

Electric
Auto



NEWS

November 1983

Association

Vol. XV No. 11

1984 SEND EVENTS NOW! Calendar NOW!

WE WOULD LIKE OUR DEC. ISSUE TO BE THE MOST COMPLETE CALANDAR OF EVENTS EVER PUBLISHED. REGULAR HANG ON THE WALL CALANDER. PLAN AND REPORT NOW !! NOW!!

EVC SYMPOSIUM & EXPO '83

*Electric Vehicles:
"A Decade of Progress,
A Time of Challenge"*

Reported By JOHN NEWELL

This title was the theme for the Oct. 4-6th Electric Vehicle Council Expo '83 and Showcase of electric cars. Detroit Edison had a most interesting exhibit at this Detroit show. We learned much from their exhibition and literature. Detroit Edison purchased their first electric car in 1977; and that started something. Today the company has 30 electrics and an infrastructure to match. What began as a curiosity evolved into a successful program. "Detroit Edison is genuinely excited about Commercialization!"

What started as an experiment grew into a project aimed at exploring ways to bring on-road electric cars and trucks to the point of commercialization. They wanted to reach the point at which they could be produced in enough volume that they can be profitable for the companies that make the parts, manufacture the cars and sell and service them.

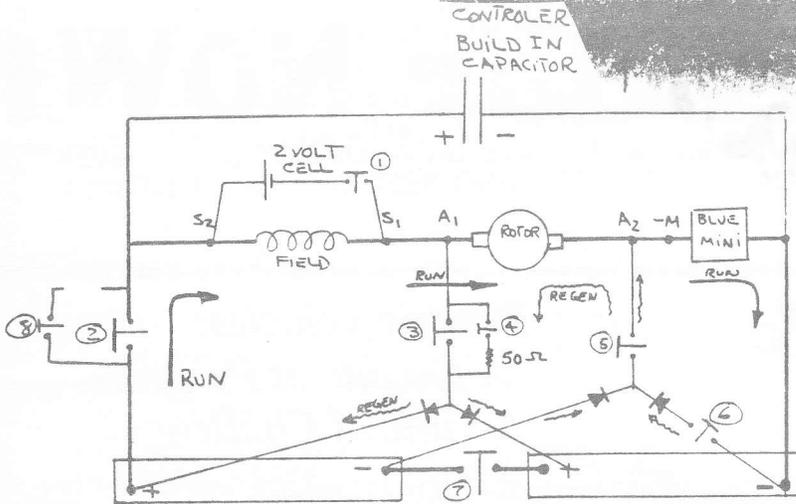
The project found five basic questions which needed answers. First Market Research. Is there a market for electric cars, assuming everything else they did falls into place? Second Technical Development. What could they do technically to make the electric car perform usefully--to satisfy the needs defined by the market research? Third Service and Maintenance.

What sort of infrastructure must be provided to keep the drivers happy and cars on the roads? Fourth Driver Training. Does proper operation of an electric require driver training? Fifth Practical Demonstration. What constitutes a real-life proof that the electric car does what drivers want it to do-- and what useful information will emerge?

At the exhibit Detroit Edison was sharing with all of us their findings and impressions after two years of a three year cost sharing program with the U.S. Dept. of Energy. They put 16 electric cars in the hands of their employes for family use. The cars were distinctively marked as electric. They began monitoring the reactions not only of people who lived near the drivers and saw the cars frequently-- but the general public as well. Within a year there was a marked upsurge in awareness and interest in electric cars. By 1982, 72% of the general public of Detroit expressed itself as being "very, or somewhat interested in electric car ownership". In addition, a more recent survey of the market potential for electric trucks suggests that there are several commercial uses in which the electric light duty truck is the preferred alternative for specific on-road applications.

