Electric Auto Association

CURRENT EVENTS

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APS PHOENIX ELECTRICS SPECIAL RACE ISSUE

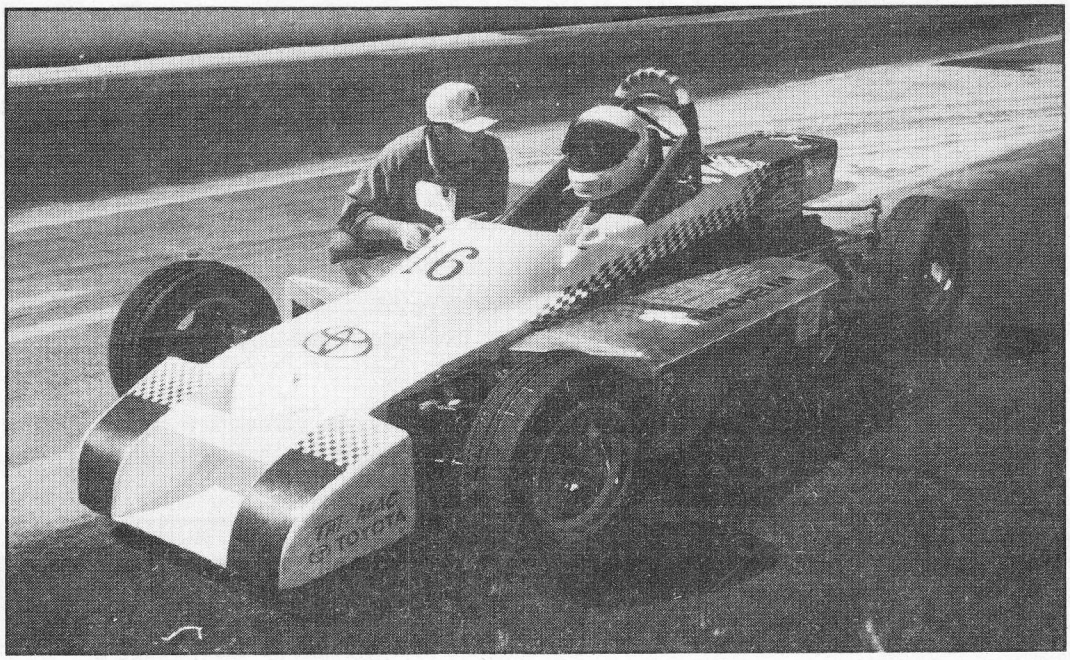
Nova Scotia's Rolling Thunder

by Clare Bell

The group of friends who formed the SAERC Girls' Highland Thunder Racing team stood solemnly around their Formula E racer as the APS Phoenix Electrics PA system played the Canadian anthem in their honor. With their hands crossed in front of them, holding their hats, these eight young women from Nova Scotia gathered almost protectively around their car and driver Dave Erb. Soon they would have to leave their creation alone on the track, to face Phoenix Firebird's 1.1 mile road race course.

These young Canadians (the oldest is no more than sixteen), had earned the recognition they were getting and more. Their spirit and determination in getting the race car built, to Phoenix and race-ready on the starting line was, quite frankly, awesome.

Cheryl Kawaja, Elisa Conner, Nicole MacDonald, Natalie MacKeigan, Amie MacDonald, Cara Dawson and Erin MacIntyre had chosen a difficult task and succeeded brilliantly.



Sitting up in the Coors' Tower pressbox, I remembered the (WE"RE-IT) women's team that I had been part of in 1994-1996. It took us several years before we managed to get a car on track without tremendous effort and endless last-minute glitches that nearly made us miss the start in '94. And here was the Highland Thunder team in its first year, the car race-prepped and on track early. Not to say that there wasn't tremendous effort and last-minute struggles; I'd been by the SAERC pit area a number of times and everyone was busily doing things to the car. However it all seemed orchestrated and in control, unlike the frenetic scrambles I'd seen going on in other pit areas (and in my team's in previous years). The Formula E car itself was a more difficult undertaking than a stock electric entry; for one thing, they'd had to rebuild the chassis These girls were barely into their

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IN THIS ISSUE

CE presents some unusual and intimate coverage of the Arizona Public Service Electrics by your editor, who was there as part of a stock electric team (see editorial) as well as press. However the centerpiece of this issue is an article about the SAERC (for Strait Area Educational and Recreational Center) Girls' Racing Team from Nova Scotia, who entered an electric Formula Ford in the open-wheel Formula E class. Formula E is run together with the ABB University Spec, so it was an ambitious undertaking. But they did quite well, as CE's readers will see.

Since your editor/reporter spent much time in the press booth and at trackside, this special race issue also features detailed coverage of the high school events and, of course, the stock electric heat and feature. There may be more blow-by-blow race reporting in this one than ever before (and I may have even overdone it in my enthusiasm.) Thanks to the enthusiasm of photographer Roy Kaylor, we also have lots of pix! Race fans, enjoy!

Our usual separate techpage section has been blended into the race coverage and discusses various technical aspects of cars that succeeded and those that didn't.

So, onward, starting with the tale of:

PHOTO CREDIT - COVER

"They've put an amazing car under me" - Driver Dave Erb of OSU praises Highland Thunder, entered by the SAERC Girls Racing Team.

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EV hEaVen at Hanger 20

The real reason I'm in EV heaven (at least for today) is that I've been playing with a whole flock of 18 EV1's. I never ever thought I'd ever see 18 in one place, let alone sipping amps from the Green/Motorworks CALSTART juice bar. GM brought them for the EV1 Bay Area Market Launch, which took place yesterday (3/31) at Treasure Island. I was asked to drive an EV1 there and rode in one on the way back. The market launch event, which I covered, had 20 EV1's there. GM had brought 9 to CALSTART the day before and I was involved in charging them. I guess we did a good job, since all but two of the 20-car flock came back to Hangar 20 to recharge (Gee, maybe they multiplied while we weren't looking. Hope so; that would be an easy way to get one).

A Record for Shuffling the Most EV1s?

Your editor spent most of yesterday afternoon and this evening finding plugs, getting convenience chargers out of trunks, scrounging extension cords, hooking up cars to the big MagneChargers, plugging in paddles and loving every minute of it. Of course, since we had to drive the little devils to shuffle them, I think I may have the record for the the most EV1's driven and/or put on charge in one day. Outside of the folks who work for Saturn or the Lansing Tech Center, that is.

Paul Shoulda Seen 'Em

I wish Paul Brasch could have lived long enough to see all twenty of the EV1's gathered at Treasure Island. He began reporting on the car in the early 1990's, when the automotive press was still sneering at it or ignoring it. Now there are over 400 that have been made at the Tech Center. One of the cars here for the marketing event had (if I remember correctly) serial number 456.

Actually, today we have 19 EV1's, since I forgot to include Silky, our Green Motorworks critter. We have two, but one is at Concord Saturn for a minor repair.

What would be the phrase for a bunch of EVs? I'd like to come up with something like the immortal "chuffle of Volkswagens" (from the characteristic sound that the aircooled V-dub engine makes.) An EVenture of EVs? An EVolution of EVs?. An EVocation of EVs?. Anyone got any ideas?

New word around the hangar - I'm not sure who came up with it - possibly me, though I don't remember. "EVOne-ing" Definition - to do anything with an EV1; drive, put on the MagneCharger, take off the Magnecharger, back up (beep-boop), put on/take off the convenience charger, blow the doors off everthing else in sight (whireeeeee, screeech)....

Like hangar mice, GM's EV-1's proliferate in CalStart's Hanger 20

Quartet for Backing-Up EV1s

New sound in the hangar - three or four EV1's all backing up at once, all going beep-boop slightly out of phase with each other to produce this fairly demented two-note concerto, "beepity, boopity, boopity beepity, etc. Phillip Glass (modern composer of oddly oscillating music), watch out. Someone may do a piece entitiled "Quartet for EV1 Backup Warning Signals with Solo for Pedestrian Warning Chirp."

This has been an extraordinary last few weeks for me. After geting the last 48 page issue out, I've been getting some encouraging feedback that says folks like the new format and the material. To all the people who've sent emails about the new CE, thanks. So it seems that my and Kurt's effort was indeed worth it. Not that we are going to get complacent. Nope. We'll continue to refine and improve the magazine as we go, and there is still a distance yet to cover.

Another nifty thing is that after turning over production to Kurt, I went racing. Not only that, my car did good! #13 took third in electric stock heat and final. Both of the two cars ahead of her were running Cocconi ACP drivelines and 300+ volts. Not too shabby for a little Porschie running 144V worth of yellowtops in a double string and a re-built Advanced DC nine-incher. She was the best DC stock class runner down there. Dave Erb did a bang-up job (not literally) of driving, Paul Compton made her handle real slick and smooth by tweaking that custom Leda suspension, Mike and Adam Slominski "made it work" par excellance, John Wayland of E-Car got Optima to give us the batteries. Gees, all I had to do was drive the rental truck and enjoy the race. I'm not used to that! —**CB**

Opening Ceremonies

The formal 1:00 PM opening of the 1998 APS Phoenix Electrics started out with a parade of EVs built or driven by local Electric Auto Association members. This was welcome recognition to a group of enthusiasts who have directly contributed to the APS race and the present bloom of EV technology. An electric VW Sirocco led off the procession, followed by an electric jeep belonging to Gary Cooper. Tom and Diane Convey's electric Chevy Sprint was next; it has 35,000 electric miles. Following the Sprint was a sweet-looking little Renault Alliance and then a Suzuki four-wheel drive mini-sport.

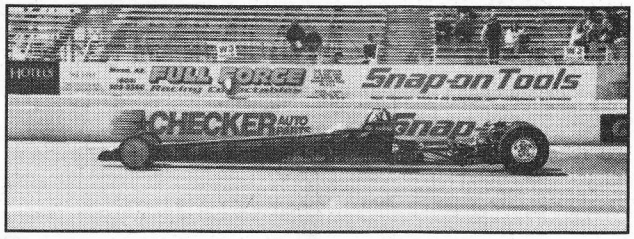
A rare Henny Kilowatt in the parade of Electric Auto Association cars at the APS Phoenix Electrics

The next car was a real treat to old-time EV enthusiasts — an immaculate maroon and pink Henny Kilowatt. This mid-fifties built-from the ground-up EV is a rare bird and hard to find, especially in good condition. There were probably one or two damp eyes among the crowd as the Henny rolled by.

Then came the classic "rolling-doorstop" of Evs, a 1979 CitiCar, designed by Bob Beaumont, the author of the later Tropica roadster.. With its unmistakable angular lines, short wheelbase and tall configuration people either loved it or hated it. I am not among the CitiCar's fans, but there are people who are so fond of the triangular beasties that they collect them by the handfuls and many are still running today. There may have even been some damp eyes for the CitiCar — who knows.

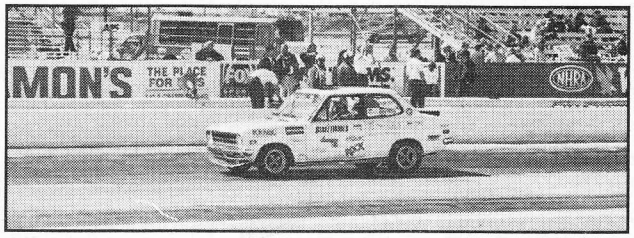
Then came something completely different — if not in style, then under the hood. Bill Dube's Ewectwic Wabbit could fool the observer into thinking it was just a super-spiffy Rabbit convertible, but beware of the 192 volts lurking behind that facade. This is a serious drag car that can generate more smoke with its tires in 2 minutes than the most determined gasmobile can from its tailpipe.

Jim Ludiker's E-dragster has no pretenses about being anything other than it is — a vehicle devoted solely to pursuit of the quarter-mile. Sprouting an open-face Grizzburger (two Auburn Grizzly controllers side by side) in the back, this unabashed drag rail is welcome competition for Dennis Berube's Current Eliminator II. And if Ludiker's stretched rail were any longer, it wouldn't have to be very far off the line to have its front wheels over the finish.



One loooong dragster - Jim Ludiker's creation on display

An electric ponycar was next, a classic '67 Mustang done as an electric. Then there was the Wabbit's Nemesis, another 192 V dragmobile clothed in the innocuous form of a Renault LeCar. Well, it would be innocuous if it didn't have the paint job that earns it the appellation Screaming Yellow Renault. The perpetrator of this car is Lou Tauber, who regularly puts Screaming Yellow up against Bill Dube's Ewectwic Wabbit (thank you, Mr. Fudd) in the pioneering NEDRA drags. These two can exchange good-natured insults all the way down the strip and they can HEAR each other.



The creator of the e-bomb known as the White Zombie, Mr. Plasma Boy himself.

John "Plasma Boy" Wayland"

The parade had saved the best for last and here they were. Though plagued by flu, overwork and a wrench-dropping incident that had earned him the name "Plasma Boy" among the aficionados of the EV Discussion List, John Wayland was back with his terror of a tire-melter, the legendary White Zombie. This radically modified Datsun 1200 was the first of the breed of high-performance EVs out of the Pacific Northwest. At the 1996 Saturday night drags, John ran White Zombie without a controller - just a couple of big contactors that jammed the amps from the yellowtops directly to the motor. It was fry, die or win and Wayland didn't know which as he sat inside that white E-bomb. By luck or skill it was choice number three and White Zombie entered the EV mythos. The Datsun 1200 inspired not only the degree of performance, but style of naming for EVs out of the E-Car shop, including the Blue Meanie and Screaming Yellow Zonker (the Renault's original moniker). One might detect a Yellow Submarine influence there, hey, E-Car?.

Dennis "Ah, Fresh Meat!" Berube

Last of all came someone and something both of which are becoming well-known to Current EVents' readers. Laying rubber along the strip before the grandstand came the Viper-vanquishing Current Eliminator II. This piece of EV ferocity is the result of five years of hard work and steady development by owner and builder, Dennis "Kilowatt" Berube. Dennis has

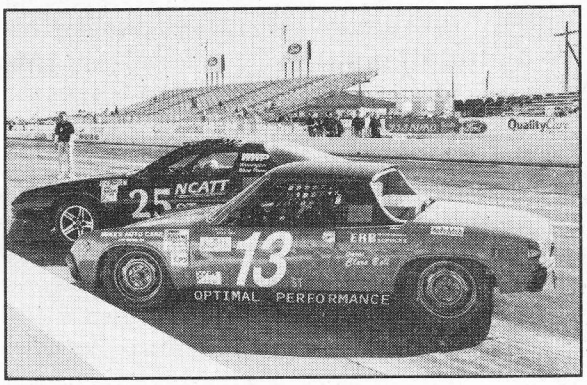
also earned the respect of local Phoenix gas dragster owners because he brings his E-monster out every weekend to challenge their machines. An easy win, thinks the unwary gas dragster motorhead, while in Current Eliminator II's cockpit, Dennis is rubbing his hands together and thinking, "Ah, fresh meat!"

Fresh from rubbing the V-10 powered nose of a Viper in the dirt even after blowing a battery at the Woodburn drags in Oregon, Current Eliminator flaunted its power in a series of burnouts in front of the grandstands. "Hold your ears," said the announcer, not entirely in jest, "it might get loud." He added that Dennis had recently posted an 11 second run and was shooting for the 10 second bracket at the night's NEDRA drags.

Canadians Looking to Kick Male Tails

Following the parade came the eight competitors in the first heat race, the ABB University Spec and E-spec class cars. Once they gridded up, the PA played the US anthem. Then, in honor of entries from Canada, including the Nova Scotia Highland Thunder team (see lead story), the officials played the Canadian anthem.

And, perhaps remembering similar efforts by the Womens' Electric Racing Team (WE'RE-IT) of previous years, the track announcer noted the presence of the young-female team with the comment "All the women are looking to kick the men's' tails today."



2nd and 3rd placers in the winner's circle. 3rd placer Mike's Auto Care Porsche stands beside 2nd placer U of Idaho Camaro. Good job, Idaho!

Stock Electric Final

Since the stock grid for this race looked a bit sparse to the EVTC officials, they decided to fill it out with high school entries, however the high schoolers would be running in their own class.

The Ford Probe broke its transaxle in the NEDRA drags Saturday night. Though the team stayed late to fix it, the car only had its lower and upper gears operational for the final. To other teams it sounded as though the king of the hill might finally be pulled down, since running in third gear (second was out) would suck more amps and make the Probe die early In the game. Rumor also had it that the U of Idaho NCATT Camaro hadn't gotten fully charged and might also have to wind down before the end. If both of these +300 V cars did slow down due to mechanical or low-battery problems, the race might go to the car gridded in third, the Mike's Auto Care/Clare Bell Optima-powered Porsche 914. Though another beast of the same species might give #13 trouble; the Cal State Long Beach 914, running on Trojan SCS 12 volt flooded batteries.

#13 is gridded in 3rd, from her placing in the heat race, right behind the Salt River Project Probe in the pole position and next to #17 of Cal Poly.

A scarlet GM EV1 crowned with a flashing light is the pace car. As the EV1 moves off, the field gathers behind it, holding their assigned positions for the flying start. Then, as the red pace car peels off into the pits, the field starts to bunch and spread. The SRP Ford Probe, driven by Mike Heath, takes an early lead, with U of Idaho's menacing black #25 Camaro close behind. Mike's Auto Care #13 Porsche maintains 3rd, while in the early laps, the red Karmann Ghia of DM3 Racing, #96, tries to catch the other Porsche 914 in the race, Cal State Long Beach's space-black '73, car #49. driven by Ramez Dabdoub. #84, Jesse James' valiant Sunbelt Battery Ghia is also in the tangle, but nobody trades paint. Car #96 succeeds in passing Sunbelt and Cal State Long Beach and starts making a bid for third against #13.

Idaho NCATT Nips at Salt

By lap 4, the margin between the two leaders narrows to 2.3 seconds as Idaho's big black cat starts nipping at the Probe's rear. In lap 6, DM3's red Ghia, #96 starts its play for fame by pulling into fourth and then suddenly swiping third from the red Mike's AutoCare Porsche. The Ghia starts looking like a real sleeper, but by laps 11 and 12, #96 starts running out of suds, yielding the 3rd place slot back to the solidly running #13. U Idaho creeps up on the Probe, narrowing the margin to 8 sec on lap 16, then to 5.5 on lap 17. The flat black electric muscle car battles the flashy blue and gold SRP #90 through the S's, briefly taking the lead. In the last two laps, the big black cat is visibly tuckered and starting to lose ground before the white flag drops.. SRP's Probe takes first through the checkered, followed by a gasping U of Idaho and a determined #13.

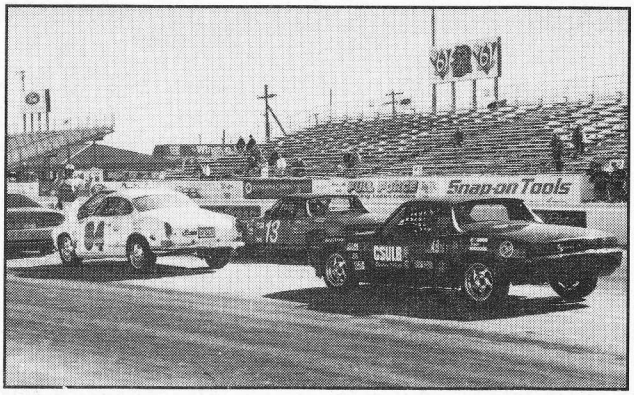
Dying Just After

U of Idaho has timed it just right — you want the car to make it through the finish and die just after - and the Camaro does. It makes the winner's circle, but needs a tow back to the pit area. The Porsche still has juice, which is easier on the team but shows that the car could have been driven harder. The Probe also seems to have reserves. Cal Poly is fourth and the doughty little 84 is fifth, which is damned good for a 108 volt daily driver. Cal State Long Beach, despite its extra batteries and custom front brakes, is fifth. Something must have gone wrong for that 914 not to have done better. Or perhaps trading in those skinny 165 R15's for some Yoko 008's might have helped.

Street Stock Electric Heat

Cars for the street stock heat were gridded by their times in the two morning practice sessions. Those who didn't make practice filled in the end of the grid. SCCA/EVTC issued a stock heat lineup sheet, but by race time, the grid order had changed, as race photos show. Mike Heath in the veteran winner, the Salt River Project Ford Probe, #90 was in pole position, flanked on the outside by Jeffery Fiscus in Cal Poly's Mazda RX7. The second row was the former aircooled V-Dub Club with Dave Erb in the Mike's Auto Care 914 Porsche, car #13 on the outside next to old buddy #84, the classic Sunbelt Battery Karmann Ghia with Jesse James at the wheel. Both of these cars have been running in this race since its inception in 1991. Behind #84 was Ramez Dabdoub in another 914, the Cal State Long Beach space black '73. Partnered with the 914 on the outside was University of Idaho's big black 348 volt Camaro, running an AC Propulsion drivetrain.

The Red Queen EV1 pace car led the field around for a wind-up lap, then let them loose. Immediately U of Idaho's big black animal lunged forward to tangle with the SRP car, a move that put both of them sideways on the track. When they recovered and the battle resumed, the Camaro passed the Probe, snatching up the lead. Back in the pack, Dave Erb in #13 Porsche caught and passed Jeffery Ficus in the Cal Poly #17 Mazda, slotting neatly into an early third..



The three members of the (Formerly) Aircooled V-Dub Club, although the two Porsches might not want to be included. Jesse James in #84 flanks Dave Erb in #13. In foreground is Ramez Dabdoub in #49.

The blue and gold SRP car made a successful bid to take back the lead from the high-powered U of Idaho #25 Camaro. Both cars had packs exceeding 300 V and both were running AC Propulsion drivelines, so it wasn't any surprise that they were soon 39 seconds ahead of the third-placing Porsche, which was running 144V of Optimas and a rebuilt Advanced DC 9-inch motor. The V-Dub club had its own little war, with Jesse's Ghia contending with the Cal State Long Beach 914.

