CAROL STREAM, IL PROC 18:49 08/13/99 #2

Fox Valley Electric Auto Association
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Address Correction Requested

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NEXT MEETING: Friday, August 20 at 7:30 PM at Ed Meyer's hangar, 216 Sunshine Drive in Bolingbrook. See location map in last month's Newsletter

DISCUSSION TOPICS - 1. Should the FVEAA become part of the National EAA? 2. Should the FVEAA become a sponsor of *Bad Amplitude?* 3. Sponsorship, speakers and and program for our May, 2000 Tutorial. 4. Negotiations for meeting place.

MEMBERSHIP INFORMATION

Any person interested in electric cars is welcome to join the FVEAA. The cost for a full year's dues is $20 which 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 August will be $ 6.

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

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August, VEEPSEZ

Ed Meyer will again roll his Piper out of the hangar so we can have our August meting at the same place we met in July. The July Newsletter included a location map that you can recycle. For those of you who didn't make the last meeting or who have lost the map, call Ken Woods

Member George Hamstra has been receiving messages from his web sites. Since putting the FVEAA on the web, George has received inquiries asking why our group is not a chapter of the National EAA. Dues are $ 39/year for each individual. Less than half of this is returned to a local chapter for their operations. Each EAA member gets a semi-monthly EAA Newsletter, *Current EVents.* I have written to the EAA offering to exchange Newsletters as we currently do with 26 other EV organizaztions, parts suppliers, EV Pioneers who have retired, and individuals who contribute material for our monthly newsletter. The national EAA has not responded.
BILL

MINUTES OF JULY MEETING

The picnic at Ed Meyer's hangar in Bolingbrook began at 6:30. Fifteen members and nineteen guests attended. Fred Kitch drove his *RANGER* to the place and it was examined by members and guests. Members Hamstra and Zak brought Net Gain Technology's Dragster, *Bad Amplitude.* It was also inspected and prepped for a test run on the Clow Airport runway.

At 8:10 PM, Ed arranged for a temporary closure of the airport and launched his two engined Piper airplane. Ed's son Steve flew cover in his Aircoupe in a circular pattern above the airport while Ed made a couple low-level test passes over the runway. The Dragster was positioned for a test run. On the next approach, the Dragster was launched as Ed approached, making a pass about 30 feet above the moving dragster. He recorded a final airspeed of about 130 mph.

The Dragster was next pushed into the hangar where it was weighed on Ed's aircraft scales. The total weight with a single motor and single battery pack was 1360 pounds. A weight sheet is included with this Newsletter.

The meeting was then called to order by President Woods at 9:14 PM. The minutes were approved and Treasurer Corel's report accepted.

President Woods reported that Member Vana has medical problems. Member Shafer reported that Jerry Mitchell has an implanted pacemaker, defibrillator, and infusion pump for antibiotics administration. The members wished these two persons well.

President Woods reported the Union Training Facility in Alsip will be under construction for remodeling for several months. Member Shafer contacted Triton and reported their auto facility is also closed for remodeling until mid-December. Since the two preferred facilities are not available, postponement of the FVEAA Tutorial until May of 2000 was approved by the membership. This will allow more time to seek a sponsor for the event.

Member and Dragster Group participant, George Hamstra, gave a report on their experiences with *Bad Amplitude* in Colorado and subsequently at the US 66 Raceway in Joliet. The last run at Joliet with 36% of the final power expected with two motors and two battery banks produced a quarter-mile run in 12:005 seconds. They continue to tune the system and have a 9.5 second goal. The group has not yet decided to compete in Woodburn, OR. George said they will never again trailer the Dragster over a long distance. Shipment to Oregon may be prohibitively expensive.

The matter of a future meeting place was discussed. There is no resolution. President Woods will be on vacation in Nevada thru August 7 th. Bill Shafer announced he too will be on vacation in Norman OK early in August. As of now we do not have a meeting place.

Member Rod Bohlman asked what maximum voltage could be used on the aircraft-style shunt motor in his "Sparky" conversion. Member Ken Meyers said it should not exceed 16 volts per commutator segment.

