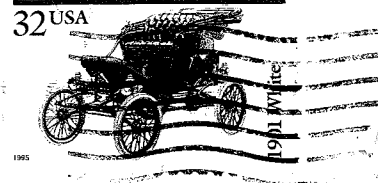
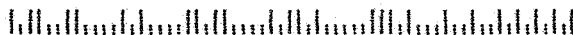


**Fox Valley Electric Auto Association
1522 Clinton Place
River Forest, IL 60305-1208**



John Emde
6542 Fairmount Avenue
Downers Grove IL 60516-2919

Address Correction Requested



NEXT MEETING _Friday, May 17 at 8 PM will be at the Nissan Worksite, Ed Myer's place, 216 Sunshine Drive In Bolingbrook. See announcement & map inside.

DISCUSSION TOPICS - 1. Earth Day Report 2. Project Report 3. Future Events

MEMBERSHIP INFORMATION

Any person interested in electric cars is welcome to join the FVEAA. The cost for a full year's dues is \$20 that will entitle the member to receive our monthly Newsletter that contains useful information about electric car components, construction, policies and events. Dues for new members joining in May will be \$ 12.

To obtain information about the FVEAA, you may contact either President Woods or Vice President Shafer:

President - Ken Woods
1264 Harvest Court
Naperville, IL 60564-8956
(708) 420-1118
E-mail Casa Zeus2@aol.com

Vice President & Editor - Bill Shafer
1522 Clinton Place
River Forest, IL 60305-1208
(708) 771-5202
E-mail WHShafer@aol.com

PRESEZ

John Stockberger announced at our last meeting that he and his wife, Martha, were preparing to move to Tennessee. John founded the FVEAA in 1975 following the first oil crisis. He recognized that an EV would free him from oil dependency for his daily fourteen mile round trip drive to the train station for commuting to the Loop.

Since his retirement from AT&T, John has continued his interest in electric cars, founded Electric Auto Crafters and converted over twenty vehicles for others, is an active participant in Ham Radio activities, learned computer use, and taken on the additional responsibility of volunteer labor for the construction of housing for the poor throughout the country. In the November 1995 FVEAA Newsletter I wrote about the Real Heroes in our free society. Certainly John and Martha would be included. John should be suitably recognized for his accomplishments and FVEAA efforts.

KEN

MINUTES OF APRIL 19 MEETING

The meeting at the College of DuPage was called to order by President Woods at 7:75 PM. Eighteen members, including new member Sam Sheth, and two guests attended. Minutes were approved.

Treasurer Corel reported \$ 2289.35 in the savings account, \$ 2876.88 in checking for a total of \$ 5166.23 (\$4200 of the total is participation shares). Report was accepted.

Project Manager Munroe lead a report on the Nissan project. Members Ken Myers, Vana, and George Krajnovitch have been working on the controller. Enclosure is complete. Soldering and board work remain. Ken estimates completion about 3 weeks. Test gel cell batteries are in the car but still require rewiring and assembly. Member Emde will investigate low rolling resistance tires.

Member Ed Meyers demonstrated a mock-up of a vacuum pump assembly from a 1982 Skyhawk obtained by Member Aarvold. He had refurbished the pump to aviation standards. It is expected to be installed at the next working session.

Ken Myers went over the controller circuitry. It is basically the same used in previous transistorized units using Darlingtons with a chopping frequency of 3 kHz. This unit uses Field-Effect Transistors (FET) that do not require tailored resistors to balance loads. They will operate at 15kHz

Members approved changing the May Meeting site to Ed Meyer's place in Bolingbrook. (See accompanying story for information and a location map.

FVEAA founder, John Stockberger, announced the will be moving to Tennessee after his house in Batavia is sold. He has the front end drivetrain and rear assembly that he at one time planned to incorporate into a frame for a purpose-built EV. It is available at no charge to any member wishing to continue the project.

