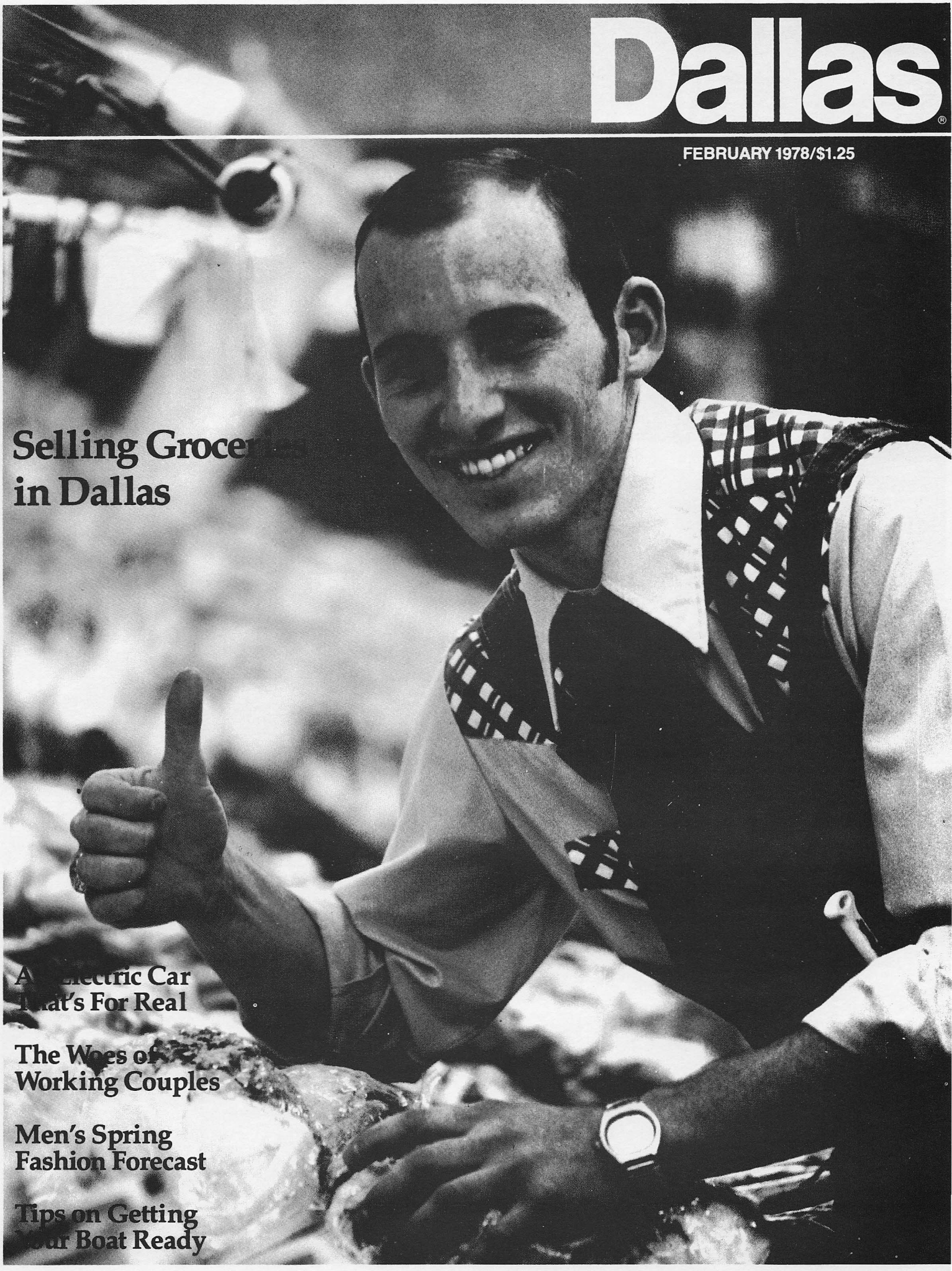
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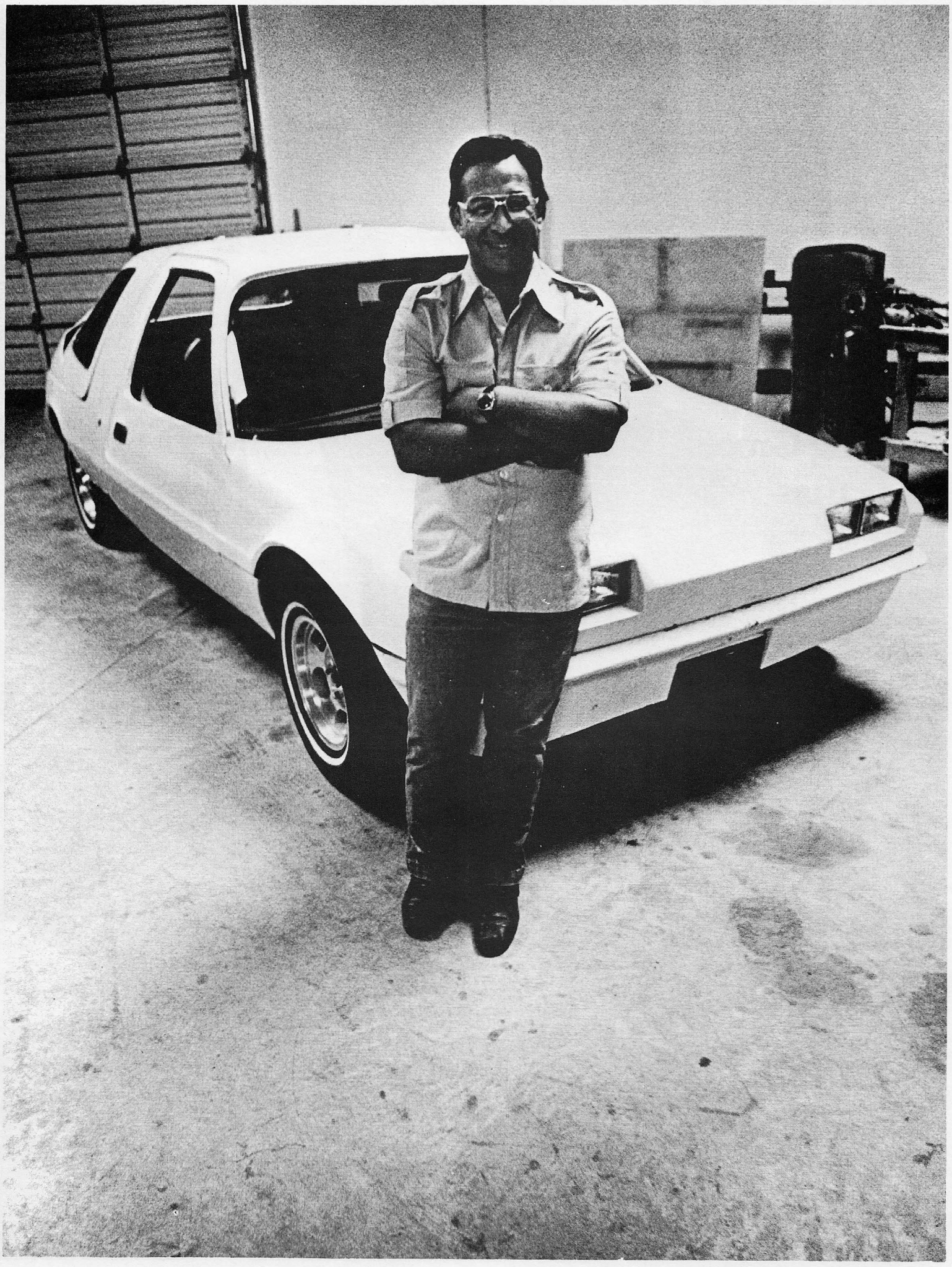


The Electric Car That Probably Can

By Daniel Garza/Photography by Bill Crump

A Dallas automaker has built a prototype electric-powered car that will hit 80 miles an hour with a 100-mile range. But who's paying attention?

Ed Ramirez thinks the boys in Detroit have been going about it the wrong way, which, on occasion, leads him to think they haven't gotten into the true spirit of the proposition.

The proposition being the development of the ideal electric automobile.

He says that by and large, emphasis has been placed on improving batteries so electric cars will have more pep and go further. "Batteries are important. I'll agree to that, but for the electric automobile to be as efficient as possible research and development needs to start at ground level, literally with the tires and work up so that each part, each component is synchronizing, if you will, with the others and contributing to a decrease in the automobile's rolling resistance to achieve greater ranges at higher speeds," he declares.

Big talk for a small cog?

Actually, Ramierz has a lot of room to talk. Because while others have been fidgeting with batteries and sputtering around with conventional car bodies using electric motors, he's at the starting line with a "ground up" prototype electric automobile sporting speeds of up to 80 miles an hour with a 100 mile range.

The Dallas automaker uses the term, "prototype," loosely. The fact is Ramirez's company, called American Ecological Transportation — AMECTRAN, for short — has more than one experimental vehicle.

The group includes a Pacer look-alike that's been getting most of the workouts recently; a sleek and sporty two-seater, strikingly similar to a Porsche 914; a quasi-futuristic two-door sedan called the "Yellow Car" that was used for testing and show, but is now retired; and a five-passenger, four-door model coming from Europe that's designed by BMW and Rolls-Royce designer Pietro Frua.

With this batch, he and his staff are working toward developing the quintessential electric automobile — a practical, economical vehicle for the everyday man.

Test driver Earl McKeehan with the working model.

There's not a showcase model since most of the limited funds are devoted to testing and experimenting. However, the Frua design will serve that purpose once it's finished and in the states, Ramirez says.

Meanwhile, the Pacer look-alike gets a fair workout daily with staff member Earl McKeehan replacing parts and testing them in an effort to achieve greater efficiencies.

This work is conducted at AMECTRAN's auto stable, located off Stemmons, a couple or so miles south of LBJ. The place is clean — looking more like a health clinic than an auto shop.

It lacks the oil stains, greasy rags and pungent gasoline smell associated with car garages. Tools, work benches, spare parts and tires are randomly placed. But an inventory of new experimental parts and their conventional counterparts is neatly arranged on shelves awaiting to be used to determine if they'll be significant contributors to the car of tomorrow.

While the electric car is tested by Ramirez and his group, a substantial amount of R & D on individual parts and sections is drawn from a number of parts and systems manufacturers. Ramirez says these reputable and well-known companies are working closely with AMECTRAN to develop the best parts for his electric car.

The prototype is frequently taken on the road to conduct tests and to show interested parties the kind of performance it offers. On straight-a-ways, it accelerates rapidly to 50, 60, 70 and on past 80 mph. McKeehan, who usually gets the nod to drive the experimental model, says the car can do 100 mph in fifth gear, however, he won't go that fast for safety precautions.

Ramirez and another colleague, Adolfo Gonzalez, point out that a recent government study states that electric cars using conventional auto bodies accelerate from zero to 38 mph in 16 to 18 seconds.

"Our model will go from zero to 60 mph in 12 seconds," they say.

Ramirez states emphatically that he has the only "*real* electric automobile in the world." What does he mean by such extravagant claims?

Just this, which he explains by first providing some background. No other companies to date including the Big Four have taken the "ground up" approach to the electric automobile, nor have they achieved the results he has," Ramirez asserts.

"Look at GM. They put in I-don't-know-how-many millions of dollars into an electric car . . . and they used the body of a Corvair," he sighs.

"The money was spent on batteries and everything else that wasn't important. Funds didn't go toward tires or suspension and rolling systems or aerodynamics. Nothing. GM violated every rule involved in the design and construction of an electric car. And they got the whole world believing that unless there's a better battery and a better electric motor, there'll never be an electric automobile."

Built from the ground up

Ramirez says it's hard for him to fathom the approach some automakers have taken. He notes that billions of dollars have been funneled into research and development for internal combustion engine cars over the years to make them operate better and look more modern. What's puzzling to him, however, is that when some of the first electric automobiles were developed, their builders used cars meant to be driven by large horsepower gasoline motors; they put in electric motors and then expected them to

"This automobile we are getting ready to deliver for about $5,000 can be compared in appearance with the $32,000 Lamborghini Espada."

operate efficiently.

"They may have gotten the electric cars running at 40 or 50 miles an hour for short ranges," he says. "But they were soon discouraged over that kind of performance and eventually talked themselves into believing the car wasn't marketable. What they may not have realized — or maybe, they didn't care — was that not even one iota of real technical R and D has been conducted in this business.

"That's why I say AMECTRAN is the only company in the world that has ever built an electric automobile from the ground up and watched every detail. Take for example, the bolt that holds the disc brake system together. I can show literally dozens of engineering drawings of a simple thing like this bolt.

"This tells you how much research we've done and about the kind of dedicated thought that went into building this bolt properly to eliminate drag on the disc brakes. Hundreds of man-hours of work, testing and engineering went into this stupid little bolt. And the end result was reducing the drag on the disc brakes by seven percent.

"But it's seven percent here and four percent over there and nine percent here and 15 there . . . and all of these percents together finally means the difference between our car going the 50 mile range and the 100 miles," he explains.

Selecting the right tire for an electric automobile is of paramount importance, as well, according to Ramirez. He says Goodyear Tire Company representatives have been working with AMECTRAN for a period of time researching and developing the most efficient tire for his electric car.

What Goodyear has done, Ramirez says, is deliver to him a tire that touts a 40 percent less rolling resistance than any other tire built today. As the name implies, rolling resistance is defined as the resistance a tire has to rolling, and the lesser the rolling resistance, the greater the ranges for the electric car.

If all goes according to plan, the car Ramirez expects to have on Dallas streets is the Frua designed, five-passenger, four-door model with an acrylic fiberglass body. Features which are normally regarded as options on conventional cars will include an AM/FM Stereo/CB radio console, electrically operated sunroof, airbags, transparent sun visors, aluminum mag wheels and heating and air conditioning. Among the options will be an air jack system that'll raise the car at the push of a button to change a flat tire. There'll also be an on-board computer that'll serve as the "brain" for a number of functions to make driving easier and safer.

The Frua design which Ramirez captured after BMW declined it because it was "too futuristic," will be used on the production model. "It's just beautiful. Not just nice, but *beautiful*," the automaker beams.

"This automobile we're talking about is in a class of automobiles that range in price from $22- to $32,000. The only car you can really compare it to is a $32,000 Lamborghini Espada. And we're getting ready to deliver this kind of body style to the common man for about $5,000."

Presenting the average guy with a better idea in economical, practical transportation will be integral to Ramirez's marketing strategy once he gets the wheels rolling. Part of that scheme will include providing convenient and inexpensive repairs, which Ramirez says will be done at the factory since his plans call for selling direct to the consumer, cutting out the middleman and saving the customer the normal dealer markup.

"Let's say one of our customers gets his fender damaged. He doesn't want to postpone fixing it, so he immediately drives to our factory. Well, we won't keep the parts in stock because we'll be making them everyday . . . so we won't have inventory and logistics problems. We won't be telling our customer that we have to check the depot for parts. So there won't be delays like the week or two-week and even a month kind of delays associated with conventional car body repairs.

"What we'll do is to mold a new fender, remove the damaged one by taking off six bolts, take the brand new fender which is literally hot off the griddle and put it on the car — all this in a matter of 15 to 20 minutes and at a cost of $35 to $50. Compare that with a $400 fender repair bill and long waiting periods you usually get with a regular car."

Then too, Ramirez argues, there are the high costs of maintaining and operating an internal combustion engine automobile — costs which are continuing to escalate to such proportions that supporting a car is dangerously bordering on a luxury expense for the common man.

The Hertz Corporation in a 1977 published report says the cost of operating the average gasoline motor car is 20.1 cents a mile. This figure includes gas, oil, periodic tune-ups and other maintenance, interest, depreciation and license fees. Ramirez says his electric prototype can be recharged in five to eight hours at a cost of 60 to 80 cents per charge. He estimates cost per mile for his electric car will be in the neighborhood of four and a half cents.

He figures that monthly payouts on a new intermediate size auto costing about $7,500 and driven about 1,000 miles a month runs around $400 — $200 for payments and $200 for operating the vehicle based on the Hertz cost-per-mile figure. On the other hand, it'll cost $85 to $100 a month to operate his electric car, he says, and that figure includes principal, interest, insurance and juice to make it go.

"What many people fail to realize — or perhaps they don't want to think about it — is that new cars depreciate astronomically. A man owning a car for 15 years will lose a minimum of between $19- and $25,000 on depreciation . . . and that's if he's lucky.

