

F.V.E.A.A. NEWSLETTER

February 1993

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Director

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NEXT MEETING

March 19th @ 7:30pm
College of Dupage
Student Resource Center
Room 1046

University of Illinois at Urbana-Champaign
Urbana, IL 61801
Urbana Rd. Entrance, Lot 7 at the Southeast corner of 22nd & Lambert
Nonmembers are always welcome!

Director

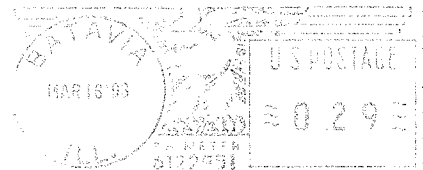
John Stockberger
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Batavia, IL 60510
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MEMBERSHIP INFORMATION

Membership to the Fox Valley Electric Auto Association is open to the public. Anyone interested in electric vehicles or electric transportation are encouraged to join. The cost to join is \$15 per year from November to November. If joining in the middle of the year the cost is \$1.25 for every month remaining til November of that year. The cost for new members joining is \$12.00.

Fox Valley Electric Auto Association

336 McKee Street
Batavia, IL 60510



First Class

John Emde

ADDRESS
CORRECTION
REQUESTED

6542 Fairmount Avenue
Downers Grove, IL 60516
USA

PRESEZ

Where's February's newsletter? Good question! Well, it's in shredded metallic pieces somewhere in a magnetic media graveyard. A little over a month ago the hard disc gods come'th and take'th away my hard drive. I was innocently working away on a service manual for work, when my PC went into hyperspace. Apparently the fourth head on my drive decided to take a swim in the ocean of magnetic material, proceeding to peel away the layers as the disc turned. No hope for data recovery, no hope for three months of work, no hope for the FVEAA mailing list or the newsletter template. As a result Murphy's Law's are out and O'brian's Laws are in. O'brian believed that Murphy was an optimist. So after lots data entry, a new hard disc, the new Word Perfect for Windows and some business catchup, I'm back at it.

Bill Shafer and John Emde have provided the newsletter with some interesting data sheets.

Included in this newsletter is an article on Chrysler's electric trek across the country from Detroit to L.A. in an attempt to gather more data on their \$120,000 TEVan and their new quick charge system. They are also claiming a distance record by an electric vehicle. Although I don't think the original trip by the previous team was intended to be distance competition for others to challenge it seems to me that this is a good idea. What better way to determine the effectiveness of a new E.V. with great distance claims or recharging claims then to make them prove on an established course. Lots of companies claim great distance on a single charge, but rarely indicate the speed at which that is accomplished. The other misleading claim is quick recharge times, but they seem exclude the amount recharge they accomplish in that time. The distance challenge across the country brings out all of the weak points of a new E.V. concept.

Douglas F. Marsh

MINUTES OF FVEAA JANUARY 15, 1993 MEETING

The meeting at the College of DuPage was called to order by Vice-President Woods at 7:40 PM. Treasurer Corel reported \$ 1463.15 in the checking account and \$ 2055.36 in the savings account. The report was approved. He also stated that copies of the 1993 membership roster are available for pickup at this meeting. Copies will be mailed in March to active members who fail to get them at a meeting. They will NOT be published in the monthly newsletter. This complies with the policy established by the membership in Nov, 92.

A lively discussion was held concerning F V E A A entering the INFRASTRUCTURE competition. The 20 year experience of FVEAA members with electric car conversions should enable submission of a credible entry. Six persons agreed to work on preparing the entry:

Ken Woods - AdHoc Chairman
Bill Beverly
Steve Clark
Richard Johnson
Johanna Helenowska
Tim Stevens

After considerable discussion of EV component requirements, such as the elements for a standard plug, it was moved, seconded and passed that the FVEAA submit the required \$100 fee and proceed with an entry preparation. Entry is due by 5/14/93. Woods noted that participation of other members would be necessary as the document framework is developed.

FVEAA 1993 SUMMER EVENT

Secretary Shafer noted receiving a call from Tom Snyder concerning an alternative energy event next summer at Blackhawk Raceway in Cedar Rapids, Iowa. In 92 the first event was successfully held and included Member Brian Klosterman's electric car. Tom was urged to contact President Marsh for information on including an Electrathon and possible workshop presentation.