Former member Tohurs Alcon has arranged for a FVEAA appearance at the Downers's Grove Founders Day event in June. There will be space for three cars. President Woods will ask ComEd for a display of the Ecostar vehicle, the Nissan will be displayed, and Ed Meyers offered to again show his jazzed-up Citicar.

President Woods announced he has added the FVEAA to the Chicago Tribune list of are car clubs.

The meeting concluded with Member Bob Barrett's account of his attendance at the American Power Conference.

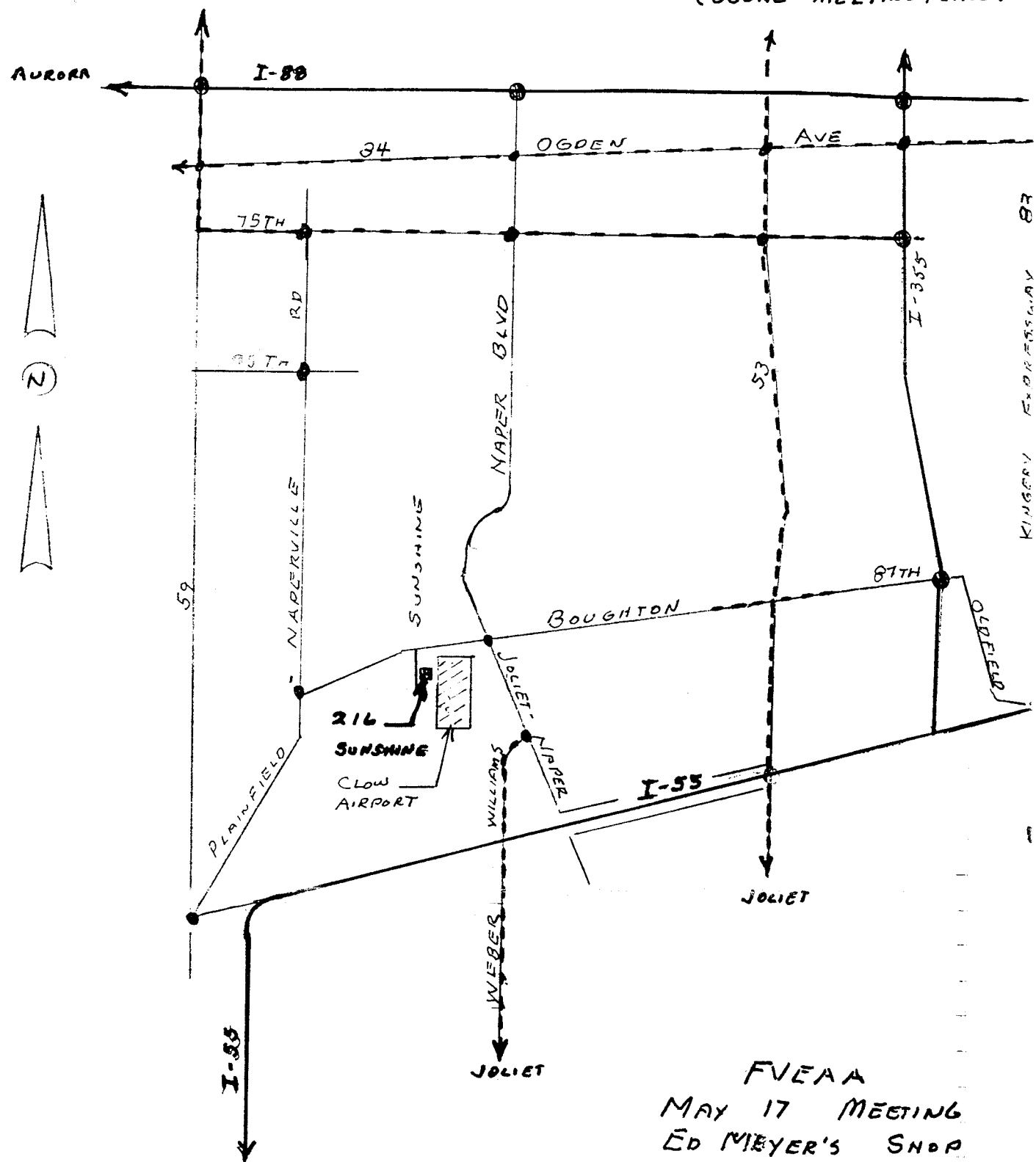
The meeting was adjourned at 10:05.

