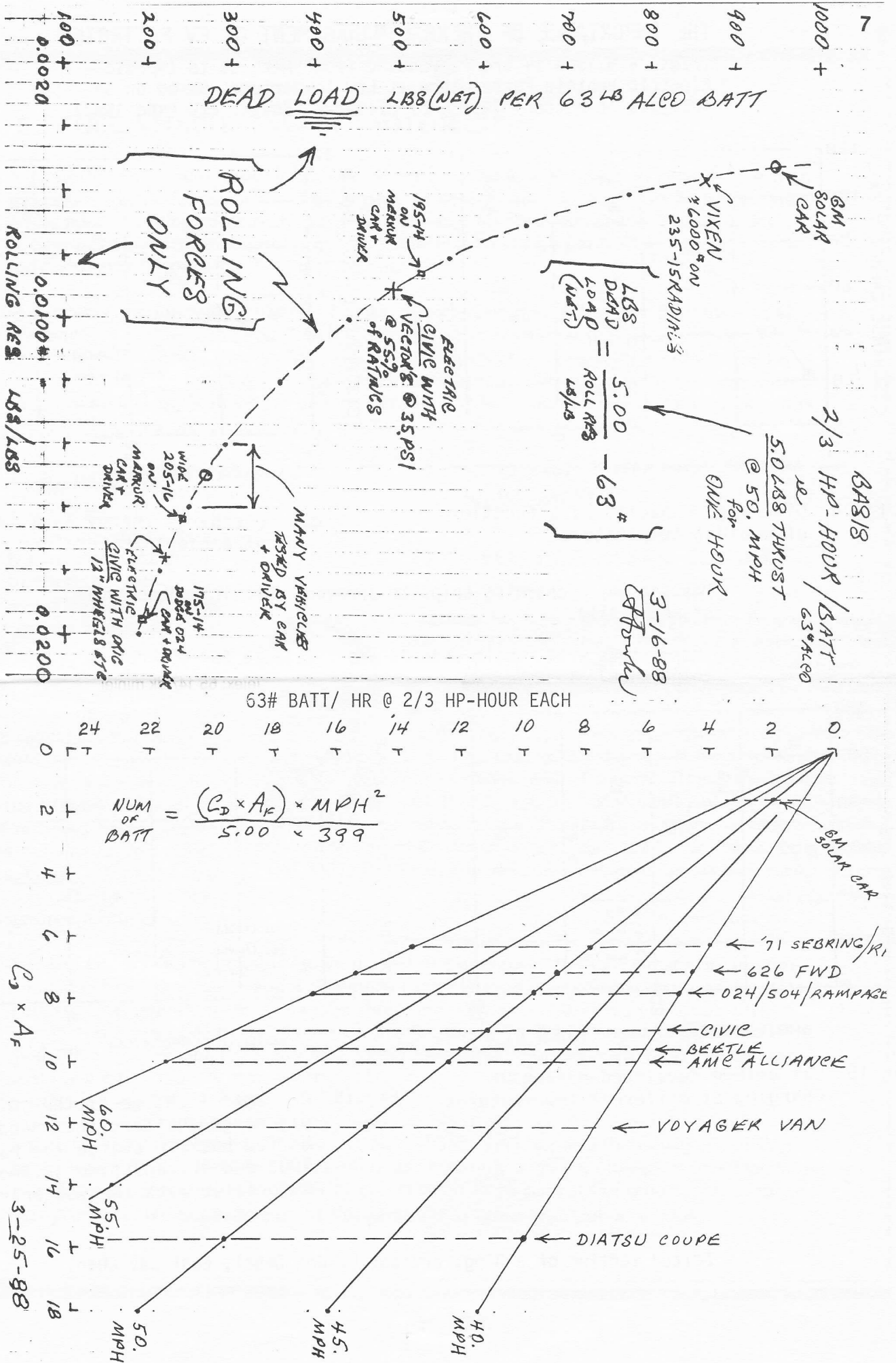
City-Car vicinity Rhode Island. CALL:
Robert Connelly collect (401) 724-9401 or
write 430 Dexter St. Center Fall, RI 02863

+++++

FOR SALE

JMJ ELECTRIC HORIZON, FIVE DOOR HATCHBACK.
16 TROJAN T-105 BATTERIES, CABLEFORM SCR
ELECTRONIC CONTROLLER, LESTER 12/96 VOLT
AUTOMATIC CHARGER. INTERIOR/EXTERIOR NEW
CONDITION! GLC! RENOVATED, CHECKED OUT, &
GUARANTEED BY CLARENCE ELLERS. CALL:
(408)248-2588 or write 2892 Mesquite Dr.
Santa Clara, CA 95051.