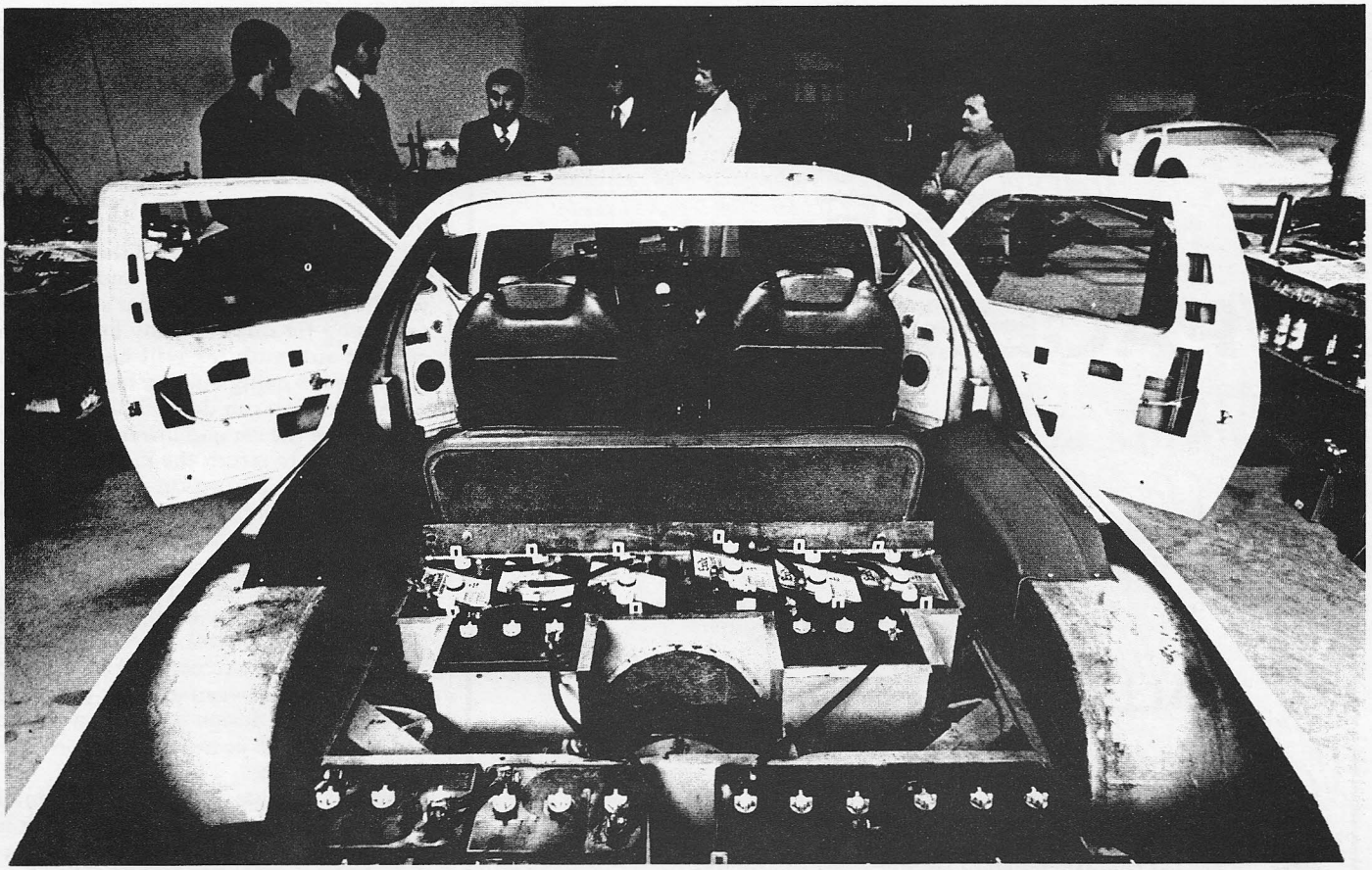
"A person would lose more value in a new $7,500 car over a couple of years than our whole car costs. Because of its inherent nature, the electric car won't depreciate very much," Ramirez notes.

"Electric cars won't age as quick as conventional ones, largely because there's really not too much that can go wrong with them. Lead-acid batteries can last maybe 70,000 miles if properly cared for. Motors can operate for five years or so before brushes need checking, and then, if they need replacing it'll cost $10 to $15 for that. Therefore, it would make sense for a person to keep his AMECTRAN electric car for a long time for short trips or in-town driving, while he uses the gas automobile for long trips only.

"And when more efficient batteries and motors are developed and become available, all the owner will have to do to upgrade his car is to retrofit the new parts in the car," he says.

The United States government is about as enthusiastic and optimistic as the Dallas automaker over getting electric cars in the hands of the public. Though Ramirez says he's yet to see any of it for his project, $160 million has been earmarked through 1981 under the Electric & Hybrid Vehicle Research, Development & Demonstration Act of 1976 to help bring the car to fruition and create an electric vehicle market.

Overseeing these funds is the Energy Research and Development Administration (ERDA), sometimes called the government's "Engine Agency." The 1976 act authorized ERDA to set up and administer a two-phase research and demonstration program into electric and hybrid vehicles during the next six years.



The AMECTRAN team partially removes the chassis to display the battery powerhouse.

Involved are up to 7,500 vehicles, the first 2,500 of which must be delivered for use within 15 to 39 months of September 1976 when the law was passed.

The initial group will represent present-day electric technology. In the next three years, however, ERDA must provide 5,000 advanced cars.

ERDA has begun feeling the pulse of the market, and feedback looks very promising. One of its reports indicates a potentially realizable market for some 470,000 electric cars by 1980. This number includes 350,000 two-seater models and 120,000 four-seater. Another estimate states that some 12 million cars in the United States could be satisfactorily replaced by an electric vehicle of present limited ranges, which can be easily understood since it's been reported that 80 percent of the cars in this country don't travel more than 26 miles a day.

What's been the catalyst propelling the electric car to the forefront? Within the last decade, it has received an increasing amount of attention, not only by the federal government, but also by private industries, utility companies, as well as by the public.

At the outset, auto pollution had people talking about electric cars as an alternative to cut down on auto emission. Then the idea gained momentum during the energy crisis created by the Arab oil embargo. Electric public utilities, meanwhile, have been looking closely at the electric car as a way of developing a slack time market. And the public, of course, sees it as a good solution to the escalating costs of regular cars.

Over the last four years, Ramirez has been closely watching the evolution of these influences, which, in turn, have given rise to a growing market demand. And in this period of time, he's been gearing up to be a significant factor in this new industry.

Once he establishes his first factory in Dallas, he expects to produce and sell about 5,000 cars annually. Subsequently, 14 other sites, each making about 5,000 cars a year will be built in other major U. S. cities.

Ramirez feels pretty good about the market being sufficiently conditioned for economical and clean transportation. And market studies indicate the electric car is the prime candidate to comply with these requirements as well as being conducive to the driving habits of a large majority of people.

"My feelings are that 95 percent of the drivers, 95 percent of the time drive less than 50 miles a day at speeds ranging between 25 to 50 miles an hour. These are speeds and ranges ideal for the electric automobile.

"Some other promising evidence comes to us from a study done by Commonwealth Electric," he says. "Among the conclusions drawn by this study is that the metropolitan area of Chicago would absorb a penetration of 10,000 electrics per year, but under the conditions that these cars are of adequate size, are safe and can go 50 miles an hour for two hours."

AMECTRAN's sales plan will be to take orders with deposits against those orders once production starts. "Various advantages will be afforded initial buyers as additional stimulants," Ramirez points out. He adds deposits will be escrowed and will be fully refundable. Delivery will be projected about seven months ahead with additional leeway available, he says.

As an aside to his manufacturing plans, Ramirez speaks warmly of the old days in auto making — back, back to the turn of the century when only a few gasoline powered "horseless carriages" tooled about. There was a lot of local hometown pride in auto workmanship back then, he says, and the factory stood by its products. "Not like today when car owners get such a hassle over poorly made automobiles."

The Dallas automaker says he wants to bring the spirit of hometown auto making back and along with it pride of workmanship. "We want to put the American back to what he's best at doing — skilled labor. We're losing a lot of that in this country due to automation.

"Automation has literally emasculated the American working man by taking

/Continued on page 48

Electric Car

/Continued from page 35

away his strength and power as a creator . . . as a craftsman . . . as a builder. This country didn't become a great nation because we were a bunch of ding-a-lings. It was because our workers were incredible.

"Yet, we stripped them of their dignity . . . of what they do best and that's to work with their hands. That's what I'm proposing for this company because our electric automobiles will be perfectly conducive to being built by hand.

"Automation can do nothing but raise the price of the car and lower the quality. We're going to return the kind of quality that only the laying-on-of-hands can produce. And at the same time, deliver a product that is within reach of the average man," he states.

There are other electric car companies in the United States trying to reach the average man, as well. However, most have not been as successful at it as they'd like, primarily because their products have lacked in design and haven't quite had the *ummmph* or the range to convince skeptical buyers.

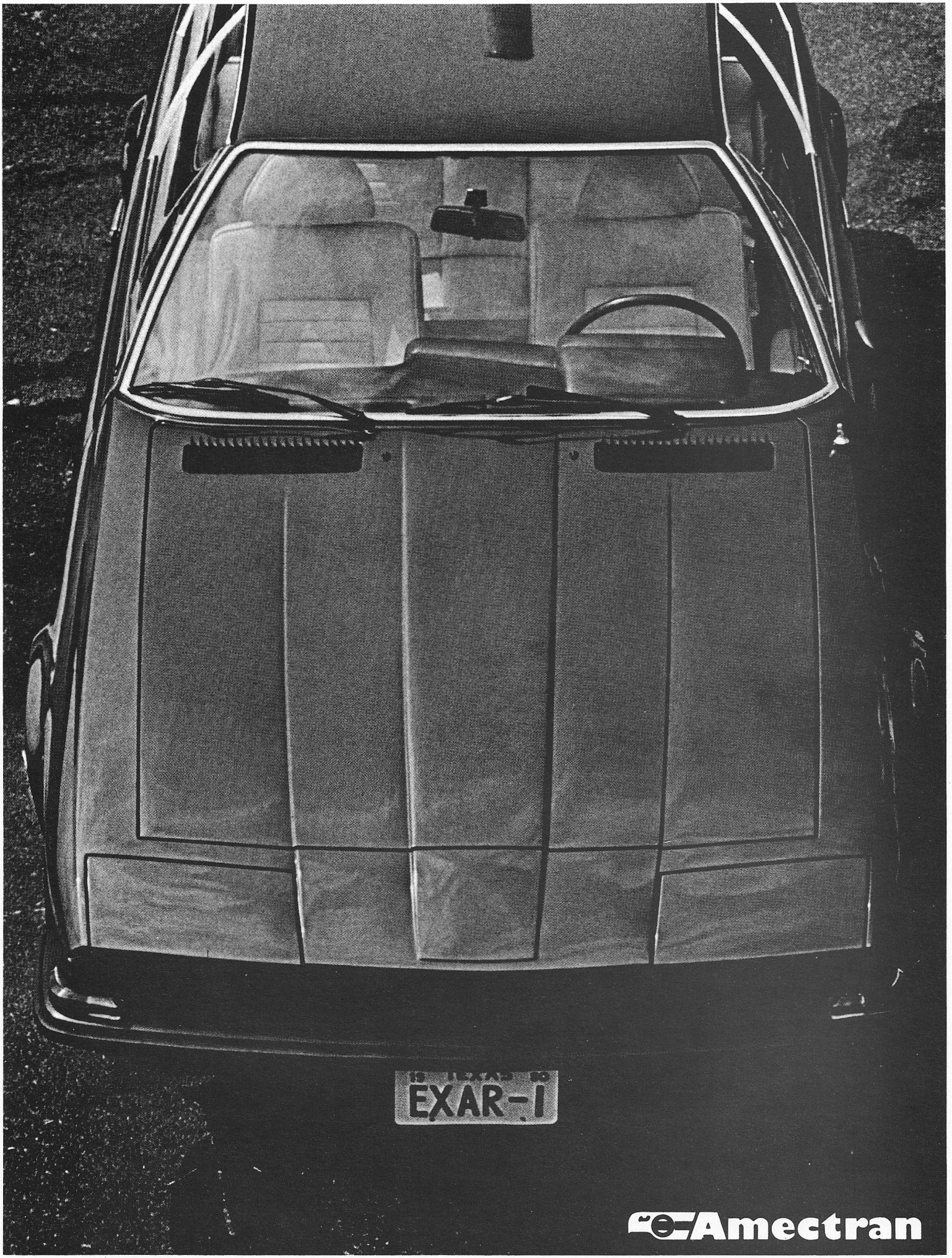
Two of the electric cars, the small wedge-shaped Citicar and Elcar which is built in Italy, took a few jabs from Consumers Union a year or so ago because the nonprofit organization said the cars were unsafe, operated for about 20 miles before requiring an eight hour plus recharge and had top speeds of only 30 miles an hour.

In another more recent report, Citicar which sells for $3,188 base price was rated at a top speed of 45 miles an hour with a 40 mile range. Yet, some critics continue to find fault with the midget, mostly with such safety factors as poor visibility, lethargic acceleration, especially uphill and brakes which "barely get the job done." Yet, the maker says about 2,200 Citicars are on highways and streets and no fatal accidents have been reported.

Then, there are those electric cars converted from gasoline-driven automobiles. The prototype designed and built by Braunlich-Roessle of Pittsburgh, Pennsylvania, for instance, is built on a 1973 Honda 600 chassis, has a range of 30 to 35 miles and speeds up to 58 mph. Electric Vehicle Association, Inc., Cleveland, Ohio, has one with a Renault TLA chassis that can go up to 55 mph and has a 60 mile range.

Regardless of the breed, it appears the electric car has a promising future. As the industry progresses, electric car makers, including those in Detroit, might eventually be detouring towards Ed Ramirez's way of thinking to provide a more efficient, less expensive mode of travel — built from the "ground up." ■

Daniel Garza is a Dallas publicist and a free-lance writer.


EXAR-1
Amectran

With the Exar-1, Amectran has reinvented the electric car, giving Americans the roominess of a mid-sized automobile, the compactness and efficiency of a commuter vehicle, and the aero-dynamic design of an expensive sports car.

Introducing the world's first real production electric automobile

Introduction

Today Amectran and its Exar-1 five-passenger electric automobile are being celebrated. This brochure is intended to be a formal introduction of the reader to Amectran, highlighting this little-known firm's claim as *the* modern-day electric car company. Accordingly, this brochure discusses some of the more significant aspects of the unlikely journey the company has taken on its way to making the Exar-1 a reality.

To a large extent this is the story of company president Edmond Ramirez's aspirations and hopes: the tale of a man who has succeeded to accomplish the American dream of creating not only his own company but an entire industry. To do this is a phenomenal accomplishment in itself in this part of the 20th century. Ramirez seems ready to do it despite overwhelming odds and numerous obstacles, including reluctant and callous government officials in some agencies; apparent enemies in key positions of certain industry organizations and corporations; and the constant need to search for additional capital in order to keep the project alive. And, he has managed to create a company over which he maintains control, having taken the care and extra time necessary to preserve for himself the preeminent position in his company, Amectran, and his industry, electric automobiles.

More than any other company in the industry, Amectran has dedicated itself to the mass production and marketing of electric passenger cars. Since the early 1970s Ramirez has surrounded himself with a staff of dedicated and professional people. Together they not only developed a high performance electric car that appears to meet the American public's criteria; they also have formulated a comprehensive plan outlining the manufacture and market of the vehicle which will enable Amectran to produce the car.

After more than two years of delays, the Exar-1, which will be Amectran's first production model, arrived in the U.S. from Italy in May 1980, where the production prototype was completed by the staff of master automotive designer Pietro Frua. The car was officially unveiled at two days of events including a parade, an awards luncheon, and a reception for the staff of Amectran in Berkeley, California on September 4 and 5, 1980. The prototype will be used to make the body molds for the production line later in 1980, after which Amectran will take the car on a 15-city, eight-month tour of the country. The company hopes to secure deposits for tens of thousands of cars before and during this tour, after which it will begin production in early 1981 at 5,000-vehicle-per-year plants tentatively scheduled for Berkeley, Chicago, and Dallas.

The company expects ultimately to build 15 regional production and service centers, each capable of producing 5,000 vehicles per year on a single shift. Each plant would cost $3 million to build and would employ 160 people. Each one not only would manufacture cars for its respective region, but also sell and service them much the way automobiles were manufactured and marketed in the early 1900s. In developing this system of distribution, Amectran is reintroducing a method of servicing, sales, repairs, and distribution which the nascent automotive industry relied on for creating an image of reliability among its customers. Amectran's emphasis on customer service is indicated by its plan to have company repair trucks for whatever service and aid the Exar-1 will need.

The Road to Amectran

Ed Ramirez first considered manufacturing electric vehicles in 1972, while he was president of Stratatron, a New York-based computer company. He was living in Queens, New York, at the time with his wife and two young boys. Worried that the children would be hit by a car while riding their bicycles in the street, he decided to give them something that was exciting enough to divert their attention away from their bikes and at the same time force them to stay on the sidewalks. He came upon the idea of taking a toy pedal-powered car and electrifying it. He asked an electrical engineer at Stratatron to study the possibility of making a toy electric car.

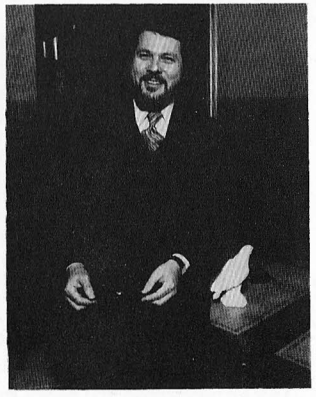
The Stratatron staff at the time was composed of 23 extremely dedicated people, mostly computer experts the firm had lured away from jobs in government agencies and at universities. The electrical engineer automatically applied the staff's standard procedure for solving problems to the electric toy car request. He outlined the problems involved in the project and assigned various experts in the firm a particular portion to solve. The staff, which was used to working long and intense hours, saw the toy car as a welcome diversion. They began immersing themselves in data and discussing what in retrospect Ramirez calls "this dumb little car." Little by little the company in this way compiled a huge amount of information on the energy efficiency and design of the toy car.

"Somehow or another, we started thinking in terms of a real automobile," Ramirez said. "Then the staff began doing little models of a car, getting into questions concerning how parts of the vehicle were going to work, whether their projections were valid for a full-sized vehicle. We started going through the standard questions then: If this was going to work, certainly General Motors would have built one by now . . . . There's just too much money involved . . . . We don't know how to produce vehicles . . . . It costs hundreds of millions of dollars just to build one plant. All of the negatives anyone else would ask I threw at them and we ultimately just set the idea aside. My kids never even got their toy car." Nonetheless, the exercise had stimulated a great deal of curiosity in Ramirez concerning the possibilities for building electric cars.

Shortly after this he read an article on the Japanese government-sponsored electric vehicle development program, which ran for several years in the mid-1970s. "I read that the Japanese had spent $15 million over five years to develop an electric automobile that was little more than a puddle jumper. It was about 4 x 8 in size and had a range of 48 miles at 48 mph." Ramirez said he could not believe that this was the best vehicle design the top firms in Japan could develop. "There was no way, that with all that talent, all that money, they couldn't do better than that," he said.

Around that time, in 1973, Stratatron was hit by a flood, which left several feet of water in the firm's basement computer room. The flood essentially wiped out the company. The firm went out of business in August of that year after an involuntary bankruptcy petition was filed against it. Ramirez began thinking more earnestly about EVs then, taking advantage of what he calls a sabbatical to consider the possibilities of the situation.