A discussion was held on a summer event by the FVEAA, similar to those held previously at Argonne and Triton. It was moved, seconded and passed that the FVEAA organize an event at College of DuPage. Four members agreed to have their cars there. Member Shafer agreed to do the preliminary work.

Member Helenowska introduced two Steinmetz High School students who are doing a Science Fair project titled, "Which battery is Best?" Several suggestions were made by members including the statistics of sampling, test procedures and techniques, and inclusion of economic factors.

Member Clark restated his December meeting opinion that he found the book "SOLO" to be informative about the EV experiences of its author, Noel Perrin. It was moved, seconded and passed that a copy of the book be obtained by Secretary Shafer for the FVEAA library.

The meeting was adjourned at 10:15 PM.

Submitted by

William H Shafer

At the January 15th meeting the FVEAA decided to hold a summer event to again inform the public about EVs and our activities. This program draft is provided for discussion and implementation at the February Meeting.

Since 1988 we have participated in one major event each year. The first was at Argonne Lab on June 11, 1988. The second was at Triton Community College in River Grove in 1989. On June 20, 1990 our vehicles were part of the 20th anniversary observance of Earth Day in Lincoln Park. We had cars at the 1991 and 1992 Alternative Energy Fair in Amherst, Wisconsin.

The College of DuPage is recommended for our 1993 event. They provided facilities for our monthly meetings and are located in a central area for our 1993 target audience, commuters on METRA that drive from home to the train station. An additional target group may be those affected by the Illinois mandate to reduce job commuting by auto by 25%.

The recommended program is as follows:

1. 9-10 AM. Set up car displays and component exhibits. FVEAA member cars Component displays Demonstration mock-up system
2. 10 AM. Open EV Forum for presentations. Seating for ?. President Marsh
3. 10:15-11:45. 1st presentation, "Why consider an EV?"
4. 12:00-12:30. 2nd presentation, "Building Prototype EVs".
5. 12:45-1:15. 3rd presentation, "Recycling & Converting a Car". Bill Shafer (Misdo Project)
6. 1:30-2:15. 4th presentation, "Commercial EV Developments".
7. 2:30-3:00. 5th presentation, "Electricity Supply for EVs".
Commonwealth Edison

ASK THE FOX

- 8 3:00-4:00. Exhibits and demonstration rides in parking lot.
9. 4:00. Tear down and clean up.

An Event Chairman must be selected in February and get started with arrangements and publicity.

W. H. Shafer

'VOLTSWAGON' MARKET RECHARGES. More than 30 U.S. states are encouraging alternate-fuel vehicle (AFV) programs with fleet purchases, tax credits, and other initiatives. The strongest push comes from California (recently joined by New York and Massachusetts), which has mandated that 2 percent of new cars have zero emissions by 1998 (10 percent by 2003). The Northeast States for Coordinated Air Use Management, a region encompassing 40 percent of the light-vehicle market, is working to follow suit.

Effectively, the demand for zero emissions has revived work on electric vehicles, a market that has lain moribund since the 1970s. One early response is Green Motor Works, a car dealer that handles only electric vehicles. It opened in April in North Hollywood, Calif. Salesman Richard Hauser said the company replaces a car's internal combustion engine with electric systems. The conversions range from small neighborhood vehicles (around \$11 000) to Porsche replicas (\$36 000). Denmark provides the only "ground-up" electric vehicle sold at Green Motors.

Green Motor cars rely on lead-acid batteries and series-wound dc motors. Hauser declined to give sales numbers, saying only, "We have a showroom and a conversion bay and we're busy." It will also soon have competition. In 1993 Chrysler Corp. will sell up to 100 demonstration TEVans, electric models of the Plymouth Voyager. General Motors Corp. will demonstrate its Impact prototype, Sweden's Clean Air Transport Co. will export its LA301 car by mid-decade, and Japan plans to export electric vehicles to California by 1995.