CURVES DEVELOPED BY EAST BAY MEMBER GENE FOWLER



THE IMPORTANCE OF THERMAL MANAGEMENT OF EV BATTERIES

(Figs. 4,5,15 & 19 are reproduced from "Methods to Improve Electric Vehicle Performance at Low Temperature, Based on an Analysis of Battery Test", by Dieter K. Nowak, EVC Expo 1983)

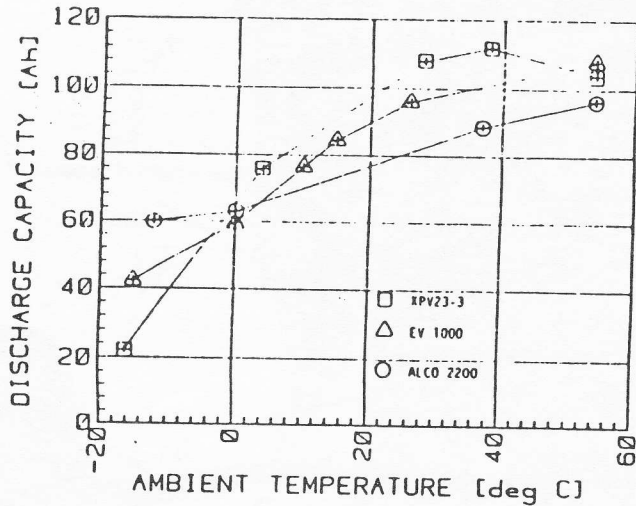


Fig.4 Discharge capacity as a function of ambient temperature

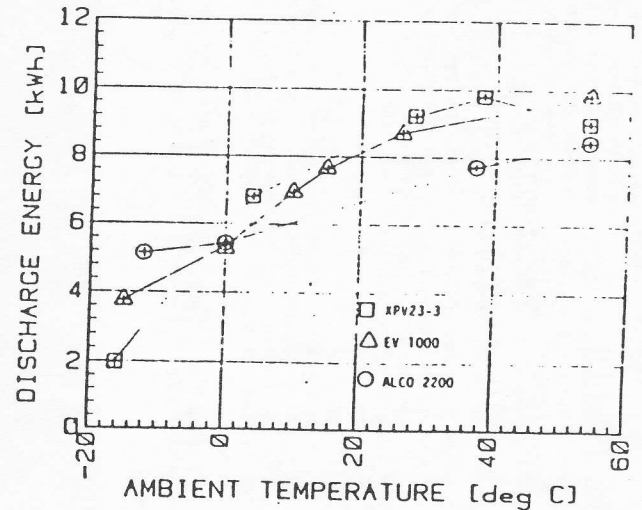


Fig.5 Discharge energy as a function of ambient temperature

Heating while charging helps to prevent chronic undercharging of weak cells.

Thermostats with remote sensors are available for control of temperature.

