Electric Auto Association NEWS

SEPTEMBER 1985 VOL. XVII NO. 9

DIRECTIONS

THE EVOLUTION OF THE AFFORDABLE CONTROLLER

Frank G. Willey

In the early days of the E.A.A., commercially available electronic controllers were heavy and expensive, while surplus aircraft relays were cheap, hence many electric car buffs used step-type battery switching controllers. In 1971, an E.A.A. task force, known as "Project X", was commissioned to study and propose an "optimum" car design for our membership, using parts and technology available to the amateur electric car builder. The author's assignment on the committee pertained to motors and controls.

Among the proposed specifications reached were: (1) Gross weight of car about 2500lb., (2) Battery weight, up to 40% of gross weight, (3) Battery type, deep discharge lead-acid (for price reasons), (4) Car body of low drag coefficient, (5) Low rolling resistance tires, such as smooth well-inflated steel radials, and (6) Electronic controller for efficient operation at any required traffic speed.

In 1972, the author started development of a solid-state electronic controller with specified objectives as follows:

(a) Cost under $800 (down from over $2500 for others on the market.)
(b) Weight 15 lb. (down from 60 lb. or more).
(c) Current rating 400 amperes.
(d) High efficiency at all speeds.
(e) Usable with either the then available aircraft generators or other traction motors.
(f) Usable on 36 to 72 volt systems (later extended to 120 volts).

please turn to pg. 2

BEDFORD GM

GRIFFONS invade US, 30 of these Bedford/GM vans will be involved in a 12-month program with 7 utilities arranged by EVDC. Made in Luton, Beds., England these Bedford/Lucas Chloride developed electrics have undergone extensive field trials since 1977. CF electrics have completed well over 1 million miles in normal service with fleet operators. Over 100 prototypes have been used for parcel delivery, newspaper delivery, maintenance work, laundry service, and passenger transportation.

ELECTRICAL

Traction batteries: 36x6 Volt tubular plate lead acid batteries, series wired to give 216V; fitted with centralized watering system for regular battery 'top-up' operation. Batteries mounted in a steel pannier, plastic coated for corrosion protection; mounted via quick-release pins under the cargo floor.

Control equipment: Choke, systems interface module, DC/DC converter and controller mounted on a fabricated subframe in the under-bonnet area.

Auxiliary battery: 12V 55Ah battery mounted in the under-bonnet area.

MOTOR

Type: CAV MT 305 separately excited 216V DC traction motor.

Power: 40 kW

Willey on Controllers CON'T.

(g) Constructable by the hobbyist from a complete kit of parts and manual, in the manner of a Heathkit TM, and
(h) Should serve as an inspiration to other E.A.A. members to produce and sell useful items for electric car builders.

Over the next five years, the author built six prototype controllers, thoroughly testing out alternative circuits, newly available components, and packaging designs. By 1976, the cost of power transistors was becoming competitive with SCR's and in 1977 he offered the light-weight "Model 7" controller to the membership as a complete kit of parts with 66-page instruction manual for $350 (or $435 with shunt field controller included).

Earlier, in 1975, the shunt field controller had been offered as a separate product, as a kit or assembled. The controller was designed as a mating printed circuit and heat sink on which all parts were mounted, and an enclosing steel case. The kits included all parts and hardware down to the last nut and lockwasher. The manual gave complete directions for assembly, test, and installation.

The Model 8 followed in 1980, using improved transistors. It was 3" shorter than but externally interchangable with the Model 7. Preparation and sales of kits and finished controllers were now handled by licensees.

In 1982, the Model 9 raised the maximum current rating to 450 amperes, shortened the housing another 3", and introduced higher-rated, more reliable transistors. By this time, several hundred controllers and kits had been sold, and up to a third of the entries in the Sunnyvale Electric Car Rally were carrying Willey controllers. The I.E.E.E. Society on Controls Systems had recognized the "design and realization of (this) electric car controller" with an Achievement Award. All of te 1972 objectives have been met and surpassed, and others (including former licensees and customers) have been inspired to manufacture controllers and other items useful to the electric car builder.