As they headed into lap 8, SRP opened it up over U of Idaho. Both leader and second rocketed down the front straight, lapping Jesse in #84. The Cal Poly Mazda targeted the Mikes Auto Care Porsche, trying to take back third. In lap 9, the Ford Probe increased its lead to 8.5 over the Camaro. In the DC field, #13 and #17 continued battling for third.

Heath in #90 stretched his lead out to 16.5 seconds over Joseph Lyon in #25, then slowed down a little as battery drain began to take its toll and the white flag fell. Rounding the track one last time and heading into the checkered, it was #90 in a clean long first and #25 second, fighting to catch up. The two contenders for third had swapped places, with #17 Mazda ahead of #13 Porsche. It was close, but at the last moment on the final straight, Dave Erb asked the Porsche for more and got it, slingshotting out from behind the Mazda. The Porsche's flat hood edged ahead of the Mazda's nose as the two shot across under the checkered, and when the announcement came, Dave Erb in the Porsche had whipped third away from Cal Poly. Following the fourth place Mazda was Jesse James in #84, in a respectable 5th, which is not too shabby for a 108 volt car!. Cal State Long Beach tailed in 6th, which was puzzling since the car had more battery than #13 and could have run harder. Perhaps the difference was in tire adhesion and handling.

Cal Poly's time in practice earned the #17 Mazda a slot next to the #90 SRP Probe.

High School Pit Crew Competition.

Saturday morning started off with the High School Pit Crew Competition. This basically involves how fast a team can take a rear tire off a vehicle and swap it for a replacement. In detail, the sequence is; the team starts behind a line away from the electric pickup truck, grabs a floorjack, runs the jack over to the vehicle, pumps the (4,000 lb. US Electricar pickup) truck up in the air, grabs a pre-adjusted air gun (the air being supplied by an APS service truck equipped with a compressor), removes the lug nuts with the air gun, gets the tire off, hustles it over to where the replacement tire is lying, dumps the old tire for the new one, hustles that one back to the pickup, mounts it, drops the truck back down, replaces all the tools in position and then scramble back behind the line, at which point the whistle blows and a time for all this frenetic activity is posted. Each team has a chance to adjust the air gun to its preference before their turn.

Imagine This

So, if you can visualize three or four eager high-school guys or girls, bolting across the line for the tools, muscling a floor jack over pavement as fast as its clattering metal wheels will take it, grunting and straining to pump the white US Electricar pickup in the air, throwing , hauling and chasing tires, and scrambling back across the line to the blast of a whistle, you have an idea what this event is like.

The first team up is Richmond Tech from Virginia, says the announcer, as beefy and not so beefy high schoolers gather behind the line to pounce at the tools. Everything goes precisely and fast until they get hung up replacing the last lug nut on the truck. A 91.33 sec or 1 minute 31.33 sec, calls the announcer, and adds that we are 20 minutes away from the start of the ABB University Spec Series practice.

Watch Where You Jack

The next team jumps the gun and requires a restart, but does better, whipping the truck tire on and off in 1:05 minutes. The team from East Valley Institute of Technology pulls a slower 1:23. This maneuver is tougher than it looks — everything has to go precisely as planned. The first team from Camelback High starts out looking good, but fumbles getting the tire off. "Start those lug nuts by hand first," admonishes the announcer, "don't try to drive them on." It's still a good time, though,; 68.37 sec or 1:08.37.

A What (?) Kind of Day?

The team from Palo Verde High School, down Tucson way, has it all together, whipping the pickup's tire on and off without a hitch in under a minute —58:35 seconds. Now the second team from Palo Verde is up and waiting while the announcer, getting into the spirit of things, expansively comments on the beauty of the morning as only an Arizonan can;. "Yes, it surely is a purple hooter kind of day."

High school team ready to lunge over the line at the start of the timed tire-swap on the US Electricar pickup truck. In the background, a ABB U Spec entry speeds by in practice.

A second team from Camelback launches itself at the white pickup, but they have a problem getting the jack under. "You guys have to watch where you jack this truck up," says the announcer, as fingers fly, twiddling the lug nuts on the first few threads before the air gun does its whir and rat-tat-tat. Back across the line, hearts thumping, sweatshirts damp, for a 1:05:07, beating their Camelback brethren.

(This poor Californian is at a loss as to the exact meaning, but it sounds exuberantly earthy. I suspect I have two of the items referenced.)

A Teleported Tire

Another team from Camelback outdoes the Tucsonians by moving that tire so fast that it might have been teleported. Camelback is now in the lead with a 51:08 second time.

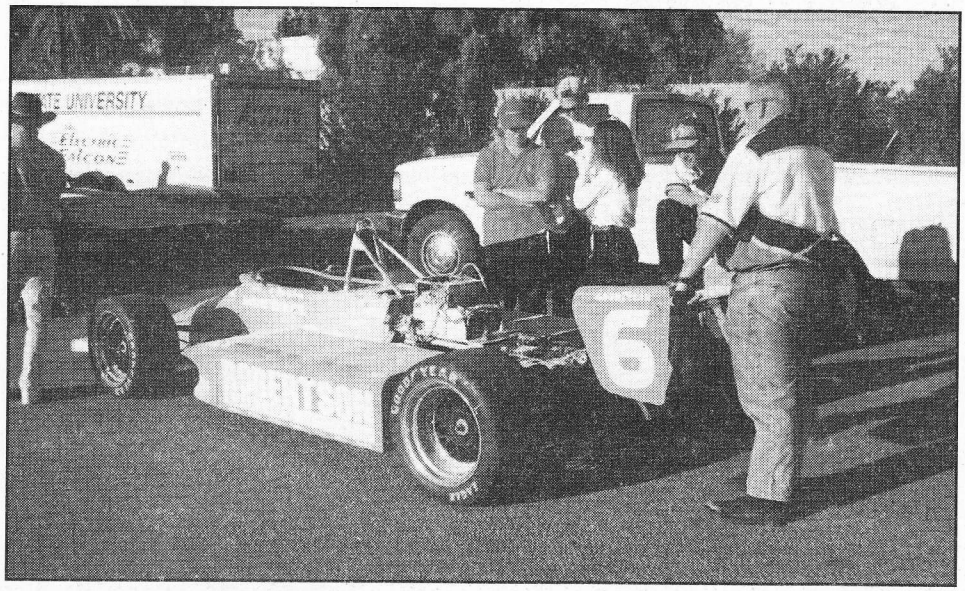
Seminole is up for the scramble and they do it. "Oops, forgot something on the wheel," says the announcer. "Get it back on now." Even with the oopsy, the team from Texas hits an under-fifty-second time, their 49.25 bouncing Camelback from the lead.

Can't Paint the Town

Palo Verde #2 pumping that jack handle.

the one tire off. Careful of that jack handle there", he warns as the wheel-carrier catches his shin and nearly goes tire-over-tennis-shoes onto the pavement. A good recovery and an 81.90 second time or 1:21.90. Another team pulls an 84.75. A second team from North completes the change in 1:25.06, but leaves one loose lugnut. "Gotta fix it," says the announcer and the team hurries back across the line.

A spectacular and well-coordinated ef-



Trouble-plagued Embry Riddle E-Spec #6 entry gets new motor after toasting its Kostov. The motor wasn't at fault — the brushes hadn't been run in, which is essential at 216 volts.

This US Electricar Pickup is pretty heavy, with 52 batteries. The announcer gives the prizes; $300 goes to the winner, $200 for second, $100 for third. The check, he adds, is made out to the school. The kids can't go out and paint the town on it, even though they probably deserve to. These teams work hard, with intensive practice.

And it's the cowboy team - Winslow High, going out to corral and hog-tie that truck tire. "Down and across, " says the announcer , then they're back over the line and panting with 66.04 seconds or 1:06.40.

Tire-over-Tennies

North High School is off and running and so is the announcer." Nice little crossing maneuver there, getting her jacked up, get

fort from Canyon del Oro High earns them a 48.43 and an OK from the guy who checks the job, putting them into the lead. Behind the pitcrew competition, ABB University Spec and E-spec cars are coming on track for practice. Bowling Green University's open-wheeler speeds by.

"The crowd is coming along for Carl Hayden," says the announcer, as that team racks up a 52.19 second time. The lug nuts are all tight, earning Carl Hayden fourth place in the standings.

Another team from Texas has some trouble with the air gun, earning them an admonishment from the announcer. "When you come up, don't turn the slide knob on the air gun. It has 160 lb. of torque which is plenty to get those lug nuts on."

Track Happenings

On the track behind the pit crews, there's more activity. Sitting up in the press box, as I am, I can hear the interchange on the radio between the race controllers and track workers. "Got a slow one on the back," crackles the radio as car 31 loses headway and glides to a stop off-track.

St. Johns High School, now performing the high-speed wheel-swap, is looking good until a tire runs away on them.

Embry-Riddle's Smoke Rocket

Some excitement erupts on-track as a blue E-Spec racer from Embry-Riddle/ Robinson Aeronautical Institute turns into a rocket on the front straight — complete with billowing blue smoke out the tail. This 216 V entry has been talked about as possibly the fastest car in the E-Spec or U-Spec field, if it holds together. Obviously something hasn't. The blue E-spec comes to a halt beyond the grandstands, its position marked by a gray plume. Emergency vehicles shoot down the track, beacons flashing. Maneuvering in front of the disabled race car, one tow truck gets briefly in the way of a black-and white open-wheeler, who has to slow and dodge past. Instead of going "on the hook", Embry Riddle gets a flat tow with a strap.

PitCrew Runoffs

The pitcrew competition is now in the run-offs. Canyon del Oro stands in first, Seminole from Texas in second and Camelback third. Miramar High from Florida hasn't run yet, so they go, earning a 69 second time.

Then comes a glitch in the proceedings. Apparently the first two teams did not get the chance to check their equipment. Los Altos High and a team sponsored by Don Bosco get re-runs, but it doesn't change the overall finish order. Richmond Tech also gets a re-run and betters its previous time with a 82.53 or 1:22.53, but doesn't displace any of the top slot holders.. The pitcrew competition ends with Canyon del Oro, Seminole and Camelback in 1st, 2nd and 3rd.

Notes on #13 - Saturday Morning - 3/7/98

Though the car was put on charge Friday night, there was a charging failure. The Mentzer charger cut out early for some reason, reaching only 58 units as read on the Badicheq battery management and charge control system. When topped up, the battery monitoring system display will read 78. Mike Slominski shifted over to the backup charger, a Zivan, but the lack of charge kept the Porsche out of the Saturday morning pro and high school stock practice session. #13 qualified based on practice times on Friday and the team thought it didn't have to run until the stock feature later on Saturday This was unfortunate because the race officials later announced that Saturday practice session times would determine heat grid positions. Cars that managed to get on track and generate some reasonable lap times in that practice displaced the Porsche and she ended up being gridded further back than the team expected.

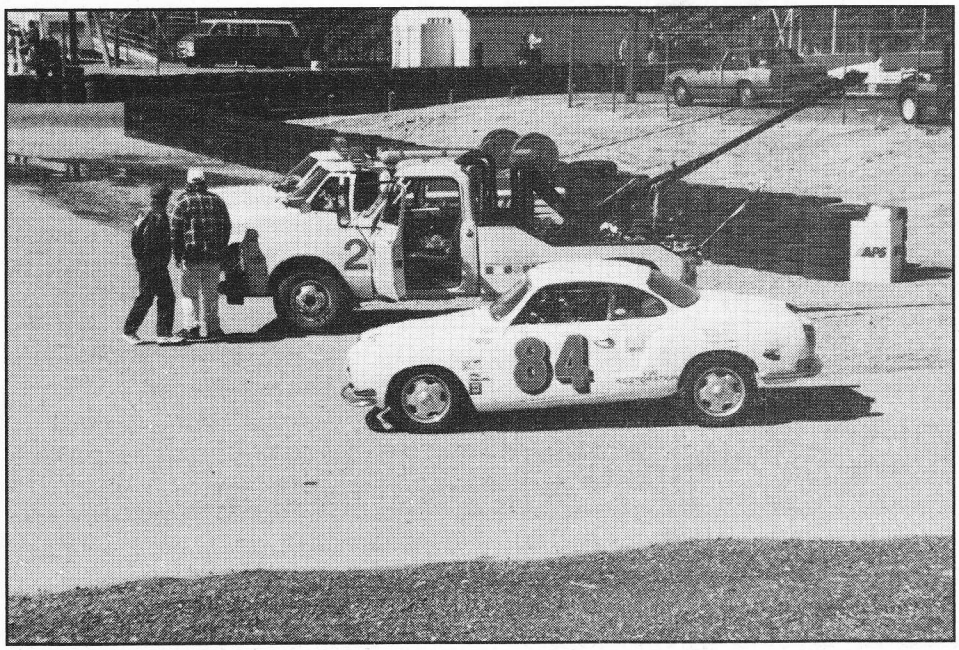
While #13 sat in the charging area sucking 9.8 amps through the Zivan into her Optima yellowtops, other street stock and high school stock entries were out testing their performance. Cars that make practice sessions (i.e. are not still being built at the racetrack!) are often winners; in fact there is a strong correlation between cars that are together enough to take the practice opportunity and those who take the heat and final races. Not that #13 was still being built in the pits—far from it. Several years of experience had finally sunk in and we'd brought a complete and running car to the race. However even the best-prepared team can be beset by charging demons and the Porsche appeared to have attracted her share.

The hotshots who got into the practice included Palo Verde High's #23 Rabbit and other HS cars; #4, #6, #14,#66 and #76,

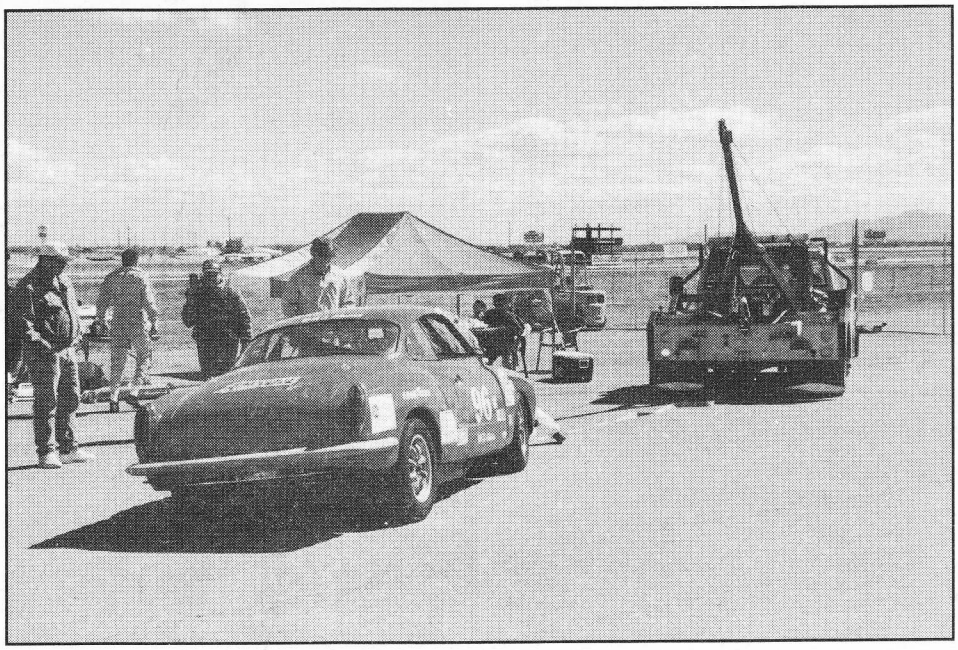
HS car #88 and Don Bosco's #25 got out late, but managed to lap several times before the group was called in.

Two pro-stock Karmann Ghias romped around the track, Jesse James white Sunbelt Battery #84 and DM3 Racing's #96.

Would the Porsche be outdone by its two Karmann Ghia cousins? Well, if she didn't get into practice....



Jesse James in #84 Karmann Ghia rolls past the tow trucks to the stock practice session. #96 Karmann Ghia from DM-3 Racing couldn't avoid them - he either got a flat or ran out of suds on the track and had to come back "on the hook". Or at least at the end of a tow strap.



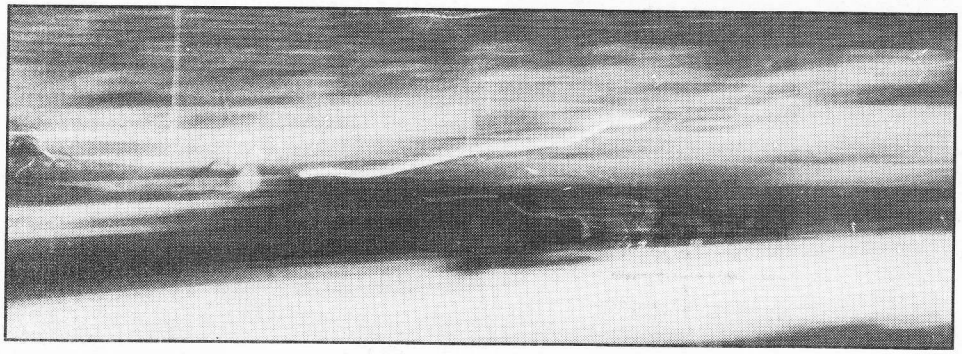
Saturday Night NEDRA Drags Notes

Maniac Mazda running against stock GM EV1, Rod Wilde ran 15.51, the EV1 ran 16.85

Rod was saying that the Mazda ran a 13 second time recently.

History-maker - Dennis Berube and Current Eliminator II broke into the 10's in the low Renault

Highland Thunder with driver MacDonald took the Nova Scotia car down the drag strip against Jesse James' 84 Karmann Ghia. Her objective was not to hit a specific time but just to have the thrill of taking the car down the drag strip fast enough to enjoy it



All you ever see of E-dragsters at night. Current Eliminator II (near lane) in record 10.88 sec run against Jim Ludiker (far lane).

quarter mile, dropping from a previous 11.01 seconds to 10.88. Berube had 10.91 chalked on his windshield before the run and he bested his predicted time. The chalked value on Current Eliminator's windshield went to 10.71. The run didn't hit that optimistic value, but Dennis succeeded in showing that the previous 10.88 wasn't a fluke by topping it with a 10.86.

Dennis has been working for 5 years to break into the 10's with his electric dragster and he was ecstatic when after his electric missile aced the numbers, dancing around and hugging Current Events' editor. The chalked 10.71 still stands on the dragster's windshield and Dennis plans to run this weekend against the gas-sters, so he will probably drop into the mid-10's and head down for the 9's. Well, Dennis, thanks for saving the breakthrough for the folks that really appreciate what you've done, namely the EV motorheads attending the NEDRA Drags at the Phoenix Electrics.

Other runners - John Wayland in White Zombie scored in the 15's

192 volt wars - Bill Dube's Ewectwic Wabbit against Lou Tuber's Screaming Yellow Renault

Highland Thunder with driver MacDonald took the Nova Scotia car down the drag strip against Jesse James' 84 Karmann Ghia. Her objective was not to hit a specific time but just to have the thrill of taking the car down the drag strip fast enough to enjoy it but not enough to damage their effort of three years. She just wanted to get her feet wet, which was great. And Jesse enjoyed it too. After all, the objective is fun, right?

Jim Ludiker in his electric drag rail was hitting in the 12's. Look for him to provide Dennis with some competition as his e-ster develops.

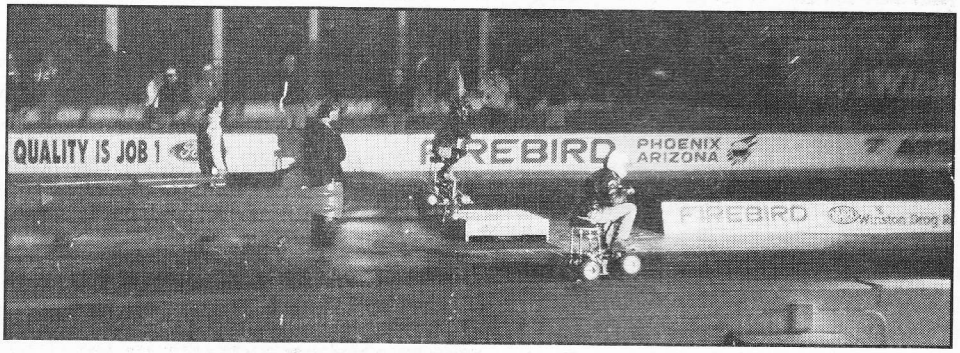
Bruce Meland 's Kawashocki II, named in honor of Ed Rannberg's pioneering drag bike, made its virgin runs at the NEDRA Phoenix drags. Fresh off the workbench, the Hawker Genesis-powered drag cycle stayed together during two launches and racked up respectable times in the 16's. Considering that this was a last-minute effort, it did far better than most last-minute productions and showed a lot of promise.

CE welcomes Kawshocki II onto the EV drag scene. If the builder of Kawashocki I is looking down, he must be tickled. After all, what is the most sincere form of adulation, right?

The most laughs per charge came from the two electric barstool racers, who catapulted down the strip with only a brain-bucket and a prayer between them and disaster. The machines proved surprisingly stable, despite their top-heavy appearance and stayed upright until their times flashed up on the Winston and Coors signs that mark the end of the 1/4 mile. They must have a lower CG than appearance suggests

The barstool pilots took so long to return to start that someone asked if they'd dropped by the bar on the way round. Well, they could have rolled right up and chugged a few. Good show, guys!

Another belly-cramper (don't make me laugh again, it hurts!) was Peter Sienkowski's hopped up .... car, bike, shopping cart, skateboard? ...No, it's the world's fastest .... Citi-El! This Danish-built machine had received enough of an infusion of California EV insanity to lift its front wheel on launch and shoot down the track like a demented Scandinavian slingshot to a terminal velocity of 58 mph! And Peter told the NEDRA official that the car wouldn't go over 35.



These guys got the most laughs per charge.

