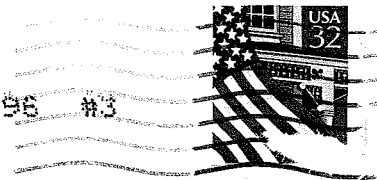
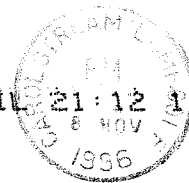


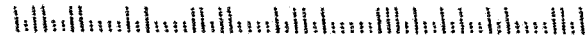
Fox Valley Electric Auto Association  
1522 Clinton Place  
River Forest, IL 60305-1208



John Emde  
6542 Fairmount Avenue  
Downers Grove IL 60516-2919

Address Correction Requested

60516-2919



**NEXT MEETING:** Friday, November 15 at 7:30PM in Room K-161 at the College of DuPage, SW corner of 22nd Street & Lambert Road in Glen Ellen

**DISCUSSION TOPICS** - 1. Election of 1997 officers 2. Project Status 3. College Hybrid Vehicle Program discussed by a speaker from Argonne.

#### 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 November will be \$ 20.

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

#### NOVEMBER, 1996 PRESEZ

The election of FVEAA officers for 1997 will be the first agenda item at the next meeting. All present officers have agreed to serve another term. I was unable to reach John Stockberger and his continuation as a director may require review since his move to Tennessee is pending.

Project Manager Munroe will give a wrap up of the Nissan conversion. Should we have a "Look and Drive" session on a future Saturday for FVEAA members? We need a testing program.

Our speaker is being provided by Argonne Lab. He will discuss the College competition for design of hybrid vehicles.

Ken

## OCTOBER, 1996 Meeting Minutes

The meeting at the College of DuPage was called to order by President Woods at 7:41. Twenty-four members and three guests attended.

The September meeting minutes were approved. Treasurer Corel reported no changes since the August meeting report.

Member Mock played a video of a news broadcast featuring the EV-1. Member Mock also presented a punch list of items needed to complete the Nissan Project. The car has been titled, licensed, and insured so performance testing can be initiated after a battery charger is installed for the 120-volt test system.

There was a discussion about taping all exposed 120-volt circuit elements as a safety measure. A plastic cover has been placed above the major exposed parts.

There was also discussion about test items. There are three essential items:

1. Acceleration with driver only and with driver and one passenger: 0-30, 0-60, 30-50.
2. Range in urban traffic with driver only and with driver and one passenger.
3. Record the energy economy (kWh/mi)

A test subcommittee will be formed to prepare a test procedure, log, and schedule.

Member Ed Meyer presented a demonstration of how a "vernier" counter emf battery can be used to supplement the regular 12 volt accessory battery and avoid the need for a dc-dc converter. This is a standard AT&T practice. He energized two sealed beams at the start with the battery registering 15 volts. Two hours later at the end of the meeting, the voltage was 14.7 and the lamps had not perceptibly dimmed. The design team will consider this option.

Member Irwin Singh presented the viewgraphs of his proposed electropusher that he presented to the Sigma Xi meeting.

Member Shafer led a follow-on discussion of the "What's Next" items introduced at the September meeting. Most of the subjects were of interest to a few members but there were four that garnered sufficient support to qualify as club projects:

1. Do another Nissan, subject to ability to obtain a late-model glider.
2. Prepare a decision tree on car conversion based on our Nissan experience.
3. Investigate an automatic transmission conversion.
4. Do a pickup truck conversion.

There was a brief discussion about having a "See & Drive" event some Saturday for the benefit of members who wish to see the Nissan and have a driving experience.

Based on the preliminary speed run on the airport taxiway, there is a need to verify the car's braking ability from high speed. We should also measure the stopping distance at various initial speeds.

President Woods reminded members that November is annual renewal time. Many members brought their checks, as suggested in the last newsletter. A new membership list will be used for mailing the January, 1997 Newsletter. He also said that officers for the coming year will be elected in November. Any member willing to serve should call Ken Woods.

Submitted by Secretary Dave Aarvold.

