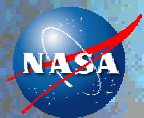


EXPRESS Pallet

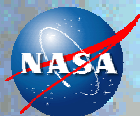
Mark Steiner/K3MS
Frank Bauer/KA3HDO

March 2004
ESTEC

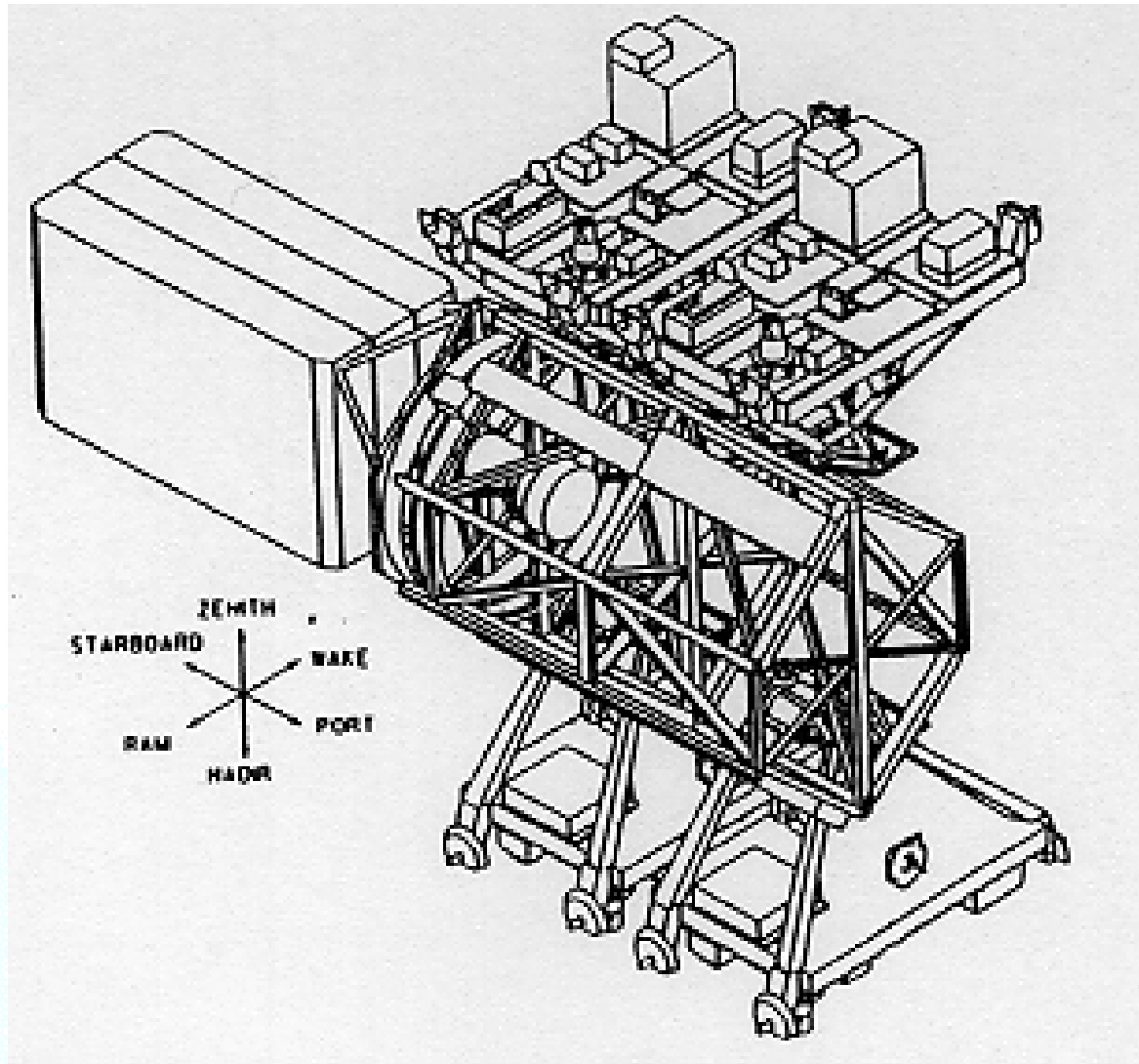


EXPRESS Pallet Overview

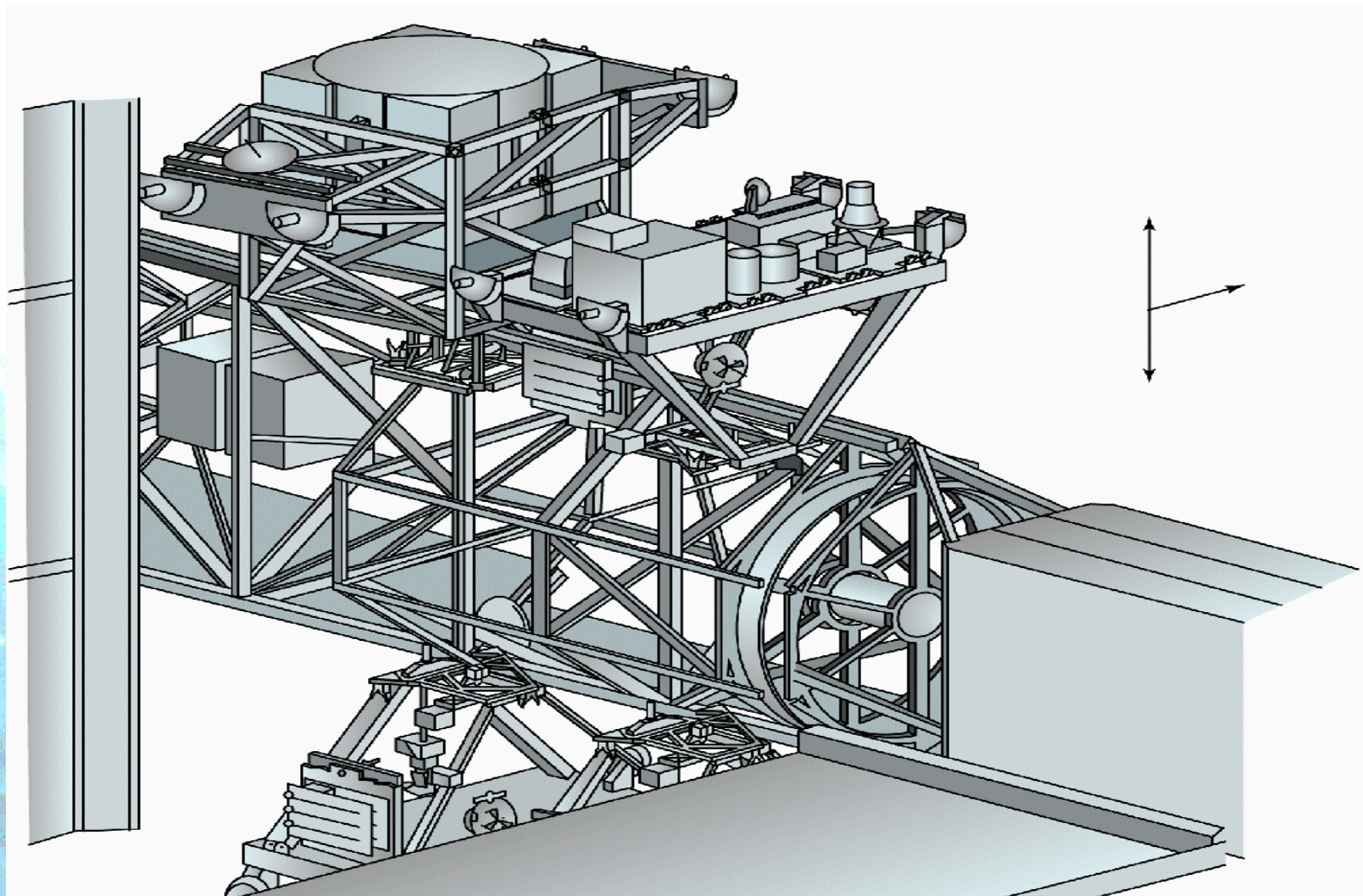
- EXPRESS Pallet is a system to mount external payloads to the ISS
- EXPRESS is the acronym for:
 - **EX**pedite the **PR**ocessing of **E**xperiments to **S**pace **S**tation. The EXPRESS program consists of two separate systems: the EXPRESS rack for pressurized payloads and the EXPRESS pallet for attached payloads.
- Attached Payloads are located outside of the pressurized volume of the space station on the truss. The EXPRESS Pallet can be located at any site on the truss segment and has six robotically replaceable adapters for payloads or payload complements.
- Attached payloads may use the station power, command and data handling system and video. The crew will interface using robotics for installation and removal of the attached payloads, with no nominal extravehicular activity operations anticipated.



