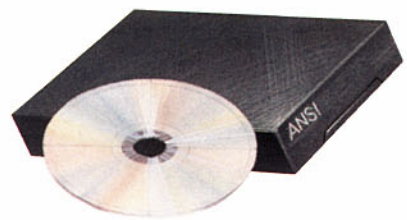


Avloy® Formable Finish
Avery Dennison
Automotive industry-approved dry paint film for injected-molded plastic parts produces smooth, high-gloss surfaces. Outstanding finish is applied in a pollution-free, safe process.

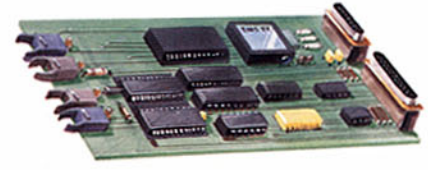


Audio Navigation System
ANSI
User-friendly, low-cost voice interactive system. Uses car CD player to give verbal instructions to the driver.

Battery Containment System
Hub Engineering
Light weight, rugged, and chemical-resistant reinforced thermoplastic containment system. Maintains integrity under crash conditions.

Safety System
Amerigon
Uses battery pack motion in a crash to actuate airbag, pretension shoulder harness and to position steering wheel. Mechanical, propellant-free, low-cost system.

Motor Controller
Delta Tau Data Systems
High-speed, proven, programmable controller maximizes motor efficiency over broad power and speed range through motor current feedback. Excellent acceleration and stopping characteristics on inclines.



Energy Management System (EMS)
Amerigon
Extends range by controlling charging and optimizing energy flow to electronic systems. Predicts available range.

Battery Monitor System
Group IX Systems
Monitors battery voltage, current, temperature and related signals to provide battery charge status and condition.

Regenerative Energy Braking System (REBS)
Dowty Aerospace
Los Angeles
Energy efficient electro-hydro-mechanical braking system extends driving range by using energy potentially lost during braking to charge batteries.

The Benefits of a Collaborative Effort

Until now, many of the technologies necessary to develop military aircraft, satellites and other aerospace hardware have been largely untapped by automakers.

The CALSTART consortium was developed to allow companies to share resources and to collaborate on research and development, so as to most efficiently incorporate these technologies into ground transportation systems. Along with aerospace companies and other hi-tech firms, CALSTART brings together electric utilities, environmental groups, labor unions and research institutions. As a product of this powerful alliance, the SEV offers automakers direct access to superior component technology, shorter product development times, and a more cost-effective avenue to advanced transportation manufacturing.

Meeting the Needs of a New Industry

The world's automobile manufacturers are rapidly developing electric vehicles in order to meet state, federal and global zero-emission goals. Because of the considerable differences between electric vehicles and conventional automobiles, approximately 70% of the present components and subsystems must change to optimize electric vehicle performance and consumer appeal. With a long history of developing durable, lightweight and energy-efficient components for aerospace and defense applications, the companies participating in the Showcase Electric Vehicle Program are in an excellent position to meet the unique needs of electric vehicles. The SEV has risen to the challenge, offering automakers nearly 20 innovative components necessary to make electric vehicles competitive. The SEV, therefore, provides a rare opportunity for different companies to share their expertise and capabilities in a collaborative effort that allows for the creation of fully integrated subsystems, leading to more advanced product features. The result: Components that increase vehicle range, improve vehicle efficiency and enhance vehicle safety.

Electric Vehicle Tires
Pirelli Armstrong
Tire Corporation
New tread design and sidewall compounds offer 30% lower rolling resistance and 15% lower weight compared to today's conventional tires.

Underbody Assembly
Fairchild Manufacturing
Recyclable, light weight underbody panel reduces vehicle drag. Removable portions allow access to vehicle components.

Variable Temperature Seat (VTS)
Feher Design
Solid state (non-CFC) heating and cooling system minimizes battery energy use to sustain range in hot and cold conditions.

Wire Harness Assembly
ITT Cannon
Light weight, dependable wire harnesses and environmentally sealed, shielded connectors withstand high temperature gradients and protect against electromagnetic interference.

Bi-Polar Lead Acid Batteries
Trojan Battery Company
Bi-polar technology offers increased vehicle range, greater acceleration, and rapid recharging by minimizing internal resistance of the battery.

Aluminum Frame
Kaiser Aluminum & Chemical Corporation
Light weight, recyclable aluminum frames suitable for cost-effective, low-volume manufacture. Advantages include shorter lead times and faster development cycles.

Brushless DC Motor
I Won Motronics
High efficiency, light weight, low-cost brushless DC motor. Superior low speed torque, cool running, multi-phase design.

Inductive Charging System
Hughes Power Control Systems
Efficient, safe battery charging system transfers power through an electromagnetic, plastic-coated inductive coupler connection.

MOSFET and IGBT Semiconductors
International Rectifier Corp.
Broad line of high-voltage, high-current semiconductor switches for motor controller, battery charger, electric brakes and other critical applications.



International Automotive Design
Vehicle Constructed by
IAD West Coast, Huntington Beach, CA.

Participants

- Amerigon
- ANSI
- Avery Dennison
- Delta Tau Data Systems
- Dowty Aerospace Los Angeles
- Fairchild Manufacturing
- Feher Design
- Group IX Systems
- HUB Engineering
- Hughes Power Control Systems
- International Rectifier Corp.
- ITT Cannon
- I Won Motronics
- Kaiser Aluminum & Chemical Corporation
- Pirelli Armstrong Tire Corporation
- Trojan Battery Company

Sponsors

- Intel
- IBM, Los Angeles
- Los Angeles County Transportation Commission
- Los Angeles Department of Water and Power
- Pacific Gas and Electric Company
- Sacramento Municipal Utility District
- San Diego Gas & Electric
- South Coast Air Quality Management District
- Southern California Edison
- State of California
- U.S. Department of Transportation