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NORTHROP GRUMMAN

CIRAS

The Commercial Infrastructure for Robotic Assembly and Services

The Commercial Infrastructure for Robotic Assembly and Services (CIRAS) program will advance key technologies for in-orbit manufacturing and assembly of large space structures to meet goals for robotic and human exploration of the solar system. CIRAS is a public-private partnership between Northrop Grumman and NASA's Space Technology Mission Directorate (STMD). Our teammates include NASA Langley Research Center, NASA Glenn Research Center, and the Naval Research Lab.

CIRAS will mature technologies necessary for robotic assembly of large space structures such as next-generation telescopes, solar-powered structures for transport, and communications platforms. These capabilities include reversible joints on a structure and addressing precision measurement and alignment through a 20-meter robotic arm and a precision robot. The first phase of the CIRAS program is to advance the technology readiness through a ground demonstration.

CIRAS will build upon the existing capabilities of Northrop Grumman's Mission Extension Vehicle (MEV) such as its rendezvous and docking capability. MEV-1 is currently in production at Northrop Grumman's Dulles, Virginia, satellite manufacturing facility and is scheduled for launch in 2018.

CIRAS was awarded under the NASA STMD's "Utilizing Public-Private Partnerships to Advance Tipping Point Technologies" solicitation. This program encourages commercial companies to mature technologies beyond their "tipping point" with the goal of developing and delivering them to market.

Mission Partners

NASA's Space Technology Mission Directorate

- NASA Langley Research Center
- TALISMAN Arm
- Jigging Assembly Robot (NINJAR)
- E-Beam Welder

NASA Glenn Research Center

- COMPASS Study
- Naval Research Lab
- Robot Control Software
- Integrated Robotic Workstation

Northrop Grumman

- CIRAS Mission Prime with Commercial Investment
- System Integrator
- Modular Truss Backbone
- Tool Changer & Tools
- Quick Disconnect Interface

Mission Objectives

To mature in-orbit satellite assembly technologies through a public-private partnership with NASA

Robotic Assembly

- Increase robotic assembly infrastructure
- Demonstrate robotic joining of modules

Reversible Joining Methods

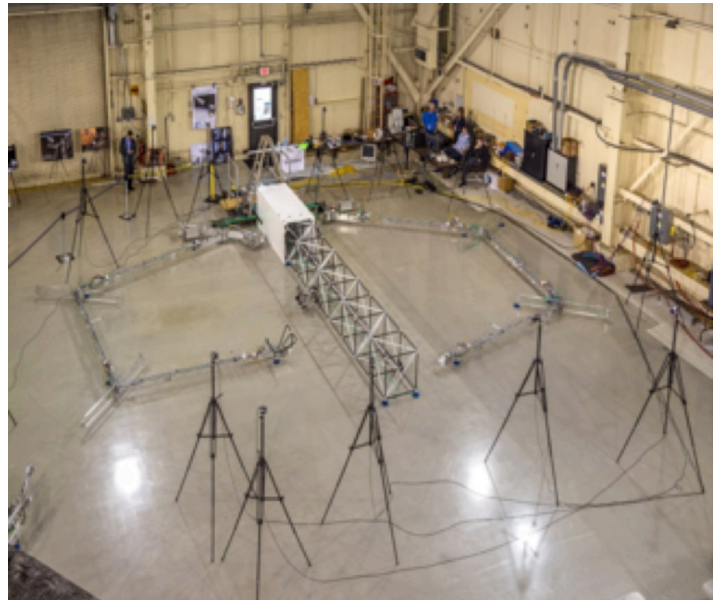
- Demonstrate precise, reversible, quick and simple mechanical and electrical connections

Metrology and Assembly Configuration

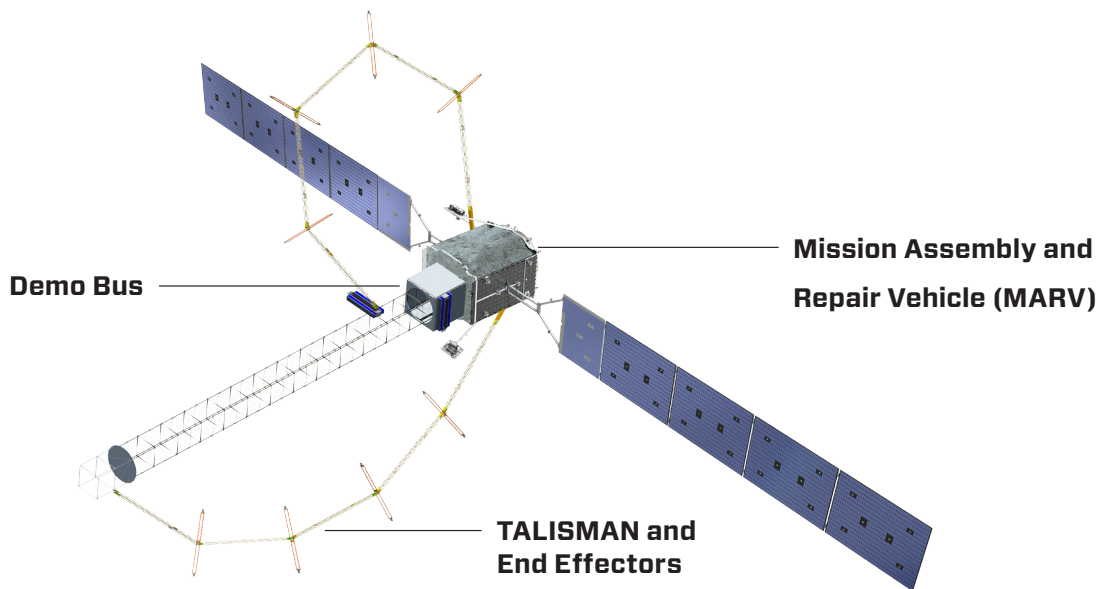
- Identify an approach to validate space assembly geometries

Modular Assembly

- Demonstrate simple, repeatable module-to-module interfaces for structural assembly



TALISMAN 1.5 demonstration at NASA Langley Research Center



More Information

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