## RECENT ARTICLES ABOUT ELECTRIC VEHICLES

**Argonne steers electric car progress.** Daily Southtown (Chicago) October 20, 96, Page 1. Argonne scientists have developed a fuel-cell technology that may be applicable to electric cars within the next decade. Since fuel cells emissions are only carbon dioxide and water, these would be applicable to zero-emission vehicles according to Kevin Miles, head of Argonne's electrochemical technology program.

Experimental fuel cells have powered a bus in the Georgetown section of Washington, D.C. for the past three years. Hydrogen required by the fuel cell was obtained from an onboard reformer using ethanol or methanol as the feedstock. The reformer in the bus was the size of a home washing machine. Argonne has succeeded in shrinking the size to where it should fit under the hood of a car. A methane reformer emission would be nearly 2000 times below the 1994 federal emission guidelines for carbon monoxide, 400 times below the nitrogen oxide limit, and 100 times lower for volatile organic compounds (VOC).

**The GM EV-1 was the subject of three Tribune articles.** Auto writer Jim Mateja reported on his test drive at GM's proving grounds. His conclusion; the car is small, fast, and efficiently inefficient. He notes the EV-1 is a contradiction, not for the impatient, the long-distance commuter, the vacationer, the family of three or more. It implied sale price is \$35,000 which results in a monthly lease of \$ 500 for the car and an additional \$ 50 for the charger. In the article **Electrifying answers 9/28/96**, the author points out that GM expects to own the EV market for at least the next two years with the EV-1 that will be built by fifty workers at the former Buick Reatta Craft Center in Lansing, MI. Plant and equipment there cost \$ 20 million. Development costs were estimated at \$ 350 million. **On 10/13/96**, a reader raised the question of a "fuel" tax on electrics. This is a question to be resolved in the future.

**Electric Car Climbs Pikes Peak.** Machine Design 9/26/96, Page 56. The starting point for this race is 9400 feet above sea level. The finish line is 12.4 miles, 156 turns away, at 14,110 feet. A car conversion featuring Watlow Electric manufacturing Company components made the climb along with 54 gasoline powered cars.

**We try an electric car.** Consumers Reports, September 96, Page 41. Their test drivers spent several days with a 1995 Solectria Force ( A converted Geo Metro). Driving range was 30 miles with the last 10 miles agonizingly slow. Acceleration was sluggish. Their conclusion, "Even if they worked well, they wouldn't help much."

**Ford Is First with Battery Electric Pickup.** Construction Equipment, 9/96, page 70. A converted Ranger is fitted with 26 batteries and costing \$ 33,990 including about \$ 3000 for air conditioning and power steering options. The step off was very smart and the truck was smooth and quiet. Payload is limited to 500 pounds. The vehicle is equipped with regenerative braking. It could be the ideal tool for the right application.

## RECENT ARTICLES ABOUT ELECTRIC VEHICLES - Continued

**Electric car aimed at retired people.** Bombardier, the snowmobile manufacturer, hopes to sell its Neighborhood Electric Vehicle to retired residents in gated communities in warm climates. Selling price is expected to be between \$ 6500 - \$7000 for a car with a top speed of 25 mph and range of 36 miles. The doorless two-seater car design has features found in both golf carts and automobiles. They have been working on prototypes for 2 years. (Sounds like the Citicar - ED)

**A Sport Utility You Plug "N": Drive.** Business Week, 11/4/96, Page 192L. Toyota's RAV4EV (electric version) has NiMH batteries manufactured by Matsushita concealed under the seating area and weighs a scant 200 pounds more than the standard vehicle. It is initially priced at \$ 35,000, with reductions expected as sales volume mounts. This is in the same price range as GM's EV-1, the GM S-10 pickup conversion, the Ford Ranger conversion, and Chrysler's EPIC minivan. The RAV4EV is expected in US showrooms in 1997.

**The Case For Electric Vehicles.** Scientific American, Nov. 96, Page 55. In this article author Daniel Sperling, the director of Transportation Studies at the Davis Campus of the University of California, presents the case for electric cars. He notes that future personal transportation has four options: 1) reduce vehicle use, 2) increase efficiency, 3) switch to less noxious fuels, or 4) switch to vehicle systems that are less polluting. He argues that only the fourth choice is a sustainable option. He presents arguments showing why the first three are not possible or realistic. He says that even allowing for an electrical system that converts 33% of the heat energy in fuel to electricity, the electric option has a net 5% energy advantage over internal combustion.