Ramirez is poised to create not only his own company, but an entire industry.



Edmond X. Ramirez Sr., president of Amectran, in his office and during testing at Ontario Motor Speedway in July 1980.

The exercise stimulated a great deal of curiosity in Ramirez concerning the possibilities for building electric cars.

British race car driver Stirling Moss impressed European auto industry officials with the Exar-1 at Brands Hatch raceway in England in early 1980.

Industrialist André Deswaef is planning on producing the Exar-1 in Belgium.

The Early Years of Amectran

"The problem never was 'could the electric car work.' That was a foregone conclusion as far as I was concerned," he said. The problem Ramirez saw was to find a way to mass produce electric vehicles without the $200 million necessary to enter production in the way Detroit automakers operate. He realized he could never put together a company capable of doing that. Thus, if he were to enter the EV field, he knew he must develop an alternate marketing and manufacturing plan.

In late 1973 Ramirez moved to Dallas, where his brother was living. The move in many ways symbolized the beginning of Amectran—an acronym of American Ecological Transportation—and the end of Ramirez's career as a computer specialist. Once he had settled in Texas, Ramirez began to spend a lot of time with his older brother, Joe A. Ramirez Jr., a design engineer who was confined to a wheelchair with multiple sclerosis. The two brothers worked together on some engineering and design problems. After a while the work became too difficult for just the pair of them, so they began turning to engineering friends at nearby LTV-Vought and Bell Helicopter for analytic assistance. New bearing systems, materials, designs, and technology for safe yet lightweight body parts came out of these efforts, including the idea of using acrylic Kevlar for the body.

By this time Ramirez and his collaborators had started building test beds of various parts, testing motors and electronic components. They hired an electronics engineer who had worked for Texas Instruments for 12 years to design the electronics for the car. This man began outlining how the car would have to perform. From the beginning they worked with the supposition that an electric automobile had to operate just like a gasoline-powered automobile, with the exception of range capabilities, in order to be accepted by the buying public. Acceleration, top speed, payload—in all these parameters the electric car Ramirez had in mind would have to be competitive with conventional automobiles.

"How could we most efficiently develop a controller? What really was required? These were the immediate problems, and the immediate solution was to computerize the control system. A computer could react much faster than a driver could, we figured. It could make instantaneous decisions and could in turn control to an exact degree the expenditure of electricity to the motor," Ramirez recalls.

Next Ramirez and his staff began to investigate the overall automobile. "We couldn't imagine any one thing that would greatly improve the car. There were no major dramatic breakthroughs that we could find anywhere. We knew the batteries were out of the question, because we had to stick with what was available to the public." Still, by paying close attention to details and by modifying even the most inconspicuously inefficient components, Ramirez was able to develop a vehicle with improved range and acceleration. One example of these efforts is the bolt that holds the disc brake system together. It was redesigned with a resulting 7% reduction of drag on the brakes. Major changes also were made to the suspension and brake systems, as well as in the controller and drive system. In an article on Amectran, *Dallas* magazine in February 1978 quoted Ramirez as saying, "It's 7% here and 4% over here and 9% here and 15% there . . . and all of these percents together finally means the difference between our car going the 50-mile range and the 100 miles."

In 1974 Amectran was formally organized and registered in Texas as a proprietorship under Ramirez's name. He continued to gather experts in electronics and automotive design engineering around him, both as employees of Amectran and as outside consultants. The size of this staff fluctuated over the next six years, growing whenever Amectran's workload needed more hands. Over the years, the Amectran organization developed into a highly dedicated staff, precisely tuned in some ways, yet still learning in others. In many ways, the essence of Amectran remained Ramirez, whose determination and imagination served to create the overall atmosphere at the company and to fuse it together.

A Roadblock, A Turning Point

Nineteen seventy-five was a critical year for Amectran, because it was then that Liz Carmichael arrived in Dallas. Carmichael, alias Jerry Dean Michaels, was described in the press alternately as a transexual and a transvestite who promoted in Texas and California a three-wheeled gasoline-powered car called the Dale. California ultimately charged that the car was used to swindle the public by Carmichael, who was found guilty of selling unregistered securities and sent to jail.

Ramirez sensed that Carmichael was a fraud, he recalled, and feared he would be caught up in the public and official reaction to the Dale scheme, should it ever be uncovered. Acting on his suspicions, Ramirez did a little investigating into the Dale, and found that she was making impossible claims about the vehicle. Fearing the backlash, Ramirez had his attorney contact federal and state officials, in order that Amectran could be on record with the government as having nothing to do with the Dale.

Before Carmichael even had arrived in Dallas in early 1975, Ramirez had begun to make a major reevaluation of his project. The Dale, as Carmichael described it, would be large enough to serve as a family automobile, yet would be designed to achieve around 75 mpg in highway driving. Market research conducted by Amectran prior to this time had indicated that the firm would need to produce a car larger than the one then under development. Ramirez accepted the research conclusions that the American public would much rather have a large car than a small commuter car, despite the insistence of many of Amectran's investors and advisors. "We already had been looking at the fact that the car had to be large," he said. "I remember that I went to the factory foreman and told him to take a Saw–all and just destroy the prototypes we had been working on at that time." He also threw away most of the existing blueprints, keeping only the design efficiencies they had discovered which would be applicable to a larger car.

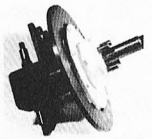
"We spent a heck of a lot of money and a lot of R & D time and everything else to bring us to that stage, but it was all in the wrong direction." Rather than try to modify what they already had done in order to change directions, Ramirez had the company fundamentally start from scratch, so that the new car would be designed as a single, comprehensive unit, and not from pieces of previous vehicles.

Carmichael's appearance in Dallas produced the commotion Ramirez had feared, and in the fallout that followed her unexpected departure from town Amectran had to file Chapter XI in bankruptcy court.

The outcome of all this was that the federal court then gave Amectran 90 days to reorganize. The judge also allowed the firm to issue certificates of indebtedness while operating under the Chapter XI involuntary bankruptcy. Amectran met the deadline, and was incorporated August 9, 1976 with more than 300 shareholders. At that time the $1.5 million they had invested in Amectran was converted into 15% of the corporation.

At the same time Amectran was reorganizing under Chapter XI, the company also began working on the first of its larger, reengineered prototypes, applying everything it had learned from the earlier test beds. Thus, when Amectran Inc., now incorporated, finally emerged from federal receivership, it was in much better shape then when the entire fiasco began. The company had a couple hundred satisfied shareholders, it was reasonably solvent—considering what it had experienced and the capital requirements of its project—and it had never had a complaint registered against it during the receivership. Furthermore, it had completed the first prototype in the series of vehicles which ultimately would lead to the Exar-1.

From the beginning, they worked with the supposition that an electric automobile had to operate like a conventional car.



Amectran squeezed extra efficiency out of every component, including reducing friction in the brakes.

This electric sports-car was an early Amectran development vehicle.

The automobile is designed as a single, comprehensive unit, not from pieces of previous vehicles.

Harold Chenault, Amectran's electrical engineer, examines different controllers.

Goodyear was one of several major manufacturers that aided Amectran's research efforts.

The Prototype Stage

That first prototype would come to be known as the Yellow Car. The car had what euphemistically could be called a unique or futuristic body design. The significant thing about it, however, is that it ran and ran well. Ametcran began testing the Yellow Car with results the staff found to be incredible. The fiberglass-bodied car had a 4,400-lb curb weight, including 24 Trojan batteries weighing 1,700 lb. The car had two doors, carried five people, and was slightly shorter than the Exar-1 ultimately would be. The car had a top speed of 70 mph and could travel 100 miles at a constant 55 mph, according to the Dept. of Energy's 1977 state-of-the-art report on EVs, which relied on information supplied by Ametcran. Ramirez amended these statistics, saying the maximum speed was 100.4 mph and that acceleration from 0 to 55 mph took only 12 seconds.

These performance figures are remarkable for an electric car, especially a five-passenger one weighing more than 4,000 lb. Furthermore, the car accomplished these performance capabilities using only a 19-hp motor, something that left engineers skeptical of Ametcran's claims for the car. Nonetheless, the company made videotapes of the car in action, including one of the driver being given a speeding ticket by an unbelieving police officer. Further evidence of the car's abilities is provided by a number of independent authorities, including personnel from some government agencies and representatives of component manufacturers, who have ridden in the vehicle and attest to its capabilities.

The list of those outside the company that drove in the Yellow Car and other Ametcran prototypes includes former Colorado Congressman Byron L. Johnson; regional Dept. of Energy and Environmental Protection Agency personnel; and Margaret E. Matta, the project officer at the Commerce Dept.'s Office of Minority Business Enterprise. Others include Goodyear, AT&T, General Electric, and LTV-Vought employees, and a number of Dallas radio and television personalities. An official from American Motors said he "was amazed at the pick-up and passing ability" of the Ametcran car he rode in, while J.D. Gilmore of LTV-Vought said, "I rode in Ramirez's car. The prototype does what he claims it will do."

Ramirez also tells of taking GE officials for test drives in his car, outfitted with an experimental controller and GE motor. After driving the car at high speeds for some time, Ramirez let the GE people inspect the motor. Friction normally would have caused the motor to heat up, and the GE experts expected to find a motor that would be too hot to touch because of the high speeds at which the car had been driven. The motor was surprisingly cool, Ramirez recalled, because the prototype vehicle had been designed to be so efficient.

The Yellow Car was followed in 1977 with the development of the S/T prototype, which was designed to convert easily from a mid-sized hatchback sedan to a small pickup truck. Ramirez eschews the doctrine that an electric car must be designed "from the ground up," or entirely from scratch with its overall performance and intended mission in mind, in order for it to be efficient and marketable. Nonetheless, the S/T prototype was constructed using AMC Pacer body parts and components in an effort to interest American Motors in investing or assisting Ametcran's development program in some way. No agreement was reached between the two companies, however, despite apparently keen interest on the part of AMC.

The white S/T prototype still is used by Ametcran, which shuttles visitors from the Dallas airport to the Ametcran offices in it at high speeds. The automobile's maximum speed is 85 mph, and it has a highway range of 75-100 miles per charge, according to Ramirez.

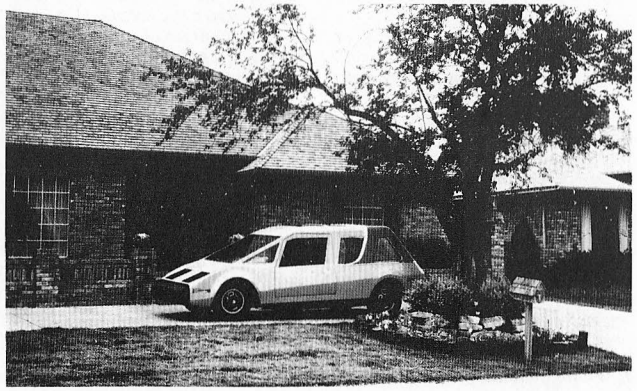
All of the time Ametcran was working on its design and perfecting its vehicle, it was in close contact with component manufacturers. In fact, much of the engineering work on the Ametcran prototypes was done by a variety of local and national firms. General Electric, for example, modified its motors to Ametcran's specifications, working closely with the Ametcran staff in optimizing the motor design. Similarly, Goodyear worked with Ametcran in developing a low rolling resistance tire suitable for EVs and the Airheart Products Division of Hurst Performance provided technical assistance with the brake system. It was in this way, for example, that Ametcran determined what the most efficient tire size for an EV the size of the Exar-1 would be, discovering that a large HR 78 15 would provide the lowest rolling resistance. Hurst Airheart helped Ametcran discover the efficacy of floating the brake calipers, which significantly reduces the drag created by this particular component.

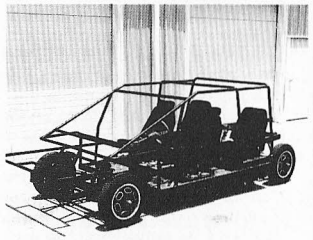
This process of repeated testing and consultation with specialists led Ametcran to develop its efficient vehicle design. For example, the Yellow Car used electronic motor controls. Despite the car's good performance, Ametcran's staff found reasons not to use such a system in later cars. The S/T initially had a five-speed manual transmission. This, too, had distinct advantages, but later research convinced the staff that the production car should use a four-speed transmission in conjunction with an electronic controller and a microcomputer. Through experimentation and testing like this—which also eliminated torque converters, dual motors, chain drives, motors on all four wheels, and several types of transmissions as unsuitable—Ametcran has "implemented the newest innovations of high technology," Ramirez explains.

Some of the innovations which Ametcran has made in its vehicles broke new ground in EV design. For example, Ametcran was the first company to turn to 15-inch tires, as mentioned earlier, in order to reduce the rolling resistance of the vehicle and improve its range. Since Ametcran, with Goodyear, demonstrated the advantages of using large tires, several other EV makers have turned to larger tire sizes. With similar foresight, Ramirez noted, Ametcran was the first EV manufacturer to design its power train so that the regenerative braking system doubles as the battery charger, a design innovation several manufacturers now are adopting.

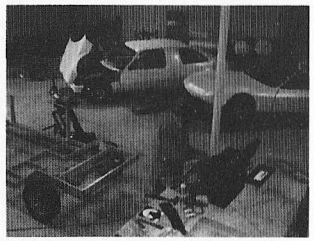
Ametcran also has taken the lead with several other improvements on standard automotive components. The company improved the energy efficiency of its drive train by going to a special rear suspension system.

Ametcran has implemented the newest innovations of high technology.





The first prototype in Ametcran's series of larger cars was the Yellow Car.



Testing was conducted on the Yellow Car and other prototypes at every stage of development.

Ametcran's workshop, where the staff tested every component.

Amectran had kept as low a profile as possible, until around 1977. The company then began making contacts with officials in the Energy Research and Development Agency, hoping that that office, searching for solutions to the U.S.'s growing problems with oil, would be interested in helping Amectran enter production. The company has established good relations with the Dept. of Transportation and such agencies as the Commerce Dept.'s Office of Minority Business Enterprise, but has had difficulties with some of the government personnel and officials in service organizations that are more closely involved in the push to create a market for electric vehicles. Former secretary of Transportation Brock Adams, for example, testified before a 1979 Senate Commerce, Science, and Transportation hearing that his department found Amectran's project fruitful, saying it ought to be pursued. Secretary of Commerce Juanita Kreps invited Amectran to represent the electric automobile industry at an automobile industry meeting arranged by Commerce that same year.

One of the unusual aspects of Amectran and Ed Ramirez is that both either win friends and admirers, or they make hard and fast enemies. Those companies and government offices that have had close contact with Amectran are remarkably impressed with the company, its resilience, and its capabilities. Many of the detractors belong to a group of people who for various reasons have remained aloof and removed from the company, never examining in detail the company's prototype vehicles.

For example, *Electric Vehicle News*, a quarterly magazine that reports on electric road transportation, until 1980 never listed Amectran in its annual directory of EV manufacturers, even though it was aware of the company's existence and includes in its directories other companies that only have preproduction prototypes, firms with experimental vehicles not intended for production, and other firms that can not be reached at the addresses provided by the directory.

In fact, says Ramirez, he once spent a week in Connecticut, where *Electric Vehicle News* has its office, trying unsuccessfully to establish contact with the magazine's publisher. The magazine has never printed any articles on Amectran or its automobiles. Similarly, although Ramirez says he has sent vast quantities of literature on Amectran and its vehicles to the Electric Vehicle Council, this EV industry association reports that it has nothing on file about the company. The magazine and council both exist to promote electric vehicles, Ramirez points out, but both have failed to give any recognition to Amectran.

Amectran also has had a disastrous relationship with the Dept. of Energy's Electric and Hybrid Vehicle Project. The staff at DOE, which has had serious problems in its first years of existence with accusations of sloppy execution of duties and dubious contracts let to corporations, is extremely cautious about endorsing individual companies, especially ones as controversial as Amectran. When asked about the company, personnel in DOE's central EV project office usually reply that they have not seen the company's prototypes, that they feel reluctant to accept offhand some of the company's claims, and that the company is unwilling to let them test its vehicles without paying for the privilege of testing them. Ramirez responds to this by saying that regional DOE personnel have ridden in his vehicle. Furthermore, he says, individuals in the DOE EV office have gone beyond these statements, actually warning government officials and others who inquire about the firm to avoid becoming connected with the operation for fear of some scandal. "We have a legitimate product that does things like nothing anyone else has," he says, "and we can demonstrate it accordingly. I think they (DOE personnel) should at least accord us the common-sense consideration of looking at our project properly."

Ramirez also remains irked that the department passed him by in awarding four grants to small businesses for the development of improved electric vehicles capable of production now. That program, called the "2 x 4" program because it required delivery of two vehicles for testing from each of the four companies ultimately chosen, was the E/HV project office's first significant journey into the world of small EV manufacturers. Several manufacturers who were passed over in the selection process complained about the DOE's procedures, and the department was severely criticized for the way the program was handled. One of the major points of criticism was that one of the firms winning a contract in the program had only been incorporated a few days before submitting the bid.

Ramirez, as is his habit, submitted a thick, highly detailed proposal to participate in the 2 x 4 program. "Their attitude was that we could not substantiate the operation of our prototype," Ramirez says in retrospect. "Now, it seems rather strange to me that they said we could not substantiate the operation of a prototype that we already had running and were willing to demonstrate to them—it seems rather strange that the people who got the contracts included a company that had been in business only nine days and had never even built a prototype. I'm curious to know how they substantiated their claims without having any physical device to show DOE."

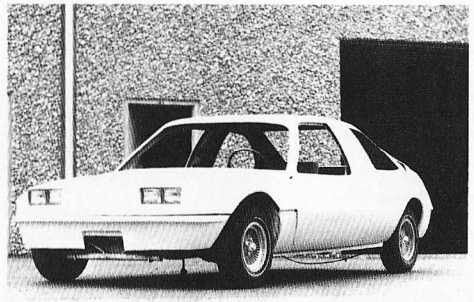
Ramirez and Amectran have had other problems in dealing with large organizations, and they all really boiled down to a lack of credibility. Part of this credibility gap stems from the numerous delays the company has had. Even so, entrepreneurs with much larger capital reserves than Ramirez have encountered similar setbacks in launching such massive manufacturing ventures. Most of the delays Amectran experienced in finishing its prototype and bringing it to the U.S. centered around the company's capital needs. The further delays did not help the firm's credibility with potential investors and creditors, thus creating a tautologous "cart before the horse" situation.