The meeting was adjourned at 10:30 PM

Submitted by Secretary Dave Aarvold

FOX VALLEY ELECTRIC AUTO ASSOCIATION

NET GAIN TECHNOLOGY's ELECTRIC DRAGSTER, *BAD AMPLITUDE*
25440 West 163rd STREET
LOCKPORT, IL 60441

Weight and balance measurements made July 19, 1999 by Ed Meyer. No driver and one 336-volt battery pack made up of Hawker Gensis units.

Left Front Wheel	**153.0 Lbs**
Right Front Wheel	**144.0**
Left Rear Wheel	**537.0**
Right Rear Wheel	**552.0**
Total Weight	**1,386.0 Lbs**

GEOMETRY:

Wheelbase - Axle to Axle, Front to Rear = 230.00 Inches
Wheel Tread -Front Axle, Left to Right = 26.74
Wheel Tread - Rear Axle, Left to Right = 41.25

CENTER OF GRAVITY CALCULATIONS

FRONT TO REAR **Front Wheel Weight = 297.00 Lbs**
Rear Wheel Weight = 1089.00

CENTER OF GRAVITY = 180.71 INCHES BEHIND FRONT AXLE

LEFT TO RIGHT **Left Wheels Weight = 690.00 Lbs**
Right Wheels Weight = 696.00

CENTER OF GRAVITY = 0.07 Inches RIGHT of Centerline

RECENT ARTICLES ABOUT ELECTRIC VEHICLES

Fuel cell miracles and urban sprawl. Column by Brock Yates in August Car & Driver, Page 30. There are a number of auto-related issues dealing with new powerplants, SUV emission regulations, ozone, and Al Gore's newly-identified scourge- urban sprawl. DaimerChrysler and Ford were first into the headlines with articles about their fuel cell cars.

There will be a test fleet of 45 cars in the Los Angeles basin powered by fuel cells. He notes that previous tests involving turbine engines, the Wankel rotary, and electric motors never went far beyond the press releases, Fuel cells may be the next abortion.

A fuel cell powerplant costs $ 4000/kw compared with the $ 30 per kw for an IC engine. The cells require expensive, exotic materials such as titanium, platinum, and complex alloys. They also require an electric motor and complicated management system. He predicts a retail price equivalent to the "GDP of a banana republic" and a repeat of GM's EV1 test experience.

Hydrogen, cleanest of all no-pollution myths. Column by Patrick Bedard in August Car & Driver, Page 32. Hydrogen is odorless, colorless, and takes up 14 times the volume as a pound of air. It is a *huge* fuel requiring big tanks or cryogenic storage at minus 453 F. Getting hydrogen requires busting up a water molecule and that requires an energy input.

Most hydrogen is derived from natural gas. NASA pays $ 1.05 per pound of liquid hydrogen delivered to Huntsville. Wholesale gasoline (before taxes) costs eight cents per pound. Hydrogen derived from petroleum is obtained by processing the liquid in a reformer that has an efficiency of only 55-65%. Hydrogen can be obtained by water electrolysis, but this process requires electrical energy. Hydrogen *could* be made from garbage, biomass, or by genetically-altered plants if we knew how to do any of these affordably.

Keep an eye on this Sparrow. Columbus (OH) Dispatch 6/26/99 (Wheels Section) This article was written by Matt Nauman of Knight-Ridder Newspapers. It is about the **Corbin *Sparrow*** EV. This is a one-person EV that is part motorcycle and part car. Its kidney-shaped exterior resembles a jelly bean or a nose with wheels. The company plans to build 3-400 vehicles this year. It is going into production after three years of development and $ 4-million spent by Corbin-Pacific in Hollister CA. Several hundred customers have deposited $ 1000 checks after seeing the car at west coast auto shows.

The car is classed as a motorcycle and doesn't require crash-testing, although the company plans to do this next year. The car has a 65 mph top speed, a range of 40-60 miles, and will sell for $ 12.900. The name was chosen by Mike Corbin who noted that, "Sparrows are found in almost every major city in the US and this is company's objective".

