Electric Auto Association NEWS

APRIL 1984 VOL. XVI No. 4

DIRECTIONS

COMMERCIAL? HOBBY?
HOME BUILDER?

BY CLARENCE ELLERS

We support commercial endeavors 100%. Infact, we admire and salute anyone with the courage to be a pioneer in an infant industry when there is a very small chance of immediate profits. From time to time, some of our commercial members feel that encouraging hobbyist and homebuilders is in conflict with their various enterprises whether it be manufacturing and/or selling cars, components, or service. As a businessman, for many years, I can assure you there is NO conflict. Every person we encourage to buy, convert, or build an ELECTRIC Is a new, potential customer for our commercial members. This Editor encourages the dissemination of technical information to all members as the most important method of promoting ELLECTRIC TRANSPORTATION.

All men and women are created equal. But we can be thankful we do not all think the same; the interest of the members of our Association are very diversified. The three at the head of this article could probably be broken down into at least 10 subsections each. You can see we are coming from many different directions. To accomplish the same thing and the only way to get there is to help each other in every way possible. We should all encourage and NEVER discourage any effort in any direction they might want to go. Working together we might get those 40 MILLION ELECTRICS on the road.

APR.24th ORANGE CO.
IEEE-JOINT MEETING PES/IAS
SUBJECT: ELECTRIC & HYBRID
VHICLES. JAMES BRYANT OF JPL
WILL BE THE SPEEKER,
CALL R. SCHINZINGER
(714) 786-7691 Days 856-6738

MORE GOOD!! GOOD!! NEWS

A SUPER SALUTE!! TO DONNA C.J. WITSCHI, Tuscon, AZ and a public apology. Donna is the on-site EV Project Manager for the municipal department. The apology is because of my Oct. '83 aricle on the disaster of demo sites. Evidently, they finally found someone who knows how to do it. Too bad the DOE didn't have Donna to show them how to do it from the beginning. She may be the salvation of the whole $246 million DOE EV/Hybrid Program. I am personally taking it upon myself to make Donna our first life member of EAA even if I have to pay her dues myself. Congratulations to Donna C. J. Witschi. Donna ... receives most of the credit from her peers for having the foresight to precisely match existing duty cycles with EV capabilitis-long before the vehicles were actually purchased-to assure that Tucson's "Electric Experience" would be all thumbs-----up. ...
From the city's administrative vantage point, Donald W. Richards, Deputy Director of Operations and the one who first decide to have the "Electric Experience" already refers to it as a "very positive" exprience. So much so, in fact, that he and his people regularly put on EV seminars for other interested parties, disseminate literature on EVs and encourage local automobile dealers and car buffs to seriously consider EVs as alternatives to ICs. (from AVN Mag.,Feb. '84.)

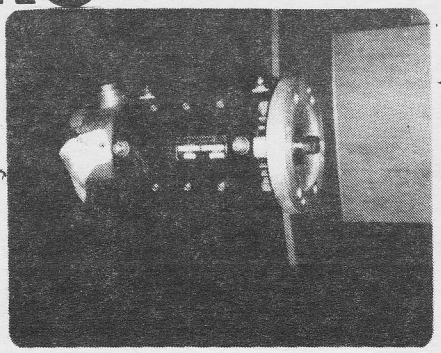
From San Jose Mercury News, Feb. 15, 1984: The Cupertino Post Office is the first in the US to use the new Grumman Allied Ind. vans. A cost of 12 cents per mile for IC Jeeps can be reduced to about 2.8 cents per mile with the electrics. They know because they have been using electrics for the past ten years.

From US News & World Report, Feb. 20, 1984: Britain's Bedford Motors, a GM subsidiary, started delivery of their new electric vans on Jan 24. Best News! Cost around $13,750 with batteries and charger. We have been paying almost that much for converted compact cars.