These problems mostly seem solved now, Ramirez said, answering questions about the firm's reliability thusly: "All you really need to know (about the endurability of Amectran) is that the company has survived for 6.5 years and that it has the world's only 'real' electric automobile. That should preclude anything else that could possibly be said. Around 95% of the new businesses in this country fail in five years, even when they're properly funded. Here's an operation that certainly has never been properly funded, yet it's been able to survive."

"Amectran has the world's only 'real' electric automobile."

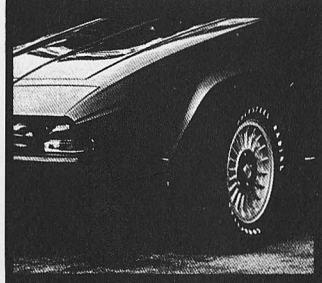
Goodyear researchers worked with Amectran to develop low-rolling resistance tires for electric cars.

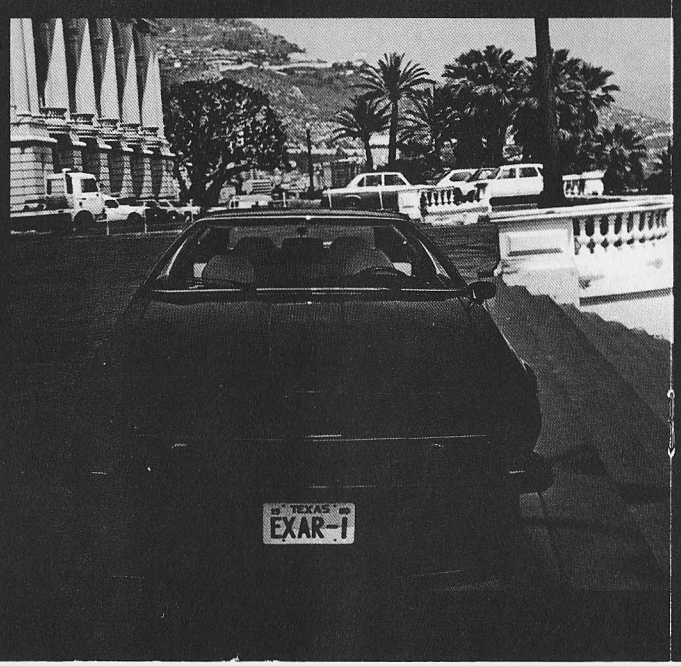
Amectran vice president Gus Pellizi examines a transmission tested for the Exar-1.



The second large prototype was the S/T, a sedan which converted into a small pickup truck.


TEXAS
EXAR-1

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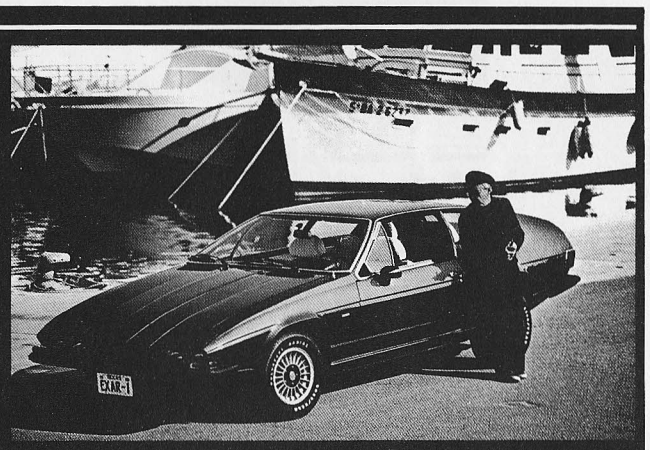
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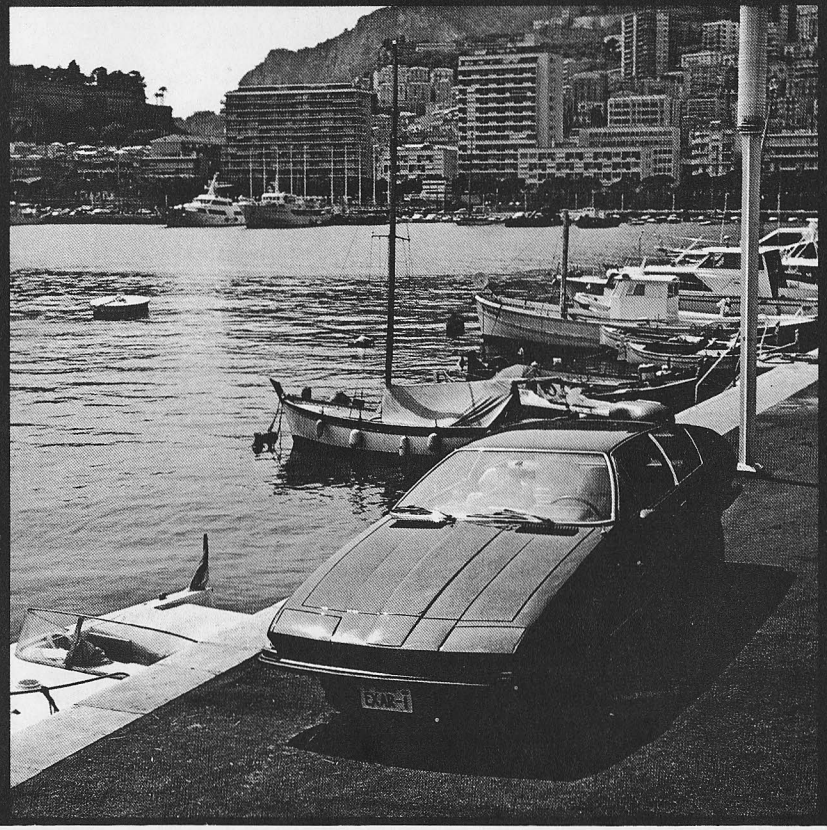

EXAR-1

The Exar-1

Ramirez had planned initially to commercialize the Yellow Car as the first Exar-1. On a fund-raising and information-gathering tour of Europe in early 1977 he changed his mind, however, realizing that the Yellow Car, which he had designed himself, was not right for the market. He immediately began to seek a more saleable body, and quickly commissioned Pietro Frua, one of Italy's premier auto designers, to modify a body which he previously had designed for BMW. The German auto manufacturer had decided the body was too racy for the company's conservative image and had elected not to produce the car.

Frua lengthened the body slightly, to accommodate Amectran's longer chassis and propulsion system. Frua also made numerous other modifications to the prototype's design. In all, Frua's staff worked on the vehicle off and on for nearly three years, ultimately producing a production prototype with a steel body.

The body that Frua has crafted for the Exar-1, which may be among his final projects before retirement (a retirement he postponed for more than a year in order to work on the vehicle), is elegant and expensive looking. It has a classic styling and sporty air that rivals the best of Ferrari and Lamborghini.

Performance of the Exar-1, as it is expected to be when deliveries of the car begin in mid-1981, will be equally impressive. The maximum speed will be 85 mph, Amectran reports, with acceleration from 0 to 60 mph taking only 12 seconds. The range at 55 mph will be as great as 100 miles per charge. The car will be sold directly by Amectran on a delivered basis, with the company providing a six-year financing plan. The company also will provide all servicing for the Exar-1s, through the regional facilities it plans to establish nationwide.

Amectran plans to offer no options on the two-door Exar 1, since the company's attitude is that if something is good enough and worthwhile enough to be on its vehicle, it should be standard equipment. Thus, standard equipment includes such items as pile carpeting, a Craig AM/FM/tape deck/CB radio, leather-trimmed bucket seats, and air conditioning.

The batteries will be equipped with a single-source self-watering system. The car will have tinted windows and windshields, mag wheels, a digital clock, and fully computerized instrumentation. Power-assisted steering also will be standard, as will regenerative braking and disc brakes on all four wheels. The body will be available in black, bronze, blue, green, red, silver, yellow, and white.

Later versions will have an electric sunroof, although the initial, limited production run made the first year may not. A number of changes also are being planned between the prototype and the production model.

The 15-ft, 1-in body is only 4 inches shorter than the 1979 Cadillac Seville. It is 69 inches wide and 51 inches high. The distance between the ground and the chassis is six inches, a typical clearance for an electric passenger car. Total weight of the vehicle, including five passengers or 1,000 lb of cargo, is 4,000 lb. The batteries comprise 1,800 lb of that total. The battery propulsion system will use 24 six-volt lead-acid batteries. Amectran is not sure which of several systems it ultimately will use, but is considering Trojan and Magneti Marelli, among others. The batteries will be charged by an onboard solid-state charger built by Amectran.

"The overall idea of this design," Ramirez says, "is to combine the roominess of a mid-size automobile, the compactness of an efficient, practical commuter vehicle, and the futuristic design and aerodynamic soundness of an expensive sports car."

Central to the advanced technologic nature of the Exar-1 and its dramatic use of high technology is the microprocessor computer which controls nearly every aspect of the car's operation. The computer onboard the prototype Exar-1 is used for a variety of tasks, and is capable of handling 10 times as many functions as it now does. The major task performed by the microprocessor is to optimize the flow of electricity from the batteries to the motor. The computer also controls and/or monitors such things as battery water level, motor temperature, cabin temperature, battery state-of-charge, voltmeter, tachometer, speedometer, ammeter, clock, brake conditions, and accessories.

Other functions performed by the microprocessor include setting the charging cycle, in order to allow the owner to take advantage of time-of-day utility rates where they exist, and a timer which will automatically start the cabin heater or air conditioning at a preset time before the driver enters the car so that the passenger compartment will be at a comfortable level.

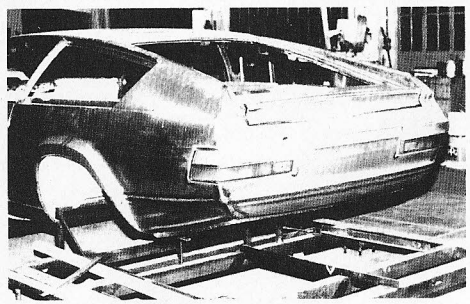
When the driver first inserts his key into the ignition, all that turning the key does is activate, or supply electricity to, the computer pad, located on the instrument panel between the front bucket seats. The computer asks the driver, by way of a two-line, 16-character gas discharge readout, whether he wants instructions or not. If the driver does not need instructions, he presses any button. The computer then flashes six randomly selected digits on the screen, for example 1, 5, 7, 9, 3, and 2. The driver must respond by punching the same six buttons in the same order, thus signaling the computer that the driver is not drunk or otherwise incapacitated. (A special bypass allows the driver to operate the vehicle without passing this test, but it causes the car's lights to flash, warning pedestrians, policemen, and other drivers that something is not quite right with the driver.)

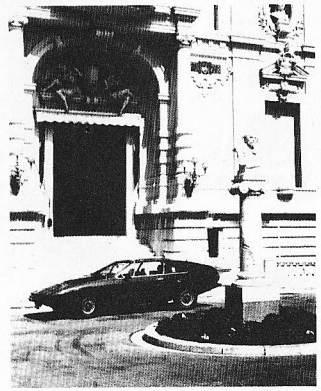
The computer also requests a personal identification number from the driver before it allows him to operate the car, so that the potential for theft is minimized. Ramirez stressed that this number will be known only by the owner of each car and those with

Frua crafted an elegant body...with classic styling and a sporty air.

Pietro Frua's staff worked nearly three years on the Exar-1 prototype.

Italian master designer Pietro Frua worked closely with Amectran's Gus Pellizi on the Exar-1 prototype.





The Exar-1 is styled in the fine tradition of elegant Italian sports cars.

whom he shares his secret. Amectran will not keep a registry of these numbers, so that the only way to operate a particular Exar-1 should the number be lost or forgotten will be to replace the entire electronic system of the car. In this way, the company has created a nearly theft-proof car, Ramirez said, completely obviating the possibility of simply hot-wiring the car.

Once the driver has repeated the six consecutive numbers and has keyed in his personal ID number, he is ready to drive. First, however, he may wish to check his messages, for the computer also will store memos and important dates for the driver. The most obvious uses for this function, Ramirez explains, is that the owner may keep an appointments calendar and a list of when such things as insurance payments are due. The messages are only accessible when the car is not in motion, however, since Amectran wants to avoid any accidents that could be caused by drivers who are reading their memos rather than paying attention to the road.

At speeds of less than 27 mph the Exar-1 emits a low frequency sound which warns pedestrians that the car is moving. Amectran did this on purpose, knowing that one danger with electric vehicles is that they are too quiet. In late 1979 an environmental impact study of EVs by the Dept. of Energy concluded that EVs would create a safety hazard because of this quietness. The study suggested that manufacturers could install low-speed audible warning devices to increase pedestrian awareness of EVs' presence—something Amectran had planned to do as early as 1976.

The Exar-1 comes with disc brakes on all four wheels. The chassis is formed of 4130 chromalloy steel and incorporates rollbar principles.

The electronic controller that will be used in the final production model will be, Ramirez said, "the best that we can garner from whomever we finally decide will be our supplier." The company is examining transistorized controllers as well as the more common SCR chopper controls and microprocessors.

The four-speed manual transmission will be operated by the driver via a T-bar or similar gearshift handle using a standard "H" gear location pattern. The clutch in the prototype is a standard pedal unit, but in the production version there will be no clutch, with gear shifts being controlled through a solenoid located in the T-bar handle, so that to shift gears the driver simply will press the clutch button on the T-bar and shift. Ramirez believes that this system for shifting gears should prove to be a smooth and easy method. The driver simply will have to let up foot pressure on the accelerator pedal when shifting, as do drivers with normal manual transmissions, because the electronic control system will coordinate the shift. Incidentally, the computer readout will warn the driver whenever he is not operating in the optimal gear, suggesting the driver shift to the best gear for the particular speed being driven at the time.

Unlike with traditional manual transmissions, the individual speeds in the Exar-1 each has its own function:
First gear is used for bumper-to-bumper driving, when the traffic is crawling along;
Second gear is for neighborhood driving up to 40 mph;
Third gear is for mixed city and highway driving up to 60 mph; and
Fourth gear is for highway driving from 60 mph to 85 mph.

Despite all of the expensive items being included as standard equipment; the expensive, stylish body; and the low (compared to Detroit figures) production volume, Amectran will be selling its cars initially for approximately $7,000 each (in 1980 dollars, less the US government rebate for purchasing an electric vehicle). This can be accomplished, Ramirez explains, by producing the vehicles in medium-sized plants designed to turn out specific numbers of vehicles each year and by marketing the vehicles directly, thus avoiding much of the added costs of traditional automotive industry marketing techniques, one of which is the dealer markup, typically 18-30%.

The regional manufacturing plants basically would be assembly plants for components made elsewhere. The bodies would be manufactured and completed at each plant, however. The tentative sites for the 15 plants are Berkeley, Phoenix, Denver, Dallas, Oklahoma City, Chicago, Cincinnati, St. Louis, New Orleans, New York, Washington, Atlanta, Miami, Philadelphia, and Boston.

Each factory would be able to meet its own expenses, including debt service on capital costs, by producing only 25% of its designed one-shift capacity, or 1,250 cars per year.

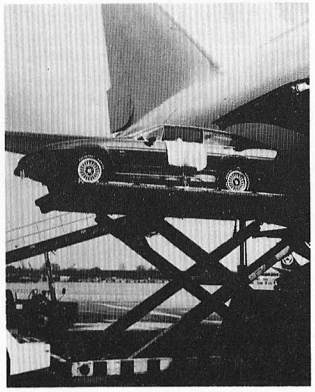
Amectran also expects to keep costs down initially by buying key components at OEM (original equipment manufacturer) quantity prices. Ramirez says a number of potential vendors already have agreed informally to those kind of price breaks in order to encourage Amectran to produce the car. Thus Amectran would overcome the price/volume relationship in component acquisition that is preventing other electric vehicle manufacturers from expanding their production and sales up to any significant level: the fact that components cost significantly more in small quantities than they do in large lots.

A major potential vendor confirms Amectran's projected component cost estimates. "He's talking about the finest electrical system we know how to build in quantities no one has considered before," John Tucker, director of General Electric's EV Systems Operations said in 1978. "At those quantities, the price of the vehicle will be less than that for a comparable ICE. If his numbers pan out, his prices are realistic."

For example, if Amectran or any other company were to order 75,000 19-hp motors with the prospects of even greater orders later, the vendor most likely would decide to build an integrated motor manufacturing plant dedicated to producing that type and size of motor. Once a component manufacturer did this, the cost per unit of the motor would plummet, not only for the original customer but for all firms which would order that motor subsequently.

Amectran's plan eliminates many costs of traditional automotive marketing.

Before arriving in America, the Exar-1 was taken on a tour of Europe.



At every step in its journey, the Exar-1 attracted attention, including when it was transported to the U.S. in May.

Now that the Exar-1 has arrived in the U.S., Ramirez is banking on his expectations that the design—coupled with its peppy acceleration, high speed, and low price—will cause the car to sell itself. While some have expressed doubts—no matter how unfounded—about the car, few people are really skeptical about the car's marketability. Tests in mid-July by independent engineers have shown the Exar-1 does more than what Amectran had promised.

Fred C. Allvine, marketing professor at Georgia Institute of Technology, is one of those who has studied Ramirez's plans. Ramirez was invited to give a presentation on his vehicle and the Amectran marketing concept in 1977 to one of Allvine's business classes. If the car is only one-half as good as Ramirez says his tests indicate, Allvine said, the marketing opportunities are outstanding. A manager from one of Amectran's potential component suppliers called the body "super," adding that "kids are going to buy it to convert it to gasoline" power.

