

**PRESIDENT**  
 William Shafer  
 308 S. East Ave.  
 Oak Park Il 60302  
 708/383-0186

**F. V. E. A. A. NEWSLETTER**

**NOVEMBER 1989**

**VICE PRES.**  
 Kenneth Woods  
 1264 Harvest Ct.  
 Naperville Il 60565  
 708/420-1118

**TREASURER**  
 Vladimir Vana  
 5558 Franklin  
 LaGrange Il 60525  
 708/246-3046

**SECRETARY**  
 Paul Harris  
 9421 N. Kildare  
 Skokie Il 60076  
 708/674-6632

**NEWSLETTER EDITOR**  
 John Emde  
 6542 Fairmount  
 Downers Grove Il 60516  
 708/968-2692

**MEETING NOTICE**

The next FVEAA meeting will be **NOVEMBER 17th** at Cragin Federal Savings & Loan 333 W. Wesley st. Wheaton, Il Time - 7:30 P.M. sharp. Guests are welcome and need not be members to attend the meeting.

**DEADLINE** for newsletter **STUFF** - in my hands the friday before the next meeting. Editor

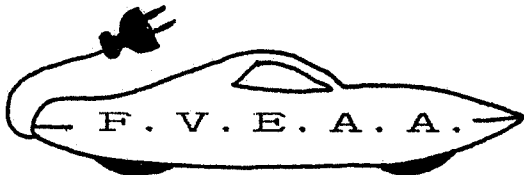
**THE PREZSEZ**

The FVEAA begins its new year with the November meeting. If you wish to continue your membership, please bring your \$15 dues to the meeting or mail you check to Vladimir Vana, our illustrious Treasurer now recovering from a mild heart attack, at 5558 Franklin in LaGrange Illinois ZIP 60525. Be sure to include your new Area Code (708).

The year past has been active. We had 12 monthly meetings; we conducted a Rally at Triton; We donated our Club Car to Triton who now has a fleet of 3 electric cars thanks to the efforts of Member Oviyach; we participated in 4 community events; we made electric car presentations to 4 organizations, and we instituted a Newsletter exchange with similar electric car groups. Individual members continued work to complete or improve their cars.

We will hold our annual election of officers at the November meeting. Further details on this are given in another article.

**Bill**



**FOX VALLEY ELECTRIC  
 AUTO ASSOCIATION**  
 6542 Fairmount Downers Grove Il 60516

**FIRST CLASS**

ADDRESS CORRECTION  
 REQUESTED

MINUTES OF THE FOX VALLEY ELECTRIC AUTOMOBILE ASSOCIATION.....OCTOBER 18, 1989

Pres. Shafer called the meeting to order promptly at 7:30 P.M. There were present 18 members and one guest. Welcome new member Richard Johnson. There was no treasurer report as John Emde reported that V. Vana, while preparing to take a stress test, had a mild heart attack and was in LaGrange hospital. (An update as of 11/10/89..Vladimir had a quad, bypass and is now at home and doing fine. Cards are welcome....hurry up and get better Mr. VANA as we miss your humor at the meetings.) John Emde reported getting a call from Mich. City member Harold Paschack who sent a check for a battery checker which was in our bulletin and no response...so members, please be carefull and don't send in money to them/ Pres. Shafer got a Thank You call from the person in charge of the Montgomery Parade for our participation.....John Stockberger went to Sandwich Illinois to help the man he sold the Fiat to...turned out to be a minor repair to put the car back in good working order. Ray O' now reports that he has had Three (3) cars donated to Triton. The latest a Vega. Dick Ness reported on his latest lightweight bike...weighs less than 70 lbs...regular 12 volt car battery...1/4 HP DC motor and a little rheostat...gets 16-17mph and can be lifted with one hand...(of course you know he is very strong). Frank Delmonico stated that he has a connection for the 107 battery at around \$47.00...tax free..