The Electric Auto Association has proven its leadership in the development of the practical electric car by encouraging these and many other activities, by sponsorship of rallies, and by promotion to increase public awareness of electric vehicles. It is no coincidence that the world records for speed (175 mph, Roger Hedlund 1974) and distance-on-one-charge (215 miles, Saied Motaei 1984) are held by E.A.A. members.

YOU CAN BUILD YOUR OWN EFFICIENT SOLID STATE CONTROLLER AND SAVE!

THE **WILLEY MODEL 9 COMPLETE CONTROLLER KIT** HAS ALL THE PARTS YOU NEED—even the nuts and screws! And a big 57-page illustrated, construction, test and installation manual. The Willey Controller Model 9 has been proven highly reliable.

All the engineering, layout, machining, parts buying and wiring (it's all on a big printed circuit) has been done for you. Just assemble, solder and test, following the detailed instructions.

Find out all about the kit from Al at **BREWER ASSOCIATES**, 21511 Deerpath Lane, Malibu, CA 90265. Or, if your soldering iron's busted, or your fingers are all thumbs, write to: **FRANK WILLEY** at 9722 Lindgren Ave., Sun City, AZ 85373 for a FINISHED AND TESTED CONTROLLER!

ON THE MOVE:
A TRANSPORTATION FAIR QL

Thurs. Sept. 28, 11 AM-5 PM Marin Civic Center Outdoor Terrace; All Programs and ADMISSION FREE. QL

M$ GET MOVING TO MARIN CIVIC CENTER TO SEE THE WORLD'S FASTEST SOLAR-POWERED CAR, ELECTRIC AND DUAL-FUEL VEHICLES, HIGH-SPEED RAIL OPTIONS, AN ENERGIZED ROADWAY, FOLDING BICYCLES, HUMAN-POWERED TRANSPORT, TRANSPORTATION FOR THE DISABLED, AND OTHER STATE-OF-THE-ART IDEAS IN INDIVIDUAL AND MASS TRANSIT. IF YOU'RE GOING ANY WHERE IN THE NEXT 20 YEARS, YOU WON'T WANT TO MISS THESE OPTIONS. QL

In addition to displays and demonstrations of breakthrough transportation technologies, there will be a wealth of transportation information for your use. Free bike repair and maintenance instruction will be offered; CSAA will offer energy-efficient car maintenance tips, the CHP will give safe driving advice, and RIDES will link interested commuters with carpools. QL

NOW!!! ANYBODY IN THE WORLD CAN WIN A GOLD MEDAL AT THE EAA INTERNATIONAL RALLY:

In 1982 we lost one of our most beloved and knowledgeable members KEITH CROCK, because Keith pioneered much of our early technology we established this award in his name.

TWO KEITH CROCK AWARDS FOR TECHNICAL ACHIEVEMENT will BE AWARDED. One for a 1985 Rally participating vehicle, and another a write-in candidate. If you have developed a special feature for your Electric Vehicle;

- Write it up-
- Have it documented by two notorized statements from disinterested parties.
- Must be INSTALLED and OPERATING in an Electric Powered Vehicle.

Send to Bill Palmer
44 Dior Terr.
Los Altos, Ca 94022

★★★

NOTICE:!!! All 100 Mile+ CARS ARE URGED TO START @ 7:30 or 8:30.

CALL CLARENCE TO ARRANGE FOR JUDGE.

Schedule

SAT 21

Rally

7:30 Registration
9:15 Drivers Meeting
9:30 Rally Starts
12:00 Lunch Break
Entertainment By
Devils'N Darlins
Square Dance Group
1:00 Resume Rally
3:30 End Run