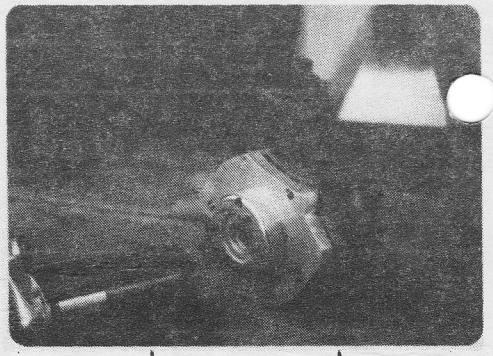
MOTORS

BY RUSS KAUFMAN

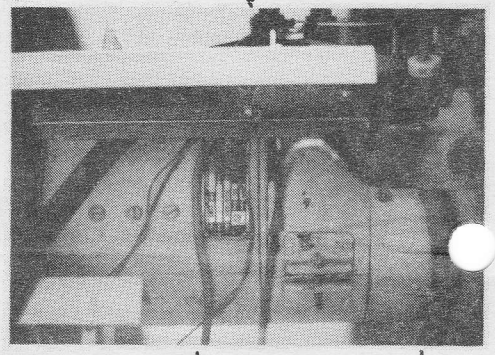
PRESTOLITE



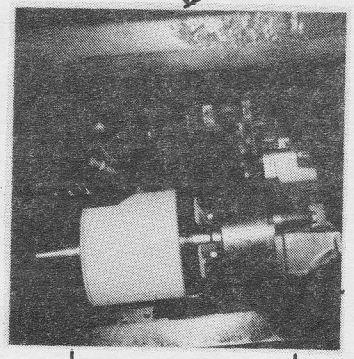
CM76 & Mount



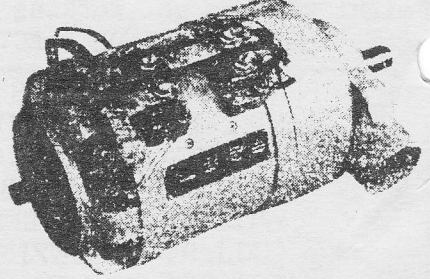
CM88/77



CM88/77 & Rabbit Trans.

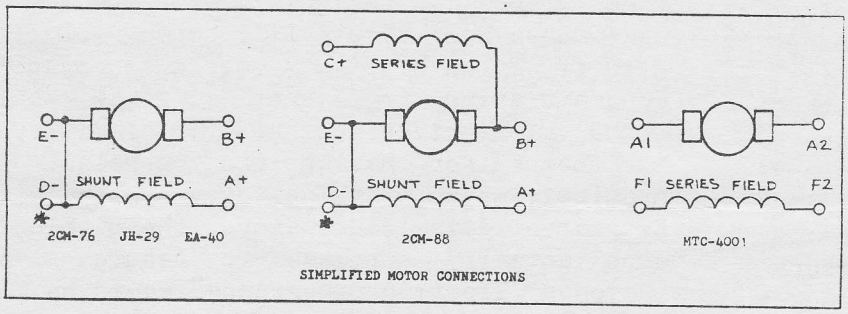


THE CHINA MOTOR



AN ANALYSIS OF AVAILABLE ELECTRIC VEHICLE MOTORS

One of the most important considerations when constructing an electric vehicle is proper motor selection. Unfortunately, there is vast disagreement on motor choice. Some swear by the aircraft motors; others prefer the newer Baldor or Prestolite Motors. This Article will present data on popular aircraft motors and the Prestolite MTC Motor. Part I will show data on the General Electric 2CM76, 2CM88 Motors, Jack & Heintz G29, Westinghouse EA40, and Prestolite MTC4001. Information on motor terminations, dimensions, weights and no-load speeds will be given in Part I. Part II will have data on dynamic testing of each Motor in an electric vehicle at speeds up to 55 MPH, plotted in watts per MPH for any speed. In this way all motors can be compared.

