

Marshall Space Flight Center

Systems Development, Integration, and Test

Engineering Solutions for Space Science and Exploration

Systems Development, Integration, and Test

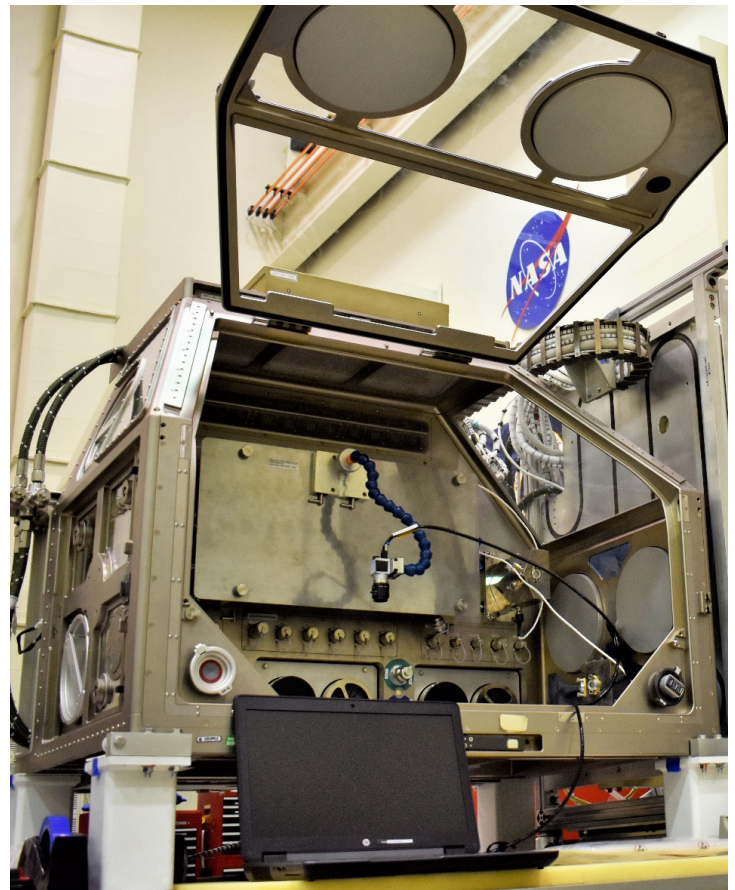
The Systems Development, Integration, and Test Division provides testing of instruments, racks, payloads, and subsystems, as well as development of specialized sensors and science instruments. This division offers subject matter experts in payload, satellite, lander, International Space Station (ISS) facilities and Environmental Control and Life Support Systems (ECLSS) development, integration, testing, and on-orbit operations.

- Plans and implements ground test programs for qualification and certification of flight projects
- Designs and develops special test equipment and related software to test functionality of flight hardware
- Develops flight hardware and hardware test beds to support proof of concept, breadboard, and subsystems/systems validation

Capabilities

Instrument Development, Integration, and Test

- Performs development, integration, and testing of:
 - ISS facilities, payloads, and sub-payloads
 - Satellites and CubeSats
 - Landers
- Develops specialized science instruments and payloads
- Labels/packages and ships flight hardware
- Provides launch site and post-launch integration/de-integration and testing
- Supports on-orbit operations and anomaly investigation
- Performs hardware-in-the-loop (HWIL) avionics and software testing and human-in-the-loop day-of-launch testing with capability of integrating across multiple NASA centers
- Performs proof and leak tests of flight and ground hardware and test systems



Life Sciences Glovebox engineering unit.

Environmental Control and Life Support Systems

- Develops new technologies and improved components for ECLSS air and water systems, from ideas to flight
- Supports system management activities related to ECLSS air and water systems on ISS and new exploration missions
- Performs system architecture studies and planning for ISS and new exploration missions
- Offers a controlled environment and integrated testing of ECLSS hardware

Facilities

Space Systems Integration and Test Facility (SSITF)

- 10,000-square-foot temperature and humidity controlled high bay
- 20-ton overhead crane
- Forklifts, hydraulic lift carts, and work platforms
- Gas distribution panels
- 110 V and 208 V 3F power, including a 100 kVA 80 kW un-interruptible power supply
- Facility grounding system; ESD workbenches
- Payload Rack Checkout Unit (PRCU)
- Machine Shop



SSITF high bay.

Mechanical Components Test Facility (MCTF)

- High-pressure test cell capable of supporting up to 5,000 psig
- 0.5-ton crane
- Wide range of pressure and flow instrumentation
- Leak-detection equipment to perform vacuum and pressure decay leak tests and fluid flow testing



MCTF vacuum chamber and mass spectrometer.

ECLSS Facility

- 24,000-square-foot high bay (120 ft by 200 ft), controlled environment
- Two 90-ton cranes with two 45-ton hooks each
- Air and Water ECLSS Ground Test Hardware (up to 150 psig), gaseous nitrogen, and ultra-pure (18M-ohm) water; 120-V, 208-V 3F, 480-V 3F power sources
- ESD workbenches
- Environmental chambers for integrated ECLSS testing; regenerative ECLSS module simulator
- Machine Shop and MakerSpace for rapid prototyping
- Chemistry laboratory
- Machine shop



ECLSS high bay.

National Aeronautics and Space Administration

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