Saturday Night Electric Desert Drags

March 7, 1998
Phoenix, AZ

This exciting event was sponsored by Hawker Batteries and Electrifying Times with additional thanks to Optima Batteries and the Salt River Project. Held at the Firebird International Raceway, the Saturday Nite Electric Desert Drags were run in conjunction with the APS Electrics. The event featured the exciting record setting of Dennis "Kilowatt" Berube as he and his dragster became the first EV to run in under 11 seconds. His official time down the quarter mile was 10.88 seconds. Other exciting vehicles included the appearance of the first street production vehicle, GM's EV-1 and a continuing rivalry between the White Zombie and Maniac Mazda.

Congratulations to one and all and thanks to all who participated. Our new record holders have been added to our list at records.html on our website.

Class Voltage	Driver/Owner	Car Name/Type	1/4 mi Time	MPH
DR/A 336	Dennis Berube	Current Eliminator/Dragster	10.882	110.5
DR/B 240	Jim Ludiker	Circuit Breaker/Dragster	14.523	86.47
HM/G 96	Amie McDonald	Highland Thunder/Lola	15.159*	41.32
HS/G 96	Chelle Myrann	Electrocyte	16.21*	39.16
MT/G 96	Peter Senkowski	No Smokin'	13.227*	51.98
MT/C 192	Cook/Solarland	Kawashocki II	16.947	80.62
MC/A 528	Roderick Wilde	Maniac Mazda	15.519	78.41
MC/A 336	John Wayland	White Zombie/Datsun 1200	15.77	81.45
SC/A >241	Salt River Project	Ford Probe	16.185	87.7
SC/C 192	Bill Dube	Ewectwik Wabbit	18.849	66.54
SC/C 192	Lou Tauber	Screaming Yellow Zonker	20.687	64.19
SC/F 112	Sunbelt Battery /James	Karmann Ghia	23.199	56.8
SP/A 336	Marvin Rush	EV-1	16.26	78.76

* For vehicles that are 96V and below, only the 1/8 mile times were taken for this event.

First Optima National Electric Drag Races - August 30, 1997 in Woodburn, OR. For photos and commentary on this event, look up http://www.icsi.berkeley.edu/~grannes/drags/index.html

We would also like to thank the sponsors who made this event possible

Optima
http://www.optimabatteries.com/main.htm

Dax Industries, Inc.
http://www.daxcontrol.com/

Baxter Auto Parts

Kilovac
http://www.kilovac.com/

Electrifying Times
http://www.teleport.com/~etimes/

EVCC

Wilde Evolutions
http://www.Wilde-EVolutions.com

Oregon Electric Vehicle Association
http://www.geocities.com/MotorCity/Downs/6058/

Hawker Energy
http://www.hepi.com/

E-Car: Electrifying Performance, Inc

From NEDRA's website as of: Mar 18

It's coming *soon*
Help EAA Grow - *Support*
CARS FOR CLEAN AIR

High school main event

Observing the High School grid, the announcer comments that "These guys aren't afraid to tear things up, since their conversion race cars don't cost as much to fix as the U spec cars." I imagine though, that a high school team would be equally upset if their car was badly damaged, having put a tremendous amount of effort, sweat and love into it. Car #44 (Los Altos HS, Hacienda Heights, CA), which has been marginal, pulls out just before the race.

As soon as the EV1 pace car leaves the track, the Palo Verde High Rabbit, #23 shoots ahead of the bunch. Carl Hayden's #15 takes second followed by Joseph City's #37.

Now Joseph City takes second off the corner, besting the Hayden car.

Palo Verde's 12.5 sec lead widens as the Rabbit streaks down the straight. The rest of the bunch battle for position far behind it. A strong favorite, last year's winner, Port Townsend HS #77, is fifth. They may not do as well this year, since they had charging problems the previous night. The announcer says that the entries need to finish 23 laps to finish the race.

Through turn 10 at the Coors tower, eyes go to the Paradise Valley #7 Saturn car as it makes a strong move. For a moment it looks like a fight as the Saturn challenges the bunny for the lead, but the fur flies only briefly as #7 drops back. PaloVerde opens the lead to 7.6 seconds after only a few laps. As Elmer would say, "Lookit dat Wabbit wun!

By the fourth lap, the next placers are, in order; #15, Carl Hayden, #37, Joseph City, # 66, Desert Vista, # 77, Port Townsend, #99, Buckeye, #9, Kearny H.S., #98 St. Johns, #6,

Kearny HS's 924 Porsche, car #9, making a late bid for the lead, a move that earned Kearny first place in the final. Following (left to right) are a Ford Escort, car #6, North HS, a Dodge Charger ,#37, from Joseph City HS, and a Chevy Citation, car #43 from Camelback High.

Palo Verde HS #23 Rabbit from Hell at the juice bar - This bunny dominated the track until the very end

Phoenix North, #4, another Palo Verde car and #38, Central Shenandoah.

With 5 laps down, Port Townsend comes alive, shooting by the 4th position to take third away from Joseph City and jockeys to the inside of 2nd place holder Carl Hayden.

Leader Palo Verde Rabbit is having to contend with some lapped cars in the S's while #77, Port Townsend holds second and chases first. #15 of Carl Hayden keeps third.

After six laps, Palo Verde has a 13.2 second lead over Port Townsend. All other cars are at least one lap down to the leader. With amazement in his voice, the track announcer says that despite his lead, the Palo Verde driver "is not laying it down. He's

getting all he can out of that machine."

The margin between lead and second is 14.7 seconds. Port Towsend starts to reel it in, passing #17, the Camelback HS pickup truck.

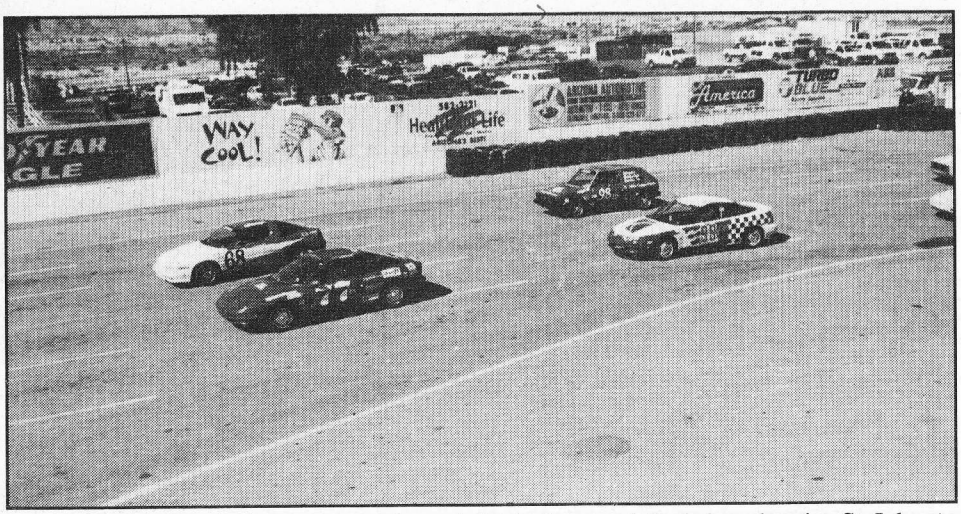
The race takes its first victim as Desert Vista's #66 slows on the course. Palo Verde stays way out in front, but here comes a determined 77 Port Townsend Probe, lapping the pack in a bid to shorten the lead. Working lap nine, the margin widens to 15.1 seconds. #23 comes up on a faltering #66 as the announcer comments that Desert Vista may be "the next victim to the Palo Verde Monster."

Now there is a 16.0 sec lead for the Rabbit From Hell (what it must seem like to the other cars) with Port Townsend's. 77 outside, inside, then outside again.

Another car bites the dust —Carl Hayden off the course.

St. Johns HS fights by Buckeye while Port Townsend falls back to 6th. That car definitely must have had charging problems, but chose to run anyway. The Rabbit From Hell has 20.9 seconds on the next car. Fourteen laps are complete. Phoenix North does some four-wheeling through the dirt surrounding the S's. Now hold everything! Is the Rabbit From Hell proving vulnerable after all? Yes, #23 is definitely slowing, draining batteries reducing its lead to 14.2 sec.

"It all comes down to strategy," says the track announcer. "Save what you've got until the end." Which Palo Verde hasn't.



Car #99, Buckeye's Saturn, moves through the pack towards 2nd place, lapping St. Johns Rabbit, #98, which took 3rd. Favorite Port Townsend, #77 Probe, falls back , starting to run out of energy — it had charging problems, but the team decided to race anyway.

trying to close in through the S's. #99, Bucke is third, 4th, Joseph City.

With 11 cars on the lead lap, The (innocent-looking) Palo Verde Rabbit From Hell maintains its 15.3 sec lead. The leaders are, in order: 23, 77, 997, 98, 9. Following is car #15 from Carl Hayden, while the announcer says that the last car on the lead lap is another Palo Verde, #4.

Number 23 is opening it up further over Port Townsend. Buckeye's # 99 coming up on the inside of Port Townsend, swings They have, as the saying goes, shot their wad.

That Palo is pooping out is confirmed when St. Johns and Buckeye pick up six seconds on the Wagin' Wabbit.

At 16 laps on the books, the favorite Port Townsend is down, out of juice and out of the cvent. How ignominious for the Probe; to be beat by a bunny! But a valiant effort, PT.

It must be March hare fever getting to the Rabbits, since up comes another bunny to duke it out with the leader. #98 of St. Johns HS leaps into the fray and into a hare-y battle with Palo Verde's #23. Yes, folks, its a real Rabbit fight as St. Johns narrows the lead to 4.1 seconds and then takes the top slot away from Palo Verde in turn three.

Palo Verde's bunny goes fishing, trying to reel in St. Johns, but comes up with an empty hook.

#4, Central Shenandoah remains the last car on the lead lap Now Kearny HS, #9 which has been hiding in the pack, makes its move.

At 19 laps down, it is ;

St. Johns, Buckeye, Kearny , Palo Verde. In a Wabbit Wrangle, St. Johns goes to inside of Palo Verde. Buckeye surges by the battling bunnies to take a 3.3sec. lead, but watch out for Kearny HS, who is now running faster than anyone else, says the announcer.

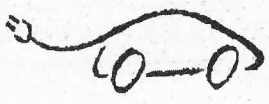
Kearny is pouring on amps to thread up through the pack. Now it is St. Johns, Kearny and Buckeye. 8 cars remain on the lead lap. The nines nip each other as #9 Kearny and #99, Buckeye go nose to tail through the S's, followed by St. Johns. Only one car length separates Kearny and Buckeye as the white flag waves.

The announcer excitedly yells, "These two will duke it out on the last lap!"

"In a classic Dale Ehrhard move," Kearny slingshots past Buckeye into the top slot. Buckeye, now finally running out of energy, still holds down second while St. Johns hangs onto third.

"Kearny's got it!" rings out of the track PA as the Kearny 924 Porsche sails under the checkered. Buckeye's #99 is second while the #98 Rabbit of St. Johns cruises around to the finish to third while Palo Verde shows that it still has some get up and go by hopping in fifth.

The margin of victory between Kearny and Buckeye is close; 2.7 seconds. The spectators agree — an exciting race and a spectacular finish. —CB



High School *Acceleration*

One car stood out from the crowd in this compassion, namely Port Townsend's Ford Probe, car #77. This sleek conversion toasted all others in the class by dropping into the 12 second bracket in the quarter mile, while the nearest competitor could barely reach the mid -14's. The coastal Washington-Oregon area is a hotbed of high-performance EV-dom since it boasts NOPEC and the electric boat racers such as Dave Cloud, Burton Gabriel and others, NEDRA (National Electric Drag Racing Association) and SEVA (Seattle Electric Vehicle Association). John Wayland, Lou Tauber and Gehrhard Wagner of E-Car in Portland are up in that area and surely must have provided some inspiration.

The Port Townsend entry, car #77, shown in pole position in the High School Feature race.

Student electric acceleration competition (top ten)						
Car #	Team name	First time	2nd time	Best	Place	Points
77	Port Townsend	12.887	12.811	12.811	1	30
30	St. Johns	14.351	14.238	14.238	2	29
23	Palos Verde	14.566	14.984	14.566	3	28
15	Carl Hayden	14.719	14.845	14.719	4	27
68	Cortez High	14.963	16.563	14.963	5	26
98	St. Johns	15.607	15.380	15.380	6	25
07	Paradise Vlly	15.389	16.039	15.389	7	24
09	Kearny HS	15.568	16.070	15.568	8	23
88	Holbrook	15.575	16.411	15.575	9	22
28	Seminole	17.282	15.584	15.584	10	21

U of Oklahoma Wins College PitCrew Contest

Posting a new record in the process, the University of Oklahoma's team won the pit crew competition for ABB University Spec series electric racers entered in this weekend's APS Electrics Race at Firebird International Raceway. The pit crew competition was conducted in front of the Arizona State Capitol during lunch hour on Friday.

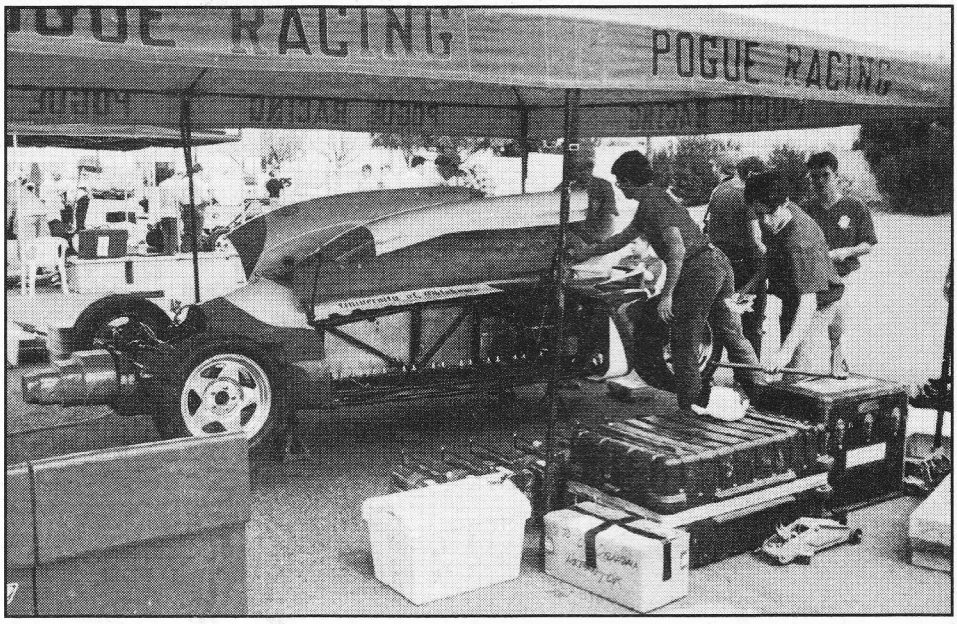
From the time Arizona House Speaker Jeff Grosscroft sounded the horn to start their battery change until driver Billy Roe, a veteran of the Indianapolis 500 mile race, pulled the car away from the pit, the time was only 14.27 sec, which broke the former record of 15.00 also held by Oklahoma.

"It was just a terrific effort on everyone's part, commented Todd Cannon, the team's crew chief. "These guys (on the pit crew) are busy every weekend working on this car and practicing when other people are busy doing other things, and this is the result of the time they've put in."

The battery change required crew members to lift the side pods on each side of the car, remove the installed battery packs and install new packs. Each pack weighs about 100 lb.

Members of the winning crew are Josh Freeman, Monty Pipher, Steve Lindo, Rick Pendergraft, Drew Bailey, Emmanuel Dane, Ian Lee, Chris Bowman and Randy Parker.

Each of four competing teams got two chances to record a time. Oklahoma's other effort of 15.29 was the second best time recorded.



University Pitcrew Competition winners from the University of Oklahoma shown loading their car with batteries prior to the ABB U Spec heat race.

Kettering University placed second in the competition with a time of 15.67, with Bowling Green State University third at 17.50 and the Ohio State University fourth with a 19.18 clocking.

Eight schools are entered in the ABB University Spec competition at Firebird this weekend, while more than thirty high school teams are entered in the Student Electric Competition (SEC), one from as far away as Florida.

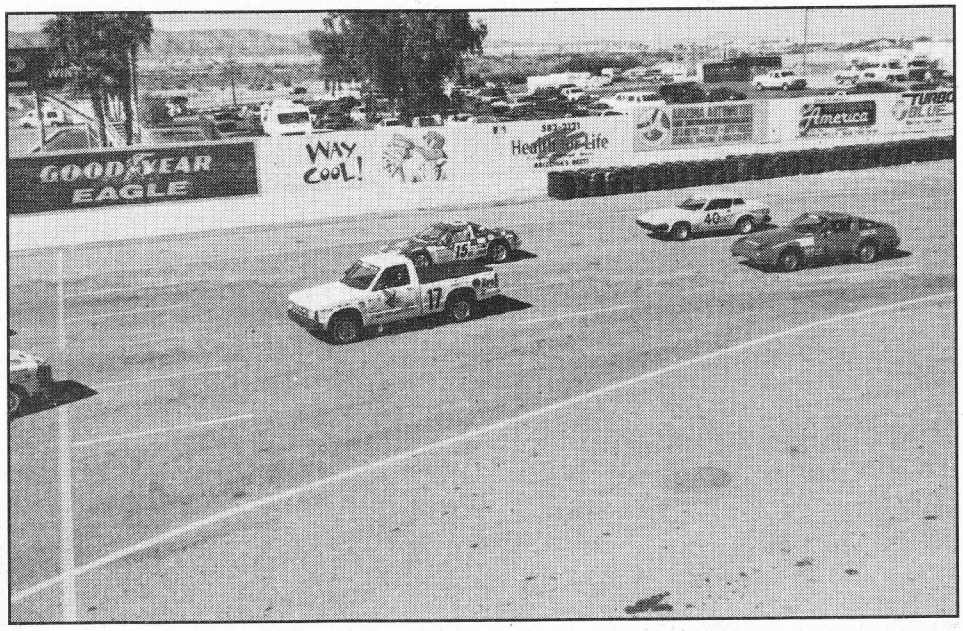
The ABB U Spec cars resemble formula-type cars, while the high school racers are conversions of street-legal machines.

Source: EVTC press release
3/6/98 - Phoenix, AZ -
University of Oklahoma wins electric car pit crew contest with record effort

High School Braking and Handling

Before participating in the heat races, all the high-school entries had to undergo braking and handling evaluations. This involved a run though a short but twisty autocross-type track, complete with slaloms, hairpins and other challenges. Knocking over a cone during the run added a second to the score. One entry broke during testing and had to be pulled out for repair. This trial is an early predictor of who will do well in the up coming roadraces, so it is watched carefully.

Carl Hayden's #15 Fiero out to be the most agile car through the twisty course. A new entry for this year, Kofa High School's #30 Dodge Charger followed, with St. Johns #98 Rabbit taking 3rd.



Carl Harden HS's #15 Fiero during the High School Finals. In front is #17, Camelback High's Chevy pickup and behind, Sahaurita High's Triumph TR7 and Palo Verde's #4 Nissan 300ZX.

Student electric braking and handling comp. (top ten)

Car #	Team	1st time	cones	2nd	cones	Best	Place	Points
15	Carl Hayden	47.168	2	42.499	0	42.499	1	30
30	Kofa HS	44.987	7	42.810	0	42.810	2	29
98	St. Johns	49.478	2	43.021	0	43.021	3	28
03	Agua Fria	49.209	3	43.214	0	43.214	4	27
23	Palos Verde	75.389	0	44.249	0	44.249	5	26
50	Camelback	61.585	1	44.374	0	44.374	6	25
88	Holbrook	52.787	0	45.262	0	45.262	7	24
02	E. Valley Inst.	44.510	1	46.210	4	45.510	8	23
77	Port Townsend	50.884	1	46.717	0	46.717	9	22
76	Miramar (FL)	53.363	2	46.825	0	46.825	10	21

Race Tech Notes

Kettering University, #21

This entry ran 2 Advanced DC 9-inch DC motors with a chain drive into the gearbox. The controller was a water-cooled Godzilla from EVCL. This set-up worked well, taking 2nd in the ABB U-Spec heat race, one of the best finishes for a car with DC drive. The closed-loop cooling system lacked a reservoir, since it had been removed to save weight. Instead, the team was bleeding air from the system prior to running it. Apparently a bubble got into the system, causing the pump to cavitate, which prevented coolant form circulating. Deprived of cooling capacity, the controller went into self-protective thermal shut-down.

(info from Gary Flo at InnEVations and Otmar Ebenhoech at EVCL).

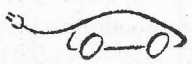
Kettering U--Late, but made it, and they took third in the heat. In the background, heat winner Bowling Green, #4

Arizona State University

ASU (Arizona State University) was running with an old EVXL M3 controller from EVCL.

Their single Advanced DC 8" motor became a casualty of the Saturday events. Arizona Public Service Company sponsored a new motor for the Sunday final. The team hustled to get it in, only to have a battery connection fail partway into the main event. As Otmar Ebbenhoech reports in his EVDL post, "They deserve a hand for great teamwork on the last minute motor swap."