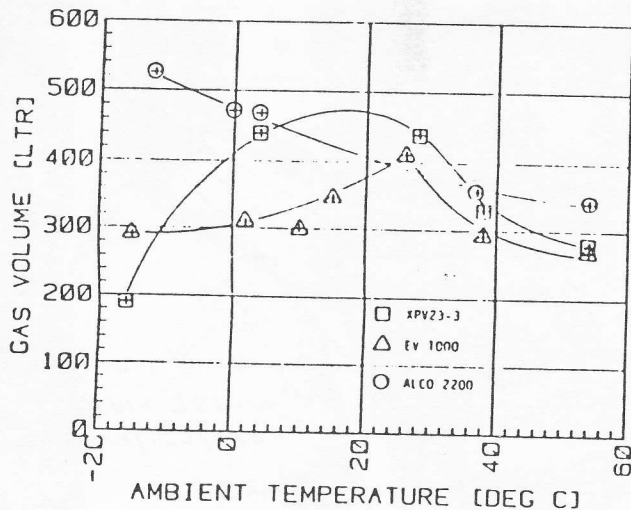


Fig.15 Gas volume developed during charging at different temperatures

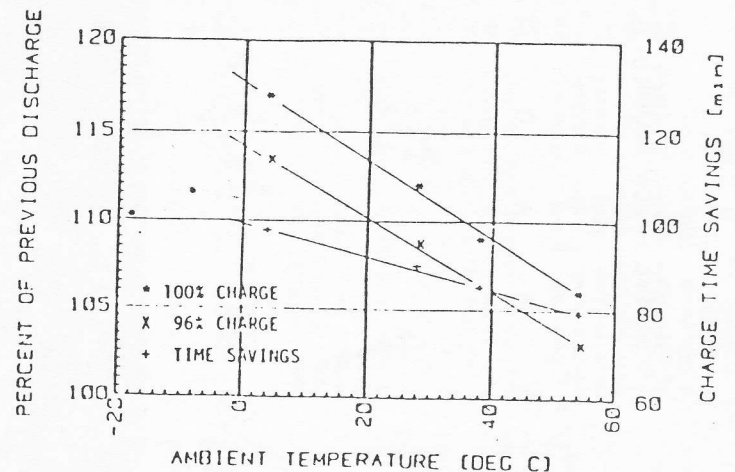


Fig.19 Percent of charge of the 100% discharged battery that needs to be fed back to charge the battery 100% and 96% and time savings associated with the 96% charge.



VANCOUVER ELECTRIC VEHICLE ASSOCIATION

9

543 Powell Street
Vancouver, B.C.
V6A 1G8
(604) 987-8188

Enfield Refurbishment Project

Work is progressing well on the Enfield at the B.C. Hydro Kitchener Street Vehicle Garage. George McCrae submitted a draft letter for comment at the March 16th meeting. The letter outlined our project and budget requirements. Suggestions were offered and revised letter will be sent to the mailing list and various companies soliciting support in kind or cash. Members are free to forward the letter to any potential supporters as they see fit. Rolly Kober suggested asking for short term loans if we are unsuccessful in our direct grant request. A tax number for non-profit donations will be secured for tax benefits to the donors (Doug Turland to action).

Other Projects

John Reilly will investigate the acquisition of the 1975 UBC EV project vehicle now in storage in New Westmister. Members expressed a keen desire to work on the refurbishment of the car on behalf of the Royal Museum of B.C.

Any member wishing to work on his EV at the garage is encouraged to do so ASAP! Space is limited so it is first come first served!

FORUM

Thanks to Frank Willey
for sending these in IEEE SPECTRUM Jan. 1988

One topic which should be of high interest to electrical and electronics engineers, as well as to environmentalists, was completely omitted. With our worsening air-pollution and Middle East petroleum-supply problems, it should behoove the IEEE to promote the only nonpolluting type of transportation: electrically driven vehicles.

At the symposium of the Electric Auto Association's (EAA) 15th annual electric-car rally in Sunnyvale, Calif., last Sept. 20, it was mentioned that 1800 electric vehicles are licensed for highway use in California. Here in Sun City, Ariz., many hundreds of licensed electric golf cars are frequently used for trips to the market, bank, church, or recreation center. Several of my friends have long used their electric automobiles for daily commuting to work. (Readers Interested in joining the EAA may write to Electric Auto Association, 1249 Lane St., Belmont, Calif. 94002.)

The official world speed record for electric vehicles (more than 174 miles per hour at Bonneville Salt Flats, Utah, 1 mile in each direction) is held by EAA member Roger Hedlund. An unofficial stock-car world record of well over 200 miles on one battery charge is held by member Saied Motael.

Electric automobiles are being produced in small quantities by a number of companies. In 1977 I pioneered a lightweight, low-cost, 30-kilowatt solid-state controller. A number of other groups are producing electronic controllers and instrumentation for electric automobiles.

Shouldn't the IEEE be encouraging the large-scale development and use of electrical transportation with up-to-the-minute design, to solve our urban air-pollution problems?

*Frank G. Willey
Sun City, Ariz.*

Electric vehicles

I have been driving electric cars since the early 1970s. Some did not perform all that well, but the Unique Mobility Electrek is reassuring to drive in traffic, even on the Denver freeways. The General Motors Griffon van is also traffic-compatible and has a battery guaranteed for four years that usually lasts for six and that requires very little time for maintenance. The range of both these vehicles is about 60 miles (100 kilometers), which is enough to be useful in many applications. The promise of better batteries would make these vehicles even more attractive.

*George E. Gless
Boulder, Colo.*



CALENDAR

MAY 1: FOX VALLEY ELECTRIC AUTO ASSOCIATION will have a show & tell session at the Kane County Fair grounds, North Randall Rd., St. Charles, IL 7AM to 4:30 PM.