The 1999 Sunrace results were reported in the June 13 Columbus Dispatch. There were 40 entries, Twenty nine from universities. The 10 day event was plagued by terrible weather. The east coast experienced clouds and storms. There was only 2 1/2 days of sunshine that forced contestants to rely on battery power from recharge points along the 1300 mile route from the Smithsonian Institution in Washington to Florida. The event was won by a team from the University of Missouri in Rolla.

RECENT ARTICLES ABOUT ELECTRIC VEHICLES - Concluded

Battle of Batteries. Business Week 8/9/99, Page 27. Car batteries may be challenged by new developments. There have been developments in nickel-zinc (NiZn) batteries by tiny Evercel in Danbury, CT. They may have found a way around the tendency of NiZn cells to grow sharp dendrites during recharging. These spikes penetrate cell separators and short out the cell after just a few recharge cycles. Evercel adds calcium to the zinc electrode to thwart this process. Tests by Evercel have recharged their batteries 500 times.

Another entrant in battery development is Boulder Technologies in Golden CO. They are increasing the power density of lead-acid cells by winding the thin plate-separators in a spiral. This increases the active area and increases the power by five times. (Editor's note - the same technique is employed by OPTIMA who have offered their Red and Yellow top batteries commercially for several years). Not to be left behind, Exide is developing the same process.

The Bolder battery could substitute for convention car SLI units. Their unit would weigh just five pounds. Boulder has an exclusive licensing arrangement with Johnson Controls (Die-Hard's) that prevents Boulder from automotive applications until 2001.

These developments could open up a whole new area for electric bikes and scooters. The initial applications will probably be offered in Asia where the bicycle and scooter use has not yet displaced automombiles.

Festival energizes environmental studies. Columbus (OH) Dispatch 5/22/99. Joseph Mastroianni from Woburn, MA has been crossing the US riding an electric bicycle. He stopped in Columbus on Earth Day at the invitation of American Electric Power to exhibit his vehicle. Batteries on his bike must be recharged or changed every 30 miles.

Smoke and mirrors and mileage. Business week 8/9/99, Page 36. The popular SUV's are making it harder for Detroit to comply with mileage mandates. The Corporate Average Fuel Economy (CAFE Standard) for light trucks (SUV's included) is 20.7 mpg. The standard for cars is 27.5 mpg. Carmakers claim the standards adopted in 1975 after the US was reeling from oil embargoes should be changed to reflect customer's current wishes. Environmentalists argue there is a need to close loopholes in the law that carmakers have been using and raise the requirements.

Gimmicks automakers use to meet a current year's target are by shortening the production year, by borrowing credits against future years, and credits granted for producing alternate fuel vehicles. The recent Postal Service purchase of vehicles that can use ethanol is an example. Regulations assume these vehicles will run on ethanol 85% of the time, but there are only 200 ethanol-filling stations in the country. Most of the time they will use gasoline and get under 20 mpg but carmakers still get the advantage of an assumed 50 mpg. It appears the Big Three have now run out of these options and face $ 150-million in fines for the 1999 model year.

FROM OTHER EV NEWSLETTERS

Most Electric Auto Groups are now issuing newsletters every other month. Only EV News and EEVC Newsletter were available at press time this month.

EEVC, the Eastern EV Club in their July newsletter led off with a story about Honda's 2000 Hybrid. Their system is called Integrated Motor Assist (IMA), using a 1 liter, 3-cylinder lean-burn engine. It uses a dc brushless motor that is only 60 mm thick. The battery is a 144-volt NiMH. The engine runs continuously and the motor gives it the performance equivalent of a 1.5 liter engine. Total vehicle weight is under 2000 pounds, achieved by generous use of aluminum and plastics. Estimated selling price is under $ 20,000. Honda expects to beat the Toyota *Prius* to market. (Editor's note - With its lightweight and engine-motor use on acceleration, it is possible the Honda 2000 will be better received than the *Prius* that uses only an electric motor for acceleration for the first 13 mph. We all know that acceleration sells cars)

Oliver Perry describes work with the Cinnamonsen High School group in their 1999 Tour de Sol participation. Oliver had to finish modifications to last year's vehicle because the students quit.