The critical path to broad success with electric vehicles is through the battery, said Jack Guy of the Electric Power Research Institute (EPRI) in Palo Alto, Calif. No battery yet meets criteria that would make the electric car a desirable consumer vehicle, he said. To move the technology along, the U.S. Advanced Battery Consortium (USABC) was formed by the Big Three U.S. auto makers in 1990; they were joined in 1991 by EPRI and the U.S. Department of Energy, which together will supply half the program's \$260 million over

The first question for this feature comes from a Wisconsin member and concerns insurance for a Wisconsin EV. There seems to be some difficulty in obtaining EV insurance coverage there. The question was referred to Member Len Fisher.

EV insurance is a dilemma for underwriting companies. They are faced with a product that is largely unknown. There is no experience to establish risk exposure for liability, comprehensive coverage, or collision damage cost. The EV limited performance may cause an accident but the low speeds will likely limit damage. The limited range where it is used is precisely the area where most accidents happen with conventional cars. On the other hand the low annual EV mileage and use that substitutes for a conventional car needs to be considered.

Some insurance carriers want to place a recycled and converted car in the same category as a custom modified "Street Rod" with astronomical premiums. Some want it in the State "High Risk Pool" along with owners that have bad driving records. Most companies will insure only for liability and use the owner's claim history as a guide. The rate is usually determined by the type of car that was converted. You must be willing and able to assume the other risks.

The local agent is the key person when it comes to EV insurance. This is the person that insurance carriers rely on to make a final decision. Show your agent the car, take him for a ride, explain how you will use the car, make him your ally and Len says he will go to bat for you. If this is unsuccessful, you might contact the State Insurance Commissioner and outline your specific problem.

FOR SALE

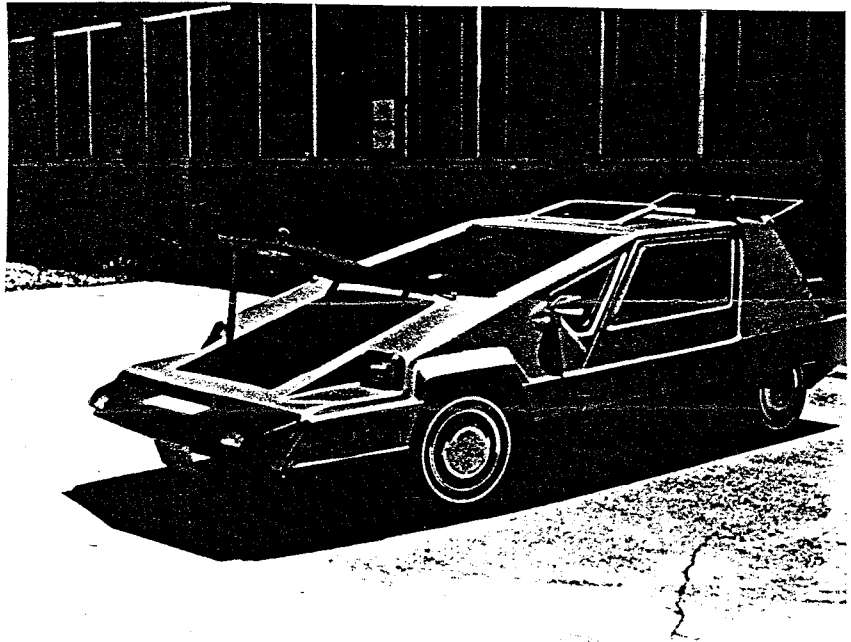
Mechanix Illustrated Electric town car by
 Owner/Builder:
 George Krajnovich
 17W381 Eisenhower Rd.
 Oakbrook Terrace, IL 60181
 (708) 834-0370

Asking 50% of material building costs less batteries.

The 2500Watt Hybrid is powered by a B&S 5 hp and 8 hp drive motor (Baldor) both removed this spring while upgrading to a 12hp G.E. Motor. Can be purchased separately.

1982 Electric Car with plans, tow bar	\$2900
Hybrid Unit complete with controls	\$450
8hp Baldor Motor with adapters	\$400

For information and/or demonstration ride give me a call. I have aspirations of converting my Caravan, old one that is, to electric.



Van claims distance record

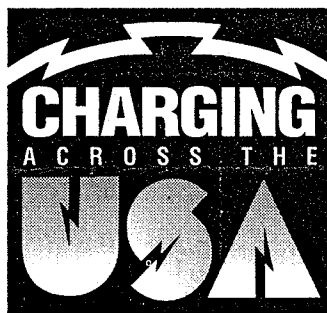
INDIO, Calif. — Chrysler's cross-country electric-van tour is claiming the world record for distance in an electric car.