He notes that worldwide, automakers have spent \$ 1 billion on EV development, but spend \$ 5 billion annually on advertising in the US alone. He also notes that a regional survey at Davis showed that about half of households owning more than one car could easily adapt their driving patterns to effectively use an electric car with a single-charge range of 60 miles. He presents a curve showing that manufacturing costs, with R&D plus marketing and administration costs would reduce EV price by 75% after production reaches 10,000 units. He also includes a further reading reference of seven other documents supporting his hypothesis.

**Electric car helps weekend mechanics get charged up.** Naperville (IL) SUN. 11/25/96, Page 33. This two-page article featured photos of FVEAA Member Ed Meyer and shots of the Nissan Conversion. The story describes how he and other FVEAA Members converted a 1990 Nissan. Ed, a retired researcher in electronics, has a CitiCar that formerly saw service as a Florida postal vehicle. He and his son restored and modified the car. They added a solar panel, raised the voltage from 36 to 48 volts and installed a dc chopper control. Ed regularly uses the car for errands around his Bolingbrook home. He noted that about 94% of all car trips are under 30 miles per day and the electric car exceeds that range. His visits to the local Sears store for parts used in the Nissan conversion resulted in his Citicar being submitted for a future issue of the company's Craftsman Club publication.

## RECENT ARTICLES ABOUT ELECTRIC VEHICLES - Concluded

Member Dana Mock's 1979 converted, Plymouth Horizon was also mentioned in the story. He is a retired chemist, also living in Bolingbrook. He noted that electric car use can free up oil supplies for other uses such as making plastics, medicines, and even asphalt for roads. He said "They serve as niche in our society that is going to have to be filled because the oil is going to run out.

FVEAA member Bob Munroe served as the Project Manager for the conversion effort. He noted the first thing is to find a car that has a body in good condition but has an engine that is shot. The converted car will need parts in the future so it can't be too old at conversion time.

## FROM OTHER EV NEWSLETTERS (Two month's of issues)

**Global Electric Auto News (GLEAN)** in their October issue reported on the S/EV96 held in New York in September. The event is sponsored annually by the Northeast Sustainable Energy Association. New York State is making a bid to become an EV R&D and vehicle production center. Exhibits included most electric vehicles discussed in previous FVEAA Newsletters. They also reported that some governmental units and large companies are looking at French-developed products for their EV purchases in the coming year. French companies will probably sell about 2000 EVs this year.

In their September issue, **GLEAN** featured a Mastretta kit electric car. This is a sporty 2-seat EV with a fiberglass body built in Mexico. It is being marketed by Simpler Solar, a Florida company with a primary interest in photovoltaics. The car has a 192-volt system, a 9" Advanced DC motor with a continuous 50 horsepower rating. Simpler Solar will build the car and offer it for sale with prices ranging from \$ 22,000-34,000 depending on options.

Test drive impressions of the 3600-lb Honda EV that features a 65-hp brushless dc, watercooled motor, 1058 lb. of NiMH batteries in a 288-volt system that gives the car a 115-mile range. The second EV was a 2-passenger curiosity, the Swiss-built TRIKE, a 3-wheel combination of pedal power and electric drive. Last year 200 of the vehicles were sold at a sales price of about \$27,000 each. With both riders pedaling the vehicle reached 30-35 mph. The car steers with a joystick mounted between the two occupants. The issue also provides a listing of 102 electric buses now in use on US transit routes.

**EEVC ( Eastern Club)** in the August issue of their Newsletter featured a description of activities at the 5th PP&L Solar & Electric Car Exhibit in July. Their member, Dave Miller, brought his electric go-kart and had fun circling the track with the pedal to the metal. He built the kart from a 1987 DAF Sprint Kart by replacing the original engine with a 1 HP Doran PM motor and Curtis controller. The 36 volt system had three Willard DC-9 U1 batteries.