(Thanks, Otmar for the info. —CB)

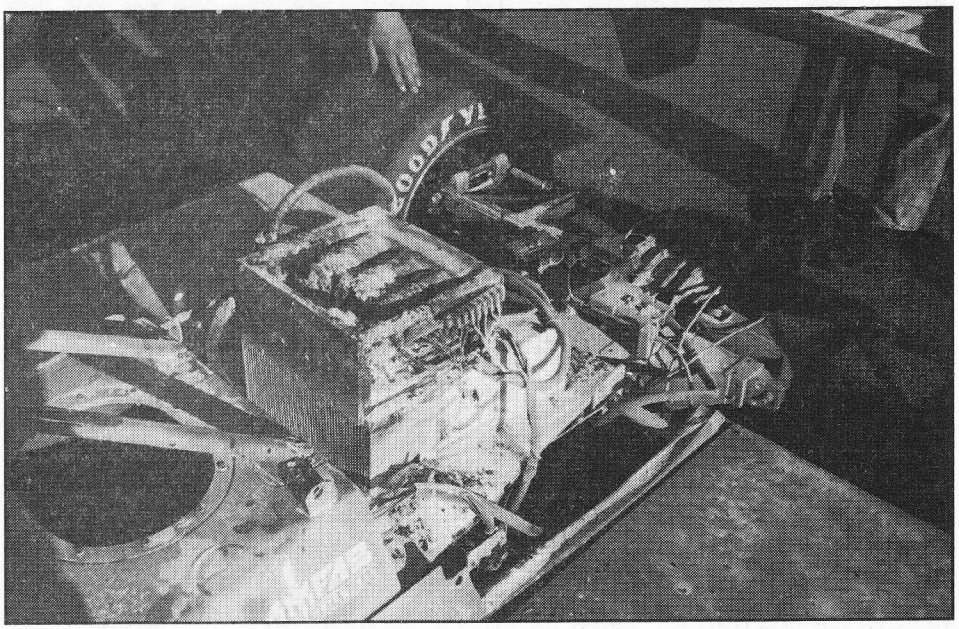


Student electric oral comp.
Top ten results, Friday - 3/6/98

Car#	Team	Score	Place	Points
23	Palos Verde	6.36	1	30
43	Camelback	5.97	2	29
15	Carl Hayden	5.50	3	28
40	Sahuarita	5.33	4	27
59	Central	5.20	5	26
17	Camelback	5.17	6	25
30	Kofa	5.13	7	24
98	St. Johns	4.57	8	23
4	Palos Verde	3.83	9	22
76	Miramar	3.46	10	20

First Kostov Meltdown

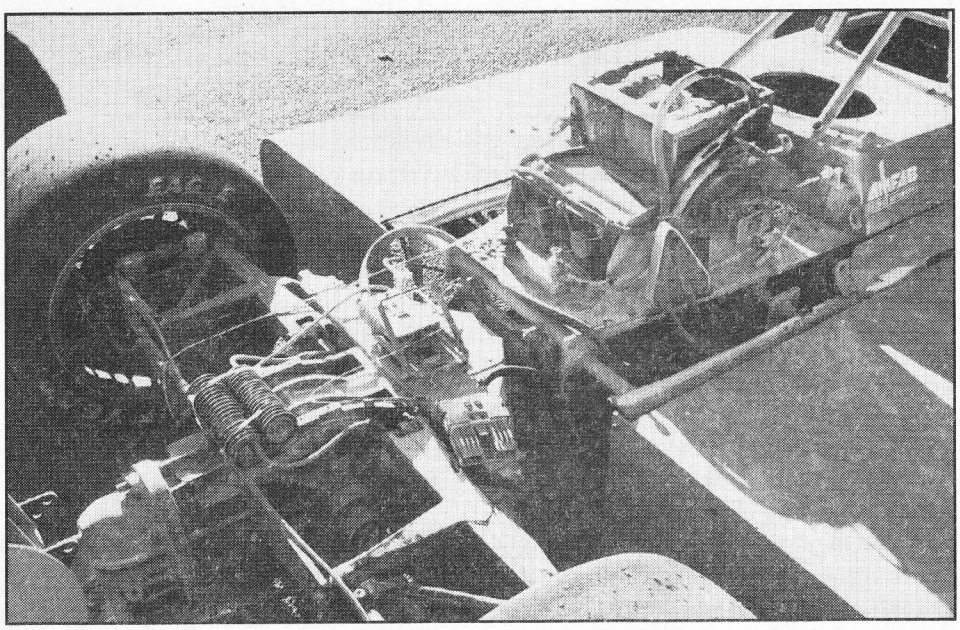
The motor itself was not at fault; it's brushes had not been properly seated or run in prior to competition. A brand new off-the shelf motor has flat-faced brushes that do not conform to the curve of the commutator. Current is transferred through the tangential point of contact rather than across the entire face of the graphite. For lower voltage street EVs, this is not that critical and the brushes will gradually wear in. But for a high-voltage, high performance race car under the stress of speed, that contact point can arc severely and burn the commutator bars. Lack of time or attention had sent the Embry Riddle car out with this vulnerability, which led to failure.



Embry-Riddle's smoked motor isn't visible, but the toasted Motorola controller showed how extensive the damage was.

Not a True Test

Gary Flo reported some of the gory details in an EV Discussion List post,



The car did not have a main contactor, but instead depended on a manually-pulled cable disconnect, which failed to release.

"E-R had a major meltdown with a lot of equipment going up in smoke. They had previously plasma-ed their Kostov in practice by running it with flat unworn in brushes at full throttle. The first Kostov meltdown, but not a true test. Brush box and part of the commutator was melted."

Kostov Flavors

Note:

The Kostov motor is also widely known under the trade name Monster Motor. Though differing slightly in a number of ways, the stock Kostov and the Monster Motor should have relatively the same performance characteristics under competition conditions.

Eagle Field

The Eagle Field EVent scheduled for June 19, 20,21 is gathering momentum and rolling toward take-off. An event management group has been formed; Eagle EVents. Eagle Field is owned and run by Joe Davis, whose brother, Bob Davis builds electric and hybrid buses. Joe is a fan of vintage WW 2 aircraft and vehicles as well as Evs, so there will be lots of stuff to see and more to do

Jim Patterson, mayor of Fresno (pop. 600,000) is expected to officiate at several EVents at Eagle Field.

Location/Logistics

Eagle Field is off I-5 just south of Los Banos after Pacheco Pass (see the map). Parking will be free during all 3 days of the event.. Anyone who brings an EV gets in free (e-bikes count!) otherwise the general admission charge is $5.00 per day.

In support of the EVent, the EAA Board of Directors will hold their meeting at the site on Friday evening.

Clare Bell, editor of CE will also be celebrating her birthday (though she won't tell any one how old she is!). The big Bell Bonfire will be later Friday night.

E-Torch Relay

An electric torch will be carried by a relay team of EVs headed by Chuck Hursch of the North Bay EAA chapter. It will run from Real Goods at Hopland, CA, through the Bay Area to Eagle Field.

Competitions

Eagle EVents is planning to make use of the field's asphalt airstrip and oiled and rolled dirt roadways for EV competition. The emphasis will be on fun rather than formality, although again, safety will be important. Basic Solo 2-style tech inspection will be made to ensure participant safety. Planned Events include:

♦ **Time-trial autocross,** which will use a coned and chalked out-out track. Any vehicle that passes basic tech inspect may run, including e-bikes, motorcycles and three-wheelers as well as cars. Timing will be via stopwatch. Helmets required, so bring-em!

♦ **The #13 Challenge** - This will be part of the autocross competition. Clare Bell in her autocrossing 914 Porsche will take on all challengers.

A line-up of some of the WW2 military vehicles at Eagle Field.

♦ **Shopping cart racing!** Scheduled for Saturday and Sunday, but may erupt spontaneously at any time. The wild and woolly craziness of shopping-cart-based EV racers is alive and well at Eagle Field. You've heard about it and perhaps seen it on TV. Now see the excitement and hilarity for real. 3 hot laps of the most uninhibited vehicles in EV racing. 2, 3, 4, 5 and 6-wheeled sky-is-the-limit racing machines compete two by two for the much-coveted Golden Caster. Starring such warehouse-built classics as The Jolly Rogers' original "11:53" and "911". Also the flame-wheeled "Bunnies" and the ferociously unpredictable "Fang". The fabled shopping cart-based "Tank" will be encouraged to make an appearance and a popcorn war may develop.

♦ **Fast Furniture** (Sat and Sun). - This class evolved out of the shopping-cart racing scene, with electrically-powered couches, love-seats, lazy-boys and any other household furnishings to which wheels and an electric motor can and have been added. You haven't lived until you've seen two couches racing in a closed circle course. These contraptions are even more unpredictable (and in some cases unsteerable) than the shopping carts. Big Daddy Roth, eat your heart out!

♦ **Classic EAA-Style Distance and Enduro Rally** (Saturday) - EV efficiency enthusiasts, this one is for you. This rally re-creates the classic Electric Auto Association performance/distance rally of the 1970's and 80's, though a minimum speed will be set (no crawling!).

Ride and Drives

Two ride and drive areas will be available - one for full-size EVs for big folks and a kiddie corral of pint-size EVs for the small fry.

The full-scale EV Ride and Drives will include cars, three-wheelers, motorcycles and bikes. We plan to have some classic EAA conversion cars and at least one Phoenix race car (Clare Bell's #13, fresh from her 3rd place electric stock win at the Phoenix

APS Electrics).

The Kiddie Corral will include kid-size (low-powered) EV bikes, one or two electric toy ride-on or ride-in jeeps, Rex Kaylor's mini-hybrid Corvette, tamed-down shopping cart racers and other kid-friendly EV critters

Workshops

Eagle EVents is also planning some unique and fun hands-on workshops for attendees. Kids and adults will be able to actually build and run various types of small EVs during the 3 day event. There will be parts, batteries, wheels, motors, axles, frames and other bits that folks can use to put together a variety of runnable contraptions with the help and guidance of experienced EV builders. Safety, as well as fun will be emphasized and helmets and other protective gear will be available to help preserve the adventurous. We will ask that participants sign a waver and there will be a fee to cover materials.

The workshops include:

- Build your own bicycle, three-wheeler or scooter
- Build your own solar-powered model and race it in the Photon 500

(Pre-registration by June 15 is requested for the above workshops. Contact Eagle Events at the number below.

Paint your EV on a T-shirt and wear it! This can be a real EV that you have or an imaginary one that you'd like to drive. Stencils and transfers will be available to help those who are artistically challenged.

What is an EV - Quick Course

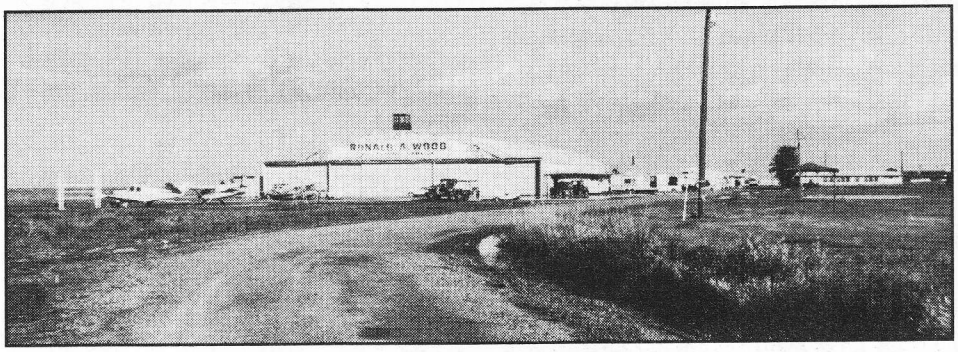
For those who are completely new to electric vehicles, Eagle EVents is doing several "What is an EV" introductory sessions. This quick course will quickly bring the newbie up to speed on how an EV runs, what are the characteristics of various EVs and how driving an EV helps the environment as well as the pocketbook. It will bring the participant eyeball to headlight with a working EV in a non-threatening and enjoyable manner.

EV Displays

Those who bring EVs will be able to display them in sections devoted to the various types (cars, neighborhood Evs, bikes, three-wheelers, etc. EAA cars will have their own area and will be encouraged to put up educational signs, flyers, charts, etc. to help the public get acquainted with their vehicles.(Friday, Saturday, Sunday)

Electric Bus - Bob Davis of BMI will demonstrate his electric bus.

Other display vehicles will include Phoenix EV race cars, new or prototype Evs such as Tiger (the Bell-Kaylor built from the ground-up EV based on the JackRabbit), Peregrin (Pacific EV's composite prototype), and a Hydrogen Hybrid car with Warsitz Fuel Cell in a Kaylor Dino body.



Main hanger and museum at Eagle Field.

Airshow!

Joe Davis is planning a show of aerobatic and vintage aircraft. This will be a repeat performance from the previous week when Eagle Field hosted an antique warbird aircraft fly-in. One or more b-25's from the Confederate Air Force will arrive on Saturday and depart on Sunday.

Aircraft/ Military Vehicles

For the military buff, Eagle Events will have static display of B-25s, Huey Cobras and some WW2 vintage aircraft such as B25s. Joe Davis will also have his collection of rare military trucks and other WW2-era vehicles on display. The airfield museum will be open with WWII memorabilia and Eagle Field history displays.

Catered Dinner, Dancing

The Event also includes a $15 catered dinner at 7 PM Saturday night with live band and dancing. Reservations and payment need to be made by June 1, 1998. (Cost will be $25 at the door.)

Charging

Eagle Field has 50 KW of charging capacity available from the line. EAA charging gurus should be on-hand to solve problems.

Facilities

Eagle Field has overnight camping for tents and RVs. There are no RV water or sewage hookups, but showers, sinks and toilets are on-site. They will be supplemented with portable facilities..

Booth Space

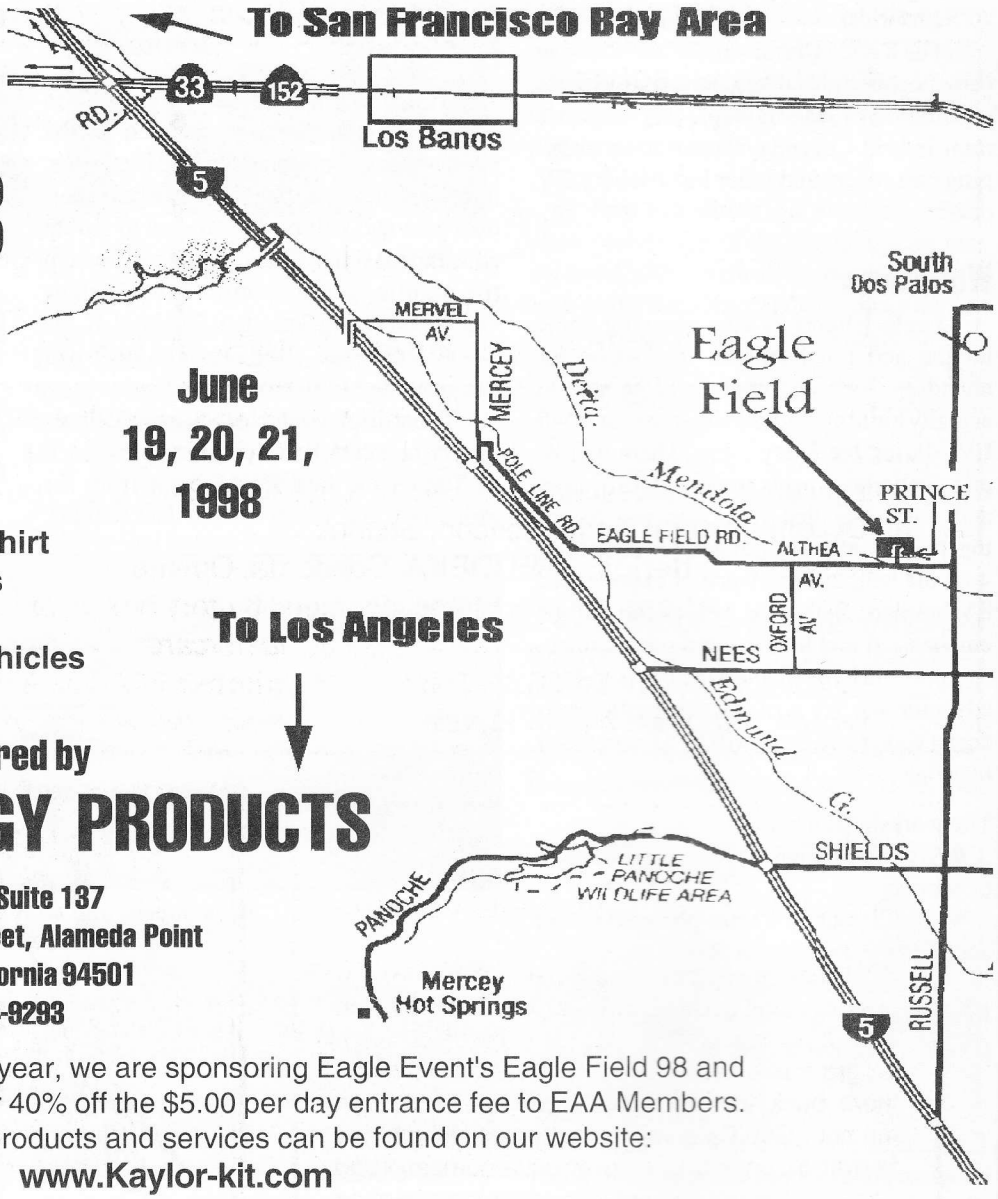
There are two types of booth space available to vendors: 10 by 12 foot inside booths and 12x 30 outside spaces.

For more information, or to volunteer help, contact Eagle EVents, Hangar 20 Suite 137, 2701 Monarch Street, Alameda Point, Alameda, CA 94501, Tel. (510) 864-9293 and (408) 338-2200.

EAGLE FIELD 98

- E-Torch Relay
- Time-trial Autocross
- The #13 Challenge
- Shopping cart racing
- Fast Furniture
- Ride and Drives
- Paint Your Own EV Tshirt
- Hands-On Workshops
- Airshow!
- WW2 Warbirds and Vehicles
- Eagle Field Museum

June 19, 20, 21, 1998



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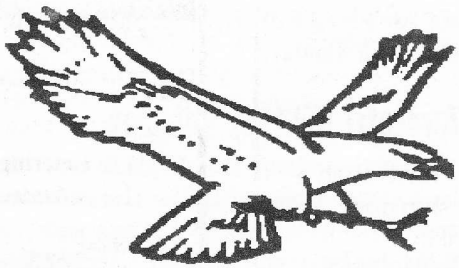

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Used Battery Exchange
Recycle Batteries —Back into Vehicles!

When EV-ers change a pack, there are frequently some good batteries among the clunkers. The San Jose (CA) EAA Battery Test/Exchange program was set up to rescue these and re-direct them back into EVs that need them. SJEAA member Don Gillis will capacity-test all batteries from an old pack, and return an equal number of bad ones so that the EV's owner can return them as cores. He keeps the good ones to supply EAA members with batteries at no cost.

Recently Don has been running low on used batteries due to a decline in donations.. So, if you are changing a pack, give Don a call at (408) 255-5446. Help your fellow EAA EV drivers keep their vehicles on the road. And who knows —the car you help may EVentually be your own.

Areas and chapters who do not have such a battery program are encouraged to start one. For more information call Don. Thanks!

Nova Scotia's Rolling Thunder

continued from page 1

teens when they started. I was tremendously impressed.

An Amazing Car

On the track, the announcer was describing the teams as they gridded up for the combined ABB University Spec/ Formula E Saturday heat race. "We've got an all-female team over here," he boomed into the portable microphone as he stooped down beside driver Dave Erb in the freshly painted pine-green and white #16 Highland Thunder car. Dave had stepped in at nearly the last minute to drive the little flying Scotswoman, since none of the young Canadians (yet) had competition licenses. Earlier discussions among members of other race teams had centered on the fact that the Canadian car, at 120 volts, would be running in with the faster and more powerful ABB University entries, some of whom had AC drivelines and nearly 200 V. Even the other car in the Formula E class, an entry fielded by Embry Riddle and Robinson Aeronautical Institute, would be a formidable contender; at 216 V and running a big Motorola controller, it could possibly be the fastest car in the combined field.

The Highland Thunder team had guts to put their car into this class and Dave Erb had guts for taking on the task of driving. Some said his main task would be to avoid getting run over by the ABB open-wheelers. And Embry Riddle's #6, if that team could keep their entry running. Dave's job would also be complicated by having to keep away from the U-Spec cars as they entered and left the pit lane for quick-exchange battery pack swaps.

Highland Thunder was the classic underdog, but Driver Dave had faith that he could do more than just dodge the traffic. "They've put an amazing car under me," he said cheerfully in response to the announcer's question.

A Competitor's Mistake

And the little electric Formula might have more of a chance than might it first appeared. The sky-blue Embry Riddle #6 had flaws that might prove fatal. In practice earlier that same day, that car had posted one of the fastest speeds, but in so doing had toasted a Kostov Monster Motor. (See Race Tech Note page 19)

Embry Riddle had managed to slap another motor in the car, but there hadn't been sufficient time to run in the brushes. In fact, as the field gridded up, the Embry Riddle team was still working frantically on their #6. The space where it was supposed to stand next to Highland Thunder was still empty. The Canadians might take the heat race by default, but in my book that would still be a valid win

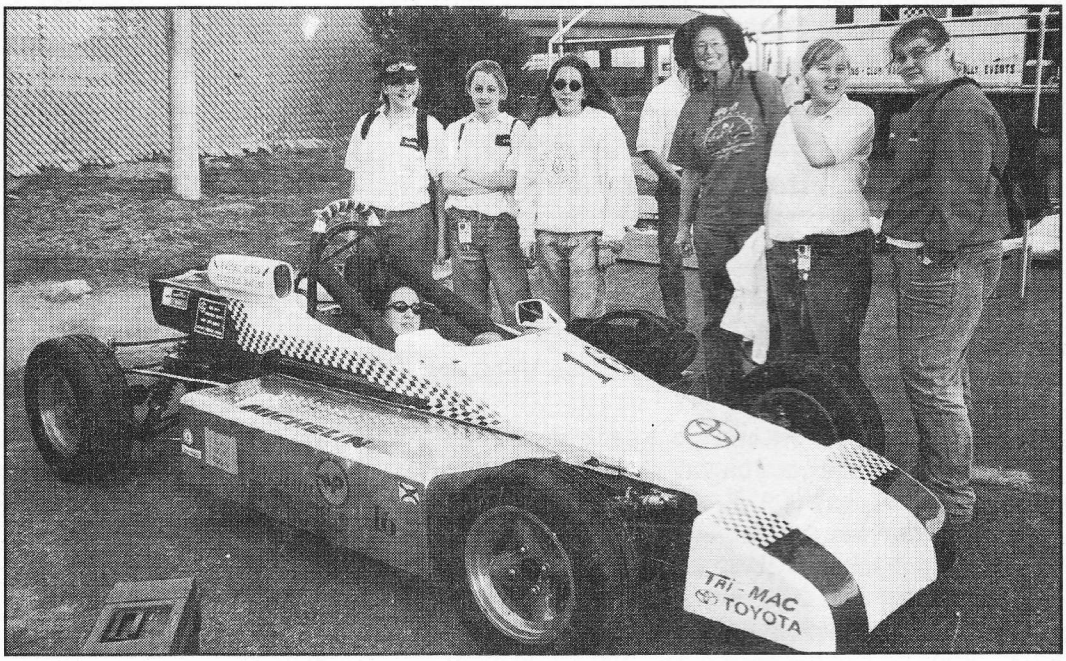
On the track, the time came for the teams to leave their cars. The SAERC girls walked away reluctantly, for little Highland Thunder looked very much alone at the back of the grid.