SQUEEZING RE GENERATION FROM A SERIES MOTOR BY

SAIED MOTAEI



MOTOR: PRESTOLITE (SERIES)
CONTROLLER: BLUE MINI SES

RUN: CONTACTOR

1 OPEN TIME → 3, 4, 5, 6 OPEN TIME → 7, 8 CLOSE → 2 CLOSE

REGEN

2, 7, 8 OPEN TIME → 4, 5, 6 CLOSE TIME → 3 CLOSE TIME → 1 CLOSE

Text by Clarence

When you add 900lbs. of batteries and remove the compression of the ICE ON ANY compact car you are overloading the braking system by at least 100%. Most of you with series motors (Prestolite or others) even the commercial people have not gone to the extra trouble and expense of installing the complex circuits necessary to achieve regeneration. The the problem is that the current in the series winding is reversed for regenerating when the motor is driven. The series field current must be reversed either by a DPDT relay (or relays) or by the teaser Battery system shown here. Since the series field is a very short piece of very large wire it takes a very small voltage to reverse the current as shown in the circuit. Saied has also added a simple diode switching system with 4 diodes and 1 relay to pass the batteries in the regenerative mode. Since the current is directly proportional to the voltage the generator is feeding into this doubles the current, therefore doubling the braking.

'Greenhouse effect' to hit by 1990, EPA

WASHINGTON — The Environmental Protection Agency warns in a report that the warming of the earth known as the "greenhouse effect" will begin in the 1990s.

John S. Hoffman, the EPA director of strategic studies, said in an interview Monday: "We are trying to get people to realize that changes are coming sooner than they expected. Major changes will be here by the years 1990 to 2000, and we have to learn how to live with them."

The EPA says the warming trend, the result of a buildup of carbon dioxide in the atmosphere, is both imminent and inevitable. In the next century, it warns, the world will have to learn to deal with severe changes in climate patterns, with disrupted food pro-

duction and with significantly higher coastal waters.

The higher water level eventually could inundate coastal cities such as Los Angeles and Santa Cruz and cause heavy flooding in low-lying areas of San Francisco and elsewhere along the Bay, such as Alviso.

Fossil fuels are the main source of the carbon dioxide, which lets sunlight enter the atmosphere and heat the earth but inhibits the escape of heat radiation into space. The report strongly recommended that planning start now for dealing with the threat.

The projected average temperature changes do not necessarily reflect the disruptive effects of wide seasonal swings that could bring extremes of heat or drought or rainfall, Hoffman said.

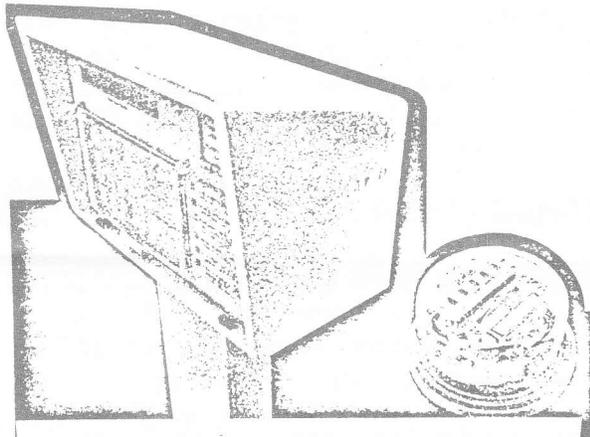
EPA

EXERTS :
PRESS RELEASE OCT. 17
FIND AND READ !!!!!

BAN ALL ICE'S
FROM METRO AREAS

WRITE LETTERS
CONGRESS
SENATE ETC. !!!

With these "family cars" they have conducted battery capacity discharge tests on a regular basis. As a result they have made significant improvements in battery life and performance. They have also conducted on-road evaluation of an improved state-of-the-art lead acid battery and a nickel-zinc battery. They have developed and are using an on-board battery monitoring instrumentation system. One of the most impressive developments is their "Park & Charge" unit or station. It actually uses a credit card for the refueling of energy, i.e. a record is made on your account for the kwhs used in recharging at the curbside. This may enable many drivers to feel at ease to drive greater distances if they know there are readily available recharge facilities along their routes.



PARK & CHARGE . . A CREDIT CARD METER

One of the first activities undertaken in the Detroit program was to build and operate an Electric Car Service Center at office headquarters. It is similar to the conventional garage but in addition it can provide maintenance on the electric vehicles. This has proved to be a learning center, for example the time required for preventative maintenance has been reduced by 50% by what has been learned.

The program was set up for everyday drivers, not professionals, using their cars for everyday purposes. After a drivers training program the family and their electric car are on their own-- using the Car Service Center as they would a car dealers facility. Fifty families have participated in the program. They have driven over a quarter of a million miles. On the average they have consumed 0.80 kwh per mile, or 5¢ per mile for energy (fuel). In short, the experience was not only pleasant and positive for the vast majority of all drivers it illustrates what one can expect with "real people" driving electric cars in the "real world".