The previous record: 2,500 miles in 158 hours, set by a Phoenix-based team driving a battery-power pickup truck along the southern edge of the USA.

The 180-volt Chrysler minivan, en route to Los Angeles from Detroit, hit 2,500 miles about 9:30 p.m. ET Tuesday and tallied 2,604 crossing the Mojave Desert at 2:30 a.m., the 158-hour mark.

"Everybody else who has set these electric-vehicle records has done so by swapping batteries. We have set the record in a more practical way, using the same batteries and recharging them," says Chrysler engineer David Smith.

"This shows the vehicle is durable and that electric vehicles can be more than glorified golf carts," says Smith, in charge of Chrysler's work with batteries and charging systems. "It also demonstrates that the charging technology is



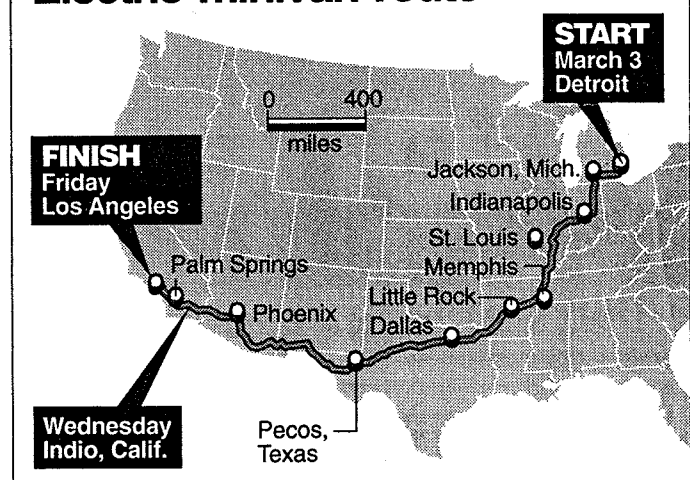
feasible and that electric-vehicle success doesn't depend on swapping batteries, which is economically unreasonable."

The cross-country trip is to demonstrate that electric vehicles can go long distances, even though they have to recharge frequently. And it's supposed to give Chrysler an image as a leader in environmentally friendly vehicles.

Chrysler says it will ask recordmeister Guinness to certify the mileage rolled up by its TEVan.

Chrysler's nickname for its minivans always has been T-van. When the electric-van project came along, engineers just

Electric minivan route



Source: Chrysler

By Stephen Conley, USA TODAY

put "E" — for electric — in the middle.

The team is hoping for a faster pace its final two days after modifications Tuesday at Chrysler's hot-weather proving grounds near Wittmann, Ariz. To help the batteries run cooler, six 1-inch air holes were cut in the hottest battery tray and

air scoops added to the side of the battery trays.

The TEVan halted here for its longest, slowest charge Wednesday. The five-hour gentle charge hopefully would fill the 30 six-volt batteries to their absolute maximum.

— James R. Healey

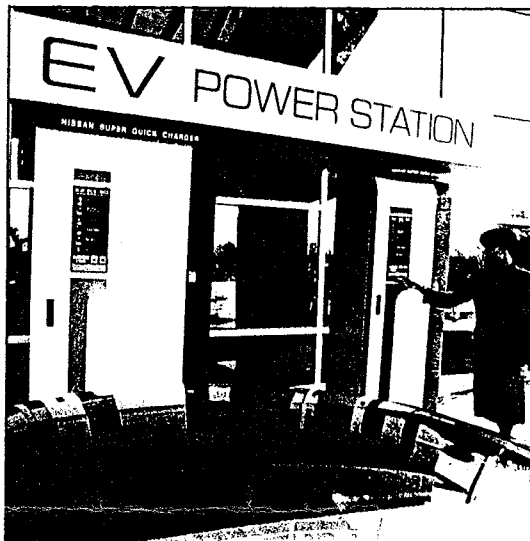
FILL 'ER UP — AND CHARGE IT

Electric filling stations are coming to a corner near you. Instead of having gas pumps, these stations will be equipped with hookups for recharging batteries on electric vehicles. Carmakers and utility companies are now looking at several charging systems and will choose a standard based on cost, safety, and convenience.

