

**Barrios
Technology**







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COMPANY OVERVIEW

Barrios Technology has brought together some of the most talented employees in the aerospace industry to build a company tailored to support the evolution of space exploration. For more than 30 years we have stayed true to our corporate mission to be the foremost small aerospace engineering services company providing extraordinary value to our customers, employees, and community.

A Houston-based, woman-owned and operated small business with approximately 600 employees, our experienced executive management team and the innovative minds we employ give Barrios the power to bring creative, cost-effective solutions to our customers. We recognize that our success is ultimately a result of our customers' trust and confidence, which is only earned through outstanding service.



“Recognizing the growth we’ve achieved over 30 years and considering the potential for our future makes me so proud of the technical accomplishments, management culture, and motivation to excel Barrios employees demonstrate every day. This, I believe, is what makes Barrios Technology succeed.”

Sandy Johnson, President and CEO, Barrios Technology

Everyone on the Barrios team embraces our corporate vision to replicate the best of who we are in targeted U.S. aerospace markets while strengthening our commitment to current customers. We fulfill our vision by staying true to our core values: Respect, Integrity, Commitment, and Excellence.

Our growth is directly attributable to a proven culture of responsive, customer-oriented employee attitudes which rewards innovative thinking. This culture continues to attract the best and the brightest individuals in the industry. Barrios leverages this foundation to continue to enhance our unique set of capabilities in **Aerospace Engineering & Science, Program Planning & Control, Mission Integration & Operations, and Software Engineering & Integration.**

*The pictures throughout this brochure feature Barrios employees at work demonstrating
“Where Innovation and Motivation Meet.”*



AEROSPACE ENGINEERING & SCIENCE

Our engineering services and scientific space research capabilities continue to expand, providing reliable and innovative approaches to meeting our customers' requirements.

SYSTEMS ENGINEERING

Barrios performs across the systems engineering spectrum; requirements development, analysis, concepts of operations, trades and studies, modeling, integration, verification, validation, testing, and documentation. This full range of services has enabled us to reliably perform mission critical responsibilities in the disciplines of:

- Avionics
- Electrical Power Systems
- Environmental Control and Life Support Systems (ECLSS)
- Guidance, Navigation and Control (GN&C)
- Human Factors
- Mechanical
- Robotics
- Thermal

REQUIREMENTS

Our engineers define, document, trace, verify, and validate requirements with discipline and rigor providing the customer with realistic and comprehensive system requirements. This capability translates well outside the aerospace market.

ANALYSIS

Barrios engineers apply critical analysis skills and techniques to complex problems such as vehicle mass properties, vibration analysis, thrust analysis, stress, fracture mechanics, thermal, high-fidelity dynamic models, mission timelines, proximity operations, and human factors.

DESIGN

We design systems hardware and software such as thermal protection, communications, automated systems, autonomous operations including rendezvous and docking, advanced designs, and tools integral to and onboard space vehicles.

SYSTEMS/VEHICLE INTEGRATION

Barrios provides manifest analysis and coordination for all vehicles transporting items to the International Space Station (ISS). This includes U.S., Russian, Japanese, and European visiting vehicles as well as commercial space vehicles.

SIMULATIONS & TESTING

Barrios develops and provides Six Degrees of Freedom (6 DOF) simulations for space missions including robotic tasks, RF system emission controls, and flight and orbital analysis. Our engineers develop criteria and plans for hardware testing as well as provide test operations, management, and oversight expertise.

MMOD DAMAGE RISK ASSESSMENT & PROTECTION

Barrios engineers provide expertise, using NASA's BUMPR analysis software, in modeling the ability of space materials to withstand Micro Meteoroid Orbital Debris (MMOD) impacts. We provide data to government and commercial space vehicle providers. Our experience also includes hypervelocity impact testing.

ROBOTIC TECHNOLOGY

Barrios provides research, engineering, development, integration, and application of robotic hardware and software technologies for specific flight and ground robotic system applications, such as Robonaut 2, ISS Mobile Servicing System, and the Remote Manipulator System.

LABORATORY & FACILITY MANAGEMENT

Our scientists and engineers developed the requirements for and oversaw the buildout of a Class 100 laboratory. Barrios currently operates and manages this clean room facility to curate samples of returned space materials. We also provide support to a Class 1000 clean room for our customers. In addition, our technicians provide laboratory support for Space Life Sciences.

ASTROMATERIALS SCIENCE

Barrios scientists are an integral part of the study of planetary and interstellar materials, extending our knowledge toward future space exploration.





PROGRAM PLANNING

Program and project life cycles require tightly integrated technical, schedule, and cost control in order to achieve optimal results. Barrios' experience enables us to offer our customers an approach that truly manages the engineering program/project lifecycle costs. Our Program Planning & Control disciplines are highly interdependent in the management of a program or project.