Don't you think electric cars are ready to start mass production?? By John Newell

EAST BAY CHAP. VERY ACTIVE

EV EXPO OCT.1&2nd. ALSO AT SOUTH SHORE SHOPPING CENTER OCT. 8th. 6 CARS,200 PEOPLE AND GAVE 40 rides 5THSHOW THIS YEAR GREAT!!

Short Circuits

Here is a time-saving idea I would like to share with other readers of THE BATTERY MAN.

Do you test batteries? If the answer is yes, valuable time is probably wasted searching for the hydrometer, only to find it broken or so dirty the numerals on the float may not be legible.

Since the hydrometer is so fragile, it cannot be kept in the tool box. Hanging it on the wall is also messy and corrosive. Wherever it is kept, periodic dismantling for cleaning is necessary. Here is a simple solution.

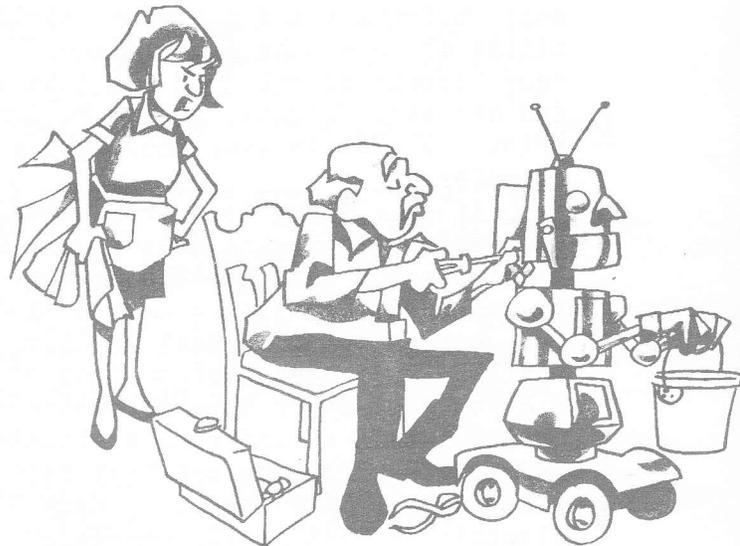
Fasten a one quart glass or plastic container (as per sketch) in a convenient place where there is no risk of breakage. Fill the container with clean water and approximately one teaspoonful of dish-washing detergent. Store the hydrometer in the solution. After each usage, submerge the hydrometer tip in the solution and

compress the bulb a few times, leaving it filled with the cleaning solution.



Time is saved by having the hydrometer in its proper place, clean and ready for instant use.

Submitted by E. A. Garner



"You'll go to any extreme to avoid taking out the garbage, won't you?"

4

I.

THE WORLD NEEDS ELECTRICALLY POWERED VEHICLES
(And the sooner, the better)

WHY, AN ELECTRIC CAR?

Gasoline powered vehicles have been an integral part of our life-style for nearly a century. Tested under every conceivable conditions, upon countless millions of miles; has uncovered whatever shortcomings were present. Mechanical minds, the universe over, contributed their ideas; and with technological progress through the years, the end product became a life necessity. Yet, we hear predictions of innovations, yet to come, that fairly blow the mind.

As acceptance of this mode of travel spread throughout the world's populace; the need for its petrol expanded tremendously. The search for new sources of Crude Oil intensified; spreading explorations to distant, remote areas. Refinement processes escalated, too. Chemists were added as research began concentrating upon the residuals derived from gasoline refinement. With the new discoveries, a whole world of new products is appearing. Their demand is already challenging the energy product for priority in the marketplace. Combined, on a world-wide level; the daily siphoned quota of oil being removed from this planet's total sources, must certainly hasten the day when NO More will be available.

There is no denying that Crude Oil (fossil fuels) has proven itself to be one, if not THE, MOST PRECIOUS resource this planet offers mankind. Considering the vast amount already drawn; it is truly amazing that much oil is still available. But, since our volume of demand, daily, is beyond our wildest conceptions, would you allow me to briefly touch on some factors that affect my concern?

To begin, we must project our numerical estimates upon a global level. Let's start by counting vehicles transversing the land mass: Those personally owned; (?) Public passenger transport; don't forget to add rail travel, too (?); Freight carriers, both rail and commercial trucking (?); The business deliveries and service vehicles (?). Remember; this is a world-wide estimate.