In order to spread the gospel of Amectran's offer of freedom from the slavery of the gasoline pump, Ramirez and his staff plan an eight-month, 15-city tour for the car. The tour would be coordinated with a series of television advertisements centering on the theme that after the Exar-1, "everything else is obsolete." Print ads simultaneously would stress that the Exar-1 has only a few hundred parts, as opposed to several thousand in conventional cars. The less number of parts to break, the less maintenance time and money spent, the ads will say.

The Amectran tour, scheduled to begin in the second half of 1980, would take the car through the 15 cities in which the company ultimately hopes to establish manufacturing, sales, and service facilities. The exhibit would spend five days at a central exhibition hall in each city. Its emphasis will be heavily on the fact that the Exar-1 meets the public's transportation needs, is reliable, efficient, almost maintenance free, and pays for itself in a short time. The central message will be that the Exar-1 makes sense ecologically because it does not pollute, make noise, or use petroleum.

Ramirez initially expects to secure a minimum of 5,000 orders per month. Each order would be accompanied by a $400 deposit into an escrow account, which the depositor could retrieve at any time. Amectran would be entitled to the interest, which at 10% would be $200,000 per year or more than $16,000 per month for every 5,000 orders. The company would apply this money—and loans drawn against it—to preparing for and entering production: building up parts inventories, constructing the first plants, and developing markets.

The only government assistance Amectran is seeking is loan guarantees, under which the government would guarantee the lending facilities reimbursement should the loan recipient—in this case Amectran—default on payment. "We're not asking for charity," Ramirez says of his plans to use his initial capital as seed money to leverage loan guarantees from various government agencies, including the Dept. of Commerce, and the Agriculture Department's Farmers Home Administration. "We just want to get started on our own. We don't want to be subsidized by the federal government."

The New Dream

Thus Amectran finds itself poised to begin production, ready to become the premier company in an entirely new industry. One of Ramirez's greatest dreams: the development of a safe, ecologic, affordable, and competitive electric passenger car, is on the verge of being fulfilled. The story is not over, however, for one dream quickly gives birth to another. As Amectran reaches its goal of creating the Exar-1, it begins another: the development of a major viable electric automobile industry in the U.S.

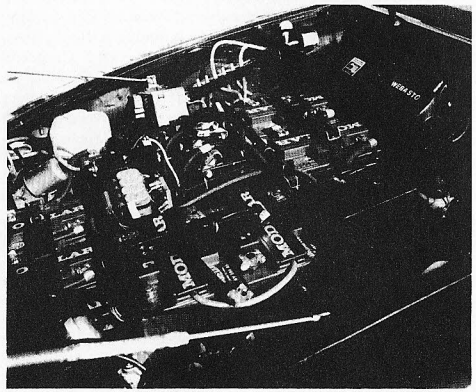
Ramirez sees himself as the father of the electric car industry in the U.S. He likens himself to Henry Ford, both in achievement and in the difficulties encountered along the way to achieving their individual dreams. In fact, if Amectran succeeds with its plans for the Exar-1, Ramirez will be the EV equal of Ford. It definitely would be the first electric passenger car to be truly mass produced in the U.S. in recent history: the next closest capable of doing so apparently is General Motors, which does not intend to market its electric cars to the public until 1984.

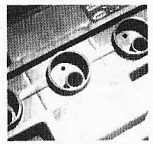
In the 1978 Amectran annual report, Ramirez wrote that his intentions were to "make an overall effort to control the electric automobile business for as long as possible." Asked about this recently, Ramirez slipped into his analogical capacity: "Henry Ford controlled the automobile industry for many years because he was doing a proper job. He was putting a car in everybody's garage. He controlled that industry despite the fact that there were more expensive cars and better cars and what have you. Essentially we currently have started the electric automobile industry properly by controlling the industry, and I don't mean forcing cars they don't want down peoples' throats.

"I mean by making a product and improving on it and continuing to deliver a product that nobody else would deliver. By controlling my own destiny I can now benefit the public. If I am not allowed to control the industry as this point and for as long as I can, the product will wind up being prostituted and the same thing that has happened with so many other products will happen with the electric automobile." He explained that often an outstanding product is developed that meets specific needs of society and then, "little by little it starts to deteriorate in order to allow more profit and to build something cheaper. Someone once said that for every product that can be built, some one can build it cheaper—and there will be a buyer for it.

"It's going to take somebody with some ideals for what this country stands for and what we were doing years ago, when a man's word meant something, when a man's name went on his product and he was proud to have produced it." Amectran has, and must continue to have as it enters actual production of vehicles, such pride in its workmanship and the quality of its cars, Ramirez continued. Reliability of its products must not become a cynical joke, he said.

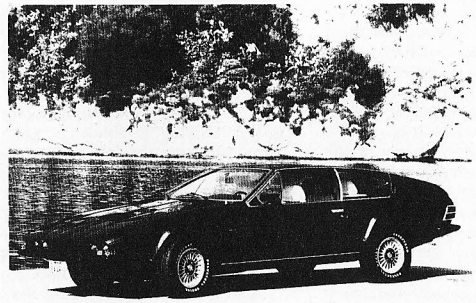
Independent tests in July showed the Exar-1 exceeded previous expectations.





24 six-volt lead-acid batteries, located beneath the hood and behind the rear seat, power the Exar-1.

After the prototype, the next step is to develop a viable electric vehicle industry in the U.S.



The steel-bodied prototype will be used to make molds for the acrylic bodies for the production vehicles.

"If this product escapes us, if we don't control it, you will find that electric automobiles will be sold through dealers the same way conventional cars are today, and that raises the price of the car instead of lowering it. You'll find that little by little they're going to build in that planned obsolescence, that they're not going to use everything of the finest quality because they don't have the same principles we do. The almighty dollar will be Number One again. Producers will lock in their designs and say 'This is good enough and we'll feed it to the public just for as long as they will take it before we change the basic engineering."

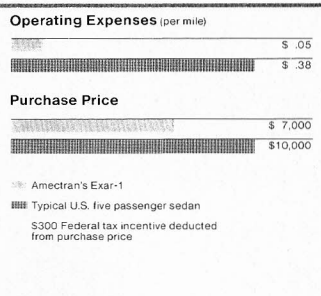
Numerous entrepreneurs have tried to break into the U.S. automobile business in the past, although none with so revolutionary an idea as an electric car. Still, the examples set by the Henry Kaisers and Malcolm Bricklins (two of those who have tried to establish a new automobile company since World War II) have highlighted obstacles that seem too great to overcome. Among these are the vast capital requirements, the complex parts supply network, and the enormous nationwide sales and service system necessary to succeed in the automotive industry. The latest try, former General Motors executive John Z. DeLorean, has had his plans delayed several times as he works with a budget of approximately $200 million—far more than the amount with which Amectran intends to operate. Still, these capital-intense characteristics of past efforts at establishing a new automobile company all are largely avoided in the Ramirez plan. The nature of the electric car eliminates the first two to a large extent: EVs' relative simplicity reduces both the number of parts and the capital costs by at least a factor of 10. Furthermore, Ramirez is avoiding the sales and service aspect with his plan to sell and service the Exar-1 directly.

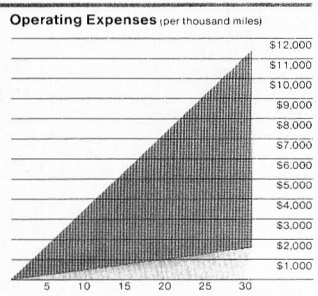
The possibility of Amectran's failure is greatly diminished now that the prototype is finished and its performance has been validated in the marketplace where supporters and detractors alike can see it and be impressed. Of course, it still is possible that Amectran could fail in its efforts to mass produce and market the Exar-1. Whether the company will succeed, whether the public will energetically take to the Exar-1 as an alternative to gasoline-powered automobiles, will be determined over the next few years. The prospects for success look bright, however. Recipients of this brochure may be among the first people who are helping Ed Ramirez and Amectran make their dreams into reality.

The economic sense of Exar-1

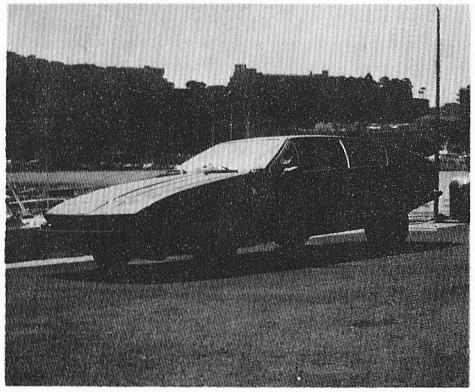
After 17,630 miles a standard US-built sedan has cost $6,700 in operating expenses—the price of an Exar-1 minus the federal tax incentive for buying an electric car. The Exar-1 meanwhile has cost an estimated $880, saving the driver $5,820. This mileage typically would be reached after 21 months of driving.

After 20,303 miles the savings in operating expenses of the Exar-1 compared to conventional cars is $6,700—the original price of the Exar-1—less the government incentive. Thus, the Exar-1 has become free transportation in slightly more than two years. Furthermore, the Exar-1 would go approximately 134,000 miles before it had cost $6,700 in operating expenses—the same amount a conventional sedan costs in 20,303 miles.





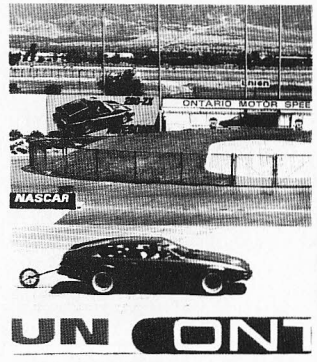
Ramirez will deliver the finest quality product possible.



Members of the Amectran staff at Ontario Motor Speedway.

The Exar-1's computer controls nearly every aspect of the car's operation.

Operating expenses of the Exar-1 are less than 15% of those of conventional cars.



Tests at Ontario Motor Speedway in California in July verified the Exar-1's outstanding performance.

Description

Vehicle type: Five-passenger, two-door electric sedan.

Standard equipment: Custom body designed by Pietro Frua, tachometer, AM/FM stereo with tape player and 40-channel CB. Kevlar acrylic body. Air conditioning, heater/defroster, carpeting. Tinted windshield and windows, mag wheels, computerized diagnostic system, special Goodyear tires with low rolling resistance.

Body colors: Black, white, blue, yellow, red, green, bronze, and silver.

Options: The Exar-1 will not be available with any options, since all improvements will become standard equipment.

Performance

Maximum speed: 85 mph

Cruising speed: 55 mph

Cruising range: 75-100 miles at 55 mph

Gradeability: Approximately 75 mph on a 15% incline

Acceleration: 0 to 60 mph in 12 seconds

Componentry

Motor: 19-horsepower series wound General Electric DC motor with internal fan ventilation. Motor weight is 225 lb.

Batteries: 24 six-volt lead-acid batteries with single-point watering and gas recombination system. Fan ventilated. One 12-volt auxiliary battery is connected to the propulsion system by a DC/DC converter, which allows it to recharge off of the propulsion unit.

Controller: The controller is a combination of General Electric and Cableform units modified by Ametran. Regenerative braking unit uses energy generated during deceleration to partially recharge the batteries.

Charger: Solid state onboard charger with automatic controls, built by Amectran.

Drive train: Four-speed semi-automatic transmission.

Tires: Goodyear HR 78-15 low rolling resistance tires, inflated to 40 psi.

Brakes: Hurst disc brakes on all four wheels.

Instruments: Computer-controlled voltmeter, state-of-charge meter, tachometer, clock, and ammeter. A digital display for battery condition, lights, battery water level, brake conditions, and other information is located on the dashboard.

Body: An acrylic-reinforced Kevlar body on a 4130 chromalloy steel chassis.

Heater: Stewart-Warner gasoline heater.

Bumpers: Shock-mounted energy-absorbing bumpers capable of withstanding a 7.5-mph impact.

Dimensions

Length: 181 in

Width: 69 in

Height: 51 in

Wheelbase: 106 in

Front track: 58.3 in

Rear track: 57.9 in

Ground clearance: 6 in

Curb weight: 3,000 lb

Battery weight: 1,800 lb

Payload: 1,000 lb

Gross vehicle weight: 4,000 lb

Members of the Staff

Amectran reserves the right to make such modifications to the Exar-1 at any time and without notice as is desirable to improve the vehicle or for any requirements of manufacturing, marketing, or government regulations. The illustrations and descriptions of the Exar-1 in this brochure are given by way of description.

Designed and produced by Douglas Wolfe Design, NYC

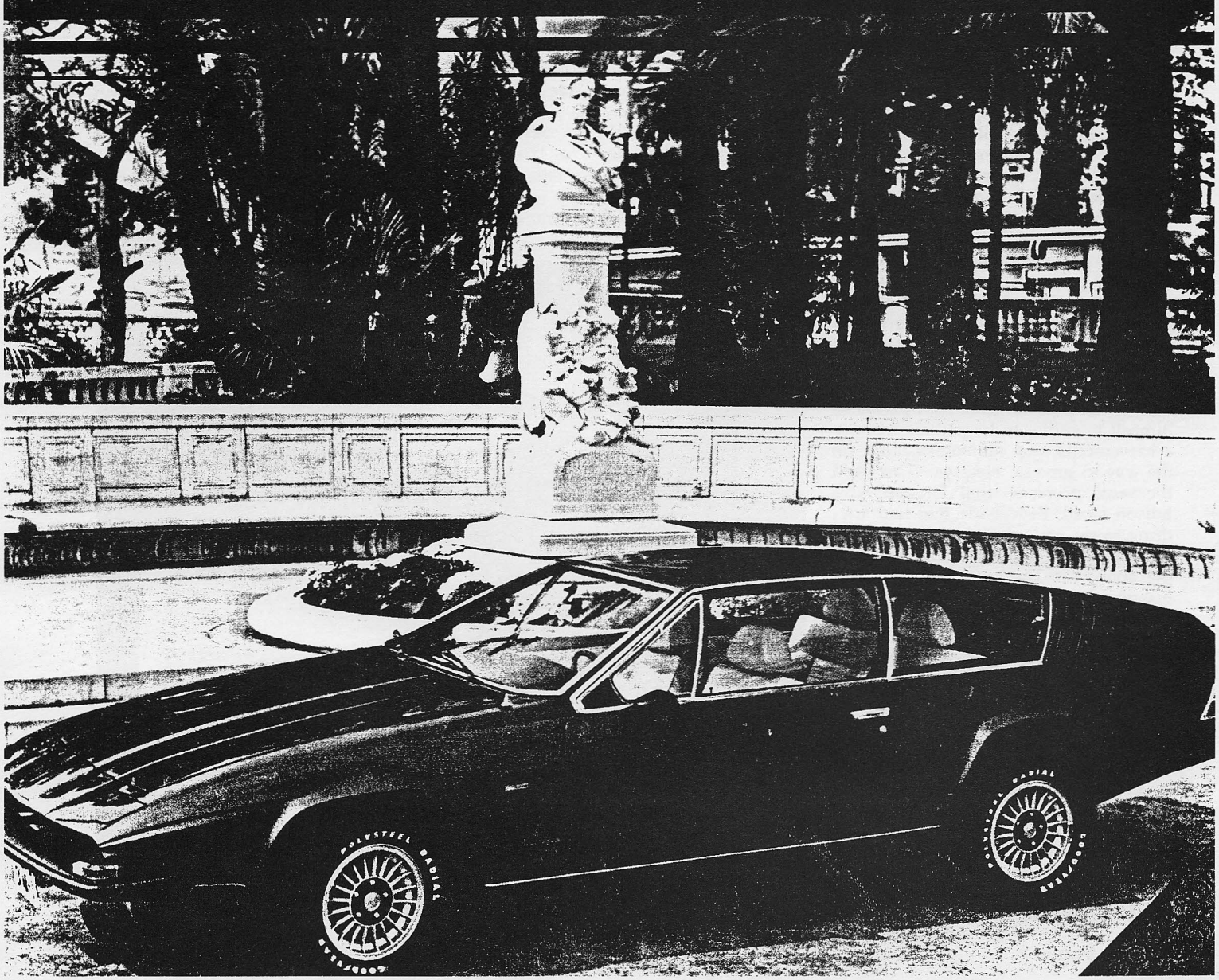
November-December 1980 Vol. 2, No. 6 $2.50

HISPANIC BUSINESS™

A MONTHLY MAGAZINE ON BUSINESS AND PROFESSIONAL LIFE

MANUFACTURING AND HIGH TECH FIRMS

AMECTRAN'S EXAR-1: THE INCREDIBLE ELECTRIC CAR



EXAR-1:

EDMOND X. RAMIREZ AND HIS INCREDIBLE ELECTRIC CAR

by Rick Mendosa

A feisty Mexican American inventor in Dallas may have the biggest impact on American industry since Henry Ford and Edison. His name is Edmond Xavier Ramirez, Sr., a name America will be hearing more of. Ramirez thinks on such a grand scale that he says he is creating not only a product, but an entire industry. His product: A five-passenger electric vehicle he developed from the ground up over the last seven years.

He calls it the EXAR-1 after the initials of his name. "I couldn't call this the Ramirez car, because nobody would buy one," he says. "Chrysler, DeLorean, Ford—those are all names people would accept, but you and I both know," he told HISPANIC BUSINESS, "that nobody would buy a Ramirez—they would be waiting to see if any tamales would come out of the exhaust pipe." The industry he's creating is a lot more than tamales: He sees himself as the father of the electric car industry, according to a new brochure put out by his company and the City of Berkeley. In it he likens himself to earlier industrialists, both in achievements and difficulties faced on the way to success. He says: "I've faced the same problems that Thomas Alva Edison faced: Everybody that had anything to do with electricity claimed the man . . . didn't know what he was talking about . . . That's the same type of insanity that I face. The NIH factor. Not invented here. Yet my car has proven itself time after time."

Not everybody is satisfied that the EXAR-1 has in fact proven itself. One problem: Ramirez consistently refuses to allow the government to test the EXAR-1. Nor will he tell the results of his own tests, the most recent of which he made in July at the Ontario Motor Speedway, conducted with the City of Berkeley. "The test data are under the protection of a Federal court order," he says. "It was done to protect the investors so that proprietary information would not be disseminated. A court in Dallas did that. It was done to protect the investors in our company. And look how perfect his (sic) judgment was. If he (sic) had not done that . . . can you imagine how easy it would be to copy or find the key . . . in order for these companies to make quantum leaps forward that have taken us years to develop?"