In a way the Nova Scotians had already won, whether or not the Formula Ford made it to the checkered. In spite of discouragement and even ridicule, difficulties with funds, logistics and other problems, their car was in the race.

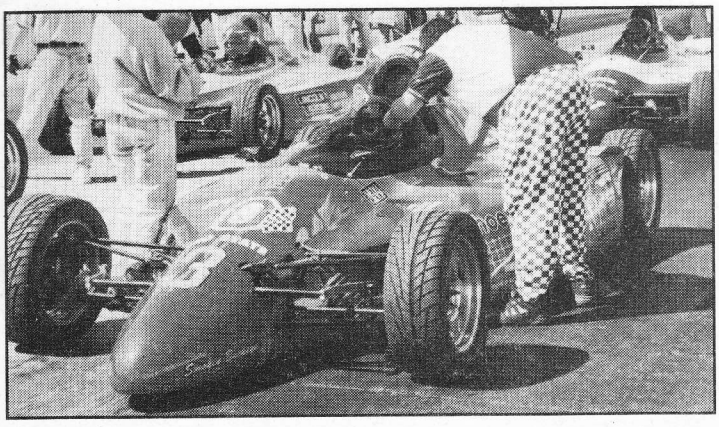
ABB Spec/ Formula E Heat

The ABB University open-wheel class is a competition for college teams sponsored by Asea Beau Browning. The class uses a special chassis, originally developed as the Formula Lightning, which has pods on the sides for batteries and can refuel by fast battery exchange pit-stops. Formula E, in which Highland Thunder was entered is a more general open-wheel electric conversion class.

Entries in this combined heat race took their places on grid according to their lap times in practice, putting Craig Taylor in Ohio State's #31 in pole position. Following OSU on the inside grid lane was Billy Roe in U of Oklahoma's car #31, Tom Bagley in Kettering University's #21 and Tom Bedell in West Virginia's blue and yellow #06. On the outside was the entry from Indiana U and Purdue University (IU/PUI) at Indianapolis, car #25, driven by Chris Schultz. In order behind IU/PUI stood #4, Bowling Green (Larry Crosser) and #9, Arizona State (Jeff Keck). In the Formula E-class was #16, Highland Thunder, driven



The SAERC Girls Electric Racing Team with. future driver Amie MacDonald in #16.



Craig Taylor of OSU expects 110 mph and "lots of fun".

by Dave Erb and built by the Nova Scotia SAERC Girls. #6, from Embry Riddle, did not make the grid in time for the official start. Kettering University's car #21 was late on grid, but made the start, even though the Kettering team was frantically working on their racer all morning.

With Pam Seymore from APS giving the starting call, "Gentlemen, energize your engines!", the flock of ABB University Spec/ Formula E cars was off, with the scarlet GM EV1 shepherding them as the pace car during the pre-start lap.

Just before the grid began to roll, Highland Thunder's driver, Dave Erb of OSU, gave a cheerful red-gloved thumbs-up to the Nova Scotia teams's young crew chief.

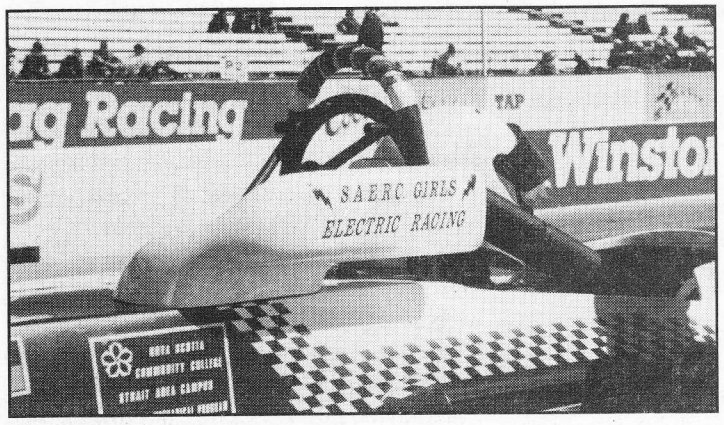
Rounding the tower, the pacer peeled off into the pits and the green flag fell for the flying start. The E-motors began winding up as the open-wheelers shot down the straight at speeds in excess of 100 mph. The Ohio State car #3, driven by Craig Taylor, took an early lead. University of Oklahoma, with APS and Indy veteran Billy Roe in the cockpit, started in fourth but quickly snagged 2nd.

Indiana State U/ Purdue Institute (IU/ PUI) took up the third place slot. Car #9 from Northern Arizona University brought up the rear.

Now the intensity of competition started to grow as Bowling Green, car #4 stole third away from IU/PUI. As the pack of ABB spec cars shot down the straight, Highland Thunder, running in the Formula E class, moved over to let them by

As high-speeds ate up the pack amps, the first car came in for a battery-swapping pit stop. The IU/ PUI car, #25, pitted unexpectedly early. While the team scrambled to unload and reload the modular battery packs, the track announcer observed that this team did things a little bit differently, apparently referring to the premature pit stop .

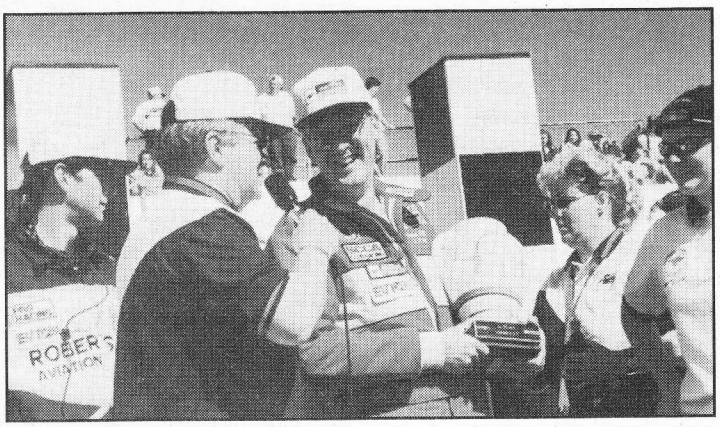
Out on the track, Kettering and Bowling Green battled for third. Billy Roe in the U of Oklahoma car, #31, zipped into the pit lane and then zipped out again after a successful fast-swap. This race could be lost or won on swap-out times in the pits and Oklahoma had started well.



#16's logos say it all.

Flying Scot Takes Formula E Heat

Ohio State came in for a second pit, giving second place runner IU/PUI the opportunity to go for the top slot. The Flying Scotswoman, Highland Thunder, slowed on the back stretch and then settled off-track behind the bridge. Driver Dave Erb reported that #16 had abruptly lost power and it looked as though they had blown a battery or lost the controller. "They are going to end their day there, " said the track announcer, sounding disappointed, but those who knew the challenges the Nova Scotia team had faced and overcome were cheering in triumph. It was a miracle they got Highland Thunder on track at all, much less completed 3 good laps. Since the only Formula E competitor, Embry Riddle, hadn't made the official start, Highland Thunder had taken the Formula E class.



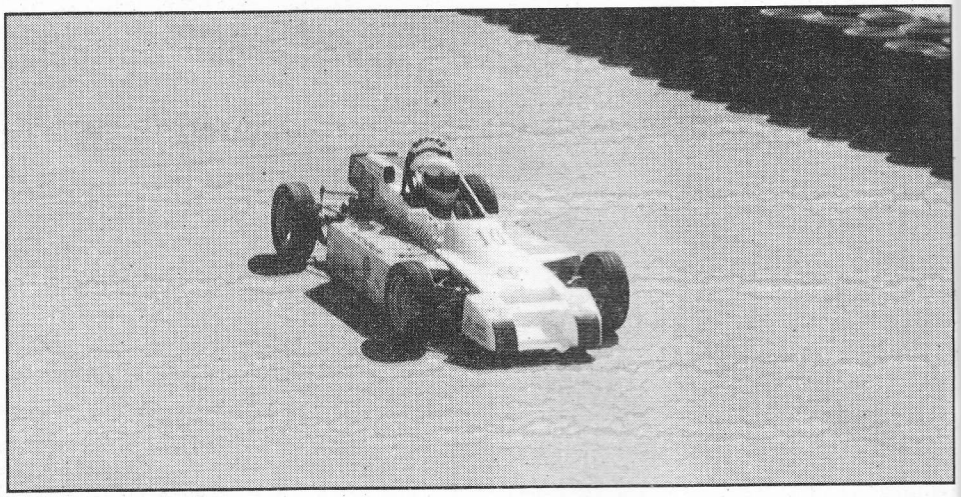
Highland Thunder driver Dave Erb accepts Formula E First-place trophy as the team's crew chief looks on.

Back in the University class, Bowling Green was unofficially in the second spot. Ohio State pitted a third time, but did not do as well, having trouble during the swap, losing a lap and putting Billy Roe and U of Oklahoma in first. It looked like U of Oklahoma would take it, but suddenly car 31 slowed in the S's with an unknown problem. Attrition was setting in as another entry, Northern Arizona, car #9 started slowing through the S's. IU/PUI also went down, losing power and coming to rest on the outside of the entry to turn 1 after the

straight. Pooped but victorious, Highland Thunder was requesting a flat tow back to their pit area. Broken-down cars or run-out racers were scattered along the course, but safely out of the path of the remaining ABB spec cars, which were still tearing .up the track.

With the white flag dropping to signal the final lap, Billy Roe in the U of Oklahoma car was on the side in the S's. Bowling Green rocketed in to be first under the checkered, followed in second by Craig Taylor of Ohio State and an unexpected third, the car that gridded last due to problems, a happy Kettering U.

Once Highland Thunder was back in the pit area, the young women were relieved to find that both controller and battery pack were intact. The controller had only gone into thermal cutback to protect itself from to overheating. By quickly installing a blower and ducting on the controller, Highland Thunder would be able to run again without much difficulty.



Highland Thunder heading toward the Winston Bridge on its 3rd lap before the controller went into thermal cutback and cut power to the car.

Alone at the rear of the grid, Highland Thunder awaits the start.

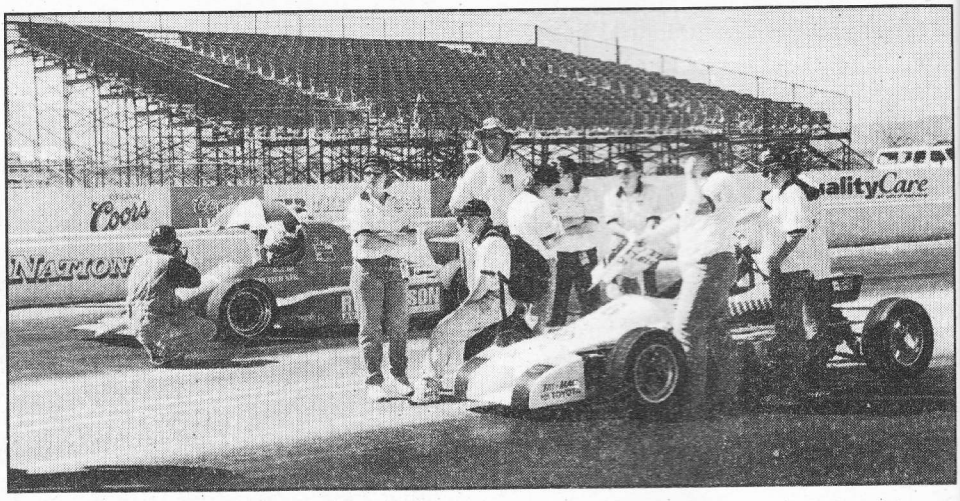
audience's gaze went to the women from Nova Scotia. They had already done exceptionally well considering what they were up against and the hearts of the race attendees went out to them.

The track announcer went from car to car with his portable mike, doing interviews with the drivers and adding his own observations. Bowling Green's Larry Crosser in pole position said that by now he should now the circuit pretty well. Kettering U's driver, Tom Bagely asked for feedback on the team's performance. Ohio State's Craig Taylor was expecting a top speed of 110 mph out of #3 as well as "lots of fun."

"If there is a hometown favorite," boomed the announcer as he spoke to Jim

ABB Spec Class Feature

Sunday had dawned with bright sun and sapphire blue above. Late in the morning the sunlight had grown strong enough that multicolored parasols were sprouting on the ABB Spec class grid to shade the suited and helmeted drivers from the heat. While the Canadian national anthem played, the

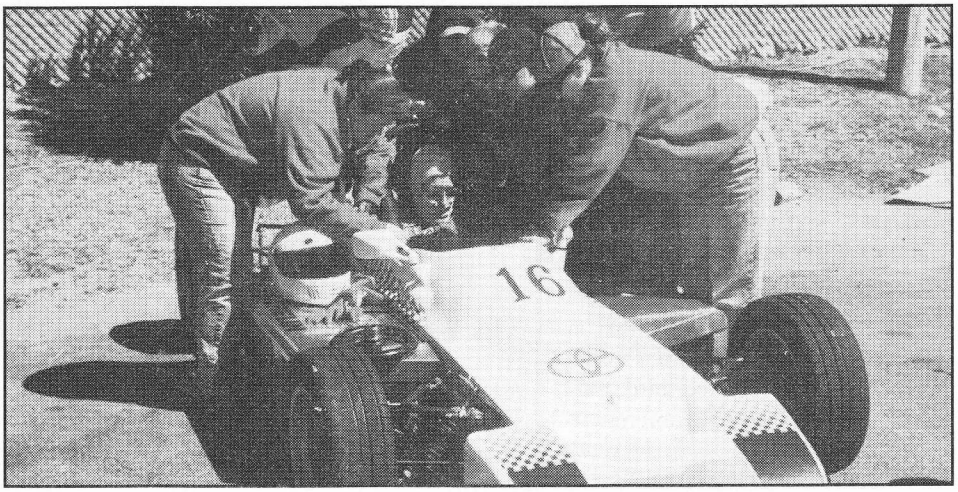


The SAERC Girls surround #16 before the start of the feature race.

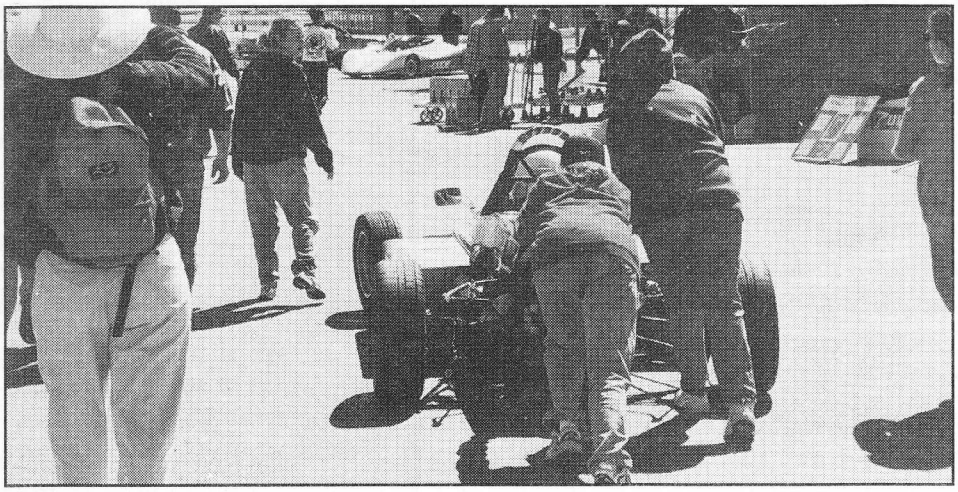
Contes in car #5, "it's right here from Arizona, Northern Arizona University." And at car # 31, it was "Our old friend Billy Roe, driving the University of Oklahoma entry." At the IU/PUI car, driver Chris Shultz commented on the fact that Indiana University and Purdue are usually rivals, but on this effort, they co-operated.

"Why Can't They Get a Girl In There?"

At the Formula E classers, the announcer stooped down by driver Dave Erb in Highland Thunder and asked the inevitable; namely with a car built and fielded by an all-women's team, "why can't they get a girl in there?" "Well that'll change next year," Erb



The young Canadian crew chief confers with driver Dave Erb as they scamble to prep their car for the Formula heat.



Driver Dave gets to ride while the girls push him over to the start.

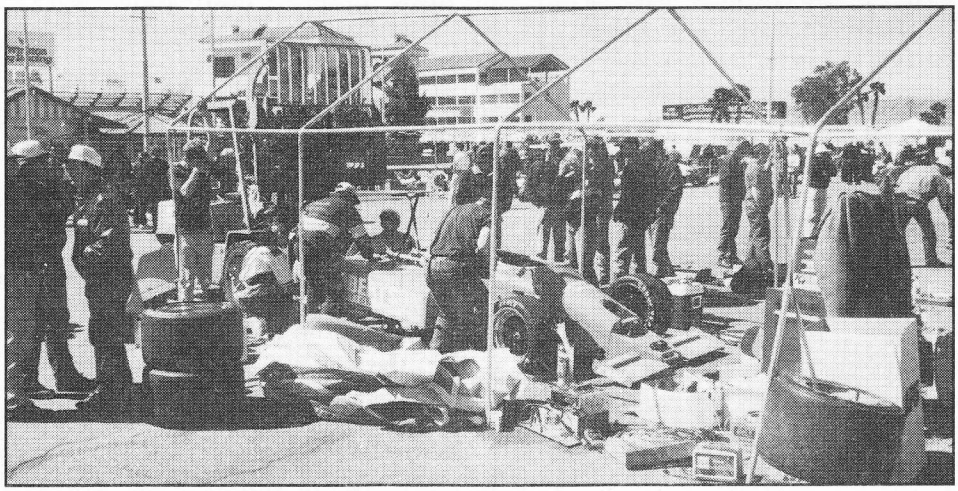
cheerfully retorted, gesturing at Nova Scotia team member Amie MacDonald, who had taken the Formula Ford down the drag strip the previous night and will soon be getting a competition licence.

At the problem-plagued Embry Riddle #6 car, he encouraged them with " You must have a great crew to slam another motor in there and get going." After missing out on the heat race, Embry Riddle was back on the track with a new Kostov borrowed from Roderick Wilde of Wilde Evolutions. Riddle's team had paid attention to seating the brushes this time, but in the short interval between the failure and the feature race, the motor's brushes hadn't been completely run in. They could arc again under the 216V stress.

As the parasols folded up, the teams dispersed to their assigned hot pits. The Nova Scotia crew chief gave one last pat on the helmet to Dave Erb and left him alone with their doughty little creation. Would the blower and ducting they'd installed after the heat race prevent the controller from going into thermal cutback?

To the starting call of "Energize your engines", the field moved off behind the pace car as the track announcer commented, "It's nice to come to a race and not have to have earplugs."

Several cars, including Embry Riddle, were weaving back and forth on track to warm up their tires (better adhesion). Dave



Trouble-plagued Embry Riddle #6 Formula E team working to replace a motor burned up during practice.

Erb in #16 stayed straight and level.

Wave Your Pants

Over the PA, the announcer asked the audience to acknowledge the efforts that had gone into this race. "Wave your hat, your shirt, your pants, your shoes, your kid, the person standing next to you, in appreciation for all the hard work" he yelled.

As the flock rolled over the flying start and the race began for real, Highland Thunder made a bid to pass Embry Riddle, but the Riddle car went to the inside, blocking Nova Scotia and #16 dropped back. I wondered briefly if Highland Thunder's additional controller cooling had been enough, or were they still controller-limited?

The race had a casualty already - Northern Arizona University, car #5, broken down against the outside wall. Another quickly followed as Embry Riddle came reluctantly back into the pits after only one lap.

They'd indeed let the smoke out of their motor again. Without a contactor in the high voltage circuit to shut off the pack, the arcing had taken out their Motorola controller as well. But competitor Highland Thunder was also coming into the pit, a cloud of dust or (was it smoke?) blowing behind it. It also looked like he might have brushed the wall.

Kettering driver Tom Bagely brought #21 in for the first battery-swap pit. "It's across the wall for car 21," the PA barked, "Left side down, right side, and away, good stop for Kettering U."

Billy Roe swung the U of Oklahoma #31 in for their first pit. Battery packs flew out, the car rolled forward and they flew in again. "Clean and he's off! 17 seconds for that pit stop."

Now it seemed as though there were more cars in the pits than on track. Highland Thunder was still at Nova Scotia's pit. Craig Taylor in Ohio State's #3 rolled in for a swap, followed by Chris Schultz in IU/PUI's #25. Ohio State was out in under 15 seconds and back on the track, maintaining their lead.

Nova Scotia's #16 was still in the pit. Were they out? No, Dave Erb was still in the car.

Bowling Green cruised into pit row and its team started their scramble to exchange the batteries.

The IU/PUI car wasn't back out on the track yet. Last year's winner, IU/PUI was having trouble completing the change.

"These guys and gals are into it," said the announcer, surveying the controlled chaos going in in at least four pits nearly simultaneously. Teams hustled to clear spent batteries out of the pit road.

On track again, Craig Taylor in Ohio State's #3 maintained the lead. Arizona University, car #9, pitted and was out again with a fresh pack.

A Strategic Move

Highland Thunder was still on the sidelines, but Dave Erb hadn't left the car. Perhaps this was a strategic move. With the only other Formula E competitor, Embry Riddle, out of the race after a single lap, the Nova Scotians were playing it safe, keeping Highland Thunder out of the way of the frenetic University teams and then going out later to take the checkered for the Formula E class. The little Formula Ford didn't need to risk getting run over or run out before the end of the race.