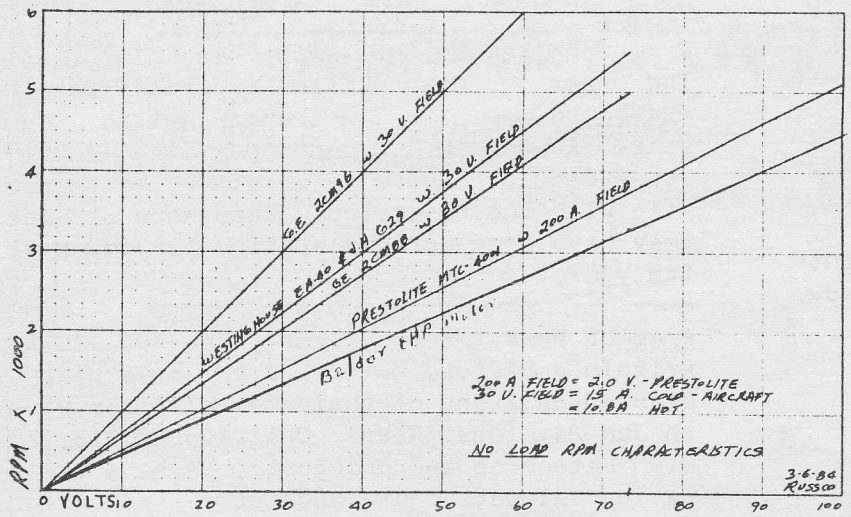


SIMPLIFIED MOTOR CONNECTIONS

MOTOR	MANUF.	TYPE	NAMEPLATE NOMINCLATURE		DIA	x	LENGTH	WEIGHT
2CM76	GE	Shunt	DC Generator	30V 400A	6½	x	15 1/8	63
2CM88/77	GE	Compound	DC Starter/Gen	30V 400A	7	x	16 5/8	95
JH-29	Jack/Heintz	Shunt	DC Generator	30V 400A	8¼	x	13	63
EA-40	Westinghouse	Shunt	DC Generator	30V 400A	7 7/8	x	13¾	66
MTC4001	Prestolite	Series	DC Motor	96V 200A	7	x	16	106

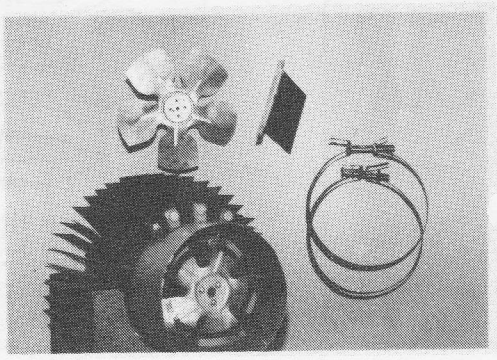
G32 J&H Shunt Gen. 30V 500A. 20HP up to 50@72V.
Baldor Comp. MOTOR 72V 98A. 8 HP
CHINA MOTOR COMP. EV MOTOR 96V 200A 20HP/40 INT

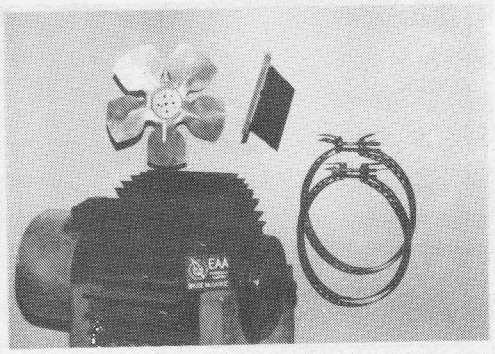
*NEVER USE D TERM CAN USE COMMON- AS COMMON+



COOL IT

BY BRUCE McCASKIE





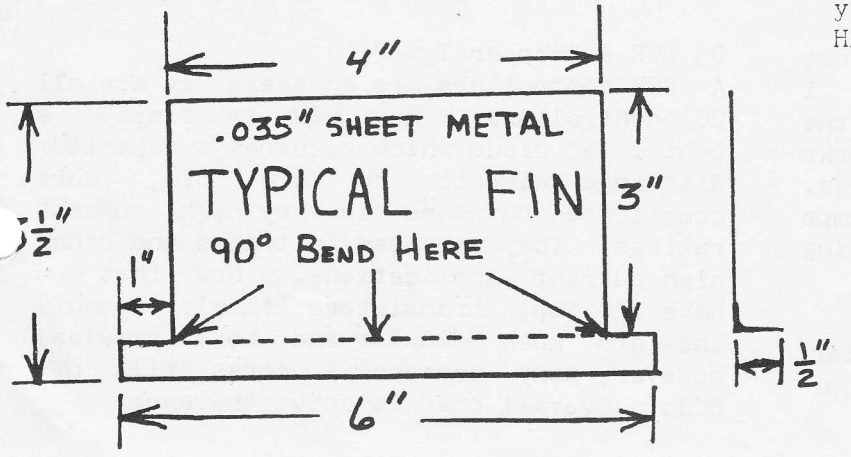
Every hi power electric motor needs cooling, because under heavy loads the motor draws more amps. The copper windings get hotter along with the brushes, and soon the motors insulation would burn up, shorting out your expensive power plant. Not a very nice thing to think about.

