



Marshall Space Flight Center

Mission Operations Training and Execution

Marshall Space Flight Center (MSFC) provides the necessary capabilities to perform the end-to-end mission operations for space science endeavors. As the NASA leader for space science utilization and operations on the International Space Station, MSFC has developed the infrastructure and expertise for integrating commercial, educational, and government customer science requirements and concepts to successfully execute space science operations.



Instructor led Training

Remote Science User, Ground Systems Interface, and NASA Tools Training

In most cases, the customer operations centers are not located at MSFC and may be in another city, state, or country. MSFC provides the NASA tools and training necessary to enable the customer to operate their science hardware through MSFC's ground control network located at the Huntsville Operations Support Center (HOSC).

Customer training is an integral part of science operations execution. This training will familiarize the customers with the science operations environment, command protocols, and communication expectations necessary for mission success.

Flight and Ground Controller Training and Certification

MSFC has developed training methods that equip and enhance flight controller competencies required for successful science mission operations. This training is built around the Four Keys of Science Payload Operations: Communication, System Knowledge, Critical Thinking, and Leadership. Training curriculums and related instructional courses provide flight controllers with system and operational knowledge that is the foundation for flight controller development.



Glass Rack Trainer

The Flight Control Team (FCT) is comprised of multiple flight controllers providing expertise over various aspects of operations such as ground control network, science operations, command and data handling, safety, communications, and planning. The FCT is trained to work together as one unit, sharing their knowledge and experience for efficient science operations. Event simulation training is used to develop critical thinking and communication skills to effectively resolve issues which arise during operations. Instructors assess flight controller candidates throughout the training process. Leading to the desired result, certified flight controllers ready to support any mission need.

XR (Virtual and Augmented Reality) Training Assessment Simulation Model Development

By utilizing XR (virtual and augmented reality) capabilities, MSFC's Mission Training Complex (MTC) will allow users to interact with virtual 3D models and overlays through Augmented Reality (AR) headsets, blending digital elements with the virtual and physical training environments. This enhances spatial awareness and practical engagement by creating life-sized virtual objects that can be used for mission-specific training without needing physical hardware.



XR (virtual and augmented reality) training

Mission Execution

Our team of highly trained and certified flight controllers brings extensive experience in all aspects of payload integration and planning, ensuring the successful execution of payload operations for scientific data collection. We prioritize the safety of the crew, vehicle, and payload hardware in every mission. Our flight controllers are equipped to support a wide range of mission types, including ISS operations, free-flyer missions, and payload activities on the lunar surface and beyond.

Crewed Mission Execution

We develop products to support every facet of crewed missions, focusing on training crews to perform science operations safely and effectively in the space environment. Our comprehensive approach ensures that crew members are fully prepared to handle the unique challenges of space, with a strong emphasis on both operational efficiency and safety throughout the mission. We create crew procedures, mission timelines, and ground support products to equip the flight control team in supporting all mission activities.



Free Flyer

Uncrewed Mission Execution

In addition to crewed missions, we specialize in uncrewed mission support. Our team develops mission timelines, resolves resource conflicts, and prepares command load sequences to enable hardware to execute science operations autonomously, with minimal human-in-the-loop support from the ground flight control team.

National Aeronautics and Space Administration

Marshall Space Flight Center
Huntsville, AL 35812
www.nasa.gov/center/marshall

www.nasa.gov/

MSFC-02-2025-G-657270 (57)

Doing Business With MSFC