SUN 22

SYMPOSIUM

SHERATON HOTEL RODEO ROOM
Mathilda & Moffett Park

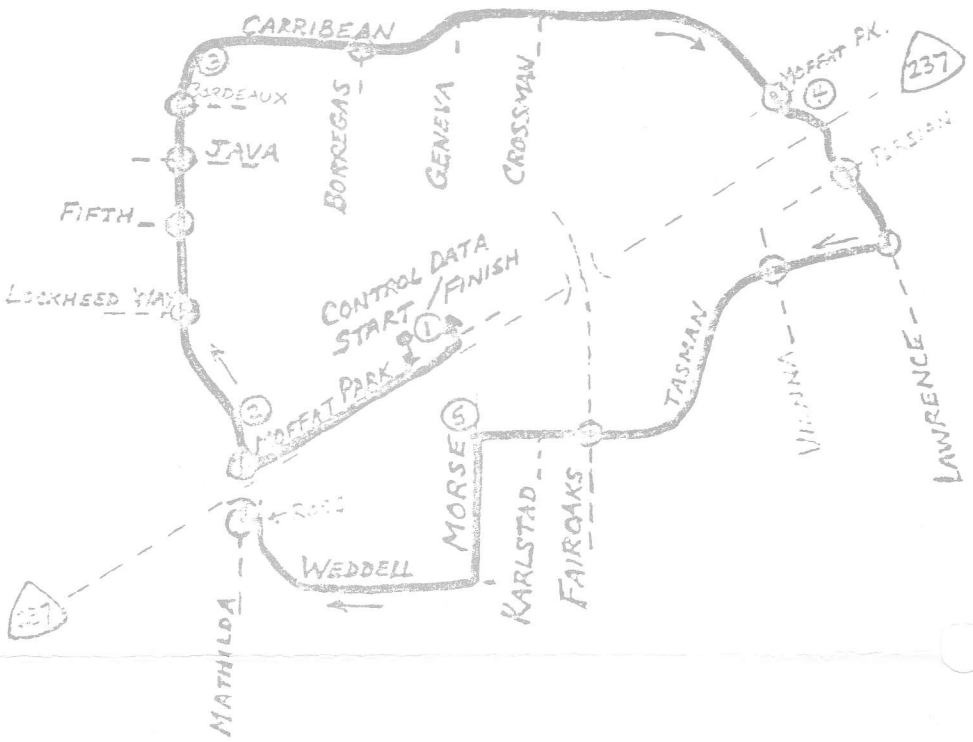
9:00AM START PROGRAM
11:45 Social Hour
Rodeo Room
12:45 AWARDS BRUNCH

Board of Directors Meeting
following brunch, Chpt. Pres.
or alternates WELCOME.

SPEAKERS

Robert Aronson
Electric Fuel Propulsion
Joseph Callahan
THERMO Oil Battery, Canada
John Anderson
ALCO Batteries
Erwin Ulbrick
21St. Century Vehicles
Charity Cheiky
EMI Santa Barbara
Bill Palmer
TVA Battery Test Report

COURSE



PRIZES

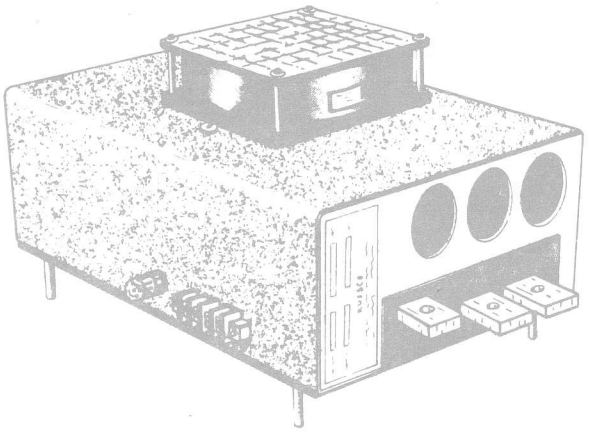
PRIZES: In Hand;
Lester 12/96 Volt CHARGER
Curtis Inst. FUEL GAGE
5 12Volt Accs. Batteries
36 HYDRO-CAPS
Subscription to AET
PROMISED:
AM/FM RADIO
Cordless Drill
MULTIMETER
Get-A-Way Weekend
Misc. BOOKS
Misc. Parts
EAA Teeshirts
& Hats
Fire Extinguisher
& MUCH! MUCH! MORE

