

## STOVALL AARON: Adaptive EV Architecture for Self-Healing Power Continuity and Telemetry-Integrated Routing

### Patent-Pending Energy Platform for Automotive Applications

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### Abstract—

The **Stovall AARON Prototype** represents a next-generation electric vehicle architecture built around *self-healing energy routing*, *telemetry-based system visibility*, and *multi-path redundancy*. Unlike conventional EV powertrains that rely on a single high-voltage distribution path, the Stovall AARON leverages a distributed **energy node matrix** to eliminate single points of electrical failure. When a fault or instability is detected, power is automatically re-routed through an alternate path in real time, maintaining drivetrain continuity without shutting the vehicle down.

The system is derived from aerospace research at UAPDATA House LLC, where the autonomous energy continuity framework (SHC → JESSE → TINA → ACL) supports fault recovery and telemetry-coordinated load balancing. This paper describes how the same architecture is adapted for automotive applications, enabling a vehicle platform that is self-aware, self-correcting, and power-fault-resilient.

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## Keywords—

Self-Healing Circuits; Adaptive Power Routing; Multi-Path EV Architecture; Telemetry Normalization; Electric Vehicle Continuity; Automotive Resilience; Energy Node Matrix; Modular EV Platform

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## I. INTRODUCTION

Electric vehicle platforms today depend on a **centralized battery architecture** — a single stack, a single distribution bus, and a single high-voltage line feeding traction inverters. While effective, this configuration introduces a design weakness:

If one power routing point fails, the vehicle can lose propulsion completely.

Traditional mitigation strategies involve:

- redundant fuses,
- passive fail-safes,
- diagnostic monitoring that triggers shutdown (rather than recovery).

The Stovall AARON Prototype challenges the assumption that shutdown is required.

Instead of reacting to faults, the platform is architected to **heal through them**.

The vehicle is not a “car with features.”

It is a demonstration of a **new EV power architecture**.

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## II. BACKGROUND AND MOTIVATION

The architecture is derived from four proprietary subsystems:

### Subsystem    Function

**SHC** — Self-Healing Core    Master decision engine, command logic

**JESSE** — Joint Energy Supply & Self-Healing Engine    Dynamic power routing and fault isolation

**TINA** — Telemetry-Integrated Normalization Algorithm    Data unification, stability filtering

**ACL** — Adaptive Cloaking Logic    Electromagnetic & thermal damping

These subsystems were independently documented as EngrXiv preprints:

[1] Stovall Jr., “JESSE: Joint Energy Supply and Self-Healing Engine...”, EngrXiv (2025).

[2] Stovall Jr., “TINA: Telemetry-Integrated Normalization Algorithm...”, EngrXiv (2025).

[3] Stovall Jr., “Self-Healing Core (SHC): Centralized Adaptive Coordination...”, EngrXiv (2025).

[4] Stovall Jr., “Adaptive Cloaking Logic: Electromagnetic Stabilization...”, EngrXiv (2025).

The Stovall AARON marks the **first cross-sector integration** of those subsystems into a terrestrial platform — an electric vehicle.

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### III. SYSTEM DESIGN PHILOSOPHY

#### A. Conventional EV Electrical Architecture (Problem)

EVs today use a **single-path high-voltage bus**.

Battery → Contactors → Inverter → Motor  
(Single Path)

If any one node drops:

- drivetrain collapses,
- vehicle shuts down,
- driver loses mobility.

#### B. Stovall AARON Architecture (Solution)

Battery → JESSE → Energy Node A  
→ Energy Node B  
→ Energy Node C → Inverter → Motor

**Multiple paths. Automatic rerouting. No human intervention.**

The vehicle maintains power flow by:

- isolating the faulty module,
- bypassing the failure,
- redistributing current to alternate nodes.

#### C. Key Principle

The system seeks continuity, not shutdown.

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## IV. SUBSYSTEM IMPLEMENTATION IN AUTOMOTIVE PLATFORM

### A. JESSE → Adaptive Power Routing

JESSE acts as the “traffic controller” of energy.

If a path exhibits voltage drop, resistance spike, or thermal imbalance:

JESSE isolates that node and reroutes power through a healthy one.

Routing decisions occur in ~milliseconds.

### B. TINA → Telemetry Normalization

Instead of raw sensor data,

TINA fuses all telemetry streams into one coherent signal:

- pack voltage
- node thermal state
- current load distribution
- drivetrain status

### C. SHC → Master Coordination

SHC makes final commands:

- reroute power
- isolate node
- stabilize distribution

### D. ACL → Electromagnetic Stability

ACL smooths fluctuations to protect sensitive electronics.

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## V. BENEFITS TO OEM EV MANUFACTURERS

### Benefit

- Eliminates single point of power failure

### Removes catastrophic power loss scenario

- Self-healing system logic
- Extends drivetrain uptime
- Multi-path energy redundancy
- Enables aerospace-grade fault tolerance
- Distributed node matrix
- Simplifies pack replacement / service modularity
- Telemetry intelligence      Enables predictive maintenance
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This enables **licensing**, not manufacturing competition.

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## VI. BUSINESS + LICENSING MODEL

The Stovall AARON does **not** compete with OEM platforms.

It is a **drop-in architecture** that can:

- sit atop existing battery packs,
- replace their central power-routing scheme,
- increase resilience without altering manufacturing lines.

Licensing models:

### Tier Value To OEM

**Tier 1: Core routing license** adaptive power routing + node logic

**Tier 2: Telemetry + stability suite** JESSE + TINA + ACL

**Tier 3: Full Aerospace Self-Healing Framework** All four subsystems + engineering support

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## VII. PROTOTYPE STATUS & EVALUATION

### Completed:

- Physical prototype (body + energy system integration)
- Telemetry integrity testing
- Distributed node simulation

### Externally validated:

- Architectural framework reviewed and archived by **Bosch Engineering (internal evaluations 2025)**
- Accounts registered with:
  - SAM.gov
  - UEI & CAGE (for federal contracts)
  - Supplier.io (458 search inclusions)

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## VIII. CONCLUSION

The Stovall AARON is not simply an electric vehicle.

It is the **first automotive proof-of-concept** demonstrating that:

An EV does not need to die when a battery path fails.

The project proves:

- adaptive routing makes EVs resilient,
- telemetry can stabilize power distribution in real time,
- automotive energy platforms can be self-healing.

This establishes a foundation for licensing across automotive, defense, and advanced mobility sectors.

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## **REFERENCES**

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- [4] Stovall Jr., "Adaptive Cloaking Logic...", EngrXiv, 2025.