COST ESTIMATING

Knowledge of and ability to assess historical data as well as skill in employing tools such as parametric models are a critical asset in any business program. Barrios cost estimators understand the importance of clear communication and the value in providing accurate information to stakeholders. We provide tools and reports to assist the customer's understanding and ability to use the data to support their decision making. Barrios cost estimators have supported numerous NASA and DoD programs/projects.

SCHEDULING

The business of scheduling requires rigorous attention to detail and expertise with tools and program/project flows. Barrios has been highly successful at integrating multiple inputs and employing the proper tools to provide clear, consistent, and dependable data to customers and stakeholders. Any impacts to a work schedule are tightly coupled with cost and are critical to program success. Our analysts understand the critical path and other dependencies that must be integrated, tracked, assessed, and managed.

EARNED VALUE MANAGEMENT

Our expertise in Earned Value Management (EVM) brings together the schedule, cost, and status of work completed to provide a consolidated picture to a program/project manager. Barrios has a certified EVM system implemented for a NASA project office that integrates the technical, cost, and schedule parameters for a program or project. EVM encompasses both performance measurements and performance management to ensure program control of risk associated with cost, schedule, and performance.

& CONTROL

DATA MANAGEMENT

Barrios' data management functions provide a major NASA program office with easily accessible, secure, and valid program data utilizing authorized program repositories and access authorization safeguards. Data management provides the mechanism for defining data, the structures that house the data, and the methods for accessing the data. We are moving away from the use of paper to a data-centric environment where information is provided through linked electronic databases.

ASSESSMENTS

Barrios' assessments specialists evaluate program/project information identifying risks and anticipating problems for timely mitigation. The evaluations consider schedule, cost/resources, technical and historical cost baselines, and performance information to provide early warning for possible cost and program impacts. Evaluations document ground rules and assumptions, input data, the analytical treatment of those data, alternative courses of action, and recommendations for any further action.

CONFIGURATION MANAGEMENT

Barrios provides all the major Configuration Management (CM) elements to our customers:

- Planning & Management
- Identification
- Change Management
- Configuration Status Accounting
- Verification & Audits
- Board and Panel Design & Administration

SUBCONTRACT MANAGEMENT

Barrios engineers perform as subcontract technical manager for a prime aerospace customer in oversight of their major subcontractors who are providing hardware and technical support. This requires an engineering and technical management skill set to independently interface with and provide direction to major hardware/software providers on behalf of our customer, similar to a Contracting Officer's Technical Representative role.



MISSION INTEGRATION & OPERATIONS

Barrios Technology provides mission planning and integration, flight operations, and post flight analysis for space exploration. Our support services include strategic planning, flight design, technical training, payload integration and mission utilization, flight crew operations and integration, on-orbit operations, risk assessment, and flight cargo manifest development. We provide innovative products for flight and mission rules, operation data files, and imagery management.

CONCEPTS OF OPERATIONS

Barrios' mission integrators and discipline-specific engineers develop concepts of operations for space vehicle missions involving multiple NASA centers, International Partners, and commercial operators soon to be flying to the International Space Station (ISS). Use of our analytical capabilities combined with our mission expertise lends itself to an effective process for developing these concepts.

PLANNING & REAL-TIME MISSION SUPPORT

Barrios' certified flight controllers provide planning and real-time mission support for numerous technical disciplines including: Communications and Tracking, Crew Systems, Environmental Control and Life Support Systems, Extravehicular Activity (EVA), Flight Design and Trajectory Operations, Guidance, Navigation, and Control (GN&C), Onboard Data Interfaces and Networks, Operation Data Files, Operations Planning, Power, Heating, and Lighting, Robotics, Structures and Mechanisms repair and maintenance, and Thermal Systems. Our flight planning capabilities include launch trajectory and abort scenarios, orbital design, rendezvous and proximity operations, and re-entry.

TRAINING

Our engineers and technical experts develop and deliver training for flight crews including experiment setup and operations as well as flight controller certification training. Our experience includes instructional design, developing simulation plans and use of simulators, and delivery of training through classroom instruction and web-based training.

FLIGHT MANIFEST

Barrios coordinates and develops the manifest for each flight to the ISS. This complex integration task is supported by a software database Barrios designed for NASA called Mission Integration Database Applications System (MIDAS), which received NASA JSC's Exceptional Software Award and was featured in the agency's ASK magazine.

PAYLOAD INTEGRATION

Barrios employees perform launch site integration for ISS payloads involving NASA, commercial research, and International Partner payloads. This requires integration of and interfacing with International Partners, original equipment manufacturers, and hardware providers, as well as coordination between contractors and government.