John Newton reported on his thoughts on his ideal type of Electric vehicle.(this would be a hybrid) He wants 100 mpg with good performance, 20 HP diesel engine with 40 HP electric motor, needs 1 hour rating, 200 amp, 5 min. battery. Will have all the amenities...Air-Cond. radio, full power, etc. He's working with an existing auto. At this point the club took a coffee break....After the break a discussion was held on different types of theories. Environmental considerations for future development of electric cars are either somewhat or very important, per 99% of club members.(present) A majority feel the electric vehicle will meet all the environmental considerations. What percentage believe that the electric vehicle meets your driving needs... 4 out of 18 or roughly 1/2..50%, of driving needs can be met by the electric 5 out of 18 or roughly 1/4..25% of " " " " " " " " " 8 out of 18 or roughly 1/10,10% of " " " " " " " " " So you can see that almost 100% of the members feel that the electric cannot fullfill 100% of our driving needs but falls somewhere between 50% and 10% of our needs. Do our members want to continue to exhibit our cars as a hobby...They feel it is a primary purpose and an important ingridient..it was unanimous. We should try to recruit new members and convert cars as a hobby.All the members feel that we should work on what we have,,increase range and upgrade cars.

Objectives for the coming year. 1. continue to tell our story. 2. encourage new membership. 3. improve cars for our members and for new members.

Frank Delmonico brought up the following question. "How many members would like to have our meetings to be a 'Hands On' type meeting on mainly one technical subject...and how many meetings should we have like that?" A questionnaire will shortly follow.

Ken Woods will try to line up the Fox Valley shopping center for exhibition for next spring.....also maybe Yorktown shopping center...more info to follow..

The meeting was adjourned at 9:15 P.M.

Respectfully submitted,

  
Paul P. Harris, Secretary

# Scientists charged up over plastic batteries

By Jon Van

Revolutionary new technology promises that miniature batteries, thinner than a piece of paper, should be on the market within a few years, researchers predict.

These ultrathin batteries, which replace traditional acid electrolytes with plastic film, are likely to compete with button cell batteries to power small consumer electronics items, such as wristwatches, calculators and cameras and may be used in new applications.

"Smart" credit cards equipped with a tiny computer chip to keep track of a user's banking records as well as such other information as medical history are being test-marketed in Europe and Japan. These cards probably will be powered by plastic batteries as soon as they become available, said Boone B. Owens, a University of Minnesota chemical engineer and battery consultant.

Other new uses could include putting tiny solid-state batteries on an integrated circuit to provide onsite power for computer memory chips.

In many applications, the plastic film batteries may be linked to a small array of solar cells that will generate low levels of current when exposed to light, recharging the batteries.

"What this technology really does better than any other is to provide for miniaturization of batteries," said Owens.

Though the first commercial

applications of plastic batteries will likely be to power electronics equipment with very low power demands, researchers are scaling up this technology so large versions of plastic batteries will be available eventually to power electric automobiles.

Their light weight, durability and lack of corrosiveness also

make plastic batteries natural candidates for space flight, and the National Aeronautics and Space Administration is interested in developing the technology.

Traditional lead-acid batteries are made from plates of lead and lead peroxide immersed in a sulphuric acid solution, called an electrolyte. Charged atoms, called ions, flow through the acid within the battery from one plate to another, setting up an electrical imbalance that causes electrons to flow through wires attached to the battery terminals and completing a circuit.

These batteries are heavy and tend to corrode, said Mark Ratner, chairman of the chemistry department at Northwestern University.

"When automobile batteries fail, it's because lots of pieces of lead are chipped away from the plates and fall to the bottom," said Ratner.

The new technology, which has attracted widespread research attention in this decade, works on the same principle as traditional batteries, but the acid solution is replaced by an electrolyte made from a thin plastic film treated

with a salt.

The plastic film conducts ions between plates typically made from lithium and vanadium oxide.

In concept, plastic batteries offer several advantages over batteries made with liquid electrolytes. Plastic batteries tend to hold their charge longer and can be recharged many times without corroding or degenerating. They also operate over a broader temperature range than batteries with electrolytes made from liquids, which may freeze in extreme cold or boil in extreme heat.

Some batteries on the market use a gel or a solution suspended in plastic as their electrolyte, but none is totally solid state.

At Northwestern, chemistry professor Duward Shriver and graduate student Peter Blonsky pioneered development of plastic films with high electrical conductivity at room temperature. Though current plastic films are about 10 times less conductive than liquid electrolytes, they still could run cardiac pacemakers, smart credit cards or other electronics that don't use large amounts of power, said Shriver.

Most plastics are electrical insulators rather than conductors, said Shriver. The idea of using plastics as significant conductors is relatively new.