Over heating caused by heavy loads is the reason I tried alternative cooling methods. I have used three basic ways to cool my electric car motors.

1. External electric blower (hi volume).
2. Internal fan.
3. Combination using internal fan and external cooling fins (heat sinks)

My first motor -GE/2CM76- was a hot running motor even using an external blower! Note, aircraft generators are insulated with class "H" wiring. Class "H" will take over 212 degrees F. Even if the motor is up to 150 degrees it feels hot, however, it could take much more before it really gets serious!

I wanted my motor to run cooler, so I tried the internal fan method. I used a six bladed fan attatched to the rear shaft. This method still resulted in a hot motor after driving to work-about eight miles on the freeway. I needed some way to really keep it cool.



About one year later, I bought a GE/2CM77 motor and installed a five bladed fan on the rear shaft. This motor ran about the same high temp. as the first motor. I needed a way to draw off the heat and still not lose too much extra power or gain weight. My idea was to cut out fourty-two seperate cooling fins and strap them to the motor. Each fin was hand made and cut out from .035 inch sheet aluminum. After cutting the three by four inch fins, I painted them flat black. I used plumbers strap and screws to tighten them to the motor. If you add up all the area, it is 504 sq. inches of heat sinks. This added less than 5 lbs. to the car and helps keep the motor at a reasonable temp. under most driving conditions.

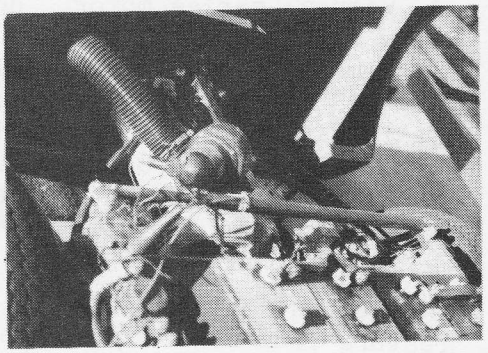
Some day it would be nice to use this excess motor heat in the winter to heat the car and the driver.

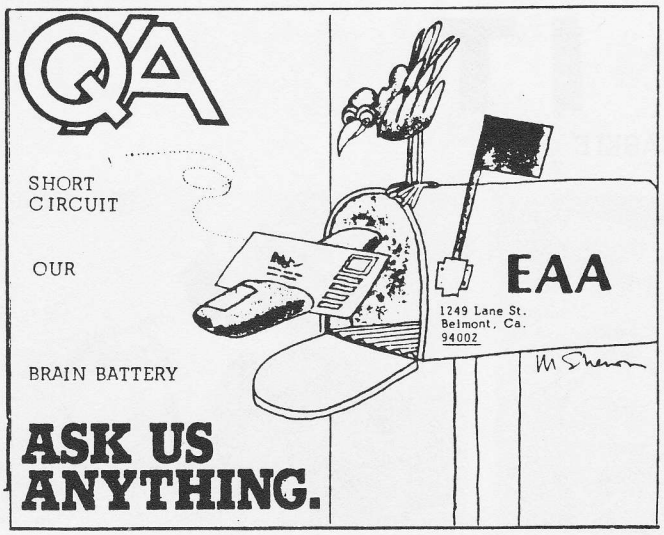
My conclusions are:

1. Drive light on the amps to keep the motor cool.
2. If you are a "lead-foot" you should have a high volume external blower. Your motor will cool when you rest at the stop lights.
3. If you don't want any external blowers, then you better learn how to cut sheet metal and make some heat-sinks for your motor.

HAPPY MOTORING...Bruce McCaskie,EAA

EXTERNAL ELECTRIC BLOWER





Q Will you print the complete controller
A Yes, we will have a complete circuit of the state of the art controller next month. Tried and proven and almost industructable! Also, we have had and will have more simple and inexpensive battery chargers.

Q Diode switching ?
A Under Oct. in our calender, Ed Rannberg's diode switching system is featured, we will have more.

Q Does the field have to be reversed?
A Yes, on a series motor the field must be reversed to obtain regeneration. Shunt motors NO.