U of Oklahoma went back in the pits for a second stop and then out again in 14.3 seconds, keeping fourth.

OSU also completed a good swap and was out again.

In 15th lap the the leader was Bowling Green, second Ohio State, third University of Oklahoma, fourth Kettering. Larry Crosser in #4 had a 3.5 second lead over Craig Taylor in #3. But a 19.3 second pit stop cost Crosser the lead, which went back to Taylor.

Oklahoma Out

Smoke spilled from behind Oklahoma's #31 as it slowed in turn 9. Billy Roe limped the car in and pit crew pushed it the rest of the way as the annnouncer commented that "This race is beginning to unravel." Roe gestured, trying to give the pit crew information about what was going on with the Oklahoma car.

In car #3, Craig Taylor was leading the way, having reclaimed the lead after his pit stops. Oklahoma was still working frantically on their car,

Women in EV Racing

Marianne Walpert - ran her electric VW Rabbit in the first APS Phoenix Electric 500 in 1991 and founded the Women's Electric Racing and Educational International Team (WE'RE-IT)

Anita Rajan - As part of the MIT Solar Racing Team and later the young company Solectria, she participated in Solectria's many winning entries.

Mary Ann Chapman - Founded the Tucson company EcoElectric and entered her own electric pickup truck, "The Peach Crate" in the early APS races and later drove the WE-RE-IT entry, placing well in heat and stock races.

Shari Prange - Partnered with Mike Brown to form ElectroAutomotive, co-authored the manual "Convert It", developed a package on EV safety for emergency personnel, and formed part of Team ElectroAutomotive in 1992-93

Nancy Hazard - Developed the Northwest Sustainable Energy Association's Tour de Sol and built it into one of the premier events in EV competition.

On lap 20, OSU had 15.8 seconds over Bowling Green, on lap 21, 15.9 seconds.

At the University of Oklahoma pit, Billy Roe was climbing out of the car. "They may be through for the day," said the anouncer. "As they were coming through the S's, the motor seems to have burned out. The brush temperature was running up around 400 degrees. This shows how important cooling systems are. They were running up front until the motor just gave out."

On track, Bowling Green was slowly creeping up on the leader. OSU would be coming in for the last pit of the race. Kettering University went off into the pit for their last swap, followed by OSU. The OSU team was a little slow on the exchange, losing 22 seconds. Bowling Green completed its last pit swiftly, gaining 10 seconds. Now the margin between the first two cars had narrowed to 7.1 seconds, with Bowling Green ahead. Taylor in the OSU car tried to make his way up to challenge Crosser in the Bowling Green machine for the lead. Bowling Green lapped Kettering, but OSU began to close in lap 25, cutting BG's margin by 2 seconds down to 5.1.

"Craig Taylor's starting to reel him in," boomed the announcer. "Four laps to go.

Kettering U started to slow in the straight, but attention was now focused on the two cars battling for the lead.

"It's Only Just Begun"

"A two-second margin with two laps to go. Craig Taylor saying it's only just begun."

Larry Crosser was now only two lengths ahead of Taylor, working down the front straight as the white flag fell. It was fangs bared on the last lap, with OSU passing BG on the #1 turn at the end of the straight, but Bowling Green snapped the lead back through first series of turns and pulled ahead.

Highland Thunder was back out on track, running the last lap behind the battling U-Spec class machines.

"OSU Has Had Their Heart Broken..."

Into the S's, OSU caught up and was soon in position to about to take BG again.Then the cost of his last effort caught up with Taylor's car as the tortured motor released smoke and OSU slowed on-track.

The checkered flag waved. and #4 came cruising in, to the cry of, "Bowling Green - Larry Crosser picking up the win!"

As Craig Taylor's car came to a halt only yards short of the finish, the announcer commiserated with him.

"OSU has had their hearts broken here today."

It looked like Chris Schultz in IU/PUI #25 had come in second, but a lap count put OSU second after Bowling Green because Taylor had completed 27 laps. IU/PUI was third.

Nova Scotia's Highland Thunder cruised under the checkered to take the Formula E class win from the smoked-out Embry Riddle.

When the winners had gone around again and downed cars were being cleared from the track, the announcer interviewed Larry Crosser of Bowling Green. "It's a great race and we love it," Crosser said ecstatically.

According to Gary Flo of InEVations, who was doing some unofficial timing, lap times were averaging under a minute; better than last year. This clearly showed that vehicle performance was improving. (Thanks, Gary).

Third Place Revision

In the interval, there had been a revision of third place. West Virginia University was in third since they had completed 26 laps and had done it before IU/PUI. As the crowd and participants started to celebrate on the now-open track, EVTC and SCCA announced another correction in the finish order. They had missed a lap on Chris Schultz. Officially car #4 had 28 laps, car #3 had 27 laps and car #25 had 26 laps., putting the finish as Bowling Green, first, OSU second, and IU/PUI 3rd.

Craig Taylor didn't look that broken-hearted as he accepted the 2nd place trophy alongside Larry Crosser's first for Bowling Green and Chris Schultz's third for IU/PUI.

Highland Thunder Celebrates

The crowd gathered around the podium near the Coors Tower grandstand for the post-race awards. The overjoyed Highland Thunder girls were unfolding their lovely blue and white Nova Scotia flag and holding it up triumphantly like a banner.

"They come home for the win in the Formula E class," said the announcer heartily. "A great team and a great bunch of gals,"

A grinning Dave Erb accepted the Formula E trophy, a beautifully done piece of Four Corners Indian pottery.

Now all that awaited the team was dinner and a celebration. The hard part was over — they'd done it! —**CB**

The SAERC Girls would like to thank Toyota Motor Corporation and all their other major and minor sponsors.

Call/Request for Technical Articles

A new emphasis will soon be placed on technical articles in Current EVents. Anyone who would like to share their design ideas, or experience in hardware are encouraged to submit articles to CE. For those interested, please contact Kurt Bohan or Clare Bell at (510) 864-9293.

Creating Highland Thunder

Team member Jeanine Goyetche credits her father Brian for the initial inspiration to build the electric racer. Goetche attended previous APS Phoenix Electrics and saw cars fielded by high schools, universities and individuals. His descriptions got Jeanine and her friends excited. These eight girls, all attending the Strait Area Educational Recreation Center, had been together since grade primary in the Canadian school system. They were a close-knit group and knew each other well. There was no reason why they couldn't form a race team and build a successful car. After all, other women had showed that EV racing wasn't only for the guys. One of the SAERC girls told me before the race that they had indeed heard about the WE'RE-IT effort and been encouraged by it. In fact they had hoped that someone from WE'RE-IT would be at the race. Since I was, we had a short but enthusiastic talk and I came away feeling that the torch that the earlier women's' team had carried had indeed been passed to deserving hands.

Inspired by Other EV Women

It wasn't just one team either. Women had been part of and essential to high school, university, lightweight and stock class entries ever since the race's inception in 1991 as the Phoenix Electric 500. They were drivers, crew chiefs, mechanics, pit crew, and just about everything else. Often they weren't as visible because the teams of which they were a part did not have as much funding or technical horsepower and didn't make it into the winner's circle as often, though they certainly deserved to. Some certainly did, and these must have inspired the Highland Thunder team..

Even Greater Obstacles

The SAERC girls in some ways faced greater obstacles. For one, they were young, barely in their teens and at an age where young women are sensitive and easily discouraged. It must have taken courage to start the project, especially when they met discouragement and ridicule early on. Both the boys in their school and Phoenix race officials tried to dissuade the team from such an ambitious undertaking.

"They were like, you're nuts - you can't do it,"; said team member Cheryl Kawaja, in an interview for the SAERC school publication Focus. (Website at http://www.ednet.ns.ca/educ/boards/sb-strait).

A Tough First Effort

And it was ambitious. Instead of doing an entry for the Electric Stock race, the eight friends decided to shoot for the more difficult open-wheel Formula E class. They weren't just going to build a street EV that could race — they wanted to build a real dedicated race car!

Why such a difficult project for a first effort? There were some advantages to choosing to build an open-wheeled racer rather than a stock electric, the team explained to me at the track. They realized that they'd need substantial sponsorship funding to get the team and their entry all the way from Nova Scotia to Phoenix. An open-wheeled race car would garner more excitement and enthusiasm than a stock EV conversion, and hopefully a greater outpouring of sponsorship. Plus this was new ground, no something another team had done before. The challenge was greater, but so was the possible reward.

They chose to go for the brass ring rather than any lesser prize.

Girls of the 1990's

SAERC principal Alanna MacInnis described the Highland Thunder team in the Focus article "as girls that are very much girls of the 90's. They had a dream, they had a plan, and they didn't let anything stop them. We're just grateful for the positive work that they're doing and the publicity that they're bringing to our school."

And they showed their skeptical schoolmates. Cheryl Kawaja, who does publicity for the team, added that those boys are now quite impressed.

Rebuilding a Chassis

Working through and with team mentor Brian Goyetche, the team purchased a used Lola Formula Ford 1600 open-wheel internal combustion racer. Turning Brian's vacant barn in West Bay into a race car garage, they divested the car of its engine, transmission and suspension. The girls stripped the 11 foot chassis, only to discover that the frame needed rebuilding. Looking around for local expertise, they found mechanical engineering instructor Barry Williams of the Nova Scotia Community College, who guided them in the use of ratchets, drills and grinders. Social life took a backseat to racecar building for two years since the team spent their weekends buying or making parts for the Formula Ford.

For a transmission, they installed a Hubbell racing gearshift encased in a Volkswagen transaxle. The motor, which cost about $2,000 (US) was a 9-inch series DC, "similar to the type of motors used in electric forklifts and conveyor belts." in the words of the Focus article. It took $8,000 to build the 1600 lb. one-seater with a length of 11 feet and a four to five foot wheelbase.

Gaining Attention

While the project was underway, the young women increased their knowledge about electronics, mechanics and EV components. Team driver Amie MacDonald enrolled in courses in Shubenacadie to obtain a special license for formula electric car racing. The team also began to appreciate the importance of public relations and took on

the task of PR.

Gradually their project gathered the attention of the local community and then moved beyond. They were invited to participate in their school's career day, were covered in two newspapers, the Scotia Sun and Chronicle Herald, were featured as the cover story in the Cape Breton Post, and interviewed on Canadian Broadcasting Company radio. In 1995 the Highland Thunder team appeared on the CBC TV program "Street Cents".(Webpage http://www.halifax.cbc.ca/streetcents.).

"We're Persistent"

Once the 1600 lb. racer was together and painted in the school colors, the team turned to the next hurdle, which was to raise $12,000 to get team and car to Phoenix. This one loomed even larger, but Jeanine Goyetche was confident they could leap it. "We're persistent and we're used to overcoming big obstacles," she was quoted on the team's webpage as the Highland Thunder girls began their fundraising effort.

Amazed and impressed by the team's accomplishments, local businesses helped out with financial support and in-kind donations. The Formula Ford went on parade in the Nova Scotia's local Festival of the Strait, appeared in a Port Hawkesbury antique show and went on display during Women's History Month (October 1997) in the Museum of Industry in Stellerton, Nova Scotia

The Association of Canadian Women invited its young creators to participate in workshops CTV's national news covered them and, on October 25,1997, the car was displayed at the Museum of Natural History in the capital of Halifax, Nova Scotia.

On January 22, less than two months before the Phoenix race, the Canadian Secretary of State for Industry, Ronald Duhamel, visited the team in Port Hawkesbury, congratulated them on their achievement and sat in the car for photos. Pictures and text celebrating the occasion were posted at the Canadian government's website. - **CB**

From the EAA History Files

Information on various aircraft generators from Keith Crock's notebooks:

Starter/ generator type	Manufacturer	Kind of information available
G32-6D	Lear-Siegler	Product data sheet Performance data
	Jack & Heinz	Outline data Drag testing (Keith Crock' data) Illustrated parts breakdown Overhaul instructions
2CM65C5	General Electric	Overhaul instructions Test proceedure Exploded views
2CM77D3V	GE	Overhaul instructions Test proceedure Troubleshooting chart Exploded views
EF-40		Specification data Wiring Performance curve Dimensions

Copies of any of these documents and manuals are availble to any EAA Chapter representative who will take responsibility to distribute them to other members for the purpose of being recopied.

For more information contact:

Terry Wilson
20157 Las Ondas Way
Cupertino, CA 95014-3132
Phone and Fax (408)446-9357

CARS FOR CLEAN AIR - SOON !

EV1 Bay Area Launch Celebrated

by Bruce Parmenter (EVangel) and Clare Bell

On March 31, 1998, a fleet of nine GM EV1's set off from Alameda Naval Air Station's CALSTART Hangar 20 enroute to the GM EV1 Unified Bay Area Launch at Treasure Island. Shepherded by EV Specialist Scott Rierby, and directed by GM Communications Manager Sharon Saris, the EV1 drivers and passengers, including various local celebrities, departed the hangar under CHP escort. They were part of 20 EV1's that left various destinations in the Bay Area to converge at Treasure Island's Fogwatch Building on the "Great Lawn" for a press conference celebrating the market launch.

"Don't Expect a Tip"

On arrival, both driver and passenger would turn each car over to a GM employee for photogenic parking. "It's valet parking, but don't expect a tip," joked one of the GM specialists just before the fleet departed.

Rain moved the EVent inside, however it didn't soak the spirits of the attendees or presenters. The first speakers included Todd Cooper, Market Area Manager, Saturn Corporation, Frank Pereira, EV1 Brand Manager, GM Corporation, and Joe Kennedy, VP, Saturn. All described the excitement and challenge of bringing the EV1 to the Bay Area.

Anil Gadre of Sun Microsystems emphasized his company's working partnership with the EV1 and its drivers, whom he described as being "passionate customers". Sun has installed chargers at their Menlo Park campus; they are now EV-ready. Gadre said that it is time for rule-changing, innovation and looking at the world in a different way. Urging more of Silicon Valley to "drive the future", Gadre pointed out that 60% of travel is less than 6 miles, well within the capability of present-day EVs. Today's progressive buyer, he added, is anticipating change and has a dream.

The Saturn dealers of the Bay Area were represented by Robert Benson from the North Bay, Kirk Heppler from the East Bay and San Jose/San Francisco by Don Lucas. Mayor Willie Brown of San Francisco was scheduled to speak, but he arrived later (see below).

San Francisco Mayor Willie Brown - He was there to accept his own personal EV1

No Longer an Outsider

Chairman of the Bay Area Air Quality Management District, Greg Harper, made an intriguing comparison between driving a regular car in urban areas versus driving the EV. "When you drive a regular car, do you feel a part of the city?", he asked and answered his own question by citing the way that gasoline car drivers become cocooned away from their environment, as if they didn't want to acknowledge the damage coming from their tailpipes into the lungs of urban dwellers. In the EV1 (or any other EV), it is different. The smiles and excitement that the car generates inspires the human contact that reconnects the EV driver to the people of the city. They recognize that he or she is trying to do something positive. When driving the EV1 in the city, Harper said, "I no longer feel like an outsider."

In a more informative mode, Harper mentioned the $5K buydown on EV1 leases. 50 grants are available, he said, though 15-20 grants had gone (as of March 31, 1998).

Dianne Wittenberg, President of Edison EV, announced that various charging stations were available in the Bay Area and discussed the importance of public EV infrastructure.

EV1 Insomnia

The presentation featured EV1 customers who would later take ceremonial delivery of their cars that day. To SF Symphony Bassoonist Steven Dibner. who grew up in the home of an inventor involved with nickel-metal hydride batteries, getting his EV1 was a major thrill. He said that his words to his family EV connections were "Get me in this car somehow." During a 24-hour test drive, he went "flying up the hills". That night, he said, he couldn't sleep, so he went into the garage, sat in the EV1 and read the car's technical reference "I'm doing something for the planet without sacrificing the thrill of performance." What downside is there, he asked. "For me there is none."

"You Can't Put Into Words..."

To Greg Hansen of Southern California, the delivery of his EV1 on the 4th of July marked "a day of independence for me." He's put 10,000 miles on the car since then and adds that his has fun racing the Corvettes. "You can't put into words what it is like to drive this car," he stated during his presentation ." He is also a member of the

pioneering EV1 Owners Club, with a website at **ev1-club.power.net**

Among the EV1 customers was EAA member, Steve Odo and Kent Harris of PG and E.

"We Have to Hide Them

As the Saturn EV1 specialists escorted the new EV1 owners to their cars, San Francisco Mayor Willie Brown arrived, looking natty in raincoat and fedora He was among the those to receive a car, having been assigned one by Saturn. Choosing a cherry-red beauty, Brown gathered TV cameras and reporters around him as he commented on the EVent. "San Francisco is looking forward to being known as the city with the largest alternative energy fleet," Brown said, mentioning the electric-powered Muni trolleybusses. He described the EV1 as "a 180 mile rocket" as well as "a practical alternative-fueled vehicle."

"SF has four of these, and every city official is begging to get one," Brown said and added, only half-jokingly, "We have to hide them."

20 EV1s plus the land-speed record Impact, "Sunny-Side Up" formed a sweeping circle along the front of the building. At 11:30, the press and dignitaries gathered for test drives. Soon there were a line of red, green and silver EV1s taking on and letting off passengers and drivers.

The EVent wrapped up at 1:00 and all but two of the EV1s caravaned back to CALSTART for recharging (see editorial).

Great fun was had by all, both in driving the cars to and from the EVent and during the ride-and drive. Thanks GM/Saturn!

The EVent was hosted by:

Saturn of Marin 415-455-1800 535 Francisco Blvd, San Rafael
Saturn of Concord 510-682-6400 1330 Concord Ave., www.saturnco.com
Saturn of Fremont 510-455-8700 39797 Balentine Drive, www.saturnfr.com
Saturn of San Francisco 650-985-5000 711 Serramonte Blvd., Colma / Daly City
Saturn of Capitol Expressway 888-684-1700 755 W. Capitol Expressway, San Jose.

Inductive public charging

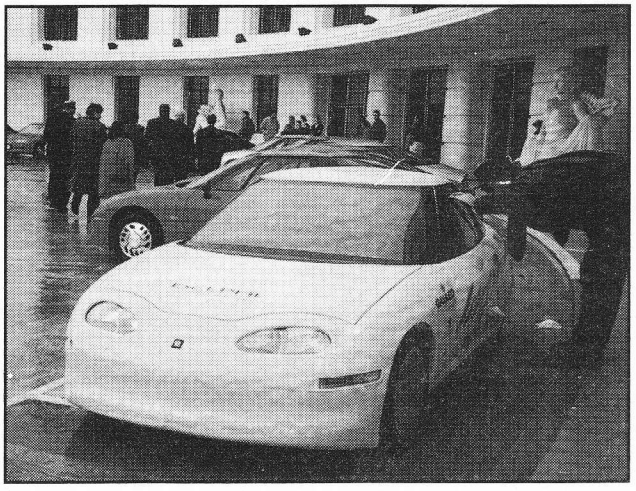
According to Saturn/GM , these sites are currently open, however, check first!

Costco - 1339 N. Davis Road, Salinas
Saturn - Burlingame 198 California Drive, Burlingame
Saturn - Concord 1330 Concord Ave., Concord
Saturn - Fremont 39797 Balentine Drive, Newark
Saturn - Oakland 2355 Broadway, Oakland
Saturn - Pleasanton 4340 Rosewood Drive, Pleasanton
Saturn - Stevens Creek 4333 Stevens Creek Blvd, Santa Clara
Saturn - Sunnyvale 1088 W. El Camino Real, Sunnyvale
Saturn - Santa Rosa 3001 Corby Ave., Santa Rosa
Saturn - San Francisco 711 Serramonte Blvd, Santa Clara
Saturn - Marin 535 Francisco Blvd, San Rafael
Saturn - Fairfield 4850 Auto Plaza, Fairfield
Saturn - Capitol Express 755 W. Capitol Expressway, San Jose

Scheduled to open in 1 month (from March 31)

Fry's Electronics - 1077 Arques Ave., Sunnyvale
SunValley - One Sunvalley Mall, Concord
Hilltop - 2200 Hilltop Mall Road, Richmond
Hyatt Regency - San Francisco Airport 1333 Bayshore Highway, Burlingame
Hyatt at Fisherman's Wharf - 565 North Point St., San Francisco
BART - 3100 Adeline St., Berkeley
BART - 365 D St., Colma
BART - 200 Ygnacio Valley Blvd., Walnut Creek
Costco - 40580 Albrae St., Berkeley
Costco - 1021 Arnold Drive, Martinez
Costco - 1900 Davis St., San Leandro
Costco - 198 Plaza Drive, Vallejo
Costco - 450 10th St., San Francisco
Costco - 5301 Almaden Expressway, San Jose
Costco - 2201 Senter Road, San Jose
Costco - 1601 Coleman Ave., Santa Clara
Costco - 48801 Central Ave., Richmond
Stone Ridge Mall - One Stone Ridge Mall, Pleasanton

http://www.gmev.com or 1-800-25-ELECTRIC
General Motors Corp. EV1 information



Close-up of land speed record EV1, "SunnySide-Up". Warning sign in the rear says 'Do Not go faster than 190 in 1st gear'.