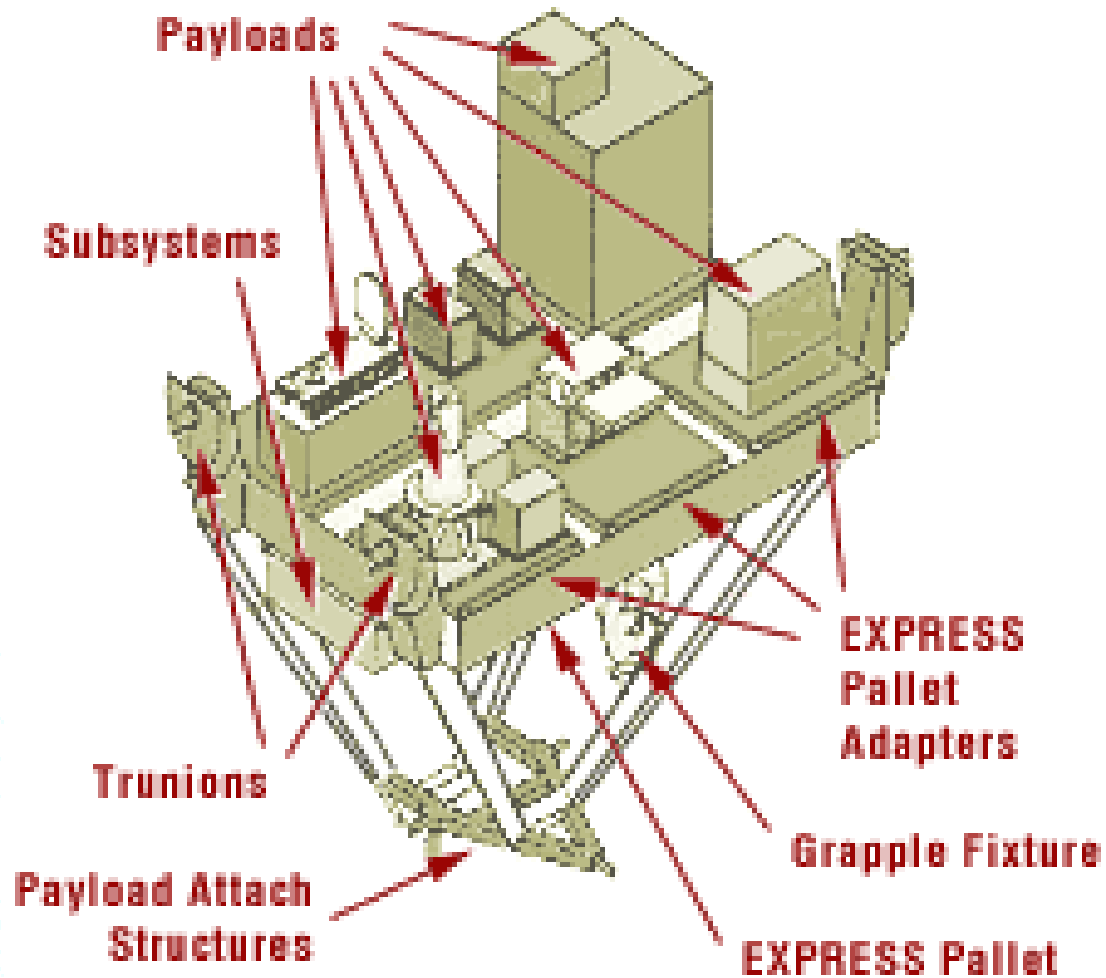
EXPRESS Pallet Views - 1



EXPRESS Pallet Views - 2



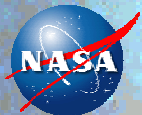
EXPRESS Pallet Views



Express Pallet – Capabilities*

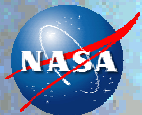
- Express Pallet carrier can handle multiple payloads on one truss
- Capabilities of whole Express Pallet (to be shared among all attached experiments):
 - Data
 - Low rate command, control, telemetry via MIL-STD-1553B bus, <1 Mbps
 - High rate data via fiber optic, being upgraded to 150 Mbps burst
 - Downlink not real-time, at best every few orbits
 - No active thermal control provided
 - Robotic installation and retrieval primary, EVA contingency
 - Carrier
 - Must provide own structure on-orbit
 - Over 2500 Kg, payload provides carrier/interface to Shuttle
- Pointing
 - Knowledge 0.1 deg at GPS sites
 - Degrades with distance to ~1-2 deg at S3 attach sites
 - Working on improving knowledge at S3 truss site
 - Stability 2.5 deg/axis/orbit

* - for previous program incarnation, subject to change



Design Considerations

- Is external to ISS, so must follow satellite design practices (unpressurized environment)
- Close proximity to other experiments, so will tightly couple to them and interactions will need to be tightly controlled
 - thermal
 - RFI
 - fields of view
 - shared power
- Little or no crew interaction after installation
- Lots of possibilities:
 - Amateur Television, including digital
 - Repeaters
 - ???



Current Status

- EXPRESS Pallet is now being developed at NASA-Goddard
 - schedule TBD
- ARISS-US team has begun to contact EXPRESS Pallet team
 - establish relationship
 - understand design and development process
 - understand possible locations on exterior of ISS
 - begin process of possible inclusion of amateur radio experiment on platform
- ARISS-US team will continue to pursue this option and communicate status and options to international team