ORBITAL DEBRIS TRACKING & AVOIDANCE

Barrios engineers interface directly with the United States Air Force (USAF) Space Command in coordination and use of the orbital debris catalog maintained by the USAF. Barrios performs conjunction analysis and recommends avoidance plans and procedures when appropriate.

IMAGERY ANALYSIS

Our highly skilled imagery specialists analyze high definition motion and still photography to provide input to our customers for critical decisions regarding the extent of vehicle damage from launch debris or on-orbit MMOD strikes.







SOFTWARE ENGINEERING

Building upon three decades of Barrios' experience in managing software, hardware, and computer/network infrastructures, we currently provide software engineering and integration skills in support of government and commercial space vehicles. Our engineers and technical professionals provide expertise in infrastructure development and design, configuration management, full software lifecycle methodology, network administration, and Information Technology (IT) security management. These skills support avionics and simulation software design and development and lab configuration and administration. In addition, we have a rich history of developing process improvement and process automation tools resulting in the savings of thousands of labor hours.

AVIONICS SOFTWARE DESIGN & DEVELOPMENT

Barrios provides technical leadership to on-orbit flight and ground software development teams as well as software engineers responsible for designing, developing, maintaining, and testing all U.S. On-Orbit Segment (USOS) avionics and software for the International Space Station (ISS). Software developed provides capabilities to communicate with and guide, navigate, control, and command the ISS.

SIMULATION SOFTWARE DESIGN & DEVELOPMENT

Barrios designs, develops and tests simulation software. Our engineers have knowledge in all aspects of avionics software to build and deliver simulation software and test environments for on-orbit software. Our Simulation Software team uses best-of-industry practices for the testing and integration of flight software and hardware in support of the ISS.

LAB DESIGN, CONFIGURATION, & ADMINISTRATION

Barrios provides both horizontal and vertical rig management for ISS Multiplexer/DeMultiplexer (MDM) configurations. Labs supported provide development, simulation, and test environments for flight software.

HARDWARE/SOFTWARE INTEGRATION & TESTING

Our Hardware/Software Integration team provides systems engineering and testing, design integration, and conducts hardware and software integration to ensure operational compatibility and integrity. Beginning with early integration testing and ending with system testing on the flight article, the

& INTEGRATION

team performs risk mitigation testing throughout the hardware and software development phase. Our risk mitigation testing identifies interface issues between hardware and software as early as possible to reduce the cost of corrections.

FORMAL QUALIFICATION TESTING

Our engineers and technical staff perform Formal Qualification Tests for all developed avionics software. Activities include development of test plans and procedures which verify, validate, and trace ISS software requirements, from specifications through design and delivery of the capability.