LODGING NEEDED AND/OR OFFERED
Call Chuck (408)296-6944
3087 Taper St. Santa Clara,CA 95051

BRUNCH INFO: Patricia Hardage (408)734-8385
RALLY Clarence Ellers (408)248-2588

EV Marketplace

SAFETY ELECTRIC VEHICLE CONTROLLER Model HV-500



SPECIFICATIONS:

- 100–500 AMP
- 24–120 VOLT
- 4000 HZ EFFICIENCY
- FULLY PROTECTED
- REGULATED COOLING FLOW
- SIZE — 4″ D x 8″ W x 12″ L (101.6mm x 203.2mm x 304.8mm)
- WEIGHT — 14.5 lb. (6.59 kg)
- FULL LINE OF ACCESSORIES AVAILABLE

SAFETY FEATURES:

- NON-GROUNDED SYSTEM
- ACCELERATOR INTERLOCK
- SOFT-START ACCELERATION
- HIGH-VOLTAGE DISCHARGED WHEN OFF
- OSHA YELLOW ENCLOSURE
- HIGH VOLTAGE WARNING LABEL
- AXIAL FAN GUARD

$550

MODELS AVAILABLE UP TO 1000 AMPS AND 300 VOLTS

CALL OR WRITE FOR DETAILS

P.O. Box 3761
Santa Rosa, CA 95402

Telephone:
(707) 542-4151

RUSSCO
ELECTRO-MECHANICAL ENGINEERING

FOR SALE: J & H G-23 Generator $300.00 Vester Dick, 332 High Street, Santa Cruz, CA. 95060 (408) 429-8834

****

FOR SALE: '80 Electro Van 750/Ford Courier, 9000 miles, $2,750. Call or write Jim Goebel, Box 995, Ross, Ca. 94957 (H)(415) 456-0804 , (W) (415) 824-9484

****

1981 Datsun pickup. Less than 6500 miles, 22 h.p. Prestolite motor, 108 volt system with Pulse-o-matic controller, 8-track stereo, heater, movable bed. $2,500 FOB Ed Gray, Phoenix, AZ (602) 278-3878

****

1981 Bradley GII Electric 450miles on odometer. $3,600. Call Clarence Ellers (408) 248-2588 or 296-8532

BUYERS WANTED

LIGHTNING ELECTRIC VEHICLES
NEW & USED EV'S, PARTS & ACCESSORIES
WILL OPERATE ONE DAY ONLY SEPT. 21St.
AT THE RALLY. BRING ANYTHING YOU HAVE
TO SELL. CHARGE: $5 PARTS $15 CARS.
MONEY WILL BE USED FOR ADD IN PAPER.

SEND MONEY NOW!!! So we can get add in paper before RALLY.

Clarence Ellers 2892 Mesquite Dr.
Santa clara, CA 95051

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, 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

INTERNATIONAL
SUNNYVALE - Sept 21-22
Call: Clarence Ellers (408) 248-2588

Go for it!

* * BRUNCH RESERVATIONS * *

Please fill and return this "BRUNCH RESERVATION FORM" as soon as possible. In the event you "CAN'T or "WON'T" release your money early, please mail the form anyway, and you can mail the money later or pay at the door. By mailing the form back early, this gives me a chance to make out the "NAME TAGS" early, instead of the night before the brunch.

Brunch is $13.75 - this covers tax, tip and banquet room, plus equipment for the whole day.

There will be _____attending. First names of persons attending:

Enclosed is my check for:_____ _____ _____

_____ _____

I would also like to join the group for Saturday night dinner. I under stand everyone picks up his own check.

There will be_____ attending.

Patricia Hardage 1085 Tasman Dr. - #732 Sunnyvale, Calif 94089
(408) 734-8385

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

SEPT. 1985

1249 Lane St.
Belmont, Ca.
94002

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

HELP !!

EAA BASEBALL CAP
$25 "RALLY" DONATION
787 Florales Dr.
Palo Alto, CA 94306

TIME DATED MATERIAL - DO NOT HOLD