In 1973, a British researcher, Peter Wright, first noted that some plastics could conduct significant amounts of current. The idea of using this property to make batteries wasn't proposed until 1979 by Michel Armand, director of a French research center, said Shriver.

"When it was discovered," he said, "a lot of people considered it a real revelation."

Ratner is working with Shriver to understand how plastic films conduct charged particles so they can develop new designs to enhance that conductivity.

Though the process of plastic conducting ions is still imperfectly understood, plastic batteries appear very close to being marketed. A division of Mead Paper Co. in Ohio has developed a plastic battery intended to be commercially viable and is offering to sell the technology, said Shriver.

Owens, the Minnesota battery researcher, said that a Japanese firm soon will produce plastic film batteries for test-marketing, according to a report at a recent international meeting.

Several federal agencies have been pushing the new technology. At Northwestern, research funds have been supplied by the National Science Foundation, the Department of Energy and the Navy.

In Canada, work to produce wide arrays of plastic batteries especially suited for electric-powered vehicles is a high priority at the Institute of Research of Hydro-Quebec, the research arm of Quebec's electrical utility.

Michel Gauthier, chief researcher for the Canadian effort, said that his group, which has worked with Armand in France, hopes to have a plastic battery capable of powering a vehicle ready for demonstration within five years.

"We will probably first prepare a battery to power a wheelchair," he said, "and then scale up from that."

As in other countries, work in Canada on small batteries suitable for powering electronics equipment is much farther along. Hydro-Quebec is negotiating with a battery manufacturer and a thin film plastics company for rights to take the technology to market, Gauthier said. An agreement is expected this year, he said.

## New plastic batteries

A battery has three basic components: two metals, or electrodes, and an electrolyte, which separates the metals and allows charged subatomic particles (ions) to flow between them. The charge imbalance set up by ions inside the battery causes a current of electricity (negatively charged electrons) to flow from the battery. Traditional batteries have used an acid solution, gel or paste as electrolytes; new batteries will use thin plastic film.

### Plastic battery

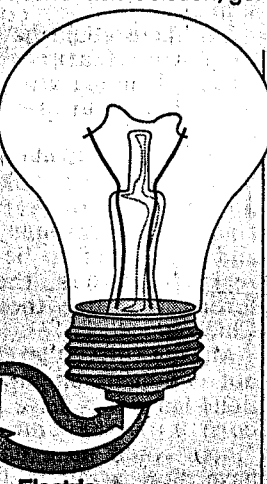
(Paper-thin layers are shown peeled back for illustration)

**Plastic electrolyte:** Provides path for the migration of ions from one electrode to the other

**Lithium (negative electrode)**

**Titanium disulfide (positive electrode)**

Ions flow between layers

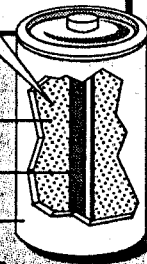


**Electric current**

### Traditional battery

**Chemical paste electrolyte:** Provides path for the flow of ions between two electrodes (zinc case and carbon rod)

**Paste electrolyte**  
**Carbon rod**  
**Zinc case**



When the electrodes are connected by touching metal parts (of a light bulb, for example), electric current flows.

### Advantages of plastic batteries:

- Miniaturization
- Lightweight
- Flexible
- No corrosion
- Tolerate temperature changes

Chicago Tribune Graphic by Megan Jaegerman and Jacqueline Combs; Sources: Chemical & Engineering News, "Osborne Introduction to Physics"

## FVEAA OFFICER ELECTION

After founding in 1975 by John Stockberger who served as President for 5 years, the FVEAA has been led by Len Fisher, Roger Sutfin, Dana Mock and myself. In November, the Club will choose persons to serve as officers next year.

At the October meeting, we decided to keep the organization on the course followed in the past. We established three objectives:

1. Continue to exhibit our cars at community events to inform the public about the capabilities of the vehicles we have constructed.
2. Encourage new members to join the FVEAA and convert cars similar to the ones we have already built.
3. Mutual assistance to members to upgrade cars they already have.

It was evident that the group wished to keep the FVEAA on a hobby basis and not undertake a club effort to develop new concepts such as a new controller or a petro-electric vehicle which we have extensively studied. It was felt that these initiatives should be left up to the interested individuals.