Another problem: Ramirez himself. He has his share of critics. Many call him abrasive. He is intense, fast talking, often angry. One acquaintance in the Hispanic community calls him "your inventor type: a maverick, persistent and pushy." He has "a troubled background." Ramirez is "either your friend or your enemy—there's no in-between." Another says his worst fault is that he doesn't follow through on what he says he will do. Another supporter says: "Unfortunately . . . he has an edge. He feels he is being discriminated against. If you can look beyond that, past it and through it, he's not really a bad person . . . He's had some bad breaks and I'm sure people are taking shots at him just because of the way he does come across. I hate to say it, but minorities aren't supposed to be as successful as he's been. And he really has been successful."

Continued on page 16

AMECTRAN's president Edmond X. Ramirez

Continued from page 15

Major Claims

Ramirez is so successful, in fact, that some say if his car does 80 percent of what he says it will, it is the best electric car in the world. Top speed, Ramirez says, will be 85 mph. When driven at 55 mph, he claims, it will go 75-100 miles before it will need recharging (which will take 5-8 hours on regular household current). Perhaps the most remarkable claim is for acceleration: 0 to 60 mph in 12 seconds. Although his brochure implies that the existing prototype meets these standards, Ramirez indicates in conversation that these figures refer to the production vehicle. At present only one EXAR-1 exists. It is made of steel and is some 2000 pounds heavier than the acrylic-reinforced Kevlar body that the production model will have. The existing EXAR-1 may be one of the most beautiful cars in the world.

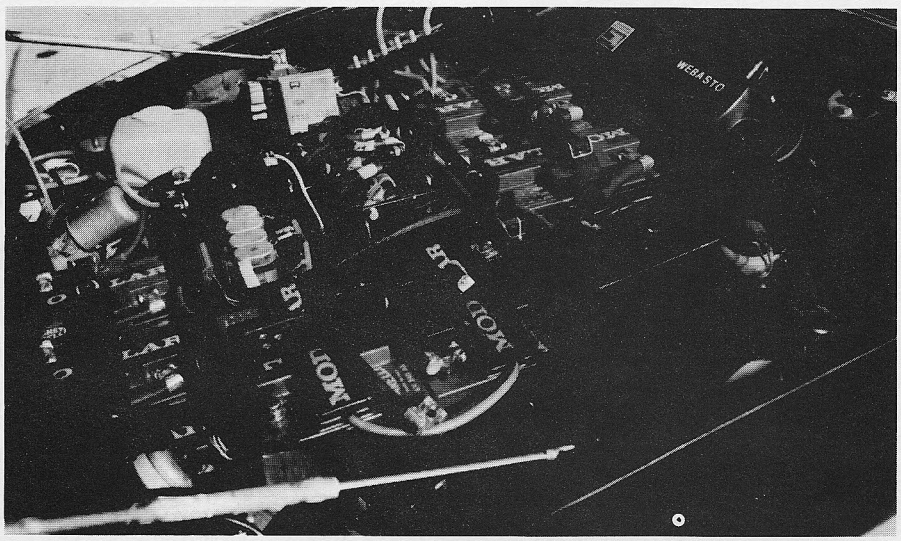
Italy's Pietro Frua designed the sleek body originally for BMW, which decided it was too racy for the company's conservative image. With modifications that took almost three years, Frua crafted a body that is elegant and expensive looking. Yet, Ramirez says, the car will cost considerably less than the $10,000 average price of American vehicles today—approximately $7000 in 1980 dollars.

This can be done, Ramirez explains, because it has only about a tenth as many moving parts as a conventional automobile and because it will be produced in medium-sized plants designed to turn out 5000 to 10,000 vehicles each year and by marketing the vehicles directly. This will avoid much of the added costs of traditional automobile marketing, one of which is dealer markup, typically 18-30 percent. Here is where the City of Berkeley enters the picture. Berkeley offers to seek about $7 million in private financing and a $1.5 million federal Urban Development Action loan in return for 12.5 percent of the pre-tax profits and jobs for up to 400 unemployed local workers. City Manager Wise Allen told HISPANIC BUSINESS that the city at present has an unwritten agreement to develop the first EXAR-1 plant in Berkeley. Dr. Allen said the City is dealing with the California Electric Car Co., which Ramirez licensed to produce the vehicle. The president of this company is Los Angeles computer businessman Chaz Haba. Entertainer Pat Boone is a stockholder in the company. Haba says that only he and Boone have any financial "exposure" in the company, but he refused to say how much Boone invested. Pat Boone's manager, Jack Spina, likewise refused comment, other than to confirm Boone's participation and to refer all questions to Haba.

Ramirez's own company is called AMECTRAN, Inc., short for American Ecological Transportation. The car is ecological because it saves energy, doesn't pollute and reduces noise. Ramirez remains AMECTRAN's majority shareholder, although it was incorporated in 1976 with more than 300 shareholders. He has had numerous financial setbacks, twice reorganizing the company under Chapter XI of the federal bankruptcy law, in 1976 and again earlier this year. "I have been probably one of the most unique people in the entire world," he says, "because most people, when they go into bankruptcy lose the company. In each case I've come out stronger than I went in. We're in from our choice . . . it's a matter of administration, not because we're broke, but to eliminate the people who are trying to shut down the company." Another bankruptcy earlier closed down a New York-based computer company of which he was president, called Stratatron, when a 1973 flood ruined the equipment in its basement computer room. The failure of the computer firm gave him the opportunity for full-time design of electric vehicles, which he had begun to work on as toys for his boys. His original idea was to electrify a toy pedal-powered car as a safer alternative to their riding bicycles on busy New York streets. "My kids never even got their toy car," he says, "they're now old enough, 16 and 18, to get the real thing when the EXAR-1 goes into production."

"... some say if his car does 80 percent of what he says it will, it is the best electric car in the world. Top speed, Ramirez says, will be 85 mph. When driven at 55 mph, he claims, it will go 75-100 miles before it will need recharging ... Perhaps the most remarkable claim is for acceleration: 0 to 60 mph in 12 seconds."

Insides of the EXAR-1



Computer Controlled

With his background in computers it is not surprising that Ramirez makes dramatic use of high technology with the microprocessor computer which controls nearly every aspect of the car's operation. It optimizes the flow of electricity from batteries to motor. It also controls or monitors battery water level, motor temperature, cabin temperature, battery state-of-charge, voltmeter, tachometer, speedometer, ammeter, clock, brake conditions and accessories. It even sets the charging cycle, allowing the owner to take advantage of off-peak utility rates. It has a timer which automatically starts the cabin heater or air conditioning at a preset time before the driver enters the car. When the driver inserts the ignition key, the computer asks whether instructions are required or not. If not, the computer then flashes six random numbers. The driver must respond by pressing the same numbers in the same order, thus signaling the computer that the driver is not drunk or

otherwise incapacitated. There is even an override which will allow the driver to operate the car anyway, but it causes lights to flash, warning others that something is not quite right with the driver.

Each owner will also have a personal identification number to be punched in to the computer after the random numbers. AMECTRAN will not keep any record of the ID number, so that if it is lost or forgotten, the entire electronic system of the car must be replaced. Ramirez says this will create a car that is nearly theft-proof. The computer also stores messages and important dates, such as when insurance payments are due. "The messages are only accessible when the car is not in motion however, since AMECTRAN wants to avoid any accidents that could be caused by drivers who are reading their memos rather than paying attention to the road." The production vehicle will have a four-speed manual transmission without a clutch. The electronic control system will coordinate shifting as the driver takes his or her foot off the accelerator. The computer will even tell the driver when the car is not operating in optimal gear.

Ramirez seems to have considered every little detail in designing his new car, from redesigning a "stupid little bolt" that he says reduces drag on the disc brakes by seven percent to using specially made Goodyear tires that he says have 40 percent less rolling resistance than any others built today. The EXAR-1 has regenerative braking, which uses energy generated during deceleration partially to recharge the 24 lead-acid batteries, which have a single-point watering system. Including the cost of battery replacement every 50-70 thousand miles plus the car's depreciation, operating costs, he says, will be 5 cents per mile, contrasted with a Hertz survey calculation of 38 cents per mile for conventional automobiles. It will use 18-20 kwh of electricity every 100 miles, which works out to about 80 cents, depending on local utility rates. The car is powered by a 19-horsepower series-wound General Electric DC motor. Although some critics doubted that the motor could give the acceleration that the EXAR-1 claims without overheating, some people who have ridden in it say that after climbing steep grades it wasn't even hot. And John R. Tucker, GE's electric vehicle systems chief, says that "his motor will produce a tremendous amount of energy on a short-term basis." He says that the "motor is designed to run at 200° centigrade," while the internal combustion engine runs at 200° Fahrenheit."

Supporters and Dissenters

Those like Dr. Allen who have ridden in the prototype say that the major difference they noticed was that it was "absolutely quiet." In fact, a well known safety hazard of electric vehicles is this very quietness. So, the EXAR-1 builds in a noise sounding like a sewing machine to alert pedestrians that a car is coming (sewing machines rarely move that fast). Al Salgado, vice president of SER in Dallas, says that he has ridden in a Ramirez prototype at up to 75 mph. He says he experienced acceleration from 0 to 60 mph in 12 seconds. Other supporters of Ramirez include former Secretary of Transportation Brock Adams, who told a Senate committee last year, "I think that [it] is a good vehicle. We should pursue it." Dr. Carl C. Clark of the Office of Passenger Vehicle Research of the Department of Transportation says: "I am satisfied that Mr. Ramirez and AMECTRAN have a significant design, with a credible production and marketing plan." A marketing professor at Georgia Institute of Technology, Fred C. Allvine, says, "if the car is only one-half as good as Ramirez says his tests indicate, the marketing opportunities are outstanding." Allvine told HISPANIC BUSINESS: "Clearly he faces enormous odds in financing his enormous undertaking, but many others who have succeeded have overcome such tremendous odds. . . . He is a very impressive individual and perhaps he can." Dr. Richard Jenner, director of Berkeley's Business Incentive Program, took part in the tests of the EXAR-1 in July. He says: "I believe that Ed Ramirez has developed the most advanced electric passenger vehicle now on the road or even planned for production through the end of this decade."

Others, particularly in the Department of Energy, doubt Ramirez and his car. One DOE spokesman who asked not to be named had nothing good to say and referred questions to his competitors. They are heads of firms in Detroit and Cleveland, one of whom said he had a better vehicle than Ramirez. Ramirez saves a lot of his wrath for the Department of Energy, which he said, "is touting you off to get remarks from our enemies. . . . Their direction is to do nothing but destroy the company. There's been a dedicated conspiracy to keep the car out of the public's eye—to hurt us as much as possible—to give us . . . bad publicity and no support while they are supporting illegitimate and phony propositions." The firms that the Department of Energy supports won contracts in 1977 in competition with AMECTRAN. Reportedly, one of these firms had been in business for only nine days, some had not previously produced electric vehicles although the proposal specified that requirement and some winners made late submissions—facts that still provoke Ramirez' anger.

The center of all this enthusiasm and controversy was born in Dallas 45 years ago, just a few years after his family emigrated from northern Mexico. For the last 22 of these years Ed Ramirez has been married to the former Elizabeth Miske, whom he met in New York. They have three boys, the youngest of whom is 6. When he's not working "a 19 to 20 hour day" he loves to play tennis, bowl and fly: "I had two airplanes at one time, and I used to love to fly, but had to sell them to put the money in the company and haven't flown since." His education after graduating from a Dallas high school was limited to "about a thousand hours" in computers. "Isn't it incredible," he exclaims, "that a Mexican from Texas with no education has a car right this minute that even his critics admit outperforms what General Motors is going to do in four years—the largest automobile manufacturers in the entire world and they can't hold a candle to what I've developed!" Production of the EXAR-1 could begin as early as April 1981, Berkeley officials say. When and if it does, the world will see whether Ramirez is a dreamer and his EXAR-1 too good to be true—or whether he is in fact the true successor to Henry Ford and his car will change the world.

"Isn't it incredible that a Mexican from Texas with no education has a car right this minute that even his critics admit outperforms what General Motors is going to do in four years — the largest automobile manufacturers in the entire world and they can't hold a candle to what I've developed"

Southwest Airlines Magazine
AUGUST 1

COULD THIS BE THE ONE?

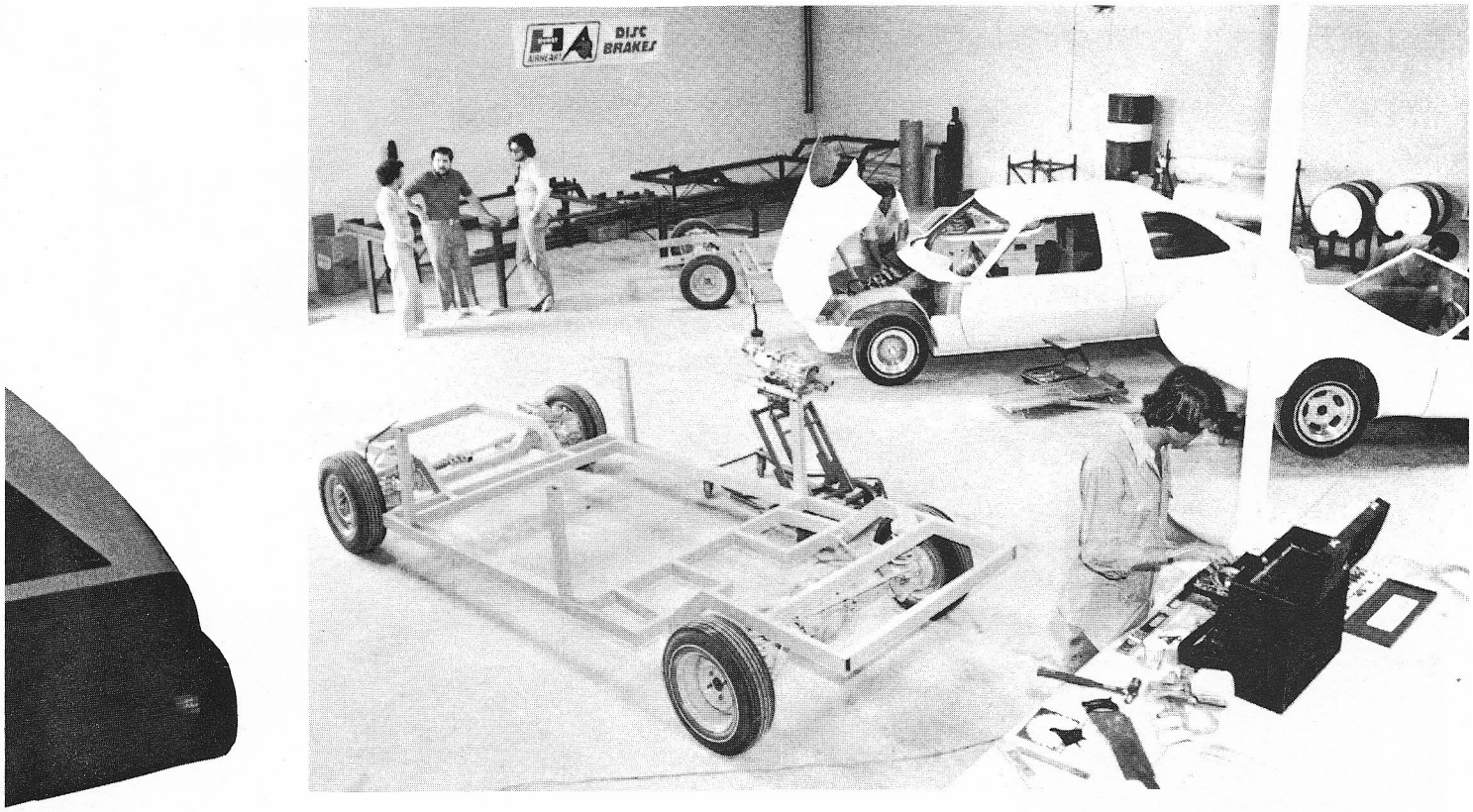
A Dallas company has unveiled its prototype of an electric car

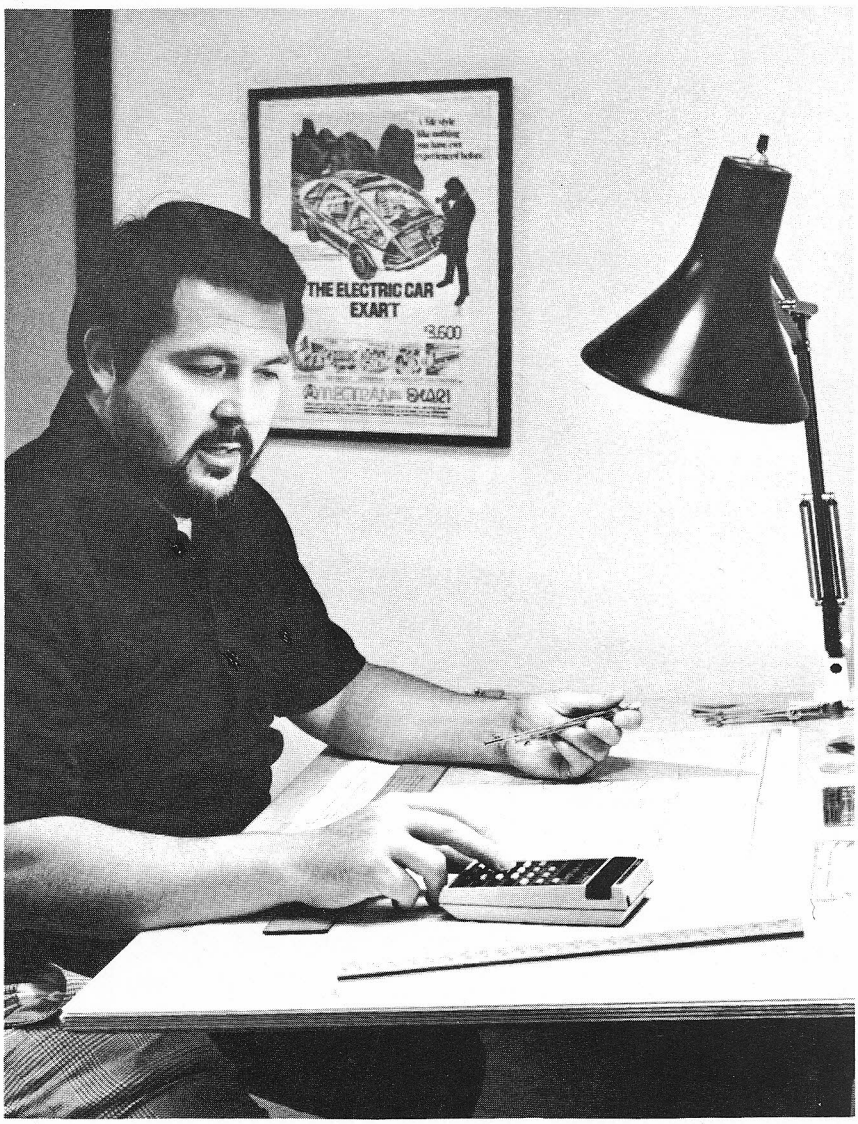
COULD THIS BE THE ONE?