Submitted by Secretary Aarvold.

MAY MEETING AT NEW LOCATION

The May Meeting will be at Ed Meyer's place in Bolingbrook. This will provide an opportunity for all members to examine the project and progress. It will be held in his hangar so bring your own lawn chair unless you don't mind standing for a couple hours. A location map is included in this newsletter. Many of the roads are afflicted with summer road construction. We plan to start at 8PM to allow for extra travel time.

COLLEGE OF DUPAGE
(USUAL MEETING PLACE)



LEGEND

- INTERSTATE OR EXPWAY
- 4-LANE
- OTHER MAIN ROAD
- INTERCHANGE OR

FVEAA
MAY 17 MEETING
ED MEYER'S SHOP
216 SUNSHINE
BOLINGBROOK
(JUST W OF CLOW)

4-31
W.

RECENT ARTICLES ABOUT EV'S

Pay a little more to hit the road. Chicago Tribune 3/18/96 (Business Section 4) Page 5. Tribune auto writer Jim Mateja in this article states the AAA says it now costs 43.8-62.7 cents per mile to own and operate a 1996 model car. Runzheimer conducted the study for AAA. They assumed 10,000 miles of driving. Insurance cost was for personal use, driven less than 10 miles/day for work and no youthful driver. Gasoline cost used was \$ 1.20/gallon. Each car was equipped with automatic transmission, air conditioning, power steering, power anti-lock brakes, drivers side air bag, cruise control, tilt steering, tinted glass, and a rear-window defogger. Operating costs include gasoline, oil, maintenance and tires. Fixed costs include insurance, license, registration, taxes, depreciation, and finance charges. The following table summarizes the data for various car types:

Car Type	Total Annual Cost - \$	Operating Costs -		Annual Fixed Costs - \$
		Cents/mile	Annual - \$	
Subcompact (Escort)	4380	8	800	3580
Midsize (Taurus)	5133	10	1000	4133
Full Sized (Caprice)	6720	10.8	1080	5189
Minivan (Caravan)	5250	10.2	1020	4230

Editor's Note: For comparison here are the figures for my Mazda RX-7 converted to electric power. In the first full year following conversion it was driven in urban traffic for 1097 miles. Energy used was 0.7 kWh/mile.

Conversion \$	Total Annual Cost - \$	Battery Amortization @ 11 cents/mile	Electricity 767 kWh @ 8 cents/kWH	Maintenance Cost - \$	Fixed Costs - \$ See Note A..
4226	1088	121	62	4	901

Note A - Includes depreciation = project cost/15 years expected life, annual finance charge = 8% of project cost, liability insurance, license and local vehicle taxes. Operating cost, excluding fixed costs, were 17 cents/mile. Total annual cost about the same as the operating cost for a full-sized conventional car.

Plugged in. Autoweek 4/22/96, Chicago Tribune 4/9/96, Spectrum May 96, & others. Just because CARB rolled back the electric vehicle mandate doesn't end EV marketing in California. Honda will offer an EV based on its Civic CUV-4, Toyota will sell electric versions of its RAV4 EV to utilities and fleets, GM will sell its EV-1. The CUV-4 has been tested for the past two years and has a 120-mile range with NIMH batteries. The RAV-4 has a 120-mile range and features air-conditioning, heated seats, stereo and other amenities. The GM EV-1 features are well-known.