As President, I discussed with organization members their willingness to serve as FVEAA officers next year. The results of my conversations indicated the following:

Vice President Ken Woods is willing to continue to serve as an officer. Since Ken is already President of the Illinois Solar Energy Association and has other commitments, he is reluctant to take on the office of President, but is willing to serve if the group demands.

Secretary Paul Harris is willing to serve as either Vice President or continue as Secretary.

Treasurer Vana is willing to continue in that office.

John Emde is willing to serve as Newsletter Editor and Director for one more year but is unable to take on another position.

Other members contacted did not wish to be an officer.

As for myself, I know that 1990 will be very demanding of my time as a township assessor during a quadrennial reassessment and for this reason I am reluctant to serve as President for a fourth year. I also feel the Association could benefit from a leadership change with different emphasis in line with the organization's objectives. I am, however, willing to serve in any position the membership wishes and stand ready to assist in any project or event.

# Solar-powered cars again find a place in sunlight

## Environmental concerns refuel concept

By Joe Kilsheimer

Orlando Sentinel

MELBOURNE, Fla.—It will be a long time before Doug Cobb worries about running out of fuel for his new car—about 3 billion years from now.

That's because Cobb's car runs on sunlight. Or, to be exact, it runs off electricity stored in batteries that are continually charged by a panel of photovoltaic cells on top of the car.

Cobb, 39, is a master electrician, part-time tinkerer and full-time enthusiast of solar power. He assembled the car during the summer of 1988, originally intending to provide his electrical contracting business with cheap transportation for short jaunts to make deliveries and pickups.

But now the car has won the attention of several business concerns, which are interested in the potential commercial appeal of solar-powered transportation. Cobb recently founded a corporation, New Technology Development Corp., to conduct further research and attract investors.

A former missionary who once taught Indians in Guatemala how to construct solar-powered food preservers, Cobb revs up when he explains that the car was put together with "off-the-shelf technology." Every component of the car comes from a commercially available source.

"A lot of people think that a solar-powered car is something that is way off in the future, but that's not true," Cobb said. "It's here right now. I've just taken all the parts and put them together."

Electric cars have been around since the turn of the century, and environmentalists long have touted them as clean alternatives to internal combustion engines. But electric cars haven't caught on with the public, largely because of their limited range.

But with environmental worries such as the greenhouse effect—a gradual warming of the earth that occurs partially because of automobile exhausts—again on the minds of Americans, Cobb and other researchers believe the time may be ripe.

Skeptics say solar-powered cars still aren't feasible, but in Cambridge, Mass., James Worden commutes to work every day in a solar car he built himself.

The car is a 350-pound silver three-wheeler covered with solar panels that suggests a cross between a golf cart and a Honda Civic. It holds two people, can reach 35 m.p.h. and for four years has taken him on his regular 13-mile commute.

Worden keeps it parked in a sunny spot outside his lab at the Massachusetts Institute of Technology. When he drives it at night, or takes it more than about 50 miles, he plugs it into an ordinary electric outlet to recharge its nickel-cadmium battery.

Worden easily kept up with traffic during a recent spin through crowded Cambridge, where the most significant trouble the car encountered was giant potholes.

One advantage was its silence.

"Has it stalled?" a passenger inquired as the car sat noiselessly waiting for a green light.

"No," Worden replied, "it's recharging."

In a month or two, the 22-year-old entrepreneur expects to produce a four-wheel prototype that will look somewhat like a more traditional automobile.

"We hope to be making a car a day in two years," said Worden, who was a high school student when he built his first solar car and had yet to graduate from MIT when he founded his company, Solelectron Corp.

Worden said his next-generation solar-electric commuter car will weigh 800 to 1,000 pounds, accommodate two people plus 300 pounds of cargo and reach 45 m.p.h. It also will be able to go for 40 miles at night and 60 miles in full sunlight before recharging.

"It's a city car," Worden said. "The idea is, it'll be sprightly and clean and easy. There's no gas and no fuel charge and no oil changes.

"There won't be a muffler, either. . . . The only service you'll need, except the tires, is watering the battery every year or so."

