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# Cimarron supporting Boeing's CST-100 Starliner

## Cimarron

### Description:

Cimarron Software Services, Inc. is an Engineering and Technical Services company, headquartered in Houston, Texas, providing real-time systems solutions since 1981. A Woman Owned Small Business (WOSB), Cimarron has a proven history of providing high-quality technical services to NASA, the Department of Defense, multiple global commercial customers and other US Government agencies as both a prime and subcontractor. Cimarron began supporting human space flight in 1988, providing real-time development solutions for the NASA Mission Control Center (MCC) and has continuously supported the MCC and a large number of NASA programs across multiple NASA centers. Today, Cimarron supports multiple NASA programs to include both commercial and exploration programs that are defining the future of NASA space exploration.

Cimarron has been a supplier to Boeing for over 20 years and a current provider of services to multiple Boeing programs. Cimarron is currently a Gold Level Supplier within Boeing's Enterprise Supplier Performance Measurement system. Our support to Boeing consists of multiple service disciplines to include software, design engineering, manufacturing, test, production, and training and deployment services. Cimarron is supporting the following Boeing programs: Boeing CST-100 (Starliner), Space Launch System (SLS), B52 modernization program, Boeing WGS Satellite, Patriot Advanced Capability-3 (PAC3), and Ground-based Midcourse Defense (GMD). Cimarron formerly supported Boeing within the P8A, Commercial Aircraft (787 Dreamliner) and International Space Station programs.

Cimarron's support has been formerly recognized as the NASA Women-Owned Small Business of the Year, Boeing Supplier of the Year, and the NASA Johnson Space Center Subcontractor of the Year.

### Support for Boeing CST-100 Starliner Program:

- Software Engineering
  - Avionics Flight Software (FSW)
  - Embedded Software
- Hardware Engineering
  - Manufacturing
  - Industrial
  - Electrical
  - Fluids
- Systems Engineering
  - Parachute Systems
  - Human Factors
  - Stress Analysis
  - Structures (including thermal, mass properties)
  - Networks
  - Landing and Recovery Systems

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#### Executive Office

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#### Corporate Operations

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#### Alabama Regional Office

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#### Florida Regional Office

100 Boeing Way, Suite 1304  
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- Testing
  - FSW Qualification
  - FSW Test Automation
  - Component Qualification
  - Environmental Qualification
  - Landing and Recovery
  - Hot Fire
  - Test Planning and Coordination
- Technician
  - Electrical
  - Mechanical
  - Instrumentation
  - Machinist
- Technical Drafting
- Quality Assurance
  - Product Acceptance
  - Production Materials Coordinator

## Briefs:

### Software Engineering

Cimarron's embedded software developers are currently responsible for **developing and maintaining flight software** for the Starliner spacecraft. We use Agile software development practices to support **avionics FSW development**. We create the crew software interface and compile and deploy software to the flight hardware.

### Hardware and Systems Engineering

We provide **parachute and airbag design** expertise including pyrotechnics integration. Cimarron provides engineering oversight of wiring harness installation, developing the **flight instrumentation harnesses**. We provide **human factors and aeromedical expertise** from requirements generation to design team participation, drawing reviews, and requirements verification. Cimarron personnel participate in Boeing's **Engineering Control Board and Program Control Board**. Cimarron led the **mass properties** team in analyzing spacecraft mass properties and provided spacecraft weight estimation and forecasting, center of gravity calculations for vehicle layout and balancing, and vehicle inertia properties for performance and controllability analyses.

Our Network Engineers are responsible for **critical communications** between Starliner, the Commercial Crew and Cargo Processing Facility (C3PF) Spacecraft Simulation Labs and the Boeing MCC (BMCC). Manufacturing Engineers act as **liaisons between design engineering and the production floor** for mechanical and electrical hardware assembly and installation.

### Testing

We provide **Starliner Test and Verification** support covering a variety of systems and activities including:

- Avionics
- Airframe

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- Environmental Control
  - Propulsion
  - Parachutes
  - Ground Systems
  - Landing and Recovery Services
  - Crew Systems
  - Emergency Egress

Cimarron performs **verification and validation** including testing and simulation of the embedded software. Our **complete testing services** include planning, qualification, and acceptance activities, certification, validation and verification, documentation tracking, from component level to complete spacecraft **for both software and hardware**. We write and implement **automated test routines** for flight software to test large software volumes.

### Spacecraft Processing

Cimarron provides **broad support for manufacturing, assembly, integration, and testing** for all three Starliner spacecraft, and we provide **assembly floor leadership** in many areas (spacecraft build, instrumentation, and manufacturing). For example, we produced designs and improvements for drilling accuracy and introduced innovations in back shell removal to keep the parachute system intact. We have a large assembly floor presence with several technician specialties represented along with manufacturing engineering and quality assurance.

Technicians support **electrical, mechanical, and instrumentation component and subsystem assembly** and we provide specialty services such as **orbital welding, precision drilling**, and machining. Product Assurance Specialists conduct tests to validate each step in the manufacturing process as well as **validating that final products meet specifications**.

Our staff hold certifications in several areas of manufacturing and assembly, including:

- Visual Orbital Welding
- Connector Mate/Demate
- Torque and Safety Wire
- Strain Gauge Inspection
- Soldering
- Pyrotechnics
- Receiving/Inspection of Flight Hardware

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