The Electric Car Unplugged. This article was published by the Massachusetts Institute of Technology in January of 1996. The FVEAA January Newsletter contained a review of the article and the FVEAA comment. The April and May issues of this magazine printed eleven letters responding to the article. Two were from electric auto associations: Mitchell Boretz in Pasadena and the FVEAA.

California eases call for electrics. Chicago Tribune 4/7/96. By an 11-0 vote, the California Air Resources Board (CARB) relaxed its ZEV mandate. The Board was under heavy pressure from auto and oil industries. A market-based strategy will be followed until 2003. An excellent account of the ZEV was written by Bob Wing and published by the Great Lakes Electric Auto Group in their Dec'95/Jan 96 issue. The article is reproduced in its entirety on the next two pages of this FVEAA Newsletter issue.

(Editor's note: This "Special Supplement" reports on a late-breaking development of major interest to our readers which occurred after the bound portion of this issue went to press. It supercedes the "California Compromise" story appearing on p.3.)

California Air Resources Board To Drop 2% and 5% EV Mandates In Favor Of Market Approach

by Bob Wing

The California Air Resources Board has moved to drop the 2% (1998) and 5% (2001) mandates for electric cars in California. Instead, it has ordered up a plan for a "market-based" approach by automakers allowing for EV sales in much smaller numbers until 2003, when the existing 10% requirement would still take effect.

Since its adoption in 1990, CARB's requirement that at least 2% of new cars sold in the state in 1998 be zero emission (i.e., electric) has towered as a regulatory landmark influencing the EV industry nationwide and foreign producers interested in the U.S. market. The 2% meant a mandated market of about 23,000 cars in California, plus another 17,000 in New York and Massachusetts as states which have adopted the California rule. The rule upped the minimum to 5% in 2001 and 10% a year in 2003 and thereafter.

Under the revised rule which CARB told its staff to prepare, in lieu of the 2% and 5% for EVs, the major car manufacturers are supposed to achieve the same amount of emissions reduction in 1998-2002 by selling cleaner internal combustion vehicles. During this period the automakers would be ramping up for the 10% in EVs in 2003 by r&d, market testing and other EV activities including placing 750 electrics in the Los Angeles and Sacramento basins in 1998, 1,500 by 1999, and 1,500 in 2000. This total of 3,750 EVs could be reduced, however, by "credits" given to the manufacturers for electrics using longer-range advanced batteries and for EVs they put into California before 1998.

CARB's action was widely portrayed as a concession to the auto and oil industry campaigns against the mandates. It also reflected studies indicating battery development, while progressing significantly, has yet to reach commercialization of batteries able to run average EVs more than 100 miles a day.

The Board members are appointed by Governor Wilson, who favors market solutions rather than mandates. In announcing its action December 21, CARB cited its battery assessment panel's report that automakers say there is not enough consumer demand for today's electrics, using lead acid batteries, to meet the 2% percent requirement. They have argued that

forced sales of EVs before they meet customer acceptance would hurt the future market for EVs.

The revised proposal is due for formal Board consideration at a public hearing in March. Chairman John Dunlap said "this plan provides for a successful launch of commercially viable electric cars that protects public health and will provide new high-tech jobs in California."

Car company representatives welcomed the lifting of the 2% and 5% requirements. They remain opposed to the 10% mandate, which would require an estimated 126,000 EV sales a year in California.

Sharp criticism of CARB's move came from a number of EV supporters. A spokesperson for the environmentalist California Public Interest Research Group called it a "sellout" to auto/oil industry lobbying.

The Edison Electric Institute, representing utilities nationwide, denounced it as a "sorry bow to anti-electric vehicle political forces." EEI's Director of Electric Transportation, Rick Tempchin, said "CARB will make a significant mistake if it continues along the course it has now taken. EV technology, consumer readiness and, to an increasing extent, infrastructure is in place to support a true retail launch in 1998. What is missing is the political will to stand up to automakers, oil companies and others who insist that token EV rollouts will ensure the success of this technology."