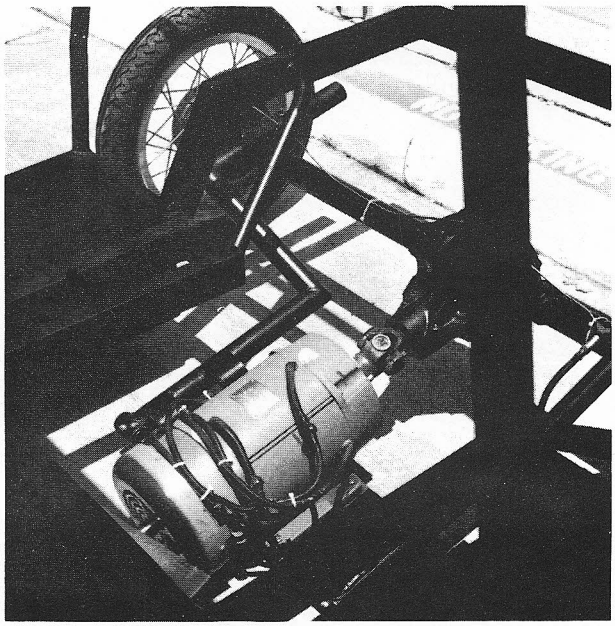
By Brenda Fuqua

The story that you are about to read is about an electric car.

No, not the one that holds two cramped passengers and floorboards out at 30 miles per hour and stops altogether before you've even gone 50 miles. This story's about a new, roomy, frisky model that's just been developed by Ed Ramirez and his Amectran Company in Dallas.







Amectran's operational prototype (top left) is one of several body styles (top right). Ed Ramirez is still at the drawing board (left) working on projections for the EXAR-1 which is powered by a simple electric motor (above).

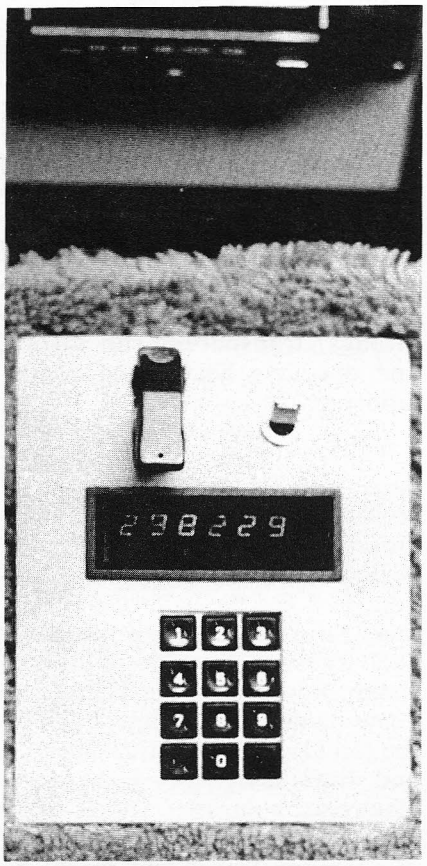
Ramirez is a home-grown boy who has spent the last three years coordinating the efforts of moonlighting engineers, body designers, and electronics whizzes who, in turn, have come up with an electric automobile that seats five adults in comfortable luxury, hums along the freeway at a respectable 55 mph and then some, and reportedly puts in a 110 to 150 mile day before it runs out of juice.

Amectran has built the prototype and plans for the car to sell for about $4600.

Certainly there ought to be a slot in America's garages for a good electric car. After all, government regulations continue to stifle the petroleum industry, forcing gasoline prices upward, discouraging exploration, and creating new shortages of hydrocarbon fuels. And although the effects of auto emissions on air pollution have been exaggerated out of proportion by overzealous environmentalists, the non-polluting character of the electric motor does have its appeal. Even more appealing is the fact that there is so little noise generated by an electric vehicle (EV), and that in itself is ecologically significant. EVs have a life span of 20 years, rather than the 10 expected from conventional cars, and since they generally are driven less than 6000 miles a year, they command a lower insurance rate. The government has offered a 25 percent rebate to people who'll buy electric cars, and that's a hefty savings.

Amectran's car hums along the freeway at a respectable 55 mph

So why, as a group, aren't they selling? Because their performance to date just hasn't measured up to what Americans expect in their automobiles. Electric cars were invented 137 years ago, and in all that time these buggies have increased their speed by only 15 miles per hour. They sputter up hills, their interiors are positively Spartan, and one of the two now offered in this country doesn't even have rollup windows. Market researchers point out that by 1980 there'll be a potential electric car market of 2,200,000



The computer in the EXAR-1 controls power, direction, the combination code and inebriation pad.

units, if only somebody can come up with a car that can compete with conventional automobiles. Which means that if Ramirez and Amectran can get their act together and come up with the money necessary for production, they can establish themselves as EV leaders by getting to the starting line first with the most.

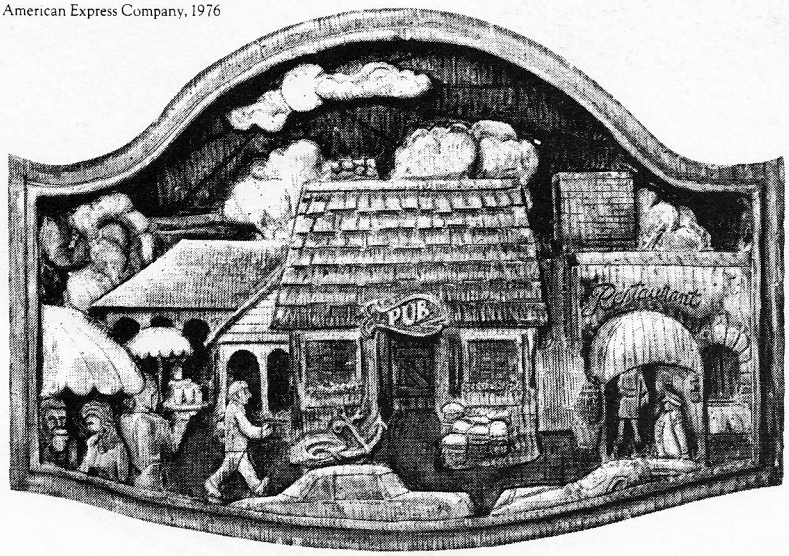
Ramirez stresses that his car is a commuter car, and, thus, Amectran plans to market the vehicle in large cities. Production sites will be set up in metropolitan areas across the country, and the car will be sold at the production plants. Since Amectran anticipates entry into the European market, which has been clamoring for an electric vehicle, Ramirez contemplates production facilities in foreign countries as well. He anticipates sales on the order of 5000 per year per city, to begin with. The fact that the two other models available in this country aren't even approaching those sales figures doesn't bother Ramirez. He feels his car is vastly superior to anything else available, and from the performance the car's given to date, he's right.

Bob Rice and Earl McKeehan test power drain from controller to motor in a prototype equipped with the electric motor.

Impressive Amectran's car most certainly is.

The body is a trim design, fashioned from color-impregnated, fiberglass-reinforced acrylic. Plush carpet (wear-dated to last 10 years) covers the floor, and the bucket seats are dressed in leather. An electrically operated sunroof is part of the standard equipment on the car, along with AM-FM radio, CB, airbags, transparent sun visors, and, of course, heating and air conditioning.

The Amectran car contains a computer system that performs all sorts of unexpected feats. It can be preset to have the car comfortably heated in winter, with the windows defrosted and the battery compartment rarin' to go before the driver even leaves the comfort of his bedroom. It operates the charger to come on at a preset time, controls the digital instrumentation displays, and disperses energy data to the electronic controller which operates the motor. The computer even discourages thieves and drunks by requiring the driver to punch in two 6-digit numbers. The first is a



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number preset by the driver; the second is a number picked by the computer. The idea is that if the driver can't punch the computer's choice within a few seconds, then he's had one too many and has no business driving anyway. In this case, the car simply won't budge.

And there's even good news for those consumers who've had it up to here (and haven't we all?) with costly body repair jobs. Amectran's car is constructed to allow the replacement of body parts at a modest cost. Where replacement of a fender on a standard car might run $300 or more and require two or three days, the Amectran fender will cost less than $50 to replace and require 30 minutes' work.

One of the most welcome innovations on the car is the run-flat tire developed by Goodyear Tire and Rubber Company. The tire is built so that if a flat occurs while the car is traveling at a high speed, the driver will not lose control nor have to stop the car to change the tire immediately. The tire can be driven on and changed at a more convenient time and place.

Some models of the electric car can be converted into small pick-up trucks, station wagons or vans, so the cars come equipped with four-wheel air shocks with a built-in pump. And on, and on, and on.

Gus Pellizzi examines the shifter mechanism on a transmission for a racing prototype by Amectran.

MANUFACTURER'S SPECIFICATIONS FOR EXAR-1

Length .....15 ft.
Wheel base .....120''

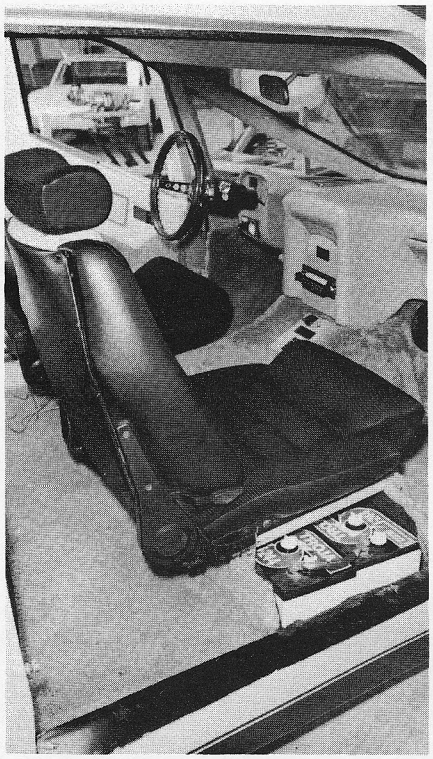
Width .....74''
Weight .....2,800 lbs.
Storage area .....40 cu. ft.
Construction

Front track .....62''
Rear track .....64''

Body .....vacuum formed of acrylic fiberglass
Chassis .....4130 chromealloy steel

Brakes .....4-wheel disc brake system, dual master cylinder
Panel board controls .....solid state LED
Tires .....special design
Maximum speed .....above 75 mph
Traveling range .....110-150 miles

- Placement of batteries settles the center of gravity 5'' below the axle.
- The car operates on a DC Electric (special conversion) motor.
- The placement of three roll bars ensures greater passenger safety.
- The undercarriage is ''considerably free of the many friction-producing conditions now present in most internal combustion vehicles.''
- Five passengers can ride comfortably in the vehicle.
- Amectran's projected automobile will consist of 300 parts, as opposed to the 3000 found in a standard internal combustion engine vehicle.



This interior shot shows the digital systems, bucket seats and batteries in the EXAR-1.

To be sure, people have been inventing "wonder cars" for decades. Some of them were supposed to run on water, some on alcohol, at least one has been designed that would supposedly run on manure. Yet most of them have run only on their developer's hot air. In most instances, the cars existed only on paper, and the few prototypes there were simply failed to perform up to claims.

Amectran's car exists.

This writer took a ride in it on a recent summer afternoon. We spent about an hour cruising along Stemmons Freeway and LBJ Freeway in Dallas at speeds up to 65 miles per hour. The windows hadn't yet been installed on the car, so I spent another hour getting the tangles out of my hair. The car runs, and it runs plenty fast.

And while it remains to be seen if the car will live up to all its claims, one thing's for sure. There's a vacuum waiting to be filled in the electric automobile industry, and if Amectran's car continues to perform as specified, then this Texas automobile might just become the one that puts the spark into the industry and sets the wheels rollin'.

A PAGINA 10

Il Fiorino

Gruppo 1/70%

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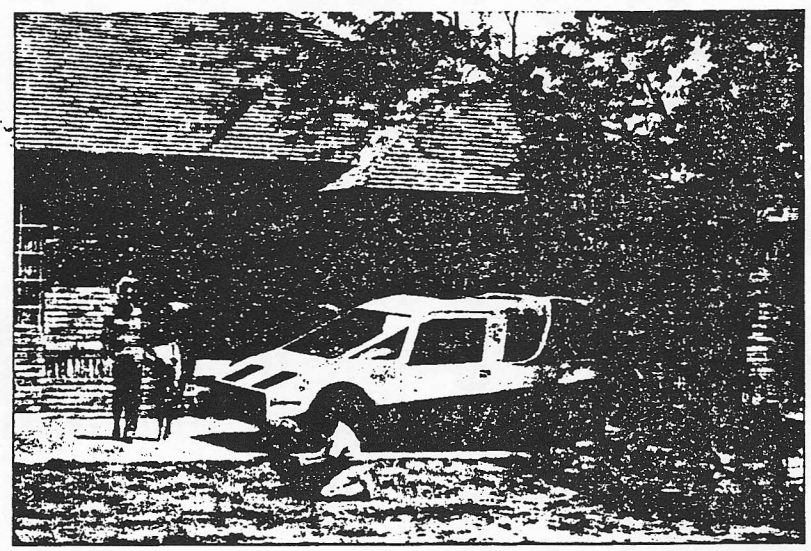
UN RIVOLUZIONARIO PROGETTO AMERICANO

Sarà carrozzata da un italiano l'auto elettrica Usa del futuro

Sperano di venderne tre milioni entro il 1980 — Duecentoquaranta km di autonomia e una velocità massima superiore ai 160 orari per una comoda cinque posti con le dimensioni di ingombro di una comune berlina

La ditta si chiama Amectran. Vuol dire: american ecological transportation. E quando c'è di mezzo l'ecologia significa che il petrolio è all'indice. Prodotta dalle parti di Dallas, Texas, la prima vera automobile elettrica viene a vestirsi in Europa. Realizzata in alcuni prototipi questa vettura è pronta per essere prodotta in serie: trecento parti al posto delle tremila che costituiscono una normale vettura a scoppio, l'Amectran funziona con uno speciale tipo di motore elettrico che la General Electric ha protetto con un brevetto. Il risultato più sorprendente è ovviamente la nullità dell'inquinamento atmosferico.

Messa su la parte meccanica, Edmond Ramirez (l'uomo che l'ha progettata) ha preso un jet per l'Europa deciso a visitare i nostri carrozzieri. Il fatto è che bisogna far presto: entro il prossimo anno, infatti, la vettura elettrica americana dovrà essere una realtà: nel Texas si sta localizzando il primo stabilimento che dovrà produrre non meno di 5000 auto elettriche l'anno. Ma altre dieci o quindici fabbriche, entro il 1980, produrranno sino a 75 mila automobili elettriche ogni anno. Il progetto si chiama: Exar-I. Ventiquattro batterie del peso di 37 kg servono a far marciare la vettura, che per via del problema della sicurezza, adotta la soluzione degli "air bags" al posto delle consuete cinture ad avvolgimento. Per migliorare l'autonomia della vettura la Good Year ha studiato gli speciali pneumatici che la equipaggeranno (in caso di foratura sarà possibile fare ancora molti chilometri) mentre viene annunciata la scomparsa della ruota di scorta per le peculiari caratteristiche delle coperture. La carrozzeria sarà in fibra di vetro acrilica a prova d'urto, i sedili anteriori e posteriori rovesciabili e ortopedici. Inoltre, in dotazione di serie, l'Exar è fornita di un



Ecco il prototipo della Amectran. La carrozzeria definitiva sarà fatta da un carrozziere italiano

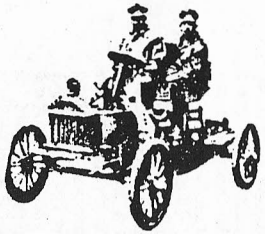
sistema di audizione ambientale per l'ascolto della musica che si avvale di un perfezionato impianto stereo. In dotazione c'è anche un sistema di Cb che potrà essere utilizzato dal conducente in caso di necessità. Poi un sistema computerizzato incorpora l'antifurto, il controllo automatico della carica delle batterie e la strumentazione elettronica.

Lunga 4600 mm, larga 1900 questa straordinaria automobile elettrica ha meravigliato i suoi stessi costruttori nella prova di velocità: oltre 160 km orari, un valore decisamente impensabile se paragonato alle attuali medie delle normali vetture elettriche. L'autonomia è piuttosto larga: dai 180 ai 240 km viaggiando a una velocità media di crociera che si aggira sui 90 km orari (e va rilevato che i limiti velocistici in atto negli Stati Uniti sono molto più bassi di quelli europei).