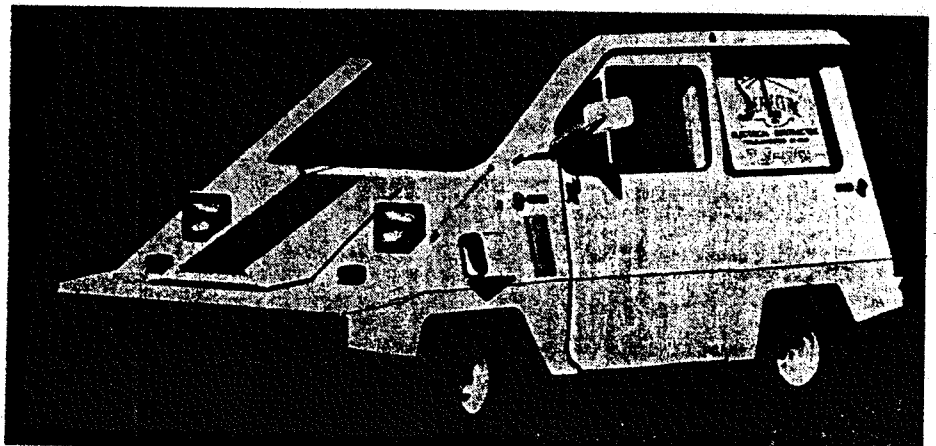
The car should sell for about \$10,000, Worden said. Extra solar panels, which could be left on a roof for recharging, would cost another \$500 to \$1,000.

Worden's four-wheel commuter car has limitations. In full sunlight, it will go only 20 m.p.h. before drawing on its high-tech lead battery. Parked a full day in the sun, it will soak up only enough light power to run 40 miles. Recharging the battery will take up to five hours.

Still, Worden and other solar energy entrepreneurs say that smog, ozone depletion and global warming make electric cars more attractive, even in places where frequently cloudy skies obscure the sunlight.

Solar-electric cars are on the market in Europe. For instance, a Swiss compact sells for \$20,600.

Continued



KRTN photo by Dennis Wall/Orlando Sentinel

Doug Cobb's car runs on the sunlight of Melbourne, Fla.; or, to be exact, it runs off electricity stored in batteries that are continually charged by photovoltaic cells on top of the car.

# Solar-powered cars again

Continued

Some proponents, such as Robert Wills, an engineer at Dartmouth College, predict solar cars will be commercially available in this country before the end of the century.

"There just aren't any better solutions to air pollution in the major cities," said Wills, an organizer of the New England Tour De Sol solar car races.

At the same time, solar technology has advanced enormously in recent years, in part because of lessons learned from long-distance solar car races.

In 1987, General Motors Corp.'s Sunrayer was driven 1,950 miles across Australia in 5½ days, averaging 41.5 m.p.h. This summer, Worden's racing car, the 270-pound Solectria, drove 3,200 miles from Los Angeles to Washington, D.C., in two weeks, with few troubles other than some flat tires.

Many observers still believe that barring soaring gasoline prices or regulatory incentives offered by states trying to reduce air pollution, widespread use of solar cars is a long way off.

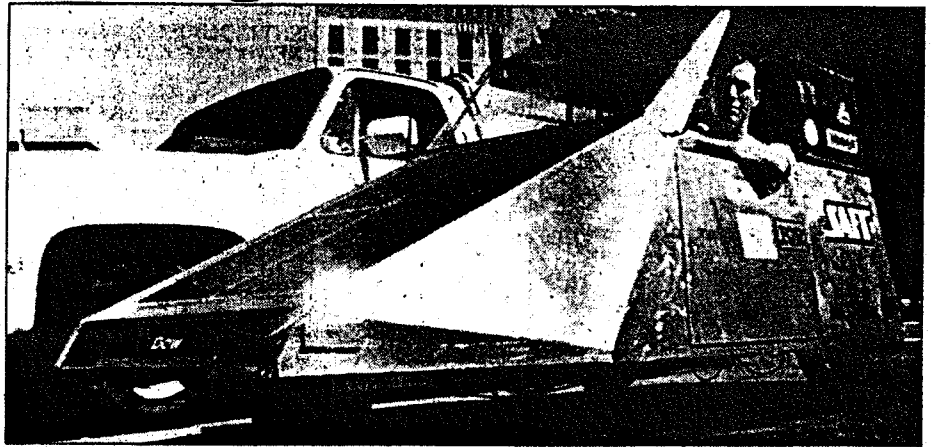
"I would agree with Worden that he has a vehicle that can easily encompass the needs of the average commuter, but whether the commuter will buy it is another question," said Edward A. Campbell, publisher of *Alternate Energy Transportation*, a monthly newsletter based in New York.