Some elements of the EV industry see the CARB action as immaterial to their prospects. Joseph LaStella, president of B.A.T. International, a small EV manufacturer, was quoted in advance of the announcement as saying "it won't affect me." He said "I sell my cars now and there are no mandates. I'm expanding and the electric vehicle market is expanding."

Observers widely agree that the California mandate has been a stimulant to r&d and investment in the EV industry throughout the 1990s to date. A major question now is whether enough momentum has built up to keep the industry advancing without the 1998 requirement, or will many EV activities collapse without it?

A number of participants said "details" under the plan which remain will have a significant effect on the California EV market potential. These include the extent to which enforcement and incentives are built into agreements under which the automakers are to lower emissions and help EV development by 2003. Under the plan, specifics would be agreed in a "Memorandum of Agreement" signed by the seven major car sellers in California and the state under a "Technology Development Partnership."

Kateri Callahan, Executive Director of the Electric Transportation Coalition, appraised pluses and minuses from the CARB action as follows:

- on the plus side, carmakers have indicated they will go ahead in a "cooperative way" with the

state's emissions reduction program, in contrast to their strenuous battle against EV mandates to date, and the manufacturers get more flexibility to enter the market in a way they see as best suited for sales. Further, the emphasis on battery development looks toward a wider market in California and elsewhere post-2000, when improved batteries will help gain wide consumer acceptance.

- on the negative side, the number of EVs to be introduced into California before 2003, under the proposal, would be only 3,750 at best compared with 20,000 plus with a 2% mandate, and it is very doubtful that the "ramp-up" of relatively small numbers proposed in 1998-2002 can realistically be followed by an immediate mushrooming to well above 100,000 EVs a year in 2003 as would be required under the 10% mandate.

"It is my hope and belief that there has been enough investment looking toward mass introduction of electric vehicles that people won't stop now, and they will continue to move forward," Callahan said. "I am hopeful that it is past the time when mandates have to be relied on for us to continue the march toward EV commercialization."

Callahan said at least one major manufacturer, whom she did not identify, has indicated its intent to push ahead with EV marketing in California at its previously planned rate notwithstanding the absence of a 2% mandate.

Automakers presently covered by the California regulation are Chrysler, Ford, GM, Honda, Mazda, Nissan and Toyota. Under the new proposal, they could continue with EVs they already have selected for sale in California but would not have to reach the mandate level until 2003. Meanwhile foreign car producers who have been developing EVs for substantial markets in Europe and Asia are eyeing California as a potential money-making sales outlet.

The two northeast states which have adopted California-style mandates - New York and Massachusetts - will now have to review their EV regulations because federal law says California's rules are the only alternative to national emission requirements that any other state can adopt. An Environmental Protection Agency spokesperson said EPA's position is that states cannot adopt emission categories different from California's but that the states are free to impose their own percentage requirements for EVs regardless of California's.

Following is the text of the CARB announcement of its staff proposal to be acted on in March:

(begin text)

Summary: This proposal would suspend the current ZEV requirement until 2003, and propose that auto manufacturers participate in a partnership program to promote and evaluate the development of advanced

ZEVs. All of the exhaust, evaporative and refueling emission reductions associated with the existing ZEV requirements, plus a premium, would be made up by the manufacturers through the production of cleaner cars.

Features:

* Market-based ZEV launch through 2002 - would suspend the current ZEV requirements until 2003.

- Manufacturers would voluntarily introduce ZEVs.

- Annual production capacity of 5,000 ZEVs in 1996/1997, 14,000 in 1998.

- From 1998 through 2002, manufacturers would achieve the shortfall in exhaust, evaporative and refueling emission reductions associated with the existing ZEV requirements, plus a premium, through the production of cleaner cars.