Now, with those figures totaled, let's take to the air: Many nations support freight and passenger airlines with flights that inter-connect to key cities all over the globe. Many flights compete and overlap with others. How many barrels of oil does all this activity demand? Then there are political and military flights, not to be ignored. And there are helicopter patrols and private planes in use, too. Now, your total figures should be beyond most computers!

At sea: There is a tremendous number of sea-going vessels of every size and description using diesel oil. Let's not ignore the extensive fleets of battle wagons most nations deploy. (land-locked nations as Switzerland can be excluded) You should have a mind boggling figure by now! ! !

Let us consider Heating Oils: - Much of the world is touched by inclement weather; some areas moreso than others. Private homes must be heated. How many did you say? Every type of business seeking to attract customers feels they must maintain a comfortable climate within the store (?); hotels; motels; and apartment houses use heat extensively (?); And: Office buildings and shopping complexes too (?). Many Utility companies require oil to operate electric generators for emergency and supplementary service; so we are told.

M. Solen
9/30/83

Thanks for listening.
- Morris Solen
Morris Solen - Northbay chap.
75 Fremont Dr.
Sonoma, Ca. 95476

II.

CON'T:

Are you still with me? ? ? Now, Let's peek into the Residual Products Field.: - I don't believe there is any way for even a remote estimate of the scope of Industrial Chemicals derived from Crude Oil. We can only touch on some of the more obvious products that come to mind. Medicine (would you believe Aspirin for one?); pesticides; fertilizers; paints; caulking compounds; tires; many forms of moldings and seals; adhesives; synthetic fibers (a tremendous array); plastics; lubricants; polishes; waxes; and asphalts: (largely for Roofing and Road Surfacing) That's for starters: - There's a wide field of plastics used in housing construction and yet a wider use as appliance materials and other sundry objects.
ALL OF THESE DERIVED FROM OIL! !!

Fantastic, as it may be; have you any notion of your TOTAL? It's way beyond my comprehension! * * * But this is all a DAILY BASE FIGURE! If we can; let's MULTIPLY this by 365 days. And Multiply it again by: choose your number of years - 20? 50? 100? Haven't we ALREADY DRAINED A SUBTERRANIAN OCEAN?

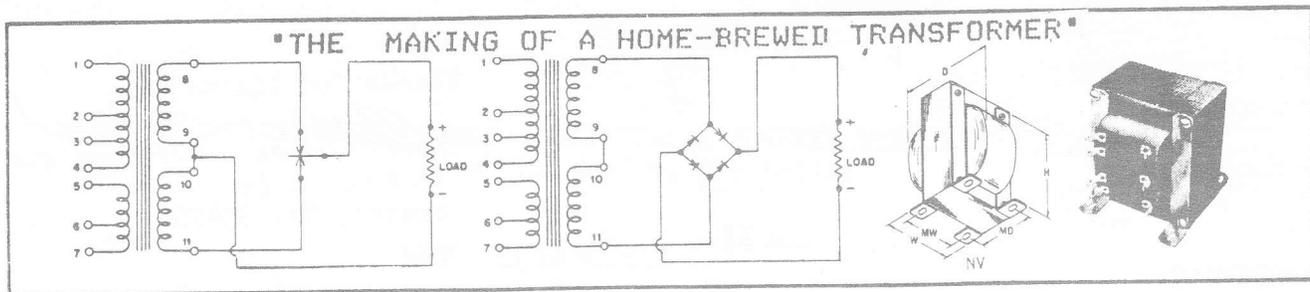
We are indeed fortunate that our planet IS NOT, in total, one solid mass of OIL. For IF IT WERE, we would be able to foresee that eventually it would be reduced to a mere wisp of smoke and a cloud of gases. Since it is NOT so, as there is much of the planet that isn't Oil; we automatically become the TRUSTEES of this ever increasingly precious resource in our tenured life-time. Certainly, future generations will hold us accountable. How dare we expend it so extravagantly: how dare we shirk our responsibilities so casually?