EV News, Larry Dussalt's effort in the July issue reported in the EnV 99 conference where fuel cells were much-discussed. The strong Nissan delegation to explain that their advanced technology vehicles will include hybrids, fuel cells, and continued development of their *Altra* EV.

The issue also had a report on the Future Car Challenge. The 99 competition was won by the University of Wisconsin modified Mercury Sable with a 1.8-liter diesel engine, an electric motor, and a battery pack made up of 600 rechargeable power packs from cordless tools. Virginia Tech placed second with a modified Lumina that had an electric drive powered by a fuel cell using hydrogen carried in a rear-mounted tank.. Their entry was the only zero-emission vehicle entered. This is the final year for Future car.

General Motors at the event announced it will continue to improve the EV 1 and offer a line of battery-electric, hybrids, and fuel cell vehicles. It was also noted that the GM EV 1 coupe recently covered 220 miles at a constant 45 mph speed on a distance run. Its energy consumption was 0.178 kwh/mile. Check Web site http://ev.inel.gov for information about other vehicles involved in the test.

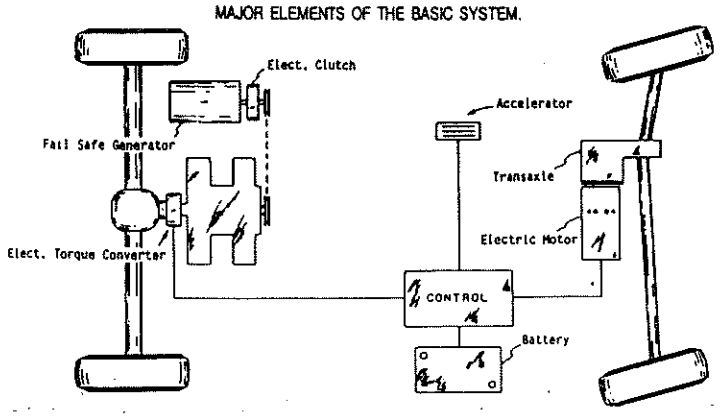
GEM was also represented at the meeting. The vehicle, built in Fargo, ND is intended for use in neighborhoods, being limited to 25 mph. The vehicle has been successful in Michigan's Bay Harbor Resort along Lake Michigan.

AN ITEM OF SPECIAL CONCERN

The Editor received a communication from Clarence Ellers. For those of you not familiar with him, Clarence is an EV pioneer of note. He was active with the California EAA. He later moved to Yachats, OR and published a monthly Newsletter until two years ago.

In 1980, Clarence designed and built a hybrid car, called the *AZTEC 7.*. It was a lightweight vehicle with a fiberglass body and aluminum frame. The car had two independent drive systems, one ICE and the other electric. The front wheels were driven by a 20 hp electric motor and 4-speed transaxle. The rear wheels were powered by a 30 hp Kawasaki motorcycle engine that drove a generator and was coupled to a rear differential through a magnetic torque converter. Clarence invented a unique control system to synchronize the two power sources.

He was granted a patent for his **Automotive Hybrid/Electric Vehicle With Full Time Cruise Control.** The major elements of his system are shown below.



In 1999, Volvo announced it is now working on a hybrid using two independent systems. Of course Clarence in unhappy. Unfortunately when you are granted a patent, it is only a license to sue for an infringement. A patent is like a fishing license that allows you to fish but doesn't guarantee results.

Clarence has a couple other beefs worth noting. Reproduced below and on the next two pages are his observations about the auto industry and a critique of the Partnership for the Next Generation of Vehicles (PNGV) program.

In 1982 we had an EV industry, by 1995 when I was looking for EVs for EXPO-86 in Vancouver there where none, not one production EV to be had. The three shown here had been closed down, plus seven others.

In my opinion their demise was caused by the major auto makers in Detroit. All of a sudden an executive from one of the big three shows up on the board, or even as CEO, a few months latter like magic-PUFF THE COMPANY Disappears? This happened at least three times, that I know of.