* Manufacturers would agree to a "Cal/Big 7" Technology Development Partnership through a Memorandum of Agreement (MOA) that meets the following criteria:

- ZEVs should be placed in the Los Angeles and Sacramento basins in the following volumes: 750 in 1998, 1500 in 1999 and 1500 in 2000 (without credits applied).

- Manufacturers would commit to continued ZEV research and development, including the purchase and evaluation of advanced battery prototypes prior to 1996.

- A market incentive (extra ZEV credits) would be provided for longer-range vehicles and early (pre-1998) vehicles. Credits retain full value through 2003.

- State of California would purchase some advanced battery vehicles each year.

- Manufacturers would provide adequate materials for training emergency response personnel.

- All vehicle manufacturer-supported media, publicity and legislative initiatives against the ZEV program would be converted to media, publicity and legislative initiatives in support of the Partnership and ZEVs.

- Ongoing review process with annual reports by a committee of signatories to include battery technology, market acceptance, infrastructure and initiatives. CARB biennial review to continue (i.e., 1999, 2000).

- Review process to include discussion of product introduction plans with CARB.

* 10% ZEV requirements begin in 2003.

(end text)

(Bob Wing is West Coast Correspondent for GLEAN/EVNews and an EV consultant. He can be reached at POB 277, Inverness, CA 94937-0277, tel 415-669-7402, fax 415-669-7407, bobwing@nbn.com)

FROM OTHER EV NEWSLETTERS

Future Drive (Argonne National Laboratory) Winter 95/96 Issue. The future car design challenge to a dozen universities is featured in this issue. Each institution is provided a new mid-sized passenger car and is expected to design a system that will achieve 80 miles per gallon fuel economy. Hybrid-electric power systems are expected to be used by many competitors. Info can be obtained on the www at <http://www.nrel.gov/research/hev>.

EVAA (The Electric Vehicle Association of the Americas) in their latest press release announced the 1996 North American EV & Infrastructure Conference will be held in San Diego, CA on December 11-13. For info, Phone (415) 249-2690 or e-mail ev@evaa.org.

The 1996 International Electric Vehicle Exhibition of Electric Vehicles will be held in Beijing at the China World Trade Center on Sept 20-26. Exhibit space will cost \$2900 for a 9 square-meter area.

The 1996 ENER-RUN (Organized by Sportspro) in Hardy, AK will begin their 3764 mile competition thru 13 states in Hardy on May 25. This event is for cars using alternative fuels and energy-efficient vehicles. They expect to be in Moline, IL on May 26th. One EV, the Skutur developed by AZ Technology that reportedly can go 250 miles on a single battery charge is expected to compete for \$ 15k in prizes.

Electric Grand Prix Corp in their Apr-June Newsletter featured a report on the 1996 APS competition held in Phoenix in Feb-March. Forty High School teams were represented in one phase. In the non-high school race competition, a converted Taurus won with an average speed of 46.9 mph. The Ohio State's 1994 Stewart Lightning won the race car event, covering 34 laps on the 1.1-mile track with a best lap time of 56.7 seconds. A converted Porsche won the 1/4 mile drag event with a 14.7 second time.

The issue also had an article on the Capstone 24kw turbine-generator operating at 96,000 rpm that weighs 550 pounds and an article on a safety "kill switch" using a Heinemann Model GJ1-BE-DU0250-016, 150-volt, 400-amp circuit breaker that can be tripped by a dash-mounted "choke" cable.

In the electric bicycle field, Sebastopol CA police now are using ZAP bikes and Sanyo says it has orders for 20,000 EV Warriors.

GLEAN (GLObal Electric Auto News) produced a 28-page magazine for the March issue. It was filled with useful information. If you want your own copy, annual subscription costs \$40 from GLEAA, PO Box 148, Arlington VA Phone (703) 276-9093. This publication is rapidly becoming the premier, non-governmental, source of EV happenings, suppliers, and articles. The FVEAA has a Library copy. C. Jackson Newell, a motor application consultant, had a 2-page article on sizing motors and batteries on an EV.