Last Updated 11/19/97

Ford Approved EV Dealer List

Dealer Code	Dealership	Contact	Phone	Fax.	Address
ALABAMA					
21717	Woody Anderson Ford	Milton Cummings	205/539-9441		2500 Jordan Ln.
ARIZONA					
71178	Lou Grubb	C. MikeTurk	602/991-3333	602/596-8555	Frank Lloyd Wright Blvd
CALIFORNIA					
71006	Downtown Family Ford	I Steve Vickers	213/746 3673	213/746 6510	1248 S. Figuero Street
71053	Villa Ford	Vic: Schwan	714/637-8222	714/921-9103	2550 N Tustin
71061	Bob Wondries Ford	Clark; Cooper	818/457-5590	818/457-5593	1247 W. Main St.
71085	Pearson Ford	Steven Bimson	619/283 7181	619/521-2424	4300 El Cajon Blvd.
71155	Fritts Ford	Duane Pratt	909/687-2121	909/354-2079	18000 Auto Dive
72023	Lithia Sun Valley Ford	A P "Skip" Brown	510/686-5000	510/682-5485	2285 Diamond Blvd
72209	Senator Ford	Ray Roy_	916/391 3000	916/391-7026	3801 Florin Road
72417	Hansel Ford	Joe Gazdowitz	707/543-0857	707/523-2321	3075 Corby Ave.
72916	Mission Valley Ford	Ernie Speno	408/436-2920	408/436-2920	780 E. Browkaw Road
FLORIDA					
24001	Friendly Ford	Scott MacDonald	305/948-4982	305/948-4974	2198 NE 163rd St
24007	Gus Machado Ford	Ed Machado	305/822-3211	305/820-2505	1200 West 49th St.
24014	World Ford Hollywood	Mike O'Bnen	954/981-6505	954/964-4753	3101 N. State Road.
GEORGIA					
12122	Southlake Ford	Roger Moore	800/821-5151	770/472-3460	7090 Jonesboro Road
21578	Famlly Ford	Jack Pierce	770/445-8891	770/445-8481	Highway 120
MICHIGAN					
48426	Varsity Ford	Pat Maurer	800/875-3673x219	313/996-2714	3480 Jackson Rd.
NEW YORK					
13010	Manhattan Ford	Al Vitarelli	212/581 7800		55 Wesl 57th Street
13083	Tower Ford	John D'Alessandro	516/466-6400	516/466-6456	124 S. Middle Neck Rd.
13085	Country Ford	Rose Martin	516/735-7400	516/579-4577	210 Gardiners Ave
13081	Syosset Ford	George Gluck	516/496 9700	516/496-3257	240 JerichoTurnpike
13161	Metro Ford	Howard Bisner	518/382-1010	516/382-1019	3601 State Street
13469	Ted Schultz Ford	Ed Ratner	914/624-3600_		80 Route:304
OHIO					
47202	Stengers Ford	Jim Studzlnski	937/298-7521	937/298-0118	2901 S. DixieDr.
OKLAHOMA					
52200	Dub Richardson Ford	Joe Drew	405/946-3381		3815 N. May

City	State	Zip
Huntsville	AL	35816
Scottsdate	AZ	85260
Los Angeles	CA	90015
Orange	CA	92865
Alhambra	CA	91803
San Diego	CA	92105
Riverside	CA	92504
Concord\	CA	94520
Sacramento	CA	95823
Santa Rosa	CA	95407
San Jose	CA	95161
N. Miami Beach	FL	33162
Hialeah	FL	33012
Hollywood	FL	33021
Morrow	GA	30260
Dallas	GA	30132
Ann Arbor	MI	48106
New York	NY	10019
Great Neck	NY,	11021
Levittown	NY	11791
Syossett	NY	11791
Schenectady	NY	12304
Nanuet	NY	10954
Dayton\	OH	45409
Oklahoma City	OK	73112

Mass-Produced EV Truck for Sale Now - NiMH Version Soon

If you are dissatisfied with the idea of leasing an EV and having to return it at the end of 3 years without the option to purchase, you might consider the Ford Ranger. This truck can actually be purchased from the list of Ford dealers to the left, and will soon be available in an improved version.

Unlike other electric vehicles, the Ranger EV is the only one that will be sold nationwide. Ford has sold more than 200 of the pickups, which are outfitted with batteries and other equipment at a supplier's plant in Detroit after being built at the company's assembly plant in Edison, N.J.

The out-the-door price of the Ford Ranger EV Pick-up is $35,080. Ford is including a wall-mount charger, valued at $1,500 an an additional incentive. If you do want to lease, the terms are $872/mo. for a 3 year lease for a total of $33,580.

The 1998 Ranger EV, Ford's first electric vehicle, will be upgraded next year to use advanced nickel-metal hydride batteries that will double its driving range from 50 miles to 100. Ford is the latest US automaker to embrace nickel-metal hydride batteries

In October 1998, Ford will offer the advanced — and more expensive — batteries as an option on 1999 Ranger EVs, said John Wallace, director of Ford's alternative fuel vehicles program "The biggest challenge is to try to make the cost and value equation work."

Ford Motor Company 1998 Ford Ranger EV Specifications

Model year: 1998

Bodystyle:	Styleside, regular cab pickup
Wheelbase:	Short wheelbase
Payload:	700 lbs.
Other dimensions:	Similar to 1998 gasoline-powered Ranger

Powertrain:

Motor:	90 hp, high-efficiency 3-phase AC induction
Transaxle:	(integrated with motor):Single-speed, rear-wheel drive

Standard Features:

Dual air bags:	Occupant safety protection

Electronic microprocessor control units:

- Battery controller:	Monitors functions of battery
- Motor inverter:	Converts high-voltage DC to 3-phase AC
- Communications center:	Operates instrumentation and climate control
- Economy drive:	Driver controlled with increased regenerative braking
- Heater:	Electric Resistance
- Regenerative Braking:	Energy recovery to increase range
- DC/DC convertor:	Electronic "alternator"
- 4-wheel ABS:	Straighter stopping and greater steering control under most conditions
- Power steering:	Electrohydraulic
- Wheels and Tires:	Lightweight aluminum wheels, low rolling resistance tires

Battery:

Type:	Sealed lead acid
Voltage:	39x8 volt modules; 312 volt system
Battery energy capacity rating @ FUDS:	23 kwh (18 kwh at 80% discharge)
Charger:	On-board,240v/30 amp

Performance:

0-50 mph acceleration:	13 seconds
Rated top speed (governed):	75 mph
Customer range @ 72F:	50 miles
Range - FUDS cycle @ 72F:	58 miles without A/C or heater operation

Warranty:

Vehicle:	Same as 1998 gasoline-powered Ranger
Batteries:	2-year (target); prorated

Website: www.ford.com/electricvehicle

EVents Calendar

APRIL 25

1998 Contra Costa County's Earth Day. There will be food, fun and EVs to see!! Some of the past favorite things to see, will be there!! If you would like to bring your EV to show, or would like to staff the area, call Anna Cornell at (925) 685-7580 from 1 2pm to 7pm. Charging available off site.

MAY 7-8

1998 TOPTEC (Topical & Technical) SYMPOSIUM at 3D Crown Plaza, La Guardia, New York, NY. Time 8:30am - 5:30pm. This symposium will cover commercialization issues facing the HEV industry in the 20th Century. Top executives & alternative fuel experts will discuss the challenges & opportunities ahead. Co sponsored by SAE International and NESEA (North Eastern Sustainable Energy Assn.) Fee Costs: $395 for Members of SAE, NESEA, and Government employees. NON MEMBERS: $400. Contact TOPTEC group at (724) 772-8524, Fax at (724) 776-4955 or e-mail Brian at: brian @sae.org

MAY 8-14

1998 NESEA Tour de Sol. It's their 10th year in road rallying and showcasing Electric, Hybrid and Solar assisted vehicles. The event is for 7 days, starting in New York and finishing in Washington, DC. The vehicles are built by manufacturers, students and individuals All vehicles must be roadworthy and vehicle types like: Sedans, Utility vehicles, Mass Transit (bus) or motorcycles. Energy Storage may include: Fuel Cells, Flywheels, and on-board generators using gaseous fuels. CONTACT: NESEA at (413) 774-6051 or (413) 774-6053 (fax) . E-mail nesea@nesea.org

MAY 12-13

10th Battery Conference and Exhibition Solihull, England. Two days of discussions on standby and portable batteries and the new technologies, with a focus on practical problems. Contact Suzie Pittman, ERA Technology, Ltd.. Phone +44 (0) 1372 367021. Fax - + (0) 1372 377927.

May 13-15

1st Asia Pacific Conference on Transportation and the Environment, Singapore. An international conference organized to promote the use of environmentally friendly transportation development and management technology with special focus on the Asia Pacific region.
Contact: Conference Secretariat, Phone: 65-777-0170, Fax: 65-777-0994

MAY 14-15

Battery and Alternator Testing and Maintenance: Future Alternative Power Sources. Portland OR. This TOPTEC will provide information on technology advances in vehicle electrical power sources such as nickel cadmium, zinc-air and nickel metal hydride batteries. Contact Brian Taylor, SAE, Phone 412-772-8524, Fax 412-776-4955

MAY 16-17

EV World Expo, Petersen Automotive Museum, Los Angeles, CA - Public exposition of domestic and international electric vehicles, both in production and near production, experimental EVs, neighborhood EVs, bikes, scooters and race cars. Contact Emanuel Lupe Organization. Phone 310-6141.

MAY 31-JUNE 4

43rd International SAMPE Exhibit and Symposium. Anaheim, (Southern) California. Possibly useful for EV fabricators. A forum which brings materials industry leaders together to hear about and see the newest and most innovative technical advances in materials and materials processes. Contact: Kadi Woolman, SAMPE Phone: 626/ 331-0616

JUNE 15-17

6th Annual Environmental Vehicles and Alternative Fuels Conference. Detroit, Michigan. The annual conference will hold twelve sessions that address technical, governmental and infrastructure issues facing environmental vehicles today. Contact: The Engineering Society. Phone: 248/355-2910, Fax: 248/355-1492

JUNE 19-21

Eagle Field EV Race, Fresno, CA. A potpourri of EVents, including drag racing, autocross, electrathon, go-carts, shopping carts and fast furniture, as well as closed-course. You bring it, you run it. Also planned are an aerial display of acrobatics and WW2 warbirds. Ride and drive Evs also planned. More events may materialize (or de-materialize, depending on interest or lack of same.) Contact Roy Kaylor 338-2200 and/or Clare Bell (510864-9293

JUNE 20-21

Real Goods EV Parade, Hopland CA. Starting from the Solar Living Center and going through Ukiah. Have a day out in the wine country with your EV. Phone and contact: TBD

JUNE 21

Palo Alto Concours d'Elegance, Palo Alto, CA. A few select show-quality EVs have been included in previous years. Contact: TBD, phone: TBD

AUGUST 20-21

Changing World of Industrial and Recreation Electric Vehicles. Orlando, FL. Conference and exhibition focusing on non-road electric vehicles and technologies. Contact: Christine Hopf-Lovette, EPRI. Phone 415-855-2000. Fax 415-855-2737.

SEPT. 27 - OCT 1

1998 FISITA World Automotive Congress, Paris France. FISITA #146;98 will provide a forum for dialogue between automobile industry and those responsible for planning the place of the automobile in modern society. It will showcase a variety of newautomo-

biles and automobile technologies Contact: FISITA ’98, Phone: 33 (0) 1 47 20 93 23 or fax 33 (0) 1 47 20 48 73

SEPT 30 - OCT 4

IFMA Cologne Bicycle and Motorcycle Exhibition. Cologne, Germany. An international conference on bicycles and motorcycles with a special EVent promoting electric bicycles and motorcycles. Exhibit opportunities available. Contact Hans Neuport. Phone +49 345 170 13 79. Fax +49 345 170 13 83.

OCT 1-3

EVS-15 (Electric Vehicle Symposium 15) Brussels, Belgium. The 15th annual international electric vehicle symposium and expo focusing on advances in EV products and technologies. EXHIBIT OPPORTUNITES AVAILABLE. Contact EPE Association. Phone +32 2 629 28 19. Fax +32 2 629 36 20.

OCT 24 - 25

Alameda, California. **Alameda EV Expo.** Two days of electric vehicle showcasing, ride and drives and EV races for the general public to enjoy. Contact: Alameda EV Expo, Phone: 888-334-EXPO

DEC 3-5

1998 North American EV and Infrastructure Conference (NAEVI '98). Phoenix, AZ. Conference focuses on commercialization issues of electric and hybrid electric vehicles in North America. Exhibit and ride and drive will be featured. Contact Pam Turner, EVAA. Phone 650-548-9464. Fax 650-548-9764

1999

JAN 17th -23rd

1999 **CITIPOWER SUNRACE '99**, in Australia. This 3rd annual 1790 mile open race is for solar & electric vehicles, going from Sydney to Melbourne in 7 days. There are 7 Categories for vehicles: Pure Solar (wsc classes), Production EVs, Electric conversions, Pure Solar (Regs. to be finalized, Array 4.5 - 6 meters) & Ultralite Electric. Each host city will welcome you with a BBQ & Breakfast Start and be team & media friendly. You may e-mail organizers at sunrace@netlink com.au OR call John Hoener at 001 1-61-3-9820-9032

For more information, or to add an EVent to this calendar, please call Anna Cornell (510) 685-7580 (10 AM to 4PM, PST only, please!)

News in Brief

Compiled by Ruth M. Shipley from information supplied by Environmental Information Networks. If reprinted, please credit CE and Ruth Shipley.

EVs Can Work in Cold Weather

The Vermont Electric Vehicle Demonstration and Technology Project (EVermont) recently released results of a two-year EV development and test project conducted by the Northeast Alternative Vehicle Consortium (NAVC) in Maine, New York, New Jersey and Vermont. The vehicles used in the test were Geo Metros converted by Solectria Corp. The vehicles were tested under regular commuting conditions as well as on controlled test courses. "This report documents 100,000 miles of on-road, daily use of electric vehicles in challenging climate and terrain," said NAVC executive director Sheila Lynch. "The bottom line is that electric vehicles performed well in Vermont despite the cold weather and long commutes. And, if they can work in Vermont's climate, electric vehicles can work anywhere in the Northeast."
(NAVC RELEASE: 3/20)

Fiat Markets Electric Seicento

Italian automaker Fiat will introduce its new city car, to be known as the Seicento, to the mainland European market this spring. The redesigned, rethought car is being touted by the company as the "ideal city car." The Seicento is externally smaller than comparable compact cars, at 3.32 meters long by 1.5 meters wide (nearly 11 feet long by a little less than five feet wide). However, the new Seicento has more room on the inside and has been approved as a five-passenger vehicle. Fiat will offer two engine models with the Seicento, at 900 and 1,100 cubic-centimeters. Additionally, an electric version, known as Seicento Elettra, will be made available. The Elettra's batteries are small enough to allow four passengers. Fiat will produce the Seicento at its plant in the Polish town of Tychy.
(MADE IN FIAT: JANUARY/FEBRUARY 1998)

POEM To Present Electric City Car

Perusahaan Otomobil Elektrik Malaysia (POEM) has announced that, barring any further delays, the prototype of its electric city car will be revealed in a few months. Dr. Ahmad Tadjuddin Ali commented that the biggest challenge facing the electric city car is getting "road worthiness approval" from the Road Transport Department, which has never had to evaluate the application of an EV on public roads. Additionally, Tadjuddin hopes to create a park-and-charge scenario for parking lots and homes where future EV drivers use pre-paid cards to charge vehicles. POEM has signed an agreement with Sirim Bhd. for performance evaluation of lead-acid batteries and development of battery charging and vending systems for electric vehicles.
(BUSINESS TIMES: 3/23)

EVs Come to India

Indian and U.S. companies are jointly producing a low-cost EV called the Reva that is expected to cut pollution on Indian roads. The two-door hatchback can carry two adults and two children for 80 kilometers (48 miles) on a charge. The car is being made under a collaborative effort between the Maini Group of Industries in the southern Indian city of Bangalore and Amerigon, Inc. of Monrovia, CA. Negotiations for commercial production of the car are underway between Amerigon and Scooters-India Ltd. of Lucknow, India. The vehicles will cost an estimated 195,000 rupees ($4,935). The U.S. Agency for International Development (USAID) has given Amerigon a $100,000 grant to help commercialize the car for use in India.
(AP: 3/23)

Dempsey EV To Break Speed Record

At a recent National Manufacturing Week trade show, Dempsey's World Record Associates displayed their record-breaking electric-powered vehicle, which has been clocked doing 237 mph in tests at the salt flats in Utah. "Our design aims are just the opposite of most electric cars," said Dempsey engineer Robert Kubinski. "Most cars want to maximize battery life — we want to pull the energy out of the batteries as quickly as possible." The speedster is powered by more than 6,000 "C" cell flashlight batteries wired together to drive two 200 horsepower motors. The battery configuration usually provides the car with power for three to four minutes. The car, at over 24 feet long, will try to better the standing electric-car speed record of 215 mph this summer.
(CHICAGO TRIBUNE: 3/17)

Quick Charge Program Recognized

California Governor Pete Wilson and the American Planning Association each have recognized Southern California's large-scale effort to aid local communities in adopting EVs. The Governor's Environmental and Economic Leadership award was presented to the City of Los Angeles for innovative EV infrastructure development under the city-wide "Quick Charge LA" program. The program has helped to install nearly 200 EV charging sites around the city, in places like public parking garages, Metrolink commuter train stations and Los Angeles World Airport. Quick Charge LA is part of a larger effort in the Southern California region to aid local communities in becoming EV-ready. Meanwhile, the LA chapter of the American Planning Association has given the regional Quick Charge program an Education Project Award.
(CURRENT: VOL. 3, ISSUE 1)

Fuel Cells Available Commercially

The technology to power EVs with hydrogen fuel cells currently is available for commercial use, according to the report, "Gearing up for Hydrogen: America's Road to Sustainable Transportation," issued by the national nonprofit environmental research organization INFORM, Inc. "No new scientific or technological breakthroughs are necessary to move these vehicles onto our nation's roads," said James Cannon, INFORM's senior fellow and author of the

study. "The major challenges involve engineering refinement and infrastructure development. Making the technology commercially viable requires a political commitment to the future." The report outlines six steps that federal leaders can take to expand the market for hydrogen-fueled vehicles.
(INFORM RELEASE: 3/13)

OTT Character To Be Published

General Motors recently took the Department of Energy's Office of Transportation Technologies (OTT) children's story, Daniel and His Electric Car off the World Wide Web in order to publish it as a hard-copy, bound children's book. "The book is just one way that OTT is working to educate students and children of all ages about the benefits of alternative fuels and vehicles," said author Ann Hegnauer. The story depicts a five-year-old boy who goes car shopping with his parents, learns the environmental benefits of EVs, and participates in the purchase of an EV for the family's second car. The next story planned will feature Daniel visiting his uncle, a farmer who grows corn for conversion into ethanol.
(OTT TIMES: WINTER 1998)

Generator Charges Batteries in Hybrid EV

A 20-kilowatt (kW) ThermoPhotoVoltaic (TPV) generator has been developed by the Vehicle Research Institute (VRI) at Western Washington University and JX Crystals, Inc. of Issaquah, WA for use as an auxiliary power unit in a hybrid EV (HEV). Under a Department of Energy contract, the TPV generator will be tested in a Viking 29 experimental research HEV. According to M. Seal of VRI, who spoke at the Transportation 2010 conference held in November in Dayton, OH, the first emissions tests showed that the generator is 50 times cleaner than an internal combustion engine-powered unit. In addition, the TPV is expected to easily meet the California ultra low emission vehicle standard for automobiles.
(THE CLEAN FUELS REPORT: FEBRUARY 1998)

Honda IMA Hybrid Technology Shows Promise

Green Car Journal editors recently were treated to a demonstration of the new Honda Integrated Motor Assist (IMA) hybrid EV technology at the automaker's research and development center in Tochigi, Japan. The system utilizes a newly designed one-liter, three-cylinder engine and an ultra-thin, DC brushless motor/generator. Honda says the powertrain can achieve a fuel economy of more than 70 mpg. The system's motor/generator converts kinetic energy captured during braking into electric energy, and stores it in a series of ultracapacitors. The capacitors and the vehicle's power drive unit are part of a single unit positioned in front of the rear wheels. The vehicle also features Honda's MultiMatic transmission to ensure high efficiency and low loss.
(GREEN CAR JOURNAL: FEBRUARY 1998)

Ford/Mobil Develop Fuel Cell Technology

Ford Motor Company and Mobil Corporation recently announced a joint agreement to develop and integrate cleaner and more efficient fuel technologies. The project will focus on the development of a commercially viable compact fuel processor for fuel cell-powered vehicles. Ford hopes the alliance will support existing fuel cell agreements with Daimler-Benz and Ballard Power Systems, and that both these partners will be involved. Spokesmen for both companies said the alliance will set near-, immediate-, and long-term goals for the advancement of automotive fuel and powertrain technology. Ultimately, the project is designed to create a wider market for alternative-fuel vehicles and produce big gains in vehicle fuel efficiency and emissions reductions.
(FWN: 3/5)

Mazda Develops Fuel Cell Vehicle

Mazda Motor Corporation recently unveiled an experimental prototype model of its Demio fuel cell vehicle (FCEV). The automaker plans to use the small passenger car to test its driveability, control system and fuel efficiency. The Demio can achieve speeds up to 90 kilometers-per-hour, with a range of 170 kilometers when fully charged. The Mazda FCEV is powered by a fuel cell system made up of a polymer electrolyte fuel cell stack that produces electricity, in addition to a metal hydride hydrogen storage tank and a small air compressor that supplies oxygen to the fuel cell stack. The vehicle is equipped with an onboard electric generator that burns hydrogen for fuel, creating no emissive byproducts with the exception of water.
(NEW STRAITS TIMES-MALAYSIA: 3/2)

Scientists Extract Hydrogen from Water

Japanese and Spanish scientists have succeeded in using catalysts to split hydrogen and oxygen from water at room temperature. The development could be important in the

quest to find cheap and easy supplies of hydrogen. Tokyo Institute of Technology researchers used visible light and a copper oxide catalyst to extract the elements from water. The Japanese researchers said their process could last for close to 2,000 hours. Spanish scientists at Valencia's Institute of Material Science used a molybdenum-based catalyst. Details on the catalyst have not been revealed, and the Spanish team has applied for a patent. Although hydrogen can be an effective alternative vehicle fuel, conventional electrolytic methods of obtaining the substance are fairly expensive. (XINHUA: 2/26)

H Power Develops Fuel Cell System

H Power Corporation recently was awarded a patent on its metal platelet fuel cell design, which reduces the size of a cell stack by 30% to 50%. The company simplified the system by combining several operations into one cell plate. The fuel cell design not only boosts power per cubic liter, it cuts manufacturing and operation expenses. H Power and the New Jersey Department of Transportation developed a prototype fuel cell-powered roadside power station that is used in intelligent transportation systems and smart signs used on freeways and highways. H Power's technology features a proton exchange membrane (PEM), which operates at room temperature and is considerably smaller than other fuel cells. (HPOWER RELEASE: 2/25)

S.K. Int'l Introduces New Battery Module

Bogart, GA-based S.K. International Research and Development, Inc. has been granted a U.S. patent on its Battery Module Energy Management Circuit and Technique. S.K. International's new technique provides a means of transferring charging energy from the overcharging battery modules to other still-charging modules in the same string. This is possible even during full fast charge because the energy is not dissipated, but transferred. The module works in a discharge mode, transferring energy from still-strong batteries to relieve the load-carrying duty of the weak ones, and keeps the string discharging to its full extent without affecting the weaker batteries. S.K. International has tested its string with a seven battery VRLA configuration under a 2C charging and 1C discharging regime for over 250 cycles. (S.K. INTERNATIONAL: 2/25)

US BATTERY REPORT

4/23/98

by Mark E. Hanson

The previous T-105 Trojans worked well with a total of 22k miles obtained with 14 EV (84V) in a Geo Metro at 30 hwy miles per charge. Presently I'm evaluating the 8V US Battery US8VGC (with lug terminals of' course). I'm getting 44 hwy miles on a charge at 112 V pack voltage. I presently have 10k hwy miles on these batteries. For the excellent performance and less temperature sensitivity, they are reasonably priced at $45 per battery and $100 shipping charge for 20 batteries. I put 8 in my 48Y golf cart, used for fertilizing and hauling firewood with a trailer attachment.