THE AUTO INDUSTRY HAS NO INTEREST IN CLEAN AIR AND/OR ELECTRICS!

GM has filed lawsuits to overturn every clean air rule and/or law ever passed or proposed by any state and/or other entity. The auto industry was forced to start production of EVs in return for the dropping of the California 2% EV in '99 and moving back the other percentage rules set for the 21 century.

Although, they are manufacturing EVs, GM, Ford and Chrysler, are doing everything possible to make sure nobody buys one!

1: Using the most expensive components to raise the price to almost double.
2: GM--introducing the $5K inductive charger, in my opinion not for safety but to scare the HELL out of people because it is to dangerous to plug in a charger the same as you do your coffee pot or 100 other electric appliances, charger should cost less than $1K.
3: Infrastructure: Of course infrastructure is very important, however, we did not have a gas station on every corner before we started building automobiles. I have taken my electrics all over the country, coast to coast three times from 1979 to present and have never had a problem finding a place to plug in my charger! In any building there are many regular 120 volt plugs that can be used for charging.
4: Absolute waste of millions of dollars, by treating every experimental and/or prototype as a production model, which, requires millions for useless drawings, expensive production tools & molds, which will never be used! This I was told by two GM executives, one in 1980 in St Louis and one in 1990 on the GM sunryace.

PROOF OF PURPOSE BUILT FAILURES

Please study the Hybrid Drive Test and the ESX test drive (Dow Jones-News) The problem is that the auto industry seems, in my opinion to be "brain dead" when it comes to any thing electrical!

No partnership in PNGV: About five years ago, GM was working on the Impact EV, the prototype for the EV-1, now being produced. On one version they but a large motor in each hub (we call wheel motors). With wheel motors and direct drive the batteries are subjected to enormous currents, as much as 2000 amps instantaneously, so you may get two normal accelerations and than the batteries would be dead.

NOW FIVE YEARS AND A HALF BILLION DOLLARS LATER: Chrysler is testing the ESX (test results attached) using a 50 hp,$7K motor on each front wheel, proving they pay no attention to previous failures. The ESX is the ideal platform for this project and with my system could do 80+MPG and would be a Zero emission vehicle (ZEV) for at least 50 miles, I have projected over 100 miles per-gallon on a long highway trip, using a new trip position I have developed. My system would cut at least $20K off the cost.

NOTE: It takes around 12 hp to drive a 3000# vehicle 55 mph on level road, we usually recommend for good acceleration a 30 hp motor and a minimum two speed transmission.

WHEEL MOTORS SHOULD NEVER BE USED EXCEPT FOR DRAG RACING!

In my expert opinion the auto industry has wasted more than a billion dollars on hybrid/EV programs since the first government support in 1976. Automotive engineers were put in charge of these programs who knew absolutely nothing about batteries and/or battery powered motors and this is still going on. Every one of these project leaders were madly opposed to electric vehicles and absolutely refused to consult with any one that might have some knowledge.

People who were knowledgeable and were actively promoting electrics to save lives by cleaning up our deadly air were avoided like the plague, I personally was ejected from two meetings that I remember.

HERE ARE NAMES YOU SELDOM IF EVER SEE:

James Worden--Founder and CEO of Solectria Corporation
World leader in EV components, motors, generators and electronics

Dr. Paul McCready--Founder and CEO of AeroVironment
World leader in Ultra-lite vehicles, electronics and first fast charger

Dr. Mike Seal--Director of VRI (Vehicle Research Inst.) at WWU.
World leader in Composite vehicle construction--First totally composite car shown at EXPO-86 Vancouver B. C. Fair August 1986.

John Gould--founder and Vice President of Uniq Mobility
In 1979 John designed and built the first composite body family sedan driven by the first brushless DC motor which he also was evolved in the design.

Clarence Ellers--Electronic Transportation Design
World leader in hybrid/EV drive and electronic controls--Designed, built, and patented world's first 84 mile per gallon, 3100# full size sports car in 1981 This vehicle was also shown and demonstrated at EXPO-86.