With the need to move about freely, and independently, so much a part of life itself; the following questions demand our sober, thoughtful consideration: - -

- (1.) Must we wait until the last drop of oil is squeezed from this ball of mud before we seriously consider developing alternate energy forms so that we may extend our OIL RESERVES? Whatever arguments to the contrary, the foregoing appraisals leaves no doubt that there must be a limit of global oil sources.
- (2.) Can we truly expect today's well entrenched energy purveyors to lead us away from this imminent morass? Possibly, in the energy field; but will fall far short finding substitutes for many of the residual chemicals.
- (3.) Are we being wise to reject all efforts of Electric Vehicle Development that falls short, in comparison, to our present means of travel? Shouldn't we recognize the advent of a new era; one that closely parallels the introduction of the Horseless Carriage which, in time, has grown to be the fine product before us today?

This Old Man has harboured the foregoing conclusions for one long time; but it wasn't until I set this all on paper, that I truly grasped the enormity of the context. The time has come that we all become aware and face up to its reality!

M. Solen 9/30/83



...BY: BRUCE MCCASKIE, EAA

YOU CAN BUILD YOUR OWN "CUSTOM VOLTAGE & AMPERAGE" TRANSFORMER. THE FIRST STEP IS TO ANSWER THESE QUESTIONS ON THE REQUIREMENTS: (1) WHAT OUTPUT VOLTAGE IS NEEDED (V_{OUT})? (2) HOW MANY AMPS AT FULL LOAD ON OUTPUT (I_{OUT})? (3) WHAT LINE VOLTAGE ON INPUT TO TRANSFORMER (V_{IN})? (120V OR 240V) (4) HOW MANY WATTS OUTPUT AT FULL LOAD (W_{OUT})? "CALCULATE OUTPUT WATTS: (W_{OUT}) = (V_{OUT}) * (I_{OUT})". BY ANSWERING THESE FOUR QUESTIONS YOU NOW HAVE THE DATA TO BEGIN DESIGNING A CUSTOM TRANSFORMER! TRY THIS EXAMPLE: MY ANSWERS TO THE QUESTIONS WERE: (1) V_{OUT} = 48 (2) I_{OUT} = 30 (3) V_{IN} = 120 (4) W_{OUT} = 1440. *WOW* 48 VOLTS AT 30 AMPS IS 1440 WATTS!! FIND THE INPUT AMPS AT 120 VOLTS, REMEMBER THAT INPUT AMPS (I_{IN}) = (W_{IN}) / (V_{IN}). SOLUTION: $1440 / 120 = 12$ AMPS NOW WE CAN SAY THIS ABOUT OUR TRANSFORMER. IT MUST HAVE A OUTPUT VOLTAGE AT 48 VOLTS (V_{OUT}). IT WILL SUPPLY AT FULL LOAD 30 AMPS (I_{OUT}). IT WILL NEED 120 VOLTS ON THE INPUT (V_{IN}). AND IT WILL DRAW 1440 WATTS (W_{IN}). IT WILL USE 12 AMPS OF INPUT CURRENT (I_{IN}) FOR FULL LOAD. NOW ASK...HOW MANY TURNS OF WIRE ON THE INPUT OR PRIMARY OF TRANSFORMER (T_{PRI})? HOW MANY TURNS ON OUTPUT OR SECONDARY (T_{SEC})? ANSWER: A GENERAL RULE IS ONE TURN OF WIRE ON AN IRON CORE WILL GIVE ABOUT (.65) VOLTS RMS. THAT MEANS YOU CAN GET (.65) VOLTS PER TURN. THEN $T_{PRI} = V_{IN} / (.65)$ SO: $T_{PRI} = 120 / .65 = 185$ TURNS (PRI)! TURNS ON SECONDARY (T_{SEC}) = $V_{OUT} / .65$ SO THEN WE CALCULATE $T_{SEC} = 48 / .65 = 74$ TURNS ON SECONDARY! HERE ARE COMMON RATIOS VOLTS : TURNS, 6V:10T, 12V:18.5T, 24V:37T, 36V:55.5T, 48V:74T, 60V:92T, 72V:111T, 120V:185T, 240V:369T. NOW...WHAT SIZE WIRE DO I USE? IF THE PRIMARY IS DRAWING 12 AMPS THEN I USED 12 GA. INSULATED WIRE. THE SECONDARY WILL SUPPLY 30 AMPS AT FULL LOAD SO I USED 8 GA. SQUARE INSULATED WIRE! (CLASS H) YOU NEED TO PUT INSULATION PAPER BETWEEN EACH LAYER OF WIRE SO I BOUGHT .010 INCH THICK "NOMEX". ONE ROLL 3" BY 80 FEET COST \$15 RETAIL. BEFORE YOU START WINDING YOU NEED TO GET A USED IRON CORE FROM AN OLD TRANSFORMER. I FOUND A IDEAL BARGAN FOR \$4 AT A FLEA-MARKET. THE MOST IMPORTANT THING TO LOOK FOR IS A LARGE ENOUGH CORE THAT CAN HANDLE 1440 WATTS. THIS TRANSFORMER WAS RATED AT 36 VOLTS AT 40 AMPS BUT IT WAS BURNT OUT. IT DID HAVE A RE-USEABLE CORE IF YOU CAN GET IT APART! WHEN YOU GET IT APART YOU WILL FIND DOZENS OF "E" CORES AND "I" CORES. THEY CAN BE INTERWOVEN TO FORM A CENTER CORE (THE CENTER LEG OF THE "E") ON WHICH YOU PLACE YOUR WIRE. MINE HAS A IRON CORE CENTER AREA OF 2" BY 3" OR 6 SQ. INCHES OF IRON LAMINATIONS. THE MORE AREA THE MORE WATTS IT CAN HANDLE WITHOUT SATURATION. GET AN OLD TRANSFORMER OF EQUAL OR MORE POWER CAPACITY FOR YOUR NEW DESIGN. TO WIND THE WIRE I MADE A WOODEN "DUMMY" CORE THE SAME SIZE AS THE CENTER "E" CORE. THEN WIND INSULATION FIRST, THEN WIRE, THEN INSULATION. WRAP WIRE AS NEAT AS POSSIBLE, BECAUSE IT HAS TO FIT BACK IN THE MIDDLE OF THE "E" CORE. PUT IT TOGETHER AND TEST WITH A VARIAC AT LOW POWER FIRST. MINE TESTED VERY GOOD AT 20 AMPS (WARM), GOT VERY WARM AT 25 AMPS, AND RAN (HOT) AT 30 AMPS. I TESTED IT FOR 8 HOURS AT EACH AMPERAGE. I PUT IN A FAN SO IT WOULD RUN COOL AT HIGH LOADS (25 TO 30 AMPS) WHILE IT SITS IN THE CLOSED TRUNK OF MY CAR CHARGING. TOTAL COST FOR UNIT \$40.

