



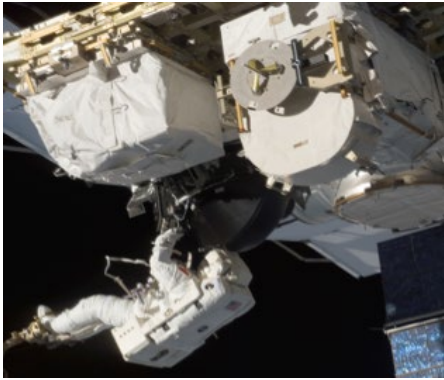
**FRAM-BASED CARGO SOLUTIONS**

# LOW COST, HIGH CAPABILITY

Our FRAMs are a highly capable, low cost experiment platform that can be used to introduce space science to users from emerging space and technology developing countries. Our portfolio of commercial, “ready products” for electrical power, and thermal management can be applied to support unique payload applications. This reach-back to “ready products” designed specifically for the commercial space market can be leveraged to offer cost effective services and solutions for extending the FRAM mission and market capture.

We have a heritage of developing complex and reliable flight hardware while maximizing value for our customers. We have produced and delivered FRAM systems to the ISS with 100% mission success with no history of quality or workmanship issues. Our FRAM solutions offer the best combination of operational flexibility, supply chain responsiveness, and cost efficiency available in the commercial market. Collins Aerospace operates a Quality Management System that complies with the requirements of ISO 9001:2008 & AS9100C.

We have a proven and robust FRAM supply chain with multiple qualified vendors for machined parts and environmental testing services. Our broadened focus on supply chain management ensures customers receive high quality flight hardware at the right time and at the most competitive price. Having multiple qualified vendors drives competitive cost and schedule, and mitigates risks associated with constrained capacity. The operational flexibility afforded by our wide, experienced supply chain mitigates schedule risk and minimizes the impacts associated with manifest changes.



*Collins Aerospace FRAM on ISS*



**KEY FEATURES & BENEFITS**

- Solutions structurally qualified for spacecraft launch environments
- NASA compliant materials for spaceflight
- Long service life
- “Reach back” to a range of specialists to ensure successful integration to your vehicle



## KEY CHARACTERISTICS

- Adapter Plate (AP) Assembly
  - Interface for mounting ORUs and payloads
- Active FRAM (AFRAM)
  - Mounts to non-ORU side of AP, and has mechanical drive system for making structural and electrical connections
- Passive FRAM (PFRAM)
  - Mounts to vehicle side Interface Plate; Contains mechanical alignment and anchoring points, as well as electrical connectors
- PFRAM Interface Plate (PIP)
  - Customized to launch vehicle to position and attach PFRAM components
- General ExPA FRAM Characteristics
  - Overall Mass: 255 lbs
  - Overall dimension: 46.05" x 47" x 13.06" (H)
  - Payload carrying capability: 34" x 46" x 49" (H) and 500 lbs
  - EVA compatible; contains EVA handrail provisions
  - EVR compatible; all EVR interfaces on ExPA
- ExPA FRAM Interfaces for Payload
  - Electrical: Power (120VDC & 28VDC), Four NATC connectors; Data (1553 Ethernet), Six NATC connectors
  - Active Heating, passive cooling
  - Structural: 2.756" x 2.756" Grid with 1/4"-28 UNF Locking Inserts and 1.625" diameter Shear Boss Provisions

Different FRAM configurations can be utilized to achieve as many as six electrical connections. Additionally, other adapter plates may be utilized to handle larger or heavier payloads.

Specifications subject to change without notice.



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