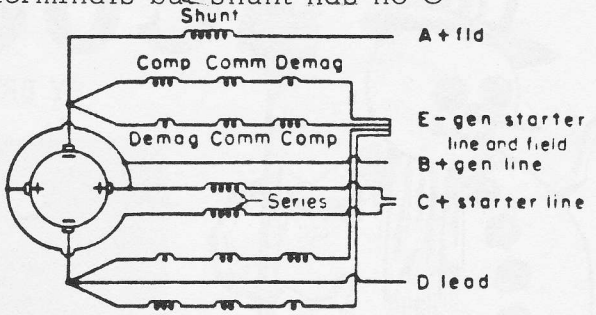
Q Battery tapping for speed control?
A No! Battery tapping is no good for speed control, the discharge is just to unbalanced to be practical. (Don't try it again, once is enough.)

Q Regeneration voltage with 30 volt aircraft generators?
A Because the most important use of regeneration is to protect your brakes, (I almost never touch my brake), it is used at slower speeds. Since the output of a DC Generator depends upon speed and field current, you must parr. your batteries down to at most, 36 volts.

Q Is braking controllable?
A With a series motor, no, at least not very easily. With a shunt motor, yes. I recommend the field controller shown in the May '83 issue. It is very simple and works fantastically! With practically no loss. With the field full on--around 10 amps (aircraft generator) you can get braking almost down to a stop.

Thanks Don: This Q/A will be a regular feature from now on, please send in your questions!

2CM77/88 all generators have same terminals but shunt has no C



Q Where does the D term. go ?
A Do not connect, D is for regulation when more than 1 gen. is used on aircraft.

The following questions/answers refer to Saied's Regeneration Article of Nov. 1983: Two volt cells are available, Trojan and others: How much current? About 40 amps. average: Battery must be totally isolated, cannot use one of your drive batteries: Switch ratings? I would use 200 amp relays: Method of switching? My regeneration circuit is interlocked with the main power relay so that anytime the drive relay is open, the regeneration circuit is on. It could be connected to microswitch on brake, however, I prefer never to use my brake except to come to an absolute stop. I will include interlock

Q About not understanding my simple electronics course: You did not follow the first instructions--which were, RUN to your nearest book or radio supply store and obtain a copy of the Radio Amateur's Handbook and The Radio Shack Engineer's Notebook. I believe you will find them to be the best investment you ever made (aprx. $20) YOU DO NOT HAVE TO KNOW ANYTHING ABOUT ELECTRONICS to convert a car to Electric, however, I believe that in this High Tech world we live in, even us old geazers would like to at least approach the 19th century even if we never make it to the 20th. This Newsletter goes to some pretty sharp people as well as us "damn fools", so we try to include something for everybody.

Q SCR & Chopper Type?
A SCR controllers are choppers as are all DC controllers. An SCR is simply a controlled diode which requires a capacitor discharge circuit to turn off, more complicated but come in very high current ratings. They are used in trains and other high current applications. Now that we have 100 amp. transisters (fairly recent) they are much simpler and more popular, however, many commercial cars still use SCRs. Overall cost is about the same.

EV Marketplace

WANTED!! QUESTIONS WITH OR WITHOUT ANSWERS, FOR OUR Q/A PAGE.
WANTED!! IF YOU HAVE A GOOD ANSWER FOR AN OFTEN ASK QUESTION,
WANTED!! SEND IT IN. IF YOU NEED AN ANSWER, ASK WE'LL FIND IT.

69 Renault sedan With Westinghouse Motor, Has controller meters and electric controls good shape. $500 takes all Orville E Smith PO Box 5035 Salton City CA 92275

'75 Sebring Vanguard Citicar. Low milage new batteries $1500. Consider delivery. Jay Moyer (retired) 2 Concord Dr. Conway Ar.72032

'68 Fiat Spt. Cpe. PMC control, 2CM77 motor-72V., 12 new Alco Batts, towbar--$2500. Also 12 used Diehard batts. Make offer. (408)732-7324.

FOR SALE-EVC, 500 AMP. CONTROLLER, TRANSISTORIZED, 12-96V, NEW, $500-HB ELEC. SCR CONTROLLER, 24-96V, 450 AMP W/REV. SWITCH, BYPASS CONTRACTOR AND ACCEL. MODULE, $450-2CM77 MOTOR-NEEDS 1 BRUSH, $95-TRANSFORMER, 220V. IN AND 96V & 12V. OUT, $50-meters & shunts-from $5, Simpson & Modutec--Call Roger (619) 453-2231 & eve. 277-3166

EV COMPONENTS NEW & USED

New: Motor-mounting **ADAPTERS** & shaft **COUPLINGS** custom made: from $200.
Willey Model-9 CONTROLLERS: $695.