WEB APPLICATION SOFTWARE DDT&E

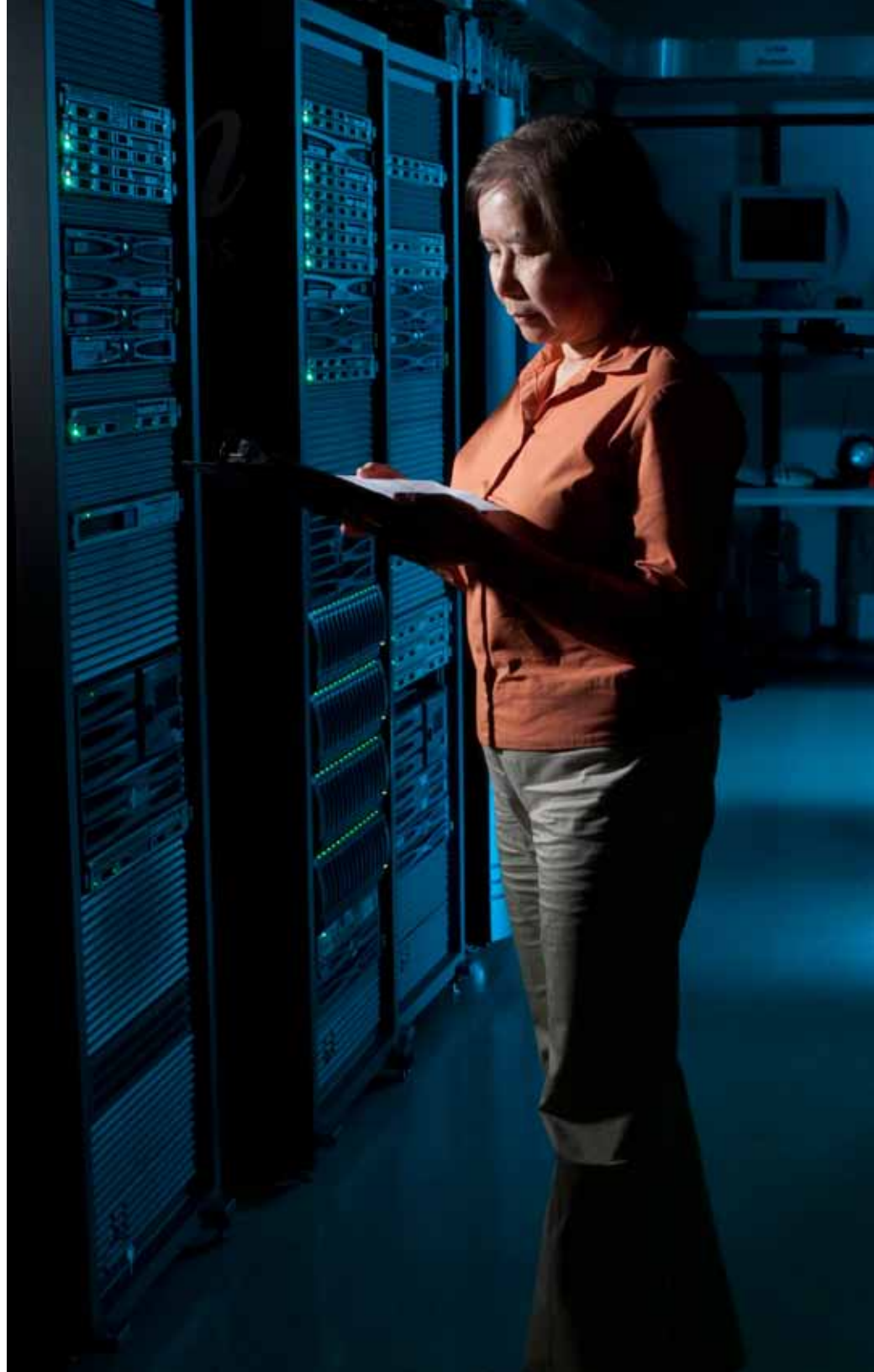
Barrios designs, develops, tests, sustains, and supports web applications used to track ISS configurations, manifests, on-orbit activities, consumable resources, and other items. Barrios teams create applications following AS9100-compliant, structured software lifecycle processes for requirements and design. The process also includes formal code development, peer review, unit and regression testing, and customer acceptance.

HARDWARE SPECIFICATIONS, DESIGN & CONFIGURATION

Barrios' hardware design engineers perform all engineering functions to support the flight software infrastructure components (network, cabling, racks, subassemblies, firmware controllers, computers) including drawing production, detailed hardware design, manufacturing support, procurement, and installation/integration of internal and external development products.

SYSTEM, DATABASE, & NETWORK DESIGN & IT SECURITY

Barrios system administrators are responsible for installing, supporting, and maintaining Windows and UNIX based servers, planning for and responding to service outages, and project management for systems-related projects. Our database administrators are responsible for the integrity of the data and the efficiency and performance of the databases. Our network administrators are responsible for the communication infrastructure and its throughput and response time. Barrios IT security experts respond to incidents and provide systems vulnerability analysis and resolution.



BARRIOS QUALITY

Whether we are developing flight software, managing space operations, integrating complex missions, or providing program planning and configuration management, Barrios Technology is always focused on ensuring quality and continuous improvement in everything we do.

Our Quality Management System is an integral part of our overall management system and is integrated into all business activity. This system is based upon the company's mission, vision, values, and quality policy with the objectives of customer satisfaction, continued improvement, and providing extraordinary value.

Barrios has established a culture of continuous improvement within its business processes at the corporate and project levels. This is reinforced by a company-wide Lean Six Sigma (LSS) / Continuous Improvement Group comprised of both Black and Green Belt LSS-certified members.

The success of our focus on quality is demonstrated by our numerous customer awards, such as NASA's prestigious George M. Low Award for Quality and Excellence, which Barrios received in both the Product and Services categories.



A strong testament to our ability to consistently and effectively deliver quality to our customers is the external validation received by each organization within our company:

Barrios Department	External Validation
Quality Systems	✓ ISO 9001, SAE AS9100
Safety & Security	✓ JSC Contractor Safety Forum (CSF) Safety Excellence Awards
Finance	✓ DCAA/DCMA Audits ✓ CPA External Audit
Human Resources	✓ OFCCP Affirmative Action Audit ✓ CPA 401(k) Audit
Contracts	✓ DCMA CPSR ✓ DCMA EVMS ✓ One NASA Peer Award
Barrios' Prime Contracts	✓ Award fee scores of "High Excellent" ✓ Employee and Team Awards ✓ NASA Woman-Owned Small Business (WOSB) of the Year
Barrios' Subcontracts	✓ Award fee scores of "High Excellent" ✓ Employee and Team Awards ✓ Boeing Exceptional Performance Award ✓ United Space Alliance WOSB of the Year

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