



Payload Test and Checkout System (PTCS)

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AGENDA



- Program Roles: PTCS/PRCU
- PTCS Capabilities Overview
- System Configuration
- Physical Configuration
- Flight System
- PTCS Design
- Subsystems
 - » Fluids/Structures
 - » Power
 - » C&T
 - » C&DH
 - » PDSS/EHS-KSC
 - » TCMS
- Block Diagrams



Payload Rack Checkout Unit (PRCU)

- Distributed verification of payload interfaces to the ISS Interface Control Documents (ICDs)

Payload Test and Checkout System (PTCS)

- Final functional checkout of payload to ISS interfaces through the use of Flight Equivalent Units (FEUs) which use the latest available version of Flight Quality Tested (FQT) software
- Physical fit check of payload to ISS interfaces (at UIP)
- Validation of the MSFC PDSS/EHS system software and databases (command and telemetry) with flight experiments
- Local end-to-end checkout of ISS payload to ground system interfaces with telemetry downlink (non-RF) to the payload developer and command and control to the payload

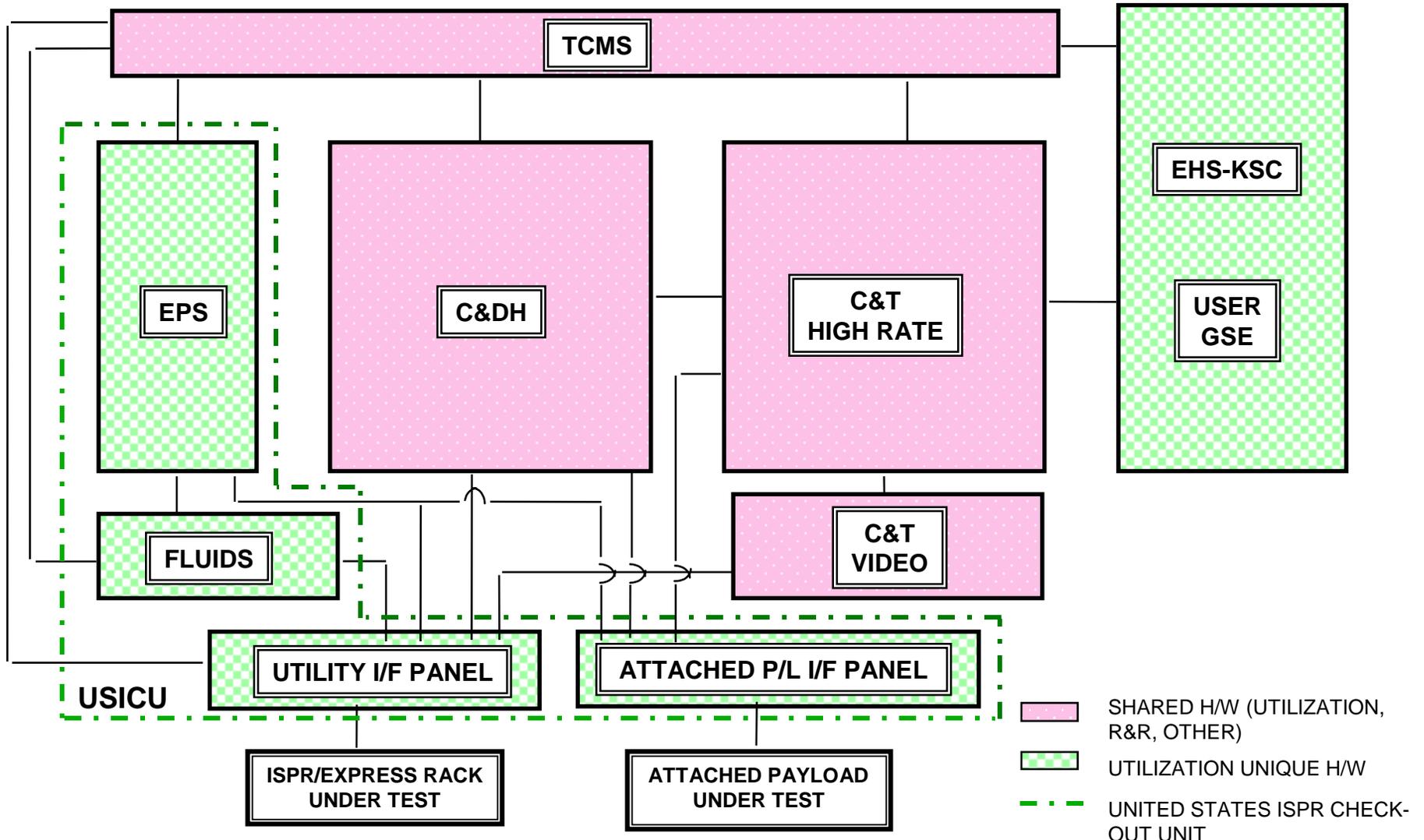
PTCS CAPABILITIES OVERVIEW



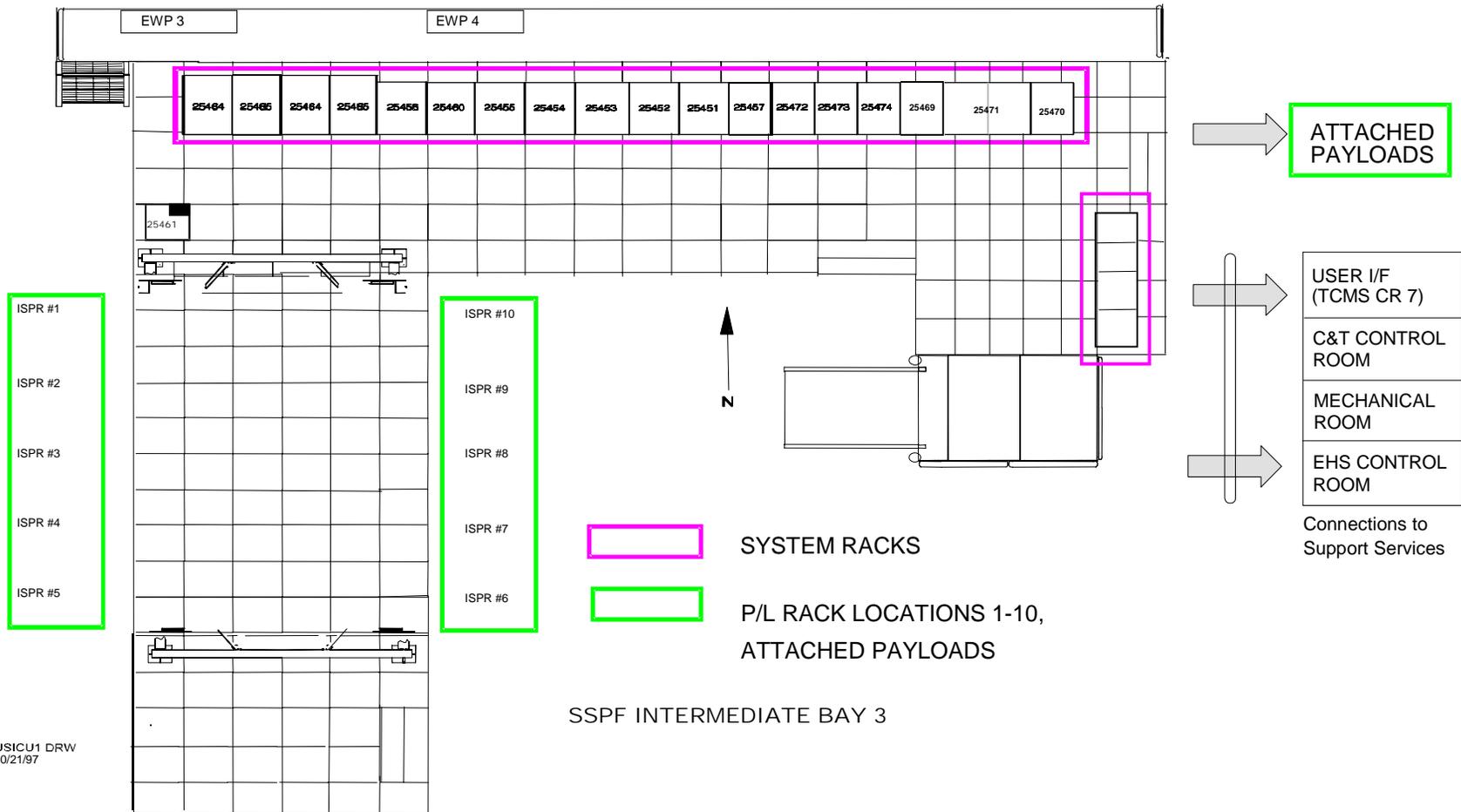
– PTCS PROVIDES:

- » **Final functional checkout of payload to space station interfaces for U.S. Payloads (ISPR, EXPRESS, or Attached) operating in the U.S. Lab, International Partner (IP) Labs, the Truss, or IP Exposed Facilities**
- » **Single payload - multi rack active checkout**
- » **Patchable to multi rack locations**
- » **Subsystem interface testing**
 - **Fluids/Structures**
 - **Power**
 - **Communication and Tracking (C&T)**
 - **Command and Data Handling (C&DH)**
- » **Services provided:**
 - **Payload Data Services System (PDSS-KSC)**
 - **Enhanced HOSC (Huntsville Operations Support Center) System (EHS-KSC)**
 - **Test Control & Monitoring System (TCMS)**

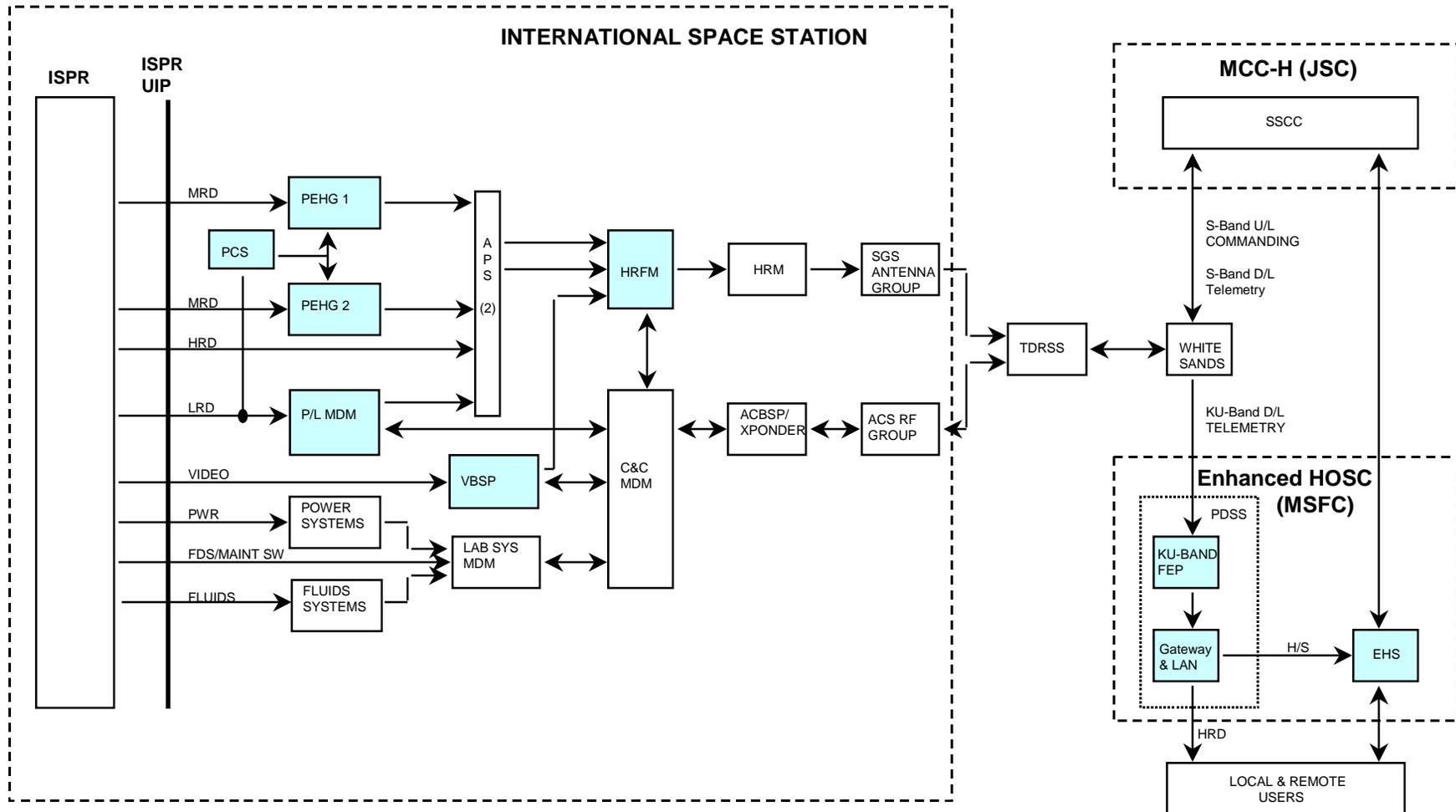
SYSTEM CONFIGURATION



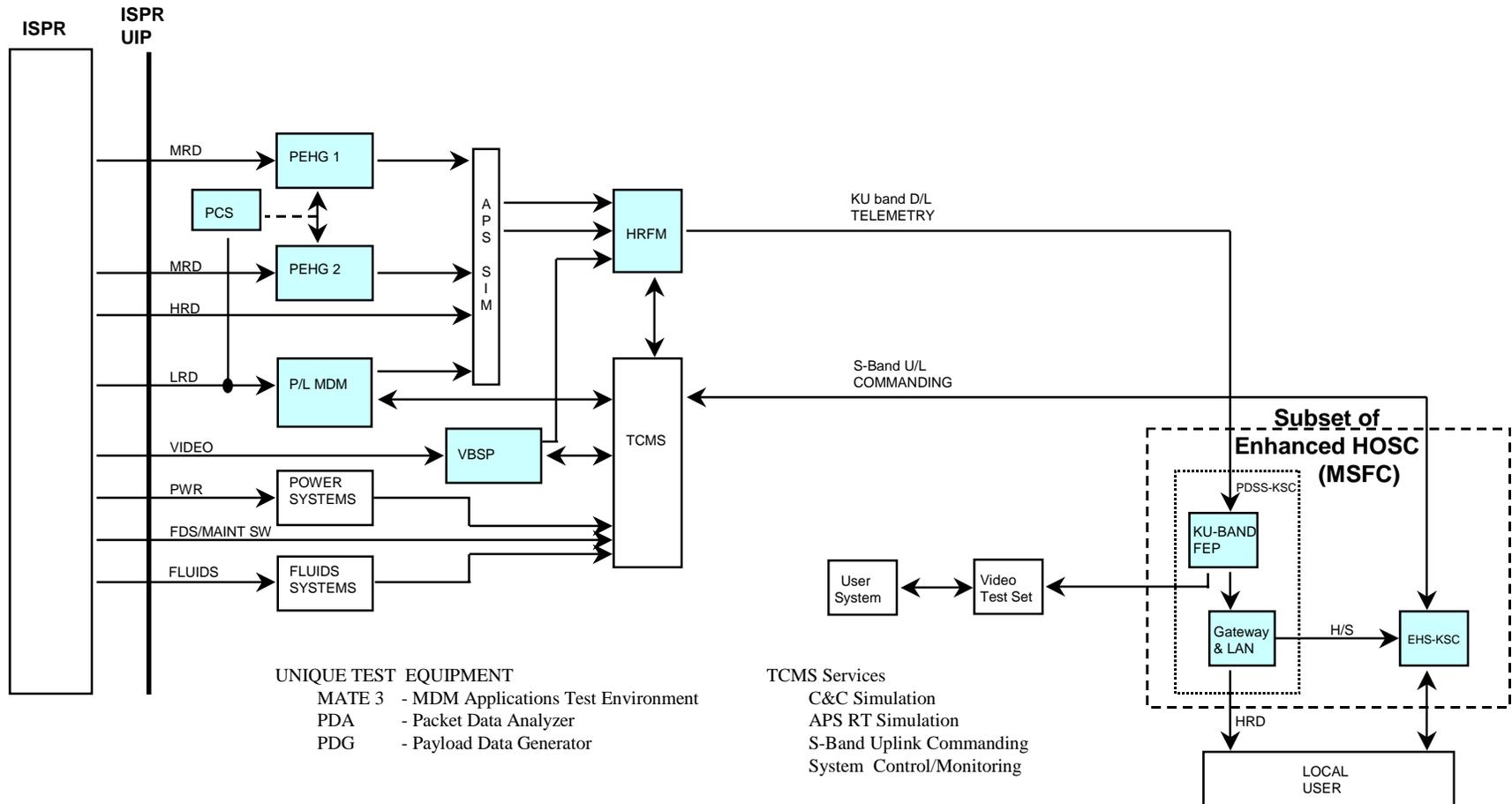
PTCS PHYSICAL CONFIGURATION



FLIGHT SYSTEM



PTCS DESIGN



UNIQUE TEST EQUIPMENT
 MATE 3 - MDM Applications Test Environment
 PDA - Packet Data Analyzer
 PDG - Payload Data Generator

TCMS Services
 C&C Simulation
 APS RT Simulation
 S-Band Uplink Commanding
 System Control/Monitoring

SUBSYSTEMS



FLUIDS/STRUCTURES (USICU)

- System Capabilities:
 - » Includes GN₂, Vacuum Exhaust, Vacuum Resource, Thermal, Raised Access Floor, and Support Structure

POWER SUBSYSTEM (EPS-USICU)

- System Capabilities:
 - » Provides Interface B and Interface C power from Power Distribution Assembly (PDA)
 - » Allows local control via panel and remote control via TCMS

SUBSYSTEMS



COMMUNICATION AND TRACKING (C&T)