Used: **MOTOR** Prestolite model MTC-4001, 20 hp, 96 volts: $600.
CONTROLLER Pulsomatic SCR 350 A. up to 140 V.: $300.
BATTERY CHARGER, Lestronic model 9455, 115/230 V. in, 12 & 72 V out, 16/25 amps: $300

Bill Palmer 44 Dior Terrace, Los Altos, CA 94022, 415 948-7677

ELECTRIC VEHICLE CONTROLLER

$495

- 400 AMP
- 24-120 VOLT
- FULLY PROTECTED

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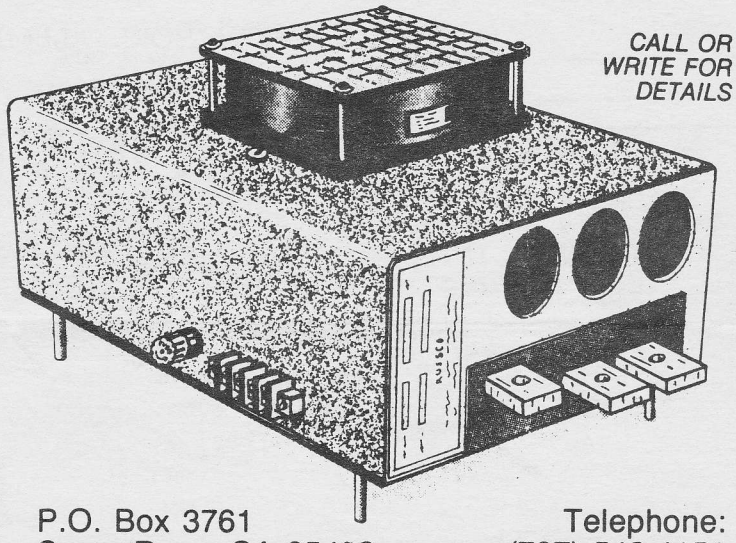

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NOTICE!!!NOTICE!!!NOTICE!!!

RENEW!! WE NEED YOUR SUPPORT!! RENEW!!!

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

WHATS HAP'N

Peninsula

Peninsula Chapter meeting April 7, San Bruno Library. Speaker Mr. Art Maimoni from Lawrence Livermore Laboratory. Subject: Aluminum Air Battery,which Livermore Lab. has been working on for the past few years! The objective of this battery is to develope an electric power source capable of providing an electric vehicle with range speed,and performance similar to a gasoline car. This project is almost comming to a successful ending! Don't miss this meeting.--Lydia Newell

EAST BAY

East Bay meeting,April 14. Speaker W. M. Brobeck, Subject THE ELECTRICAL FUTURE. Mr. Brobeck is well known for his work with the INDUCTION ROADWAY SYSTEM.

JUNE 9th SOUTHLAND MALL EV EXPO

AUG. 11th OAKLAND RALLY

OCT. 13th SOUTHSHORE ALEMEDA EV EXPO

Rally CALL CHUCK HUNTLEY After 6: (415) 431-8179

EVAC SYMPOSIUM

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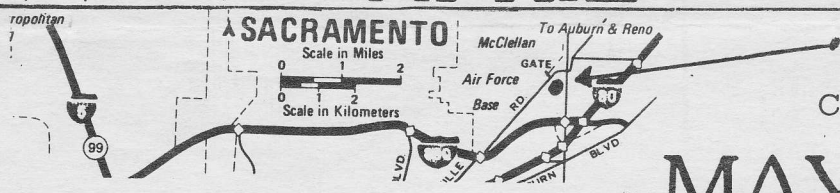
ELECTRICAL SHOWPLACE '84

APRIL 4 1984



SECOND EVER!! EFFICIENCY RUN

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MAY 19

ATTN!! SANTA CLARA CHPT. MEETING PLACE HP Stevens Ck. Between Lawerance & 280 Over Pass'es

EDITORS: - 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 Association NEWS

APRIL 1984

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