EV Marketplace

Digital S.O.C Gauges, new design. Have LED bar-graph display, alarm system, and more. Available for 12 to 120v in .6v increments. \$99ea. (1-9) Write for info: KTA SVCS., P.O. Box 1024, Tustin, CA 92681.

* * * * *

Honda Civic, auto trans. 72V \$4,995
Electravan 600 40 K miles, \$4,995
Jet Electrica (Escort) air., pwr brakes \$7,995 -- Four 12 inch Michelin Radials new \$40 each. Prestolite 20 HP motors, 96 V \$795. Stan 415-964-3974.

* * * * *

'65 Renault with motor installed with 10 batteries and charger Plus extra 2CM77 motor and many spare parts, Total worth \$2,500, only \$500 - Call Ed Smith 415-359-3739 after 4:00 p.m.

WANTED: INVESTOR for automobile of the future! Call 805-968-6537.

* * * * *

1972 Mazda 4dr. Baldor 8hp model 8 willey control 36v Lester charger. New tires, \$2000 complete or components. Best offer. 406-443-5635

* * * * *

J&H 10 HP starter generator - GE 10 HP starter gen.\$250 each - Both 400. James Coles 234-E Spc. 5005 Apt. 43 St. George Utah 84770 628-4565

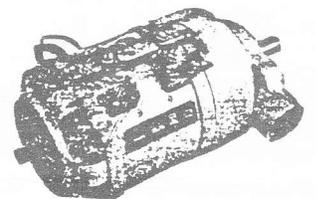
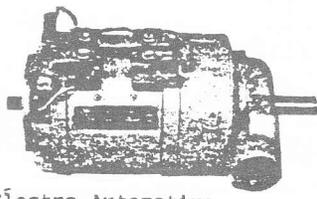
* * * * *

69 Toyota, 96V., PMC Controller, Baldor Motor, Fan, 16 J250, 112V. deep cycle Die Hard Batterys, Tow Bar, overload springs. On board Charger. Ask \$2000, Must Sell MAKE OFFER; 209 952 7370 John Allison 1108 Rosemarie Ln. Stockton, CA. 95207

COMUTA CAR 1980 needs new batteries; \$1000 415 524 9807 Karel Snajberk, 916 Regal Rd. Berkeley, CA. 94708

THE CHINA MOTOR

DESIGNED SPECIFICALLY FOR THE ELECTRIC VEHICLE MARKET!
AT A PRICE YOU CAN AFFORD!