Now USCAR (the big three section of PNGV) in a desperate attempt to save the IC engine are starting a two or three year project to use the IC engine to add to the electric motor during acceleration. This is completely ignoring the whole purpose of the clean air program. Congress must pass some standards for hybrids requiring at least 30 miles of zero

emissions, otherwise the engine well be running all the time. Toyota uses this system and it has just been proven a failure, only 37 mpg and less than 10 miles as ZEV. June 99 Popular Science.

I BELIEVE THE AUTO INDUSTRY, GM, FORD AND CHRYSLER SHOULD BE CITED FOR CONTEMPT OF CONGRESS:

1: FOR SEEKING AND ACCEPTING CONTRACTS THEY ARE NOT QUALIFIED TO PERFORM!

2: FOR ACCEPTING MILLIONS OF TAX PAYERS DOLLARS TO DEVELOP AND PRODUCE CLEAN AIR VEHICLES, WHILE DELAYING IN EVERY WAY POSSIBLE THAT END RESULT!

3: FOR SPENDING MILLIONS OF CLEAN AIR DOLLARS, WHILE, SPENDING OVER A MILLION DOLLARS A DAY TO CONVINCE THE PUBLIC THEY NEED A FOUR WHEEL DRIVE MONSTER TRUCK THAT COST ALMOST TWICE AS MUCH TO BUY AND TO DRIVE. IN MY EXPERT OPINION, ONE IN 10 MILLION HAVE ANY USE FOR SUCH A VEHICLE!

4: FOR SPENDING MILLIONS TO CONVINCE THE PUBLIC THEY NEED 0 TO 60 IN 5 SECONDS ACCELERATION, THIS CAN DO ONLY ON THING, INCREASE THE AUTOMOBILE DEATH RATE, ALREADY, SECOND ONLY TO GUNS FOR TEENAGERS!

At least five major auto manufactures are using my split-drive system and I have the perfect control system, no shake, rattle and role, anyone can get in and drive with no instructions. My vehicles perform and drive the same as the average gas cars.

I believe future funding should be limited to high speed production methods for light weight vehicles composites, aluminum and plastics. The most important component as always is a power source for pure electrics fuel cells without reformers, advanced batteries if they are really better. Hybrids will do fine with the lighter weight spiral--wound optima batteries. No hybrid should be accepted with less than 30 mile ZEV (Zero Emissions) range!

THE PURPOSE OF A HYBRID IS TO RUN ELECTRIC IN THE CITY AND TO HAVE THE SPEED AND RANGE FOR THE HIGHWAY

THIS IS THE BASICS OF MY DESIGN, PLUS PURE DRIVEABILITY

PUTTING PERFORMANCE IN YOUR ELECTRIC VEHICLE

Beginning with the April, 1986 issue of the FVEAA Newsletter, a series of articles entitled *Putting Performance In Your Electric Vehicle* was included in each month's issue. The topics began with a consideration of Newton's Laws of motion as applied to an electric car conversion.. Other articles included a consideration of efficiency, operational life of lead-acid batteries, charger design, and other topics.

I decided to update the material and include technical advances over the last dozen years. It seems timely to again present the series for the information of newer members, particularly those who are seriously considering a conversion.

The withdrawal of Honda from commercial EV production and the dismal prospects that any auto manufacturer will commercially produce a battery-powered car has diminished the press releases about their efforts. The regular feature **RECENT ARTICLES ABOUT ELECTRIC VEHICLES** has diminished in length. This gives the Editor space to present a rerun of the previous series. It can also offer an opportunity for technical discussions on each topic at future monthly meetings. We can mail five double-sided sheets in each issue for 33 cents.

Future Newsletters will not include articles about any hybrid that doesn't have provision to plug into an external source of electricity. There will also be no future articles about fuel cell cars that require a hydrocarbon-based fuel.

Electric cars are back in the hands of hobbyists where they were fifteen years ago. Hobbyists were instrumental in utilizing many advances in solid-state controls and advanced motor technology. I believe converted electric cars will have a place in the future for private urban transportation.

The first article in the series will be included in the September, 1999 FVEAA Newsletter.

Bill Shafer
Newsletter Editor
August 10, 1999