"Will the commuter accept something that can only go 40 miles a day and has to be laid up at night?"

Kirk Collier, director of photovoltaics and advanced technologies at the Florida Solar Energy Center in Cape Canaveral, notes that 80 percent of the automobile trips made in America are of 50 miles or less. Electric cars, particularly solar-powered ones, would be perfect vehicles for retirees, light delivery services and many commuters.

"Most American families these days have one main car that they use for family outings and then one smaller car that one of the spouses uses for going to and from work," Collier said. "A solar-powered vehicle would fit into that scenario very well."

Oren Zimmerman, of the Electric Power Research Institute in Palo Alto, Calif., said GM and Chrysler Corp. are committed to producing electric-powered vehicles to be used as fleet vehicles.



AP Laserphoto

James Worden commutes to work at the Massachusetts Institute of Technology in Cambridge in a solar car he built himself. The car holds two people and can reach 35 m.p.h.

The City of Los Angeles, he said, is seeking bids for a 2,000-car electric car fleet, to be used by inspectors and other city officials.

"Electric vehicles are definitely going to be a reality in the 1990s," Zimmerman said. "Mass-produced, solar-powered vehicles may be a little off in the distance, but there's probably a niche market for that kind of thing."

Cobb's little two-seater is no muscle car, but one ride in it dispels any notion that electric cars are slow. The 12-horsepower engine accelerates the car as fast or faster than most subcompacts on the road. Its top speed is 55 m.p.h., but Cobb rarely takes it faster than 45 m.p.h.

The car may look familiar to Postal Service veterans. That's because it is one of 2,000 electric cars that the Postal Service ordered from a Sebring, Fla., manufacturer in the late '70s. It was a plug-in model that was to be charged nightly, but it never lived up to expectations. The constant stops and starts made by letter carriers overtaxed its battery packs; the Postal Service sent all the cars back to the manufacturer. The company resold a few and junked others, but kept a few.

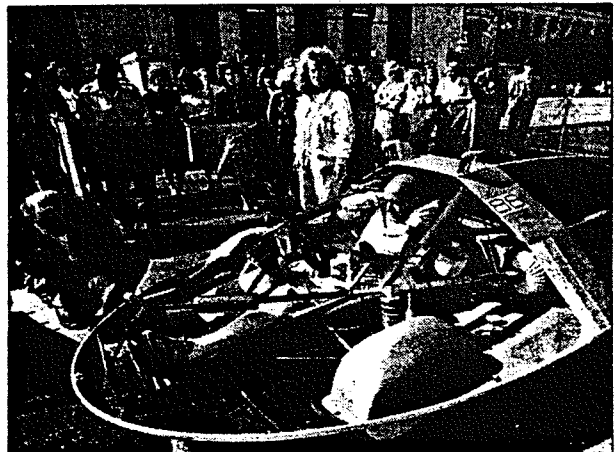
When Cobb learned of the cars in mid-1988, he traveled to Sebring and paid \$800 for one with only 20 miles on the odometer. It has an aluminum roll-cage chassis, and its body panels are made of lightweight polyresin plastic.

Since acquiring the car, Cobb has spent about \$4,200 to make it roadworthy, including the cost of the photovoltaic panels.

Presently, the car's range for a single trip is 30 to 60 miles before he must stop to let the batteries recharge. That depends on the length of the trip and how many times he must stop and start. As he uses it now, the car almost never needs its backup plug for recharging. The exception is long stretches of cloudy days, which for the most part is a rare occurrence in central Florida.

"I get in, I go a few miles, stop for 30 minutes and the batteries recharge while I'm doing whatever I have to do," Cobb said. "That helps extend the life of the batteries, because they don't discharge completely and then have to be recharged."

*The Associated Press contributed to this report.*



The Sunrayer visits the Museum of Science and Industry last April. The car is about 20 feet long, 7 feet wide and 3 feet high.