Electro Automotive
5040 Scotts Valley Drive
Scotts Valley, California 95066 (408) 438-3606

LOOK AT THESE OUTSTANDING SPECIFICATIONS:	
Nameplate continuous horsepower	10 hp.
Continuous horsepower @ 96v and 200 amps	20 hp.
Intermittent horsepower @ 96v and 400 amps	40 hp.
Nameplate r.p.m.	3000 r.p.m.
Allowable r.p.m.	6000 r.p.m.
Type Field	compound
Shunt Field Voltage	36 or 72 volts
Shunt Field Current	8 or 4 amps
Weight	110 pounds
Mounting	6" C face
Shaft Type (front)	7/8" 16 tooth spline
Shaft Type (rear)	1-1/8" keyed shaft

Fiat EV excellent condition, solid state controller, GE 72V Motor, Lestermatic charger. \$1300 312-553-5344

Trimuter EV componants L.W. Spencer 4743 Mendoza Ave. San Jose 95111 408-225-2430

OUR DEC. ISSUE WILL BE A CALANDER OF ALL!!! EVents (EAA OR NOT) 1984 SEND NOW!!NOW!!

ADS must be received with payment by the 10th. of the month, for the following month's issue. AD rate is min. 1 to 5 lines \$5.00, 1/4 Pg. \$15.00, full Pg. \$50.00, full Pg. 2 sides \$80.00. Wanted, Trade, For Sale, etc. Mail to EAA 1249 Lane St. Belmont, CA. 94002

Bookshelf

The Complete Book of ELECTRIC VEHICLES by Sheldon R. Shacket
 Revised & Expanded 2nd. Edition, Pictures & Description of almost every Electric ever
 built including many by EAA members, Basic Technical section covering Electricity, Motors
 Batteries, Controls and history back to the year 1600 Legislation and Future Energy needs.
 PLEASE SEND \$10.00 DONATION TO HELP COVER COST OF RALLY TO Clarence Ellers 2892 Mesquite Dr.
 Santa Clara, Ca. 95051. Be sure to include your name and address so we can mail your book.

Current Flight Systems Electric Vehicle Components Catalog is 80 pages, 8 1/2 x 11 glossy
 paper catalog covering motors, controls, replacement parts, books, plans and ideas.
 It is worth the \$3.00. Send for it: Flight Systems, P.O. Box 25, Mechanicsburg, PA 17055

STEP-BY-STEP CONVERSION MANUAL _ By Clarence Ellers. Complete instructions on
 conversion of gas cars to electric. Simple method saves hundreds of dollars. Also
 information on parts and where to get them. Send for summary to Clarence Ellers, P. O.
 Box 2781 , Santa Clara, Ca 95055

NOTICE !!!

STEVE LOUGH & LAWERENCE SHERMAN ARE HOLDING A HANDS ON CONVERSION CLASS
 THRU OCT. NOV. & DEC. ASUW EXPERMENTAL COLLEGE. FOR INFO. CALL
 STEVE AT 206 325 2600

LOS VEGAS; ANYONE WILLING TO PERTICIPATE IN A EV RALLY IN LOS VEGAS
 PLEASE WRITE C. L. FEELEY 10780 GILES, LOS VEGAS, NV. 89119



THIS MONTH

SEATTLE

EV EXPO 1984 INTERNATIONAL AUTO
 SHOW KING DOME NOV. 16 20

EVENT

SEVA EV EXPO PACIFIC SCIENCE CENTER
 NOV. 26 27

ED ITORS: - Walter Laski - John Newell - Bill Palmer - Paul Brasch - COMPILED AND
 PUBLISHED By Clarence Ellers. SEND IN YOUR PERSONAL AND CLUB NEWS AND COMING
 EVENTS. ARTICLES _ COMMENTS etc. all correspondence to address below.

Electric
 Auto



NEWS

NON-PROFIT
 ORGANIZATION
 U.S. POSTAGE
PAID
 SAN JOSE, CALIF.
 PERMIT NO. 3021

NOVEMBER 1983

1249 Lane St.
 Belmont, Ca.
 94002