Perhaps the safest system proposed so far is Hughes Aircraft Co.'s inductive charger. Working with parent company General Motors, Hughes designed a family of charging stations that transfer energy magnetically rather than electrically. An inductive coupler, basically an electromagnet, fits in the vehicle, and a pickup coil automatically clamps around it. Power flows from the coupler to the pickup through magnetic induction.

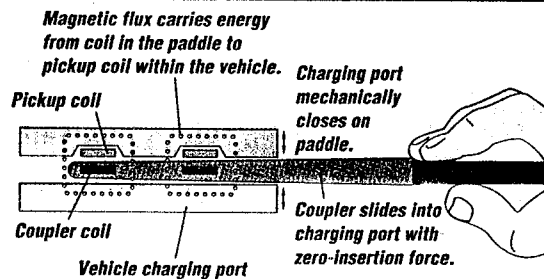
Covered in plastic, the paddle-shaped coupler is easy to handle and presents no shock hazard. This con-

continued on page 34

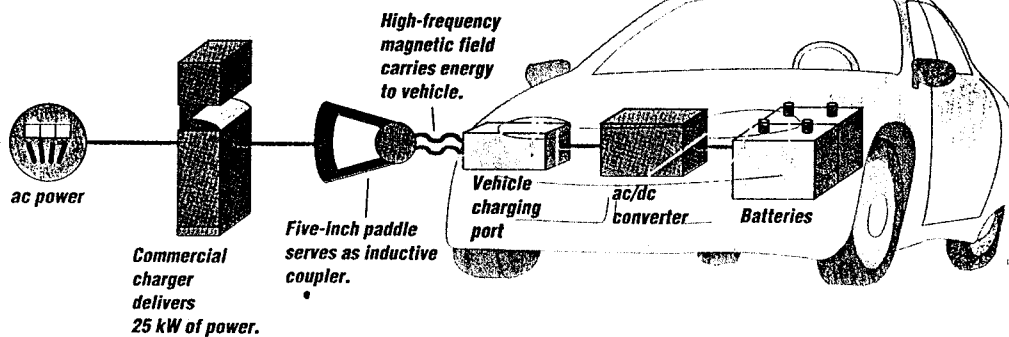


Nissan's Super-Quick Charger makes recharging electric cars almost as easy as filling a gas tank. Motorists insert a computerized card, plug in the cord, and receive a 40% charge in six minutes or 100% charge in 15 minutes. The card provides vehicle charging requirements as well as billing information.

Inductive battery chargers made by Hughes Aircraft Co. take the danger out of refueling electric cars. With no metal contacts, they're safe even in rain. The disc-shaped coupler or paddle readily inserts into the vehicle's charging port and delivers power magnetically to internal pickup coils. Wall-mounted residential units deliver 6 kW of power; commercial "energy stations" for service fleets deliver 25 kW. Both operate on 220 V.



Filling up with flux



continued from page 32

trasts with conventional 220-V plugs and cords which are cumbersome and have exposed metal contacts.

Hughes originally developed inductive couplers for powering valves on oil wellheads at the bottom of the North Sea. To shrink the components enough to fit into cars, Hughes used technology from its high-frequency radar systems. Fast switching circuits based on IGBTs (insulated-gate bipolar transistors) boost line frequency to around 80 kHz, letting designers use smaller coils and capacitors than normal. Lit-

tle energy is wasted as heat because of the low-loss switches. The designers also used special RF shielding techniques to stem electromagnetic interference.

In Japan, the big contender is Nissan's Super-Quick Charger. Compared to inductive couplers, which take two to three hours for a full charge, Nissan's charging system takes only 15 minutes. But there are several drawbacks. The system operates on 140 A at 400 V and works only with high-recharge-rate nickel-cadmium batteries. It also uses conventional metal plugs and connectors.