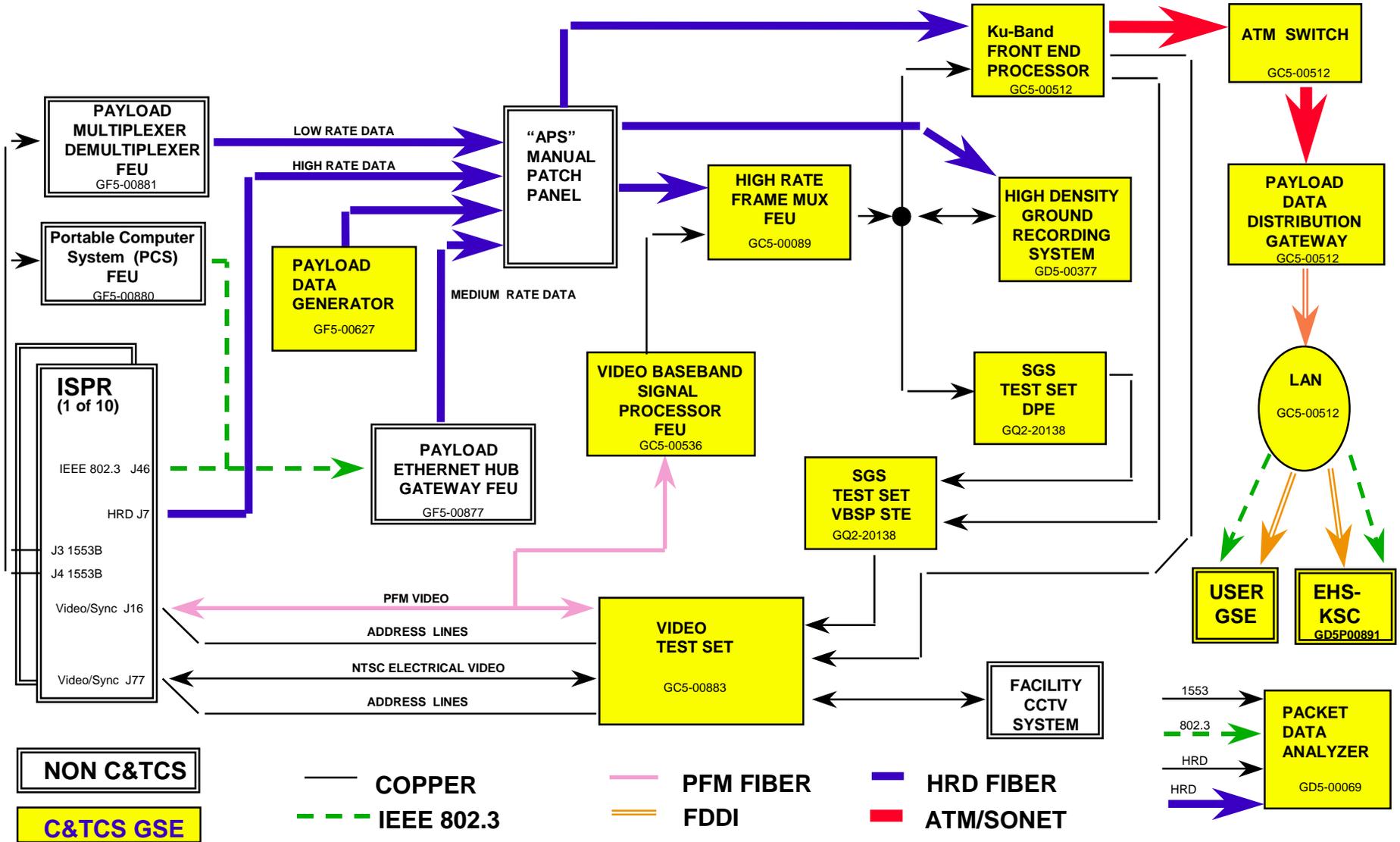
- System Capabilities:
 - » System provides high fidelity compliment of on-orbit interfaces through the use of Program FEUs (HRFM, VBSP)
 - » Provides services to verify video and telemetry pathways/interfaces

COMMAND & DATA HANDLING (C&DH)

- System Capabilities:
 - » System provides high fidelity compliment of on-orbit interfaces through the use of Program FEUs (PL MDM, PEHGs)
 - » Provides services to verify command and data pathways/interfaces

INTERNATIONAL SPACE STATION

KSC PTCS
INTEGRATION TEAM



SUBSYSTEMS



PDSS/EHS-KSC (Payload Data Services System/ Enhanced HOSC System - KSC)

– **System Capabilities:**

- » PDSS-KSC provides payload telemetry routing and distribution to EHS-KSC and User GSE.
- » EHS-KSC provides a user interface for uplinking data to ISPR/AP and accepting health and status data from the ISPR/AP
- » PDSS-KSC is a subset of the MSFC PDSS system (H/W and S/W)
- » EHS-KSC is a subset of the MSFC EHS system (H/W and S/W)

TEST CONTROL MONITOR SYSTEM (TCMS)

– **System Capabilities:**

- » Utilization: Payload to station interface tests
- » Resupply/Return; MPLM post delivery verification, prelaunch checkout, and launch operations

PTCS CONFIGURATION

