# Dossier: EMPIRICAL SYSTEMS AEROSPACE INC

## SBIR Award Details

**Award Title:** N/A

**Amount:** $2,999,147.00

**Award Date:** 2024-08-29

**Branch:** DARPA

## AI-Generated Intelligence Summary

**Company Overview:**

Empirical Systems Aerospace, Inc. (ESAero) is a California-based aerospace engineering and technology company specializing in innovative solutions for aircraft design, development, and testing, with a strong focus on unmanned aircraft systems (UAS) and advanced air mobility (AAM) vehicles. Their mission centers around pushing the boundaries of aerospace technology through research, prototyping, and flight testing, addressing the need for more efficient, sustainable, and versatile air vehicles. ESAero's unique value proposition lies in its ability to rapidly design, build, and fly experimental aircraft, integrating cutting-edge technologies like electric propulsion, autonomous flight control, and advanced composite materials, ultimately enabling faster innovation cycles and reduced development costs for complex aerospace systems.

**Technology Focus:**

* Electric Propulsion Systems:\*\* ESAero develops and integrates advanced electric propulsion systems for both manned and unmanned aircraft, including high-power density motors, battery systems, and power electronics. Their work involves optimizing these systems for specific mission profiles to maximize efficiency and performance, often targeting significant reductions in noise and emissions.
* Autonomous Flight Control:\*\* ESAero designs and implements autonomous flight control systems enabling capabilities such as beyond-visual-line-of-sight (BVLOS) operations, autonomous landing, and precision navigation. This includes developing sensor fusion algorithms, path planning software, and robust control architectures for safety and reliability in complex operational environments.
* Advanced Airframe Design & Manufacturing:\*\* ESAero utilizes advanced composite materials and additive manufacturing techniques to create lightweight, high-performance airframes tailored for specific applications. They focus on optimizing aerodynamic efficiency, structural integrity, and manufacturing costs to deliver aircraft that meet stringent performance requirements.

**Recent Developments & Traction:**

* NASA Electric Powertrain Flight Demonstration (EPFD) Program:\*\* ESAero is a key partner in NASA's EPFD program, working with GE Aviation to integrate and flight test a megawatt-class electric propulsion system on a modified Saab 340B aircraft. Flight testing is scheduled to begin in 2024/2025.
* Phase II SBIR Award (2021):\*\* Received a Phase II Small Business Innovation Research (SBIR) award related to developing advanced aerospace technologies, likely pertaining to their work in electric propulsion or autonomous systems. Specific details of the project are not readily available.
* Continued work on X-57 Maxwell:\*\* ESAero has been involved in the design and integration of components for NASA's X-57 Maxwell all-electric experimental aircraft.

**Leadership & Team:**

* Andrew Gibson (CEO):\*\* Holds a strong background in aerospace engineering and management, overseeing ESAero's strategic direction and overall operations.

**Competitive Landscape:**

* Joby Aviation:\*\* While focused on eVTOL passenger aircraft, Joby Aviation shares a similar technological focus on electric propulsion and autonomous flight, although Joby is further down the commercialization path.
* Aurora Flight Sciences (a Boeing Company):\*\* Aurora specializes in developing advanced aircraft and autonomous systems, competing with ESAero in areas like UAS development and flight testing services. ESAero differentiates itself through its rapid prototyping capabilities and focus on experimental aircraft development, offering a more agile and flexible approach compared to larger established companies like Aurora.

**Sources:**

1. [https://www.esaero.com/](https://www.esaero.com/)

2. [https://www.nasa.gov/centers-and-facilities/glenn/research/epfd/](https://www.nasa.gov/centers-and-facilities/glenn/research/epfd/)

3. [https://sbir.nasa.gov/](https://sbir.nasa.gov/) (Search for ESAero to find relevant SBIR awards)

4. [https://ntrs.nasa.gov/citations/20220002142](https://ntrs.nasa.gov/citations/20220002142) (NASA Technical Reports Server for X-57 related publications).