—Larry Bevardanis

1993 TOWED-VEHICLE GUIDE

CARS

Manufacturer	Curb Weight	Speed/Distance Limits	Manual Transmission	Automatic Transmission	EPA MPG City/Hwy	Base Retail*
CHRYSLER						
LeBaron	2863	none	yes	no	19/28	\$13,999
DODGE						
Colt	2085	none	yes	no	32/40	\$8,976
Daytona	2779	none	yes	no	24/34	\$10,874
Shadow	2613	none	yes	no	24/34	\$8,397
Spirit	2788	none	yes	no	20/27	\$11,941
EAGLE						
Summit	2085	none	yes	no	32/40	\$8,274
FORD/MERCURY						
Escort	2323	55/none	yes	no	30/37	\$8,355
Festiva	1797	55/none	yes	no	35/42	\$6,941
Probe	2815	55/none	yes	no	21/26	\$12,845
Sable	3084	55/none	yes	no	21/30	\$17,349
Taurus	3084	55/none	yes	no	18/26	\$15,491
Tempo	2532	55/none	yes	no	24/33	\$10,267
Topaz	2532	55/none	yes	no	24/33	\$10,801
Tracer	2356	55/none	yes	no	30/37	\$8,577
GEO						
Metro	1621	55/none	yes	no	41/46	\$7,250
NISSAN						
Maxima	3129	70/500	yes	no	21/26	\$20,960
Sentra	2266	70/500	yes	no	29/38	\$8,715
Stanza	2788	70/500	yes	no	24/30	\$12,780
240 SX	2699	70/500	yes	no	22/28	\$14,755
300 ZX	3313	60/200	yes	no	18/24	\$30,095
PLYMOUTH						
Acclaim	2784	none	yes	no	25/32	\$11,941
Sundance/Duster	2613	none	yes	no	27/32	\$8,397
SATURN						
SC1 coupe	2304	65/none	yes	yes	28/37	\$10,995
SC2 coupe	2388	65/none	yes	yes	24/35	\$12,795
SL 4-door	2320	65/none	yes	yes	24/33	\$9,195
SL1 4-door	2323	65/none	yes	yes	24/35	\$9,995
SL2 4-door	2423	65/none	yes	yes	26/36	\$11,495
SW1 wagon	2367	65/none	yes	yes	28/37	\$10,895
SW2 wagon	2467	65/none	yes	yes	24/35	\$12,195
SUZUKI						
Swift Hatchback	1936	55/none	yes	no	39/43	\$6,899
Swift Sedan	1779	55/none	yes	no	39/43	\$7,699

* Price without options

ELECTRIC VEHICLE APPLICATION GUIDE

S-2 THERMAL TESTS PER DIN & ISO STANDARDS

TEST VOLTAGE 96 VOLTS - .03I

120 VOLTS - .03I

144 VOLTS - .03I

	Time - On	Volts	Amps	RPM	H.P.	KW
L91-4003 6.7" Dia. Motor Weight 82 lbs. 38 kg	5 minutes	87	280	3650	26.4	20.00
	1 hour	91	150	4950	15.0	11.40
	Continuous	92	130	5100	13.6	10.25
	Peak H.P. Developed 62					
	5 minutes	112	260	4650	31.0	23.40
	1 hour	115	135	6200	17.9	13.50
	Continuous	116	122	6500	16.0	12.00
	Peak H.P. Developed 72					
	203-06-4001 8" Dia. Motor Weight 107 lbs. 49 kg	5 minutes	86	322	3600	31.5
1 hour		90	190	4800	20.6	15.50
Continuous		91	178	5000	19.0	14.40
Peak H.P. Developed 68						
5 minutes		111	300	4650	37.0	28.00
1 hour		114	180	6200	24.0	18.00
Continuous		115	165	6500	21.7	16.30
Peak H.P. Developed 83						
FB1-4001 9.1" Dia. Motor Weight 143 lbs. 65 kg		5 minutes	88	360	3300	35.0
	1 hour	89	210	3600	23.0	17.30
	Continuous	90	190	3900	20.0	15.00
	Peak H.P. Developed 70					
	5 minutes	109	340	3520	43.0	32.50
	1 hour	114	205	4800	27.5	20.80
	Continuous	115	182	5200	25.2	19.00
	Peak H.P. Developed 85					
	5 minutes	134	320	4200	48.8	36.80
	1 hour	138	185	5700	30.4	22.90
	Continuous	139	170	6000	28.5	21.50
	Peak H.P. Developed 100					

RMA ASSOCIATES

PO. BOX 0491
PALATINE, IL 60078-0491

ings are without controller in circuit.

Updated Data
Revised Data 12-10-92