The April Executive Report contained an article that sales are up at Solectria for the **Force**, a converted Geo Metro sedan. It has a selling price of \$ 30,995 with lead-acid batteries and \$ 74,495 equipped with Ovonic's NIMH units.

Hawker Energy, a quarterly news publication by the company located in Warrensburg, MO, was furnished by a FVEAA member. In a new facility they manufacture the "Genesis" battery rated 120/26Ah or 190/38Ah, and also the 60/80-watt "Odyssey", a 12-volt sealed lead-acid starved-electrolyte battery. A Genesis unit is used in the Japanese-produced "Love Bicycle". In the photo of the bike, the battery and power unit appears to be mounted on the front fork of the bicycle above the fender. (This might cause stability problems.)

A copy of the **Nation Station Car Association's** information brochure was provided by a FVEAA member. This group, formed in 1995, is promoting the availability of small EVs for commuters. Info available by phoning (510) 839-6054, e-mail stncar@ix.netcom.com or <http://www.stncar.com>.

FROM OTHER EV NEWSLETTERS - Continued

The 1996 NESEA Symposium and Trade Show will be held at Madison Square Garden, September 16-18. It will feature sessions on Advanced EV Technology, Hybrids, Buses, Sustainable Transportation, Business and Marketing, and Fundamentals of Building an EV. Individual registration fee is \$ 395.

The 1996 Michigan Electrathon will be on May 25th at the Jackson Race Track and June 8 at the Berlin Track. Information from Coopersville High School, Phone (616) 837-9753. Their Newsletter # 3 reports it will cost \$1500-10000 to build an electric car for an Electrathon competition. The first Coopersville car cost \$7,000 due to the amount of outside help that was hired. Succeeding cars were about \$ 1500. A series-wound motor costs \$50 and is 50-60% effective, a permanent magnet motor starts at about \$200 and is 86% effective, and a brushless magnet motor costs \$ 1000-5000 with a 96% effectiveness. A controller costs about \$300. The frame about \$50. Gauges cost \$300, tires another \$ 300, batteries \$ 200, , sprockets and chains about \$100.

VEVA (The Vancouver Group) in their April Newsletter reports the Honda EV, planned for 1997 has an expected 125-mile range, 0-60 performance in 18.7 seconds, a top speed of 80 mph, and an estimated price tag of \$ 35,000. The issue also covered Hundal's converted Excel and Toyota's RAV-4. The Japanese and Koreans have arrive California Mandate or not.

THE NISSAN CONVERSION PROJECT

Project Manager Munroe reports things are going well., There have been two working sessions in the past month at Ed Meyer's place, and other individual efforts on conversion tasks. The vacuum system for power brakes is essentially finished. The potbox has been mounted and connected. Ken Myers estimates he should complete the controller circuit board work by May meeting time. Test gel cells have been placed on temporary plywood mounts. These are grouped in 60-volt (Five 12-volt ;batteries) modules. Four modules are equipped with chargers, three do not. Ten batteries are in front and 20 in the rear seat space. The car now looks like a low-rider in the rear. Aarvold and Mock are investigating spring replacement options. Stevens has volunteered to form the front belly pan that will protect the motor from road splash. Work has yet to begin on a 96-volt permanent charger, dc-dc converter, power contactor, "kill switch", and instrumentation.

We plan to exhibit the car during the Downer's Grove festival in June, probably with test batteries..

The financial balance sheet and task table are omitted from this Newsletter. Not much money has been expended although we have made good progress . Income and expenses remain essentially unchanged. Power brakes are now 90% complete, potbox is 95%, controller is at 90%

May meeting will offer members who attend an opportunity to inspect the work in progress and offer their comments and suggestions.

Bill Shafer
4/7/96