## FROM OTHER EV NEWSLETTERS - Continued

The issue also contained an account of member Dan Carlin's improvement to his GE Electrack tractor that he bought for \$ 100. He replaced the original motor with an 8-hp Baldor compound-wound motor hooked with a pair of v-belts to the original transmission. Eight Yuasa-Exide DMS 90-12 batteries connected to a GE EV-1C controller. He first tried the motor with only the series field. The tractor laid rubber and nearly did a wheelie.

**The Electric Grand Prix Corp.** in Rochester (NY) in their oct.-dec. issue had an excellent three page article on cycling Lead-Acid Deep Cycle Batteries written by Jim Drizos of Trojan Battery Company. I hope to get permission to include it in a future FVEAA Newsletter issue when we have the space available. EV information is available from CALSTART, the west coast organization. Their News Notes are available on the Internet, <http://www.calstart.org>.

**EV Circuit ( The Ottawa Folks)** in their July-August Newsletter noted their EV library is located in the office of ESTCO Energy. Two members wrote papers on thermal management of EV batteries at S/EV96 discussing how their techniques keep batteries at efficient operating temperature during those Canadian winters. Member Jelinski reported a significant performance improvement when he replaced the RV tires on his Datsun with Firestone 195 70 R14 tires from Firestone. This is the only size available. They also reported on the six solar cars entered in the Toronto-Kingston-Ottawa solar race.

**The Michigan High School Electrathon Competition** in their September Newsletter states the fourth annual competition will be held at Grand Valley State University in Allendale on September 21. In addition to this event two additional races are scheduled, May 24 at the Michigan Ideal Speedway and on June 7 at the Berlin Raceway. The National Electrathon Competition will also be held July 14-16 at Berlin.

**EV Update from the Sacramento Club** in their September Newsletter reported there are 2604 electric vehicles registered in California, according to Department of Motor Vehicle records. There were 273 trolley buses. There were 660 electric cars and an additional 574 that were likely to be electrics. The Legislature authorized low-emission cars to drive in the High-Occupancy lanes of California Freeways. Ordinarily there must be two or more in a car. In their October Newsletter they note that four battery companies have received \$ 3.7 million development grants. Battery types are lithium-ion (Saft and SRI International) and NiMH (Varta and Yardney).

**The Maine Sun** in their Fall Newsletter featured an article by their President, Richard Komp, about the development of Park Forest, IL that contained elements of solar design when they were built fifty years ago. Thirteen solar homes in Maine were opened for the 1996 national Tour.

## FROM OTHER EV NEWSLETTERS - Concluded

**VEVA (The Vancouver Folks)** in their September Newsletter reported on DaVinci Days in Corvallis (OR) that included an Electrathon race. The GM EV-1 was in the city for test driving evaluation in "the harsh Canadian climate". The issue contained a comprehensive analysis of the car. Some interesting data: 136 mile range @ 45 mph constant speed, 89 miles @ 60 and 78 miles with the J1634 driving cycle with 164 wH/mile. Acceleration 0-50 in 6.3 seconds @ State of Charge (SOC) of 100%, 0-50 in 6.7 seconds @ 50%. Curb weight was 2922 pounds. The issue also contains a description of the "Gizmo, a 370-pound 3-wheeler being developed in Eugene OR. It is a 1-person car with a top speed of 35 mph. Estimated sales price \$ 6-7,000. They also report that Matsushita in 1997 will offer an EV motor rated at 80 kW @ 20,000 rpm.

In their October Newsletter they report that two EVs exceeded 200 mph on trials at Bonneville. The two-pass average was 198.487 mph, about 15 mph over the EV-1 record set in 1996. Norway has an EV, the City Bee built by PIVCO. Prototypes of these cars were used at the 1994 Olympic winter games in Lillehammer. Member Rod Cameron has started construction of a 3-wheeled vehicle that features a 27-pound aluminium chassis. Total weight is limited to 132 pounds for classification as a "Limited Speed Motorcycle" in Canada.

**World Electric Transportation (WET)** by Clarence Ellers in Yachacts OR in his August issue provides a summary of 10 battery types for EVs. Energy storage ranges from 56 wH/kg for lead acid to 373 for NiMH.