Ftevi i vostri chilometri e la sera, quando tornate a casa, non dimenticate di attaccare la spina", dice sorridendo RAmirez (che è il presidente dell'Amectran). Infatti bastano otto ore per ricaricare le batterie se ci si serve di una corrente a 110 vopts (tre ore in meno se la corrente è a 220 volts). In Usa sperano di venderne almeno tre milioni entro il 1980. E per l'Europa? Diciamo duecentomila, ammiccano i responsabili del marketing.

Elegante, piuttosto voluminosa, spaziosa come una limousine questa Amectran ha tutta l'aria di essere davvero l'auto del futuro, la vettura giusta per i tempi difficili che seguiranno alle deficienze energetiche (prima o poi si pros iugheranno i pozzi di petrolio). Il suo costo non è alto: intorno ai cinque milioni, meno di una normale berlina a benzina. Adesso l'incognita è legata al nome del carrozziere che dovrà vestire questa Amectran. Sarà Giugiaro o Pininfarina, oppure Nuccio Bertone? La rosa dei concorrenti non è ampia. Sicuramente sarà un italiano. La vettura americana del futuro s veste in Piemonte. E per la prima volta, nella storia dell'automobile, parlare di auto elettrica significa fare cronaca e non fantascienza.

Gino Roca



autokrant

Uitvinders van de eerste volwaardige elektrische auto deze week te Oostende

(Vervolg van blz. 1)

Daar waar een normale wagen uit ongeveer drieduizend stukken is samengesteld bestaat de Amectran-auto slechts uit 300 onderdelen, carrosserie en 24 batterijen van 37 kg. inbegrepen.

De wagen is klaar om in serie geproduceerd te worden, van zodra de wereldreis van Ed. Ramirez voorbij is en hij een idee heeft van de bestellingen die zouden kunnen geplaatst worden. De man is een en al enthoesiasme als hij voor de zoveelste keer alle voordelen van de door hem uitgevonden elektrische auto uit de doeken doet.

Het ligt in zijn bedoeling telkens afzonderlijke montagefabrieken te bouwen die elk 50.000 wagens in een jaar kunnen bouwen. Dit kan aan vrij grote snelheid gebeuren gezien het beperkte aantal stukken. Omdat hij het brevet van zijn uitvinding niet wil verkopen doch zelf wil in uitvoering brengen en zelf hoofdaandeelhouder wil blijven van zijn maatschappij heeft hij wat meer perikelen gehad om de nodige fondsen bijeen te halen om in produktie te kunnen gaan maar van zodra het startsignaal hiervoor kan gegeven worden staat het technisch vast dat acht maand later de eerste dagelijkse produktie van auto's kan geleverd worden. Marketing onderzoeken hebben al uitgewezen dat in de U.S.A. van nu tot 1980 drie miljoen elektrische wagens kunnen verkocht worden. In Europa zou dat in die periode tweehonderdduizend bedragen. De voorziene verkoop van de Amectran zou 4.600 dollar bedragen (ongeveer 160.000 fr.)

In de Verenigde Staten ligt bovendien reeds een wettekst vast waardoor iedereen die een milieuvriendelijke elektrische wagen aankoopt een vierde van de kostprijs door de staat terugbetaald krijgt. Een voorbeeld dat ook bij ons zou kunnnen gevolgd worden ?

TECHNISCHE GEGEVENS

De elektrische auto van Pamirez is 4.60 m. lang 1.90 m. breed. Hij biedt makkelijk ruimte aan 5 personen. De Amectran funktioneert met een speciaal type van elektrische motor die bij General Electric gebreveteerd is.

De wagen kan een snelheid behalen van 160 km. per uur, hetgeen de konstrukteurs zelf op een bepaald ogenblik heeft verwonderd.: het streefdoel was immers slechts het in de U.S.A. toegelaten snelheidsgemiddelde van 90 km. per uur te behalen.

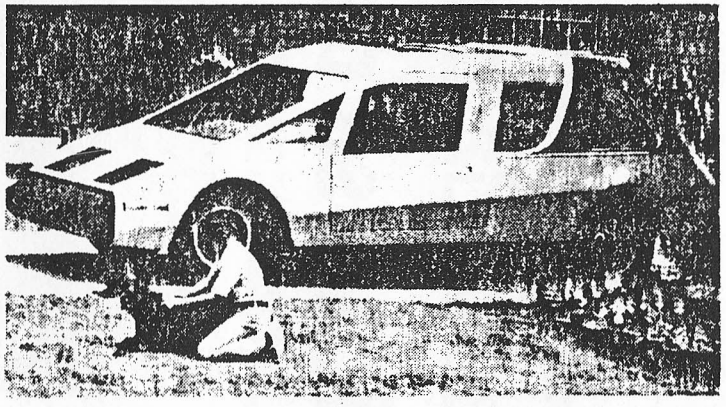
Hoe dan ook: Wanneer u met de elektrische wagen de baan op gaat rijdt u zonder enig probleem 180 à 240 km. aan een stuk. Daarna steekt u gewoon een stekker in een stopkontakt, laat de batterijen gedurende vijf uur opladen (liefst aan nachttarief) waarna u de baan terug op kunt. Dit systeem van heropladen van batterijen dat onvermijdelijk is bij elektrische wagens zal vermoedelijk in een zeer nabije toekomst verbeterd worden, gezien de NASA opzoekingen doet waardoor het herladen van dergelijke batterijen in twintig minuten zou kunnen gebeuren.

Opzoekingen van Amectran zelf moeten ook de autonomie van de wagen gedurende 480 km. garanderen.

Onder leiding van Edmund Ramirez (42), een computer- en elektronisch ingenieur, heeft een team jonge mensen aan de realisatie van de wagen gewerkt.

„Op een kruciaal ogenblik van de realisatie hebben we een viertal maanden dag en nacht gewerkt. We leefden toen volledig ter plaatse, sliepen in de loodsen, stonden middenin de nacht op als ons ideens iets te binnen schoot. Het was een fenomenaal boeiende tijd. En de kreativiteit van zo'n jong team heeft ervoor gezorgd dat de wagen in alle opzichten beantwoordt aan wat men van een volledig „nieuwe" wagen kan wensen."

Een der mooiste bewijzen van de frisse aanpak en jeugdige animatie vindt men ondermeer in de aanwezigheid aan de zijde van Ramirez van Gus Pellizzi (27), een Amerikaan van Italiaanse afkomst, die zich vooral heeft ingelaten en zich nog steeds toespitst op de realisatie van een sportwagen en racingwagen die op elektrische batterijen zou werken.



Een prototype van de eerste volwaardige elektrische auto : milieuvriendelijk en even snel als een benzinewagen.

WAGENVERNIEUWING

Naast het uitwerken van een elektrische wagen heeft het team van Ramirez ook gedacht in termen van wagenvernieuwing. Aldus voorziet men in de standaarduitrusting van de nieuwe wagen heel wat snufjes die het ook in een traditionele auto niet slecht zouden doen.

— In samenwerking met Goodyear werden banden ontworpen die niet plat kunnen worden. Zelfs in het slechtste geval kan men nog heel wat kilometers blijven rijden. Daardoor is het niet langer noodzakelijk een reservewiel bij te hebben.

— De auto wordt voor een groot deel geregeld door een kleine komputer. Er is daardoor ondermeer geen kontaktsleutel nodig om de wagen in gang te krijgen : op een klein toestelletje (als een zakrekenmachientje) wordt een kode met zes cijfers opgegeven om de auto te doen starten. Ditzelfde zakkomputertje doet de automatische batterijkontrole.

— Er is in elke wagen een stereoradio-installatie voorzien.

— De standaarduitgave is uitgerust met een oproepsysteem dat binnenkort in de Amectran zijn ze dan ook niet voorzien.

— Voor- en achterzetels kunnen helemaal platgelegd worden waardoor de ruime wagen ook in noodgevallen kan dienstig zijn om in te slapen of te rusten.

— Naast de verwarmingsinstallatie zal elke wagen ook air-conditioning hebben.

GOEDKOOP

Indien herstellingen aan de wagen moeten gebeuren zouden ze volgens Ramirez snel en zonder veel kosten kunnen gedaan worden. De schokbreker zou een tweeduizend frank kosten bijvoorbeeld en men kan hem in een half uur vervangen.

De voorzitter van de Amectran-maatschappij is ook heel fier over de levensduur die zijn auto kan hebben: hij geeft garanties die ver de hedendaagse normen overtreffen. Enkele ideeën: de transmissie zal voor verscheidene jaren gegarandeerd worden, de motor voor vier à vijf jaar, de tapijten in de auto zullen na tien jaar nog niet versleten zijn.....

Ed Ramirez is ook erg in zijn nopjes met de speciale veiligheidsuitrustingen: de banden, de versterkingen in de carrosserie, de luchtzakken, en het komputersysteem waardoor dieven er nooit zullen kunnen van onder muizen met uw wagen.

Het zou ons dan ook niet verwonderen wanneer binnen afzienbare tijd de eerste elektrische wagens op onze wegen hun intrede doen. Ze zullen de bevolking van verdere luchtvervuiling door uitlaatgassen beschermen, ze zullen veilig zijn. Voor de moderne mens, die niet als een gek wil rijden. Voor het hele gezin om in een ruime wagen erop uit te trekken. En ook de prijs van de auto zal ons niet mogen afschrikken: er is geen onderhoud nodig, geen stijgende benzinekosten, en er is de wagen een lang leven beschoren.

De Amectran is er dus. We kijken al uit naar zijn verschijning bij ons. En we zijn blij dat Oostende de eer te beurt viel de uitvinders ervan binnen haar muren te herbergen.

A.M. Deswaef - Baels

Packaging

Would you drink to this?

How about a glass of fresh milk from a carton that's been stored for six months? Soon, you may be drinking it—and liking it. Corn flake fans say Ultra High Temperature (UHT) milk tastes better than day-old milk from the cow.

UHT milk has been in production for more than 30 years: The aseptic laminated-paper packaging for it was a 1951 patent of Real Fresh Inc., Visalia, Calif. But approval for sale in the United States wasn't granted by the Food and Drug Administration (FDA) until this year.

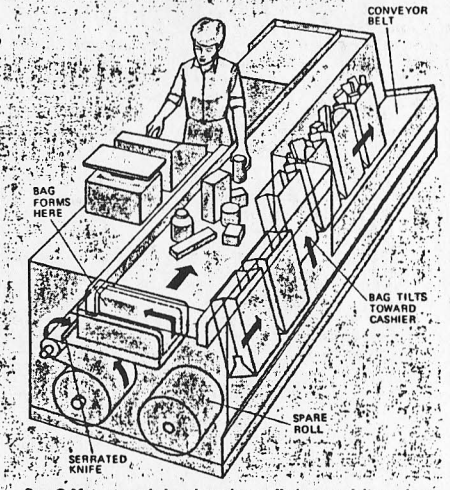
Real Fresh is marketing the UHT product in 10 western states. Prices are roughly 20 percent above the tag for conventional milk. Plans are afoot to distribute the product nationally.

During the UHT process, grade-A milk is pushed to 300° F., held for three seconds, then cooled. The resulting fluid stays drinkable for six months without refrigeration.

Food to go-go

A Canadian company is offering a new machine to speed up sluggish lines at supermarkets and help shoppers make a faster getaway. H. J. Langen & Sons, Mississauga, Ont., recently unveiled its $7,000 Bag-O-Mat checkout counter, a sophisticated device that:

- Makes grocery bags automatically, in seconds, from roll stock.
- Sends empty bags zipping on a conveyor belt past the cashier, who rings up and packs merchandise with ease.
- Delivers filled bags to you on the same belt, thereby slashing the time a customer spends waiting in line by as much as 30 percent.



Bag-O-Mat cuts and glues bags from roll of paper, delivers them on demand to cashier and carries full bags to pickup area.

The system has rung up approval from cashiers. Bag-O-Mat cuts bending and lifting, they report. And there's another bonus in the bags: Their softer edges cause fewer paper cuts.

Energy

Underground heat tap

Researchers at Oak Ridge National Laboratories in Tennessee are investigating a simple way to tap into geothermal heat in the ground under houses with crawl spaces.

They're snaking ductwork from the center of the crawl space to the intake of a heat pump. Ralph McGill at Oak Ridge reports that in preliminary tests last winter, when ambient air temperature was 5° F., air in the crawl space was 25°. The ground, at a constant 55° F., warmed the air. Result: less work for the pump and lower energy costs.

A hot issue

How do you light and maintain a fireplace fire? A debate roars.

Squared off are Lawrence Cranberg, a physicist and inventor of the Texas Fireframe, and the Consumer's Union (CU) which publishes *Consumer Reports*. Cranberg's double-decked grate holds logs in an arrangement that curves toward the room. In theory, the curve slings heat out of the fireplace better than random piles of logs. In its January 1981 issue, *Consumer Reports* aimed a barbed poker at the fireframe (and all grates), in favor of a grateless "standard fire." Cranberg says unequivocally: "CU's 'standard fire' won't work."

In a not-so-neutral corner is *PM* (*The Art of Burning Wood to Get More Heat*, page 122, Sept. '80) with its own entry—a two-log fire built over a bed of ashes. *PM*'s thesis: Hot embers, not fire, deliver maximum heat.

The power that will be

Electric utilities as you know them today are the mastodons of power—headed straight for extinction. That's the opinion of a brainy group at Massachusetts Institute of Technology, headed by Prof. Fred C. Schweppe, an electrical engineer and specialist on power systems.

But Schweppe says there is a way to avoid the demise of the big power companies. The key to the plan is dialog between the utility's microprocessor and yours.

A major reason to establish communication is to allow quick sales of power *to* the utility from wind, water or photovoltaic generation. Another reason is to set prices. The MIT group believes the current rate structure ought to be scrapped. In its place "will be rates determined solely by basic supply and demand," Schweppe contends. For instance, during hot spells, when airconditioners demand more than generators can supply, prices would rise. "When it gets up to a dollar per kilowatt-hour, people are going to start to back off," Schweppe says.

During the dog days, such a system could leave customers howling. But there's a bright spot to the idea. It could end blackouts.

TECH LINES TECH LINES TECH LINES

Automotive

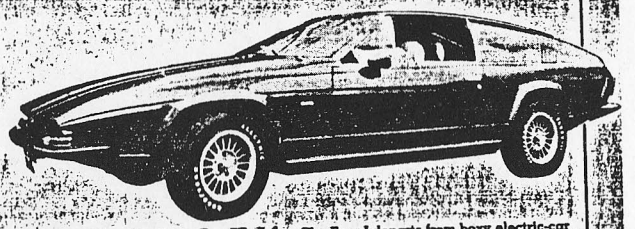
Smart electric GT

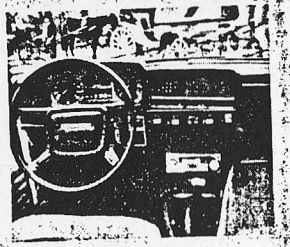
Historically, electric vehicles have been squat and boxy, with a minimum of creature comforts. Recently, we got a chance to drive an electric that not only looks like a "real" car, but also is fitted with a first-class leather interior, a computer and all the comforts of a high-priced touring car.

It's called an Exar I and it's built by a Dallas firm, Amectran, which spent $3 million to build the prototype. The body was designed and built by the famed Italian design studio, Frua, in Turin.

The company says that the car will achieve a range of 75 to 100 miles on a charge and can cruise easily at 60 mph. It has an on-board computer which senses road speed, load and electric-motor demand, and adjusts the flow of current to optimize mileage.

The car uses conventional lead-acid batteries and will retail for $7,800 when it goes on sale sometime next year.





The Exar I departs from boxy electric-car look with exotic styling. The dash (left) features a cathode-ray-tube display.

The price sounds like a bargain, and some auto-industry and electric-vehicle industry people are highly skeptical. A GM spokesman says that even with GM's economy of scale, it would be hard to produce such a vehicle for less than $10,000.

Ed Ramirez, president of Amectran, says that the reason GM or any other auto company can't beat his stated price is that he's using advanced assembly and production technology, something the auto companies are unwilling or unable to do.

Since Amectran is starting from scratch, and not locked in to obsolescent tooling, it can buy the latest and most efficient production machinery, Ramirez argues. But it remains to be seen whether the Dallas company can beat Detroit in a battle of watts.

Aviation

Chopper simulator

A new helicopter simulator presses pilots back into their seats during acceleration, vibrates realistically as they change rotor angle, and displays a moving, tilting scene through five windows—all at just a fraction of the cost of a ride in the real thing.

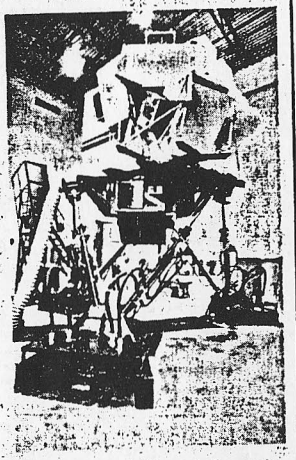
A program developed by the American Airlines Training Corp. teaches corporate pilots to fly the Sikorsky S-76 twin-jet copter without leaving the ground. An hour's ride in the $2.5-million simulator costs $500—a third of the price of an hour in the helicopter itself.

Spidery legs

The heart of the new simulator is an actual cockpit, taken from Sikorsky's production line. It's mounted on a spidery set of six 2-inch-diameter legs, the working end of a hydraulic system under 3,000 pounds of pressure. Movement of these rods, which is controlled by a computer, pivots, pitches, and rolls the cockpit. The rods can also raise and lower the white chamber by three feet, shift it forward, backward or side to side. For the pilot sitting inside, this bobbing and twisting duplicates forces felt during flight, up to one G over the background force of gravity.

The device is the first commercial helicopter simulator built by Reflectone, a Tampa, Fla., firm that has produced several military helicopter trainers over the past decade. The visual-display system, designed by Rediffusion Simulation Inc. of Arlington, Tex., flashes computer-generated scenes of night and dusk. It can fog visibility with scud clouds reflecting aircraft lights. It simulates lightning bolts. And it can even project the dark form of a truck straying out onto a landing area.

The training is so realistic that pilots require just 2½ hours in an actual S-76 before they are free to fly the $1,676,000 craft home.



Cockpit, surrounded by a shell, permits visual effects, rides on six moving legs.