FOR SALE ---- ELECTRIC CAR

1973 4 Door SUBARU Deluxe Model Series 1400

The car is in remarkably good condition. It is orange. The tires are in good condition. It was converted to electric power in 1980. It has been in service ever since with standard maintenance of new brakes, and two sets of batteries. The current set of batteries, all thirteen, are new and have approx. 50 miles on them. It has always been garaged since it was converted and is in excellent running condition. The mileage is currently 39,583 miles. Of those 6,500 miles were under electric power. The car was converted by John Stockberger, Ken Meyers, Everett Harris, John Ahern, and Len Fisher at the Electric Auto Works in Batavia, IL. It is completely equipped with a custom built tow bar, spare tire and radio.

It was the pace car for the 1980 Americas Marathon (26.2 mile race) in Chicago. It is described in "The Complete Book of Electric Vehicles" by Sheldon Shachet, Page 178 of the 2nd edition. At present it is licensed and is insured by Allstate Insurance Co.

PROPULSION: There are 12 six volt batteries (Two series of six to supply 36 Volts at 400 amperes.) One 12-volt auxiliary battery provides power for lights, controls, etc. The Electric Drive Motor is a surplus aircraft generator that can achieve a maximum speed of 42 mph with a cruising speed of 30 mph. Range has been noted at approx. 50 miles.

Controller: Custom designed Transistor Motor Controller, made by Electric Auto Crafters Batavia, IL, 36 volts at 400 amps.

It has a custom built on-board charger which charges the 36-volt and 12-volt batteries automatically. The car can be plugged in anywhere there is a 120 volt outlet.

Selling Price \$1750, Henry Setton, Phone 485 0334

# BUY IT.



FOR SALE

'82 Dodge Colt hatchback  
4 cyl. 4 speed with 2 speed  
power/economy shift (8 speeds)  
Air cond. Needs CV joint.  
\$150.00

John Emde 968-2692  
708

FOR SALE

Electric car \$1600  
1975 Honda Hatchback O.B.O.  
New tires 54 Volt  
On board charger  
Needs new batteries  
Good condition

Everett Harris

708 232-0344



WANTED TO BUY BACK

To whoever purchased a Homelite  
30 volt 60 amp MOTOR GENERATOR SET  
from Frank Delmonico: Would you  
be willing to sell it back to me?  
Call Frank at 708 544-6312

SEND YOUR:

News, articles, events, want ads, photos to the : *NEWSLETTER ED*  
Membership inquiries, applications & payments to the : *TREASURER*  
Inquiries on club info, tech ??? & all other ??? to the : *PRES.*

ADVERTISING

Free to members  
Commercial: On quote

NEWSLETTER EXCHANGE

The FVEAA newsletter is now being exchanged without charge to other clubs on a reciprocal basis. So far we're sending to New Mexico, Pennsylvania, California, Colorado, Canada and Illinois. These and hopefully many more will keep us informed of news and events in other areas.

**DEADLINE** for newsletter *STUFF* - in my hands the friday before the next meeting. Editor



# FOX VALLEY ELECTRIC AUTO ASSOCIATION

F. V. E. A. A.

Rev. April 15, 1988

## MEMBERSHIP

A membership in the FOX VALLEY ELECTRIC AUTO ASSOCIATION (FVEAA) is open to everyone. Currently there is only one grade of membership regardless of the members degree of participation in association activities. Membership in the FVEAA is contingent upon payment of the annual membership fee. The membership fee can only be waived by special vote of the board of directors. Each member in the FVEAA receives a copy of the FVEAA NEWSLETTER each month. They are also entitled to attend and vote at all association meetings.

All memberships in the FVEAA run from November 1st to October 31st of the following year. The dues are \$15.00 per year payable at the November meeting or by mail.

The following form may be used to apply for membership or to renew your membership.

----- cut ----- cut -----

## APPLICATION FOR MEMBERSHIP OR RENEWAL

Date \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone # \_\_\_\_\_ (please include your new area code # if it changes)

- Just interested in electric vehicles
- I have an electric vehicle (describe) \_\_\_\_\_
- I wish to build an electric vehicle

Amount enclosed \$ \_\_\_\_\_

Make checks payable to: **FOX VALLEY E. A. A.**

Mail to: MR. VLADIMIR VANA, FVEAA TRES.  
5558 FRANKLIN  
LA GRANGE, ILL. 60525