The Trojan T875 s were $75. I got 733 cycles from my last flooded cell pack, and these should be about the same since they have similar construction. I've tried various sealed batteries that deliver less life (typically 200-300 cycles) and cost more. I'm using a smart-charger of my design, so results may vary). They use less and even H20 with my individual charger with a 7-coil secondary and 14 Schottky diodes, but probably this type of charger is more useful for sealed types due to its complexity.

I'm using sealed Eagle Pitcher batteries in my 36V Lawn Mower and they work fine since they only get one cycle per week.. The US buttery (500 amp lug terminal) US8VGC is presently the best bang per buck or dollar per mile value at $730 total or 3 cents per mile. Tip: Painting the terminals with gray enamel paint keeps the bolts from working loose and provides a neater appearance than grease.

Rainwater is more distilled than distilled water! 20k ohms per square inch vs. 5k for "distilled water" in the grocery store gallon jugs!

These best value batteries are available from US Battery in Georgia 1-800-522-0945 George Budwick or Tom Bradham. In California 1-800-522-0945 David Mason. They will ship to your door and take card or check- (US Battery, 653 Industrial Park Drive, Evans, Georgia 30809)

Sincerely,
Mark E. Hanson
7042 Vista Lane
Fincastle, VA 24050
540-473-1248 phone/fax
mhanson@roanoake, infi.net

The National Electric Drag Racing Association says
SMOKE TIRES, NOT GAS
at the
NEDRA Woodburn (Tire-burn?) Oregon.

NEDRA Woodburn (Tire-burn?) Oregon.
August 29, 1998, Woodburn Oregon.
Info at website www.Nedra.com
or call 1-800-FAST-EVS (Wilde EVolutions)

Race Tech Note: Controllers at Phoenix

EMS 390 Amp Flux Vector AC Controller

Bob Gruenwald, Electric MotorSports
members.aol.com/evguru/evc2600.html
Powering:

Bowling Green State University (Electric Falcon)
WINNER University Spec
Controller
Motor: Lincoln Electric
www.lincolnelectric.com

EVCL 1500 A 250 V Godzilla DC Controller

Otmar Ebenhoech, Electric Vehicle Components Ltd.
Powering 5 entries:

Current Eliminator II
Dennis Berube
Electric dragster 1/4 mile world record of 10.88 sec.

Maniac Mazda
Wheel standing drag RX-7
Roderick Wilde, Wilde EVolutions,
Two 9" ADC motors.

White Zombie
Pioneering drag and stereo competition Datsun 1200.
John ("Plasma Boy") Wayland,
Kostov motor, 336V 1200A

Kettering University (University Spec)
Two 9" ADC motors, 288 Volts.
Otmar

DCP1200

DC Power Systems
Damon Crockett
Powering:

Kearny HS Porsche 924
WINNER - HS Final
96 V, Motor type unknown

Port Townsend HS Ford Probe
96V, Motor type unknown

Auburn Grizzly

Auburn Scientific
Powering:

Jim Ludiker's Electric dragster
(Two Grizzlies side-byside on a big heatsink)
Volts not known,
Motor type not known

Mike's Auto Care/ Clare Bell Porsche, #13
3rd place, Electric stock heat and final
Watercooled Grizzly

ACP 150, 336V

Allan Cocconi, AC Propulsion
AC Propulsion Three-Phase 336V
Powering:

Salt River Project Probe, #90
WINNER Electric Stock
ACP 3-phase motor.

University of Idaho Camaro, #25
348 V. Motor type unknown

Thanks to Otmar Ebenhoech, Damon Crockett, Bob Gruenwald, and Gary Flo for their posts on the EVDL

EAA CHAPTER LISTING

ARIZONA

PHOENIX EAA

Jesse James , President (602) 250-2131
PO Box 40153, Phoenix, Az 856067-0153
Meetings: 4th Saturday/month, 8:30 am
Arizona Public Service Center
400 N. 5th St.,
Phoenix, AZ.
Homepage: www.primenet.com/~evchdlr/">http://www.primenet.com/~evchdlr/

CALIFORNIA

NATIONAL EAA HEADQUARTERS

June Munro, Membership Secretary
2710 St. Giles Lane, Mountain View, CA. 94040
HomePage at http://www.eaaev.org/

EAST BAY EAA

Kurt Bohan, President (510) 864-9293 (510) 864-2093 Fax
E-mail: techline@best.com
Hangar 20, Suite 137 (CalStart Hatchery)
2701 Monarch St., Alameda Point, Alameda, CA 94501
Meetings: 4th Saturday/month, 10:00am
Hangar 20, Room 215, old Alameda Naval Air Station
From Hwy 880, take Broadway turnoff to Webster St.; from Webster, go through the tube to Atlantic, right on Atlantic to the old Alameda Naval Air Station

LOS ANGELES EAA

Irv L. Wiess, President (818) 841-5994
2034 N. Brighton
Burbank, CA 91504 USA
Meetings: 1st Saturday/month, 11am - 1pm
Cal Tech Campus, Winnett Lounge
Pasadena, CA.

NORTH BAY EAA

Chuck Hursch, President (415) 927-1046
Email: gandhi!chuck@uunet.uu.net
Homepage: www.ecoalliance.com/nbeaa/
Meetings in Santa Rosa, CA: Call (415) 927-1046 for time and exact location

RIVERSIDE EAA

Dr. Jea Park (909) 309-3060
25998 Reynolds St. Loma Linda, CA 92354 USA
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SAN FRANCISCO/PENINSULA EAA

Kip Smith, President (415) 587-7784
Email: kws@merkle.baaqmd.gov
Homepage: www.geocities.com/MotorCity/1759
Meetings: 1st Saturday/month, 10 a.m.
San Bruno Public Library.
701 West Angus St. (at El Camino)
San Bruno, CA

SAN JOSE EAA

Don Gillis, President (408) 225-5446
5820 Herma St. San Jose, CA 95123-3410
HomePage:members.aol.com/sjeaa
Meetings: 2nd Saturday/month, 10:00 AM, contact Don for meeting location

SACRAMENTO ELECTRIC VEHICLE ASSOCIATION

Tim Loree, President (916) 962-3044
2428 Wisconsin Dr. Citrus Heights, CA 95610-7432
Meetings: 2nd Saturday/month, 10am - Noon
SMUD, 6301 S Street, Sacramento, CA
HomePage: www.calweb.com/~tonyc/sevahome.html

SAN DIEGO ELECTRIC VEHICLE ASSOCIATION

Scott C. Kennedy, President, (619) 658-4152
1621 San Elijo Ave., Cardiff, CA 92007
Meetings: 4th Tuesday/month, 7pm
San Diego Automotive Museum
2080 Pan American Plaza,
San Diego, CA.

SILICON VALLEY EAA (Founding Chapter)

Will Beckett, President (650) 494-692, fax (650) 852-8384
4189 Baker Ave, Palo Alto, CA 94306
HomePage at http://www.geocities.com/MotorCity/1754/
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Hewlett-Packard, Santa Clara facility
5301 Steven Creek Blvd.
Santa Clara, CA
(Lawrence Expressway and Stevens Creek)

COLORADO

DENVER ELECTRIC VEHICLE ASSOCIATION (DEVC)

George Gless, President (303) 442-6566
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FLORIDA

SOUTH FLORIDA EAA

Bill Young (407) 269-4609
PO Box 156 Titusville, FL 32781-0156 USA
Meetings: (call for information)

HAWAII

HONOLULU EVA OF HAWAII

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MASSACHUSETTS

NEW ENGLAND EAA
Bill Ryan, President (617) 254-5882
340 Market St., Brighton, MA 02135
Meetings: 3rd Saturday (Jan, Mar. Jun, Sept.) 1:00-4:00 PM
Center for Technology Commercialization, 1400 Computer Dr.
Westboro, MA
HomePage: norfolk-county.com/users/ws3f/neeahome.htmcounty.com/users/ws3f/neeahome.htm

PIONEER VALLEY

Karen Jones (413) 549-4999, (413) 253-1633
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Meetings: 3rd Saturday/month (Jan-Nov.), 2pm
Jones Library (Amherst Rm),
Amherst, MA

MISSOURI/KANSAS

MID-AMERICA

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13700 W. 108th Street Lenexa, KS 66215
HomePage at http://www.geocities.com/MotorCity/Downs/4214/
Meetings: Contact Bill for date, time and location

NEVADA

LAS VEGAS EAA

William Kuehl, President (7070 642-4000
4504 W. Alexander Rd. North Las Vegas, NV 89030
Meetings: 3rd Thursday 7:00pm
Desert Research Institute
755 E. Flamingo (corner of Swenson)
Las Vegas, NV

NEW JERSEY

TRI-STATE EAA

Kasimir Wysocki (201) 343-1252
293 Hudson St. Hackensack, NJ 07601 USA
Meetings: Quarterly. (call for information)

NEW MEXICO

ALBUQUERQUE EAA

Joan Wolf, Contact
7019 Red Sky Ct. NE
Albuquereque, NM 87111
Dale Riddle, President (505) 260-0070
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Shoney's Restaurant, 9700 Montgomery NE,
Albuquerque, NM

NORTH CAROLINA

SOUTHEASTERN EVA

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PO Box 1025 Monroe, NC 28111-1025 USA
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TRIANGLE EAA

Jerry Asher, Contact (919) 403-8137
409 Brooks Ave, Raleigh, NC 27607
Meetings: 2nd Tues 3:00 PM, odd months
Conference Room, IEL Lab, Centennial Campus, NC State University
(Call Jerry for details)
Email teaa@rtpnet.org
HomePage: www.rtpnet.org/~teaa/

OREGON

TULATIN OR EV ASSOCIATION

Lon Gillas, President (503) 434-4332
505 W. 25th St. McMinnville, OR 97128
Meetings: 2nd Wed, even months,
Energy Resource Center, 7895 SW Mohawk Center
Tulatin, OR (503) 694-6020

TEXAS

HOUSTON EAA

Ken Bancroft (Contact) (713) 729-8668
4301 Kingfisher St., Houston, TX
Meetings: 3rd Thursday each month 6:30PM
Citizens National Bank - Activity Center
5217 Cedar St., Bellaire TX
(Take Bellaire exit off West 610 Loop go west on Bellaire about 1 mile to Ferris, turn right one block to Cedar, Activity Center on right)

NORTH TEXAS EAA

Paul Schaffer, President (972)-437-1584
430 Ridge Crest, Richardson, TX 75080-2532
Email: pschaffer@cyberramp.com
Meetings: 3rd Thursday/mo, see www.engr.tcu.edu/ntega for time and location

UTAH

WEST VALLEY CITY EAA

Harry Van Soolen, President (801) 969-1130
3622 South 4840 West
West Valley City, UT 84120 USA
Meetings: (call Harry for date, time and location)

VIRGINIA

CENTRAL VIRGINIA EAA

Jim Robb, President, (804) 342-0925
3106 Porter St., Richmond, VA 23225
Meetings: 3rd Wednesday/month
Science Museum 2500 W. Broad St.,
Richmond, VA

WASHINGTON

NORTHERN OLYMPIC PENINSULA ELECTRIC CAR CLUB (NOPEC)

Karl Schreiber (360) 385-3532
11 Kanu Dr. Port Townsend, WA 98368
Meetings: 3rd Saturday/month, 10 AM
Port Towsend High School Shop:

SEATTLE EVA

Ray Nadreau (206) 542-5612
19547 23rd N.W. Seattle, WA 98177 USA
Meetings: 2nd Tuesday/month (call for information)

WASHINGTON, D.C.

ELECTRIC VEHICLE ASSOCIATION OF GREATER WASHINGTON, DC

David Goldstein, President, (301) 231-3990 (301) 869-4954
9140 Centerway Road Gaithersburg, MD 20879-1882
Meetings: 2nd Tuesday/month, at 7pm (call for location information)

CANADA

VANCOUVER ELECTRIC VEHICLE ASSOCIATION

Bill Glazier, Contact (604) 980-5819
3344 Baird Rd. North Vancouver, B.C. Canada V7K 2G7
Meetings: 3rd Sturday/month 7:30 PM
BC Transit Cafeteria

EAA Chapter List - Chapter contacts and meeting locations. Most verified as of 5/98. For information about the Electric Auto Association, call 1-800-537-2882

FOR SALE - MEMBER WANT ADS - FOR SALE

1984 "INDY" FIERO -- 9" ADVANCED DC MOTOR #FBI - 4001 72-144 VDC 28 HP -- CONTROLLER CURTIS PMC 1231-C 7701-550 AMP. -- FULL INSTRUMENTATION -- NEW LOW RR TIRES -- 16-12 VOLT INTERSTATE BATTERIES ON BOARD -- 115 V CHARGER -- TACHOMETER -- X-TRA CLEAN -- POWER BRAKES $9,950.00. Albert Ryan, 5369 Lilac Ave., Livermore, CA 94550-1219 Tel. (925) 447-5369

1976 Porsche 914: Drive, Race, or Show EV! Complete restoration with fiberglass body kit. Setup with racing suspension and tires. ADC XP motor, 600 amp controller, DC/DC converter, dual 144 volt DC battery packs, 12 volt deep-cycle sealed VRLA batteries, KW meter + more! $15,000, OBO. Call Bob (310) 233-2221 (California)

1972 Karmann Ghia: Red convertible electric; GE 40HP DC motor, Curtis 1221B controller, on-board 120VAC charger, 120 volt DC, 10 x 12 Volt Trojan 5SHP lead acid batteries, DC/DC converter, volt+amp gauges; Fun transportation! $4500, OBO. Call Bob (310) 233-2221 (California)

Electrica 707 1980 30m Curtis, 2 Chargers 1 on board, no dings, white $2M Russ Burrows (650)854-0447

1997 Tavria Courier: New import car, less than 50 mi. on odometer, recently registered with CA license; 2-dr, 4-passenger; ADC 55 HP motor, 500 amp controller, DC/DC converter, 96 volt DC, 16 x 6 Volt Trojan 125 lead acid batteries (new), on-board 120VAC charger, E-Meter; $12,000. Call Bob (310) 233-2221 (California)

1981 Jet Electrica (Ford Escort). Refurbished, 4-spd, 96V/400A Prestolite, PMC 1221B, new battery (16x USB 145), DC/DC, new paint. $8,995 -- Call (650) 964-3974

Jack & Heinz aircraft generator/motor with complete clutch assembly/adapter for VW. Inside storage 15 years. Runs. Free/pay freight. Eric DeGroat, Jr., 108 Morningside Drive, Columbia, SC 29210 803-798-4483

MEMBER WANT AD RATES

WANT ADS: Print clearly or submit typed copy of your ad with your name, address, and phone number. The EAA is not responsible for the accuracy of ads. Want ads must be received before the 1st of each month and must include payment to run in the next issue of CE.

$10 for the first 35 words. Each additional word, 25 cents. Want ads are available to EAA members for the sale of electric vehicles, equipment and parts only. If you want to run your ad in more than one issue, please specify and include payment for each issue requested.

For corrections or updates, please send a written note or fax to EAA Want Ads at (510) 864-2093. Photographs of your vehicles may be submitted with your ad. If room is available, we run one photo each issue. These photos will not be returned. Send your Member Want Ad request and check payable to:

EAA Want Ads
Hanger 20 Suite 137
2701 Monarch Street, Alameda Point
Alameda, California 94501

Electric Auto Association (EAA)
Membership Application

New Member: ._____ USA: ._____ Note: EAA membership dues are
Renewal: ._____ Canada: ._____ tax deductible in the USA
Other Country: ._____ as allowed by the IRS.

Date: .____/____/_____

Name: ._____ Company: ._____
Street: ._____ Phone: . Hm-_____ Wk-_____
City: ._____ Fax: ._____
State: ._____ Zip:_____ Country: ._____

If a new member, where did you hear about the EAA ?_____
EAA Chapter you attend or support:_____
I need chapter information:_____

Membership / Vehicle Information — Please complete if new or changed

Please identify your primary areas of interest relating to EAA
(Please rank your your choice with a "1" being most important, "2" second, etc.)

1: ._____Hobby / Builder
2: ._____Professional (EVs are a source of income for you)
3: ._____Competition (Rallies, Races, and Records)
4: ._____Environmental and Government Regulations for EVs
5: ._____Social (Rallies, Shows, Dinners, Other)
6: ._____New Technology and Research
7: ._____Promotion and Public Awareness of EVs
8: ._____Student or General Interest
9: ._____Electrathon / Bicycle / Off-road Vehicles
10: ._____Owner / Driver of Electric Commute Vehicle
11: ._____Other: Please Specify:_____

Number of total EVs you have ever owned ?:_____
Number of EVs you now own ?:_____

Please describe any Electric Vehicles you now own or are building: (if more than one, attach information on each)

Vehicle Lic#:_____ State:_____ Country:_____
Vehicle Type:_____ Make/Model:_____ Model Year:_____
Converted Yr:_____ Number of Wheels:_____Motor Type:_____
Controller type:_____ Batteries: No./Type:____/_____ %Completed_____
Pack Voltage:_____ Avg. EV Mi./Week:_____ Avg. EV Trips/Week:_____
Other Features:_____
Comments:_____
_____

Please make your check or money order for appropriate amount (see below), payable to the Electric Auto Association, fasten it to this form and mail it to :

Electric Auto Association
2710 St. Giles Lane
Mountain View, CA. 94040 USA

USA $39 /yr (U.S. Dollars only)
Canada $42 /yr International $45 /yr

Note: All information and statistics in this application are for the exclusive use of the EAA. We never sell or loan our mailing lists.

ver 8/29/97

EAA Store Order Form

Printed materials

CE	Selected Current EVents (specify specific issue)	$3.00 each issue
CEFY	Current EVents - Full year {specify specific year)	$20.00 each year
PB001	Discovered: The Perfect EV Battery	$2.00
FW001	Flywheel Energy Storage	$5.00
BG1997	1997 Buyer's Guide to Electric Vehicles (April 97 CE)	$6.00
BG 1996	1996 Buyer's Guide to Electric Vehicles (Feb. 96 CE)	$5.00
BG1995	1995 Buyer's Guide to Electric Vehicles (Feb. 95 CE)	$4.00
TT001	Team Tucson Land Speed Record Plans	$5.00
IDX001	EAA Current Events Index - 10 Years!	$4.00
XA100	EAA XA-100 Hybrid	$5.00

Other EV items

BS800	Bumper Sticker with 800 number 3.75x15 inch	$3.00
BS002	Bumper Sticker with "the Switch is On", 3.75x15 inch	$3.00
CAP001	100% Cotton Cap, Forest Green with Yellow Ink	$8.00
DC001	Decal - black and red, 3x9 inch, for Window	$3.50
KC001	Key Chain with LED light and "30 Years 1967-1997"	$2.50
MUG002	Thermal Mug	$6.50
MUG003	Porcelain Mug	$5.50
PS001	Polo Shirt w/ embroidered logo select shirt color & size: Teal Green, Forest Green or Navy (s,m,l,xl)	$30.00
SS001	Auto Window Sun Shade with Logo	$8.00
PN001	Ball point writing pen with EAA and 800 number	$1.00
CS001	Current Solutions/Motor Show Video Tape (14 minute runtime)	$15.00
WL001	Window Literature Holder (fits pages 8 5 x 11 inch)	$25.00
PARK01	"EV Parking Only" Sign (18"x12") green icon	$25.00

Electric Auto Association Store Order Form

Send order to: EAA Store
5820 Herma St.
San Jose, CA 95123-3410

Name _____ Phone _____ _

Address _____ _

City _____ St, _____ Zip _____ _

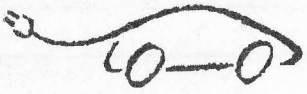
Item #	Size/Color	Quantity	Item Description	Unit Cost	Amount

Subtotal	
Postage (10% of subtotal, for USA*)	
Handling	$2.00
Total	

* for Canada add 15% or for other foreign destination add 25 % for postage

ELECTRIC AUTO ASSOCIATION
2710 St. Giles Lane, Mountain View, CA 94040

• Address Correction Requested •



NON-PROFIT ORGANIZATION U.S. POSTAGE PAID SUNNYVALE CA PERMIT NO. 420

55 P4

• Time Dated Material - Please Do Not Hold •