Payload Rack Checkout Unit (PRCU) Capabilities

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- The Payload Rack Checkout Unit (PRCU) is housed in the Space Systems Integration & Test Facility (SSITF) on Marshall Space Flight Center

- SSITF is a multi-purpose facility that enables and supports development, qualification testing, and operation of on-orbit payloads from proof-of-concept to real-time deployment

Available resources

- Internal Thermal Control System (ITCS)
  - MTL or LTL temperatures
  - Flow rate
- Electrical Power System (EPS)
  - Main and Aux Channels
- Vacuum System
  - Pump down to 10^{-5} Torr
- Nitrogen Gas System
- Command & Data Handling
  - MIL-STD-1553
  - Medium Rate Data Link (MRDL)
  - High Rate Data Link (HRDL)

External Connections

- Joint Station LAN (JSL) lab
- Huntsville Operations Support Center (HOSC)
- Remote Payloads
  - Direct connection to payload
  - Via HOSC deployed router that is provided once the requirement is levied

- Flight Engineering Units
  - Payload Multiplexer/Demultiplexer
  - EXPRESS Rack
  - Microgravity Science Glovebox (MSG)
  - Materials Science Research Rack (MSRR)
  - Life Science Glovebox (LSG)
- Computers
  - PLMDM Interface
  - EXPRESS Laptop
  - Enhanced HOSC System PC (EPC)

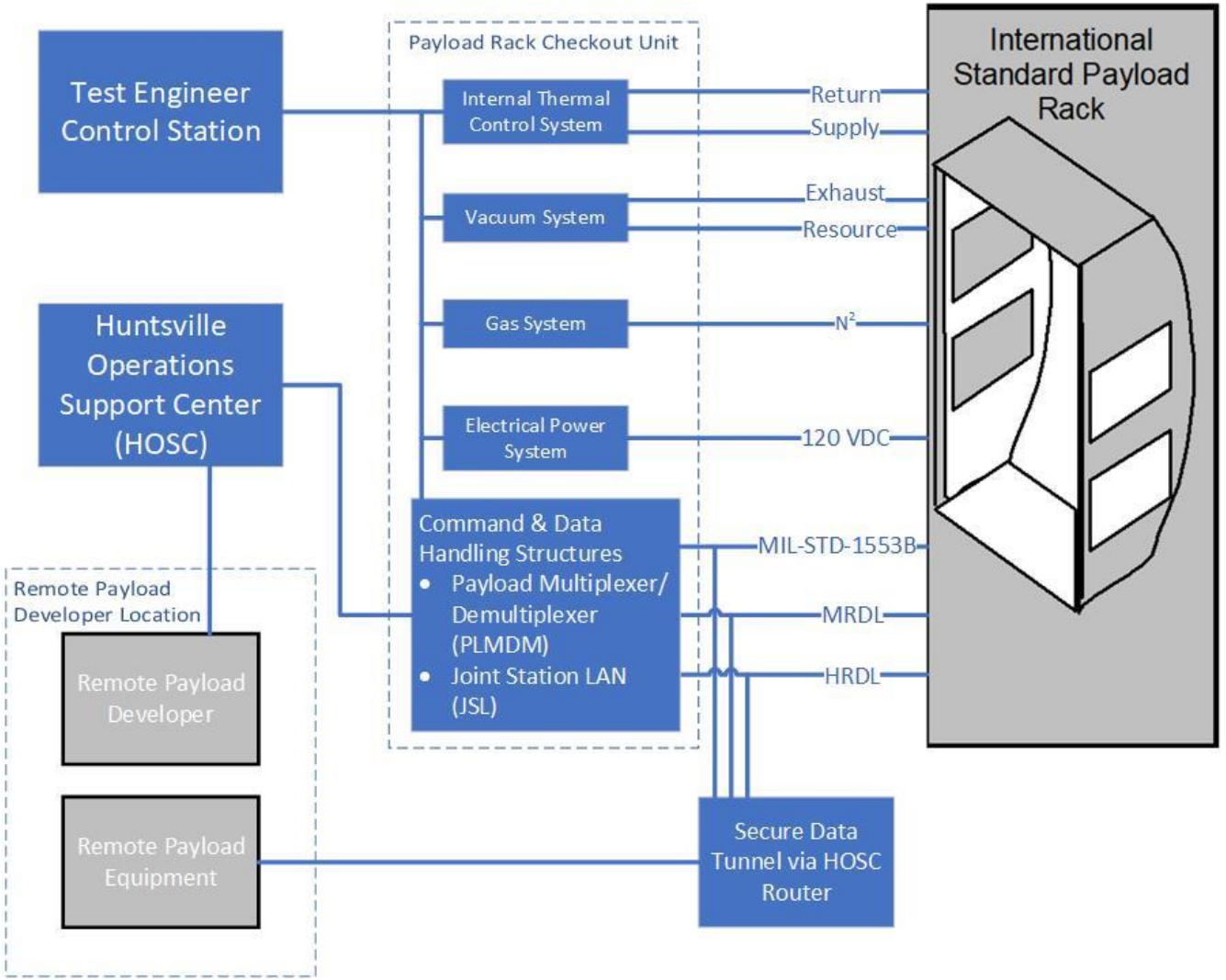
What does this mean?

The PRCU enables users to perform qualification and acceptance testing prior to on-orbit operations by providing access to resources in an ISS-analogous environment.

- Payloads
  - Directly interface with EXPRESS rack and PLMDM
  - End-to-End testing
  - Systems checkouts
  - Verification with upcoming flight software

- Payload Developers
  - Remote payload testing
  - New procedures
  - Hardware verification
  - Firewall checkouts
  - Training

Remote Testing with the SSITF



Space Systems Integration & Test Facility (SSITF)

- Decades of experience with flight hardware
- Development, qualification, and acceptance testing
  - Environmental testing (Thermal vacuum chamber, Vibration, Electromagnetic Interference)
  - Hardware-in-the-Loop avionics and software testing
- Operations support and anomaly resolution
- Labeling and packaging
  - Pre- and post- shipment functional testing
- Proof and leak testing of flight and ground hardware and test systems
- Internal Thermal Control System (ITCS) water fills
  - Pre-flight filling with ITCS water
  - Vacuum leak check is performed as part of the fill process
  - Filtered for particulate below 10 microns
  - Cycled for 24 hours to ensure no air bubbles or particulate remain

Space Systems Integration & Test Facility (SSITF) (cont'd)

- High Bay
  - 10,000 ft^2, temperature and humidity-controlled ISO 8 Clean Work Area
  - Gas distribution panels
  - 20-ton overhead crane
  - Facility grounding system, Electrostatic Discharge workbenches
  - 100 kVA 80 KW Uninterruptible Power Supply
- Machine Shop
  - Bridgeport mills
  - Precision and motor lathes
  - 50-ton CNC Press Brake
- Leak lab
  - 5,000 psig high-pressure test cell
  - Wide range of pressure and flow instrumentation
  - Leak detection equipment to perform vacuum and pressure decay leak tests and fluid flow testing

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