MAY 1: MELBOURNE CANON ELECTRATHON, VFL Park (03) 758-6871.

MAY 2-5: SAE Govt/Industry Meeting & Expo, Washington, D.C.

MAY 10-12: DIGITAL SCOPES ELECTRO/88 Boston, MA.

MAY 14: EAST BAY PG&E Service Center 4801 Oakport St. Oakland; Russ Kauffman (RUSSCO) will speak on his new controller and larger motor.

MAY 24-27: 4th INT'L Mtg. on Lithium Batteries, Vancouver, B.C., CANADA.

MAY 29: MELBOURN ENDURANCE; Edithvale tract.

MAY 30-June 3: ISATA Automotive Electronics Conf. Florence, Italy.

JUNE 11, Fox Valley EAA & Ill Solar Energy Asso. in cooperation with Argonne Nat'l Laboratory are sponsoring an Electric Vehicle Show & Symposium at the Laboratory. CALL: Ken Woods (312) 420-1118.

EAA Chapters

ARIZONA: PHOENIX
Roger Smith 602-969-9667
P.O. Box 16800 #273
Mesa, AZ 85202

CALIFORNIA:
Burbank
Irv Weiss 818 841-5994
2034 N. Brighton #C
Burbank, CA 91504

East Bay
Scott Cornell 415 798-0909
60 Alan Dr.
Pleasant Hill, CA 94523

North Bay
Gordon Schaeffer 415 456-9653
211 Bellan Blvd.
San Rafael, CA 94901

Peninsula
Mae Bensen 415 992-5453
8 San Juan Ave.
Daly City, CA 94015

Sacramento
Carl Metcalf 916 486-0321
3654 Bausell St.
Sacramento, CA 95821

San Jose
Don Gillis 408 225-5446
5820 Hern St. #3410
San Jose, CA 95123

Santa Clara
Lee Henstreet
787 Florales Dr.
Palo Alto, CA 94306

OREGON: Willanette
Leslie Brundidge 503 390-3871
4040 Gary St. NE
Salem, OR 97303

TEXAS: Houston
Ken Bancroft 713 729-8668
4301 Kingfisher
Houston, TX 77035

WASHINGTON: Seattle
Bryan Lowe 206 632-4496
5011 9th NE
Seattle, WA 98105

WISCONSIN: Milwaukee
Dave Pares 414 481-9655
3251 S. Illinois
Milwaukee, WI 53207

NEW JERSEY: Hackensack
Kasimir Wysocki 201 342-3684
293 Hudson St.
Hackensack, NJ 07601

Vancouver, B.C.
VEVA 604 987-6188
543 Powell St.
Vancouver, B.C. V6A 1G8

NON-AFFILIATED GROUPS

CANADA
Ottawa, Ontario
Fred Green
Box 4044 Sta. "E" K1S 5B1
Ottawa, Ontario, Canada

NEW MEXICO: Albuquerque
Mike Lechner 505 848-2331
PNN Alarado Square
Albuquerque, NM 87158

Southern Cal-EVA of SC
Ken Koch 714 639-9799
12531 Breezy Wy.
Orange, CA 92669

DENVER CO DEVC
Genny Clark 303 451-5051

Fox Valley IL 312 879-0207
John Stockberger
25 643 Nelson Lake Rd.
Batavia, IL 60510

Eastern 215 696-5615
P.O. Box 717
Valley Forge, PA 19482

For information on forming a chapter in your area write Electric Auto Association, 1249 Lane St. Belmont, CA 94002. For a sample copy of the newsletter send SAE #10 envelope. PHONE (415)591-6698

EDITORS: - Walter Laski - John Newell - Bill Palmer - Paul Brasch - COMPILED AND PUBLISHED by Clarence Ellers. SEND IN YOUR PERSONAL AND CHAPTER NEWS AND COMING EVENTS. ARTICLES-Comments etc. all correspondence to address below

Electric
Auto



NEWS

Association

MAY 1988

1249 Lane St.
Belmont, CA
94002

Address Correction
Requested

NON-PROFIT
ORGANIZATION
U.S. POSTAGE
PAID
SUNNYVALE, CA
PERMIT NO. 420

HELP!! PROJECT-X
State of art HYBRID



PLEASE
TIME DATED MATERIAL - DO NOT HOLD DODGE CARAVAN