In the September issue, he lists the 13 Electric Vehicle Symposiums, a biennial meeting that began in Phoenix AZ in 1969. The latest was held in Osaka Japan this year. The next will be in Orlando, Florida December 15-17. Attendance has been about 2000 persons. He reports that Al Cicconi of AC Propulsion drove his Honda CRX 145 miles on a single charge of Optima batteries.

## MEMBERS HAVING STUFF FOR SALE

Bob Sachs, a Chicago fireman bought Member Everett Harris' 1978 Civic that was converted by John Stockberger and Ken Meyers at the Electric Autowerks. He drove the car 5 miles between home and the fire station. He got 18-20 miles per charge and a top speed of 43 mph. He says his kids need new toys and he doesn't. He wants so sell the car for \$1800, Or Best Offer. The batteries are sulfated. Like the usual toy, batteries are not included. Considering the excellent job Everett did on the car, this would be a good car for a tinkerer. Call Bob at (312) 463-8410.

Member Dick Ness has a brand-new, never used, McGunn home safe for sale. It is about an 18" cube and has both a combination and keylock. He is asking \$ 175, fob his house in Chicago. Call him at (312) 889-7757 if you are interested.

# FOX VALLEY ELECTRIC AUTO ASSOCIATION (NISSAN CONVERSION PROJECT)

Report Date

11-02-96

## Balance Sheet

Expenses

Income

1	Car procurement	\$ 550.00		1	Sale of unused engine components	\$ 120.00
2	Tow bar attachment	\$ 75.00		2	Sale of Certificates	\$ 4,700.00
3	Repair body rust	\$ 40.00 Estimate		3	Authorized transfer from treasury	\$ 2,000.00
4	Paint	\$ 138.00 Estimate		4		\$
5	Motor	\$ 1,654.00		5		\$
6	Controller (1231C-7701)	\$ 1,045.00		6		\$
7	Battery (trial)	\$ 100.00		7		\$
8	Battery (Permanent)	\$ 960.00 Estimate		8		\$
9	Main Charger (Ken Myers)	\$ 150.00 Estimate		9		\$
10	Suspension Upgrade	\$ 150.00 Estimate		10		\$
11	Motor adapter plate	\$ 114.66		11		\$
12	Machined plate	\$ 200.00		12		\$
13	Broach to cut keyway	\$ 51.55		13		\$
14	Machine steel Hub	\$ 320.00		14		\$
15	Lifting eyebolt	\$ 4.10		15		\$
16	Misc. Nuts & bolts	\$ 17.22		16		\$
17	Misc. Fasteners	\$ 34.24		17		\$
17	Power cable 2/0	\$ 48.00		17		\$
18	Clutch Disc	\$ 32.59		18		\$
19	Tow bar nuts and bolts	\$ 6.41		19		\$
20	Steering wheel & Ign. Sw.	\$ 50.00		20		\$
21	Motor shock mount	\$ 24.70		21		\$
22	Machine Mtr. Mount	\$ 40.00		22		\$
23	Motor Mount Mat'l.	\$ 14.00		23		\$
22	Master relay	\$ - Owned		22		\$
23	Circuit breaker	\$ - Owned		23		\$
24	Pot-box (Dana Mock)	\$ - Owned		24		\$
25	Auxiliary battery	\$ - Owned		25		\$
26	Vacuum assist (brakes)	\$ 20.00		26		\$
27	DC-DC Converter	\$ 450.00 Estimate		27		\$
28	Electrical Meters	\$ - Owned		28		\$
29	Heater	\$ 125.00 Estimate		29		\$
30	Illinois Transfer Fee	\$ 90.00		30		\$
31	License & Title	\$ 34.00		31		\$
32	Elec. Wiring Supplies	\$ 11.81		32		\$
33	Auto Insurance	\$ 130.93		33	Overrecovery	\$ -18.79

Estimated Items = \$ 1888.00  
Expenditures to 11/6/96 = 4793.21

Total expenditure \$ 6,681.21  
Original Estimate \$ 7,000